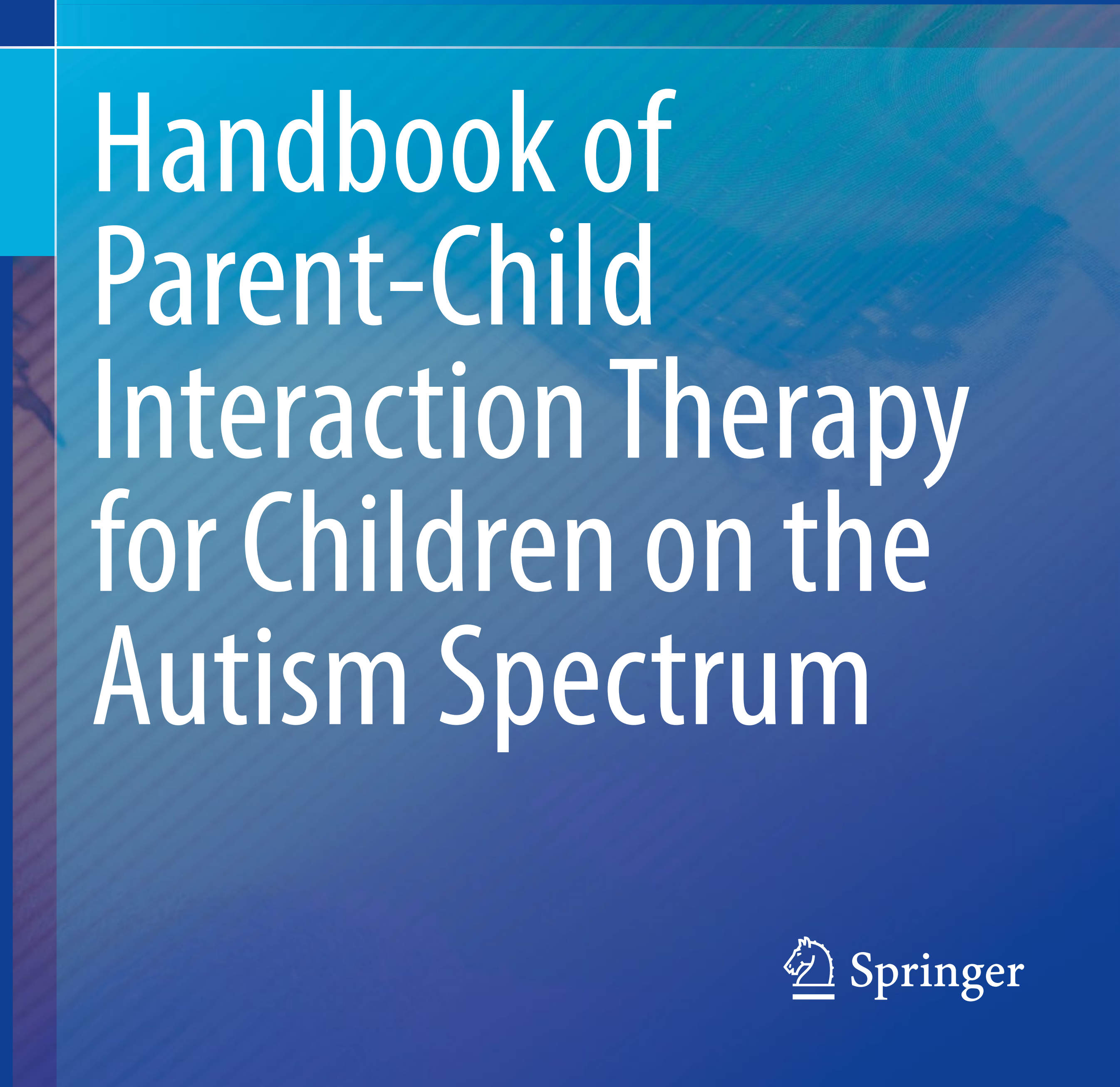
Cheryl Bodiford McNeil
Lauren Borduin Quetsch
Cynthia M. Anderson
Editors

Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum



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Cheryl B. McNeil
To my wonderful family, amazing doctoral students, brilliant mentors, passionate colleagues, and all of the struggling families referred to me for clinical care, thank you for inspiring me to explore new ways to make an impact in the field of children's mental health.

Lauren B. Quetsch
This book is dedicated to my husband, Tim, and my children, Layne and Connor, who bring joy and balance to my life. Their support and endless love shine a light on how important family is and how I am so lucky to dedicate my career to help others find that same light in their own families.

Cynthia Anderson
To the many individuals with autism spectrum disorder and their families that I have been lucky to work with and learn from, and to my incredible husband and son who keep me balanced and focused.

Foreword

According to the *Diagnostics and Statistical Manual, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by deficits in social interaction and communication, as well as restricted and repetitive behaviors, interests, and activities. Recent estimates indicate that as many as 1 in 59 children in the United States have ASD (Centers for Disease Control, 2018). Many children with ASD present with comorbid behavior problems that many families feel underprepared to address.

In this handbook, we highlight Parent-Child Interaction Therapy (PCIT) as a promising treatment for complementing evidence-based ASD services. In recent years, approximately one dozen published PCIT studies have demonstrated positive outcomes with children on the autism spectrum. Because PCIT is intended to serve as a complementary treatment for other evidence-based approaches, we review those approaches in some depth.

PCIT is an empirically supported parent training program originally designed for young children (2 to 7 years) with disruptive behavior problems. The intervention has been demonstrated to be effective for children presenting with a variety of child mental health concerns including separation anxiety, trauma, ADHD, intellectual disability, and depression. PCIT is unique in that it involves in vivo coaching of parents while they interact with their child, and typically is conducted with the therapist/coach stationed behind a one-way mirror. Parent and child skills are coded and graphed in each session to assess progress toward established mastery criteria; these data are used to guide intervention decisions.

This book compiles the collective knowledge of both PCIT and ASD researchers to present a foundation for the utilization of PCIT for children with ASD. It is the hope of the editors that PCIT will become a standard component of the milieu of services for young children in this population. In PCIT, the first phase of treatment, Child-Directed Interaction, is intended to improve the caregiver-child relationship and increase the social reinforcement value of the parent. The second phase of treatment, Parent-Directed Interaction, typically yields large and rapid changes in disruptive behavior, with noticeable improvements in compliance after only a few weeks of receiving this intervention stage. Research demonstrates that a short course of PCIT (~11–22 sessions; $M = 19$ sessions) for children with ASD leads to significant reductions in behavior problems (as measured using the Eyberg Child Behavior Inventory—Intensity Scale; Eyberg

& Pincus, 1999) from outside normal limits (88th percentile) to within normal limits (34th percentile) and substantial improvements in child compliance (from 41% to 87%) (e.g., Zlomke, Jeter, & Murphy, 2017; *N* = 17). In this handbook, we argue that PCIT is most effective when provided early in the treatment process, either while waiting for intensive services (e.g., applied behavior analysis) to begin or concurrently with necessary interventions. For higher functioning children with disruptive behavior, PCIT can be conceptualized as a gateway intervention in that it systematically trains parents to quickly modify noncompliance, aggression, and tantrums and thereby improves the effects of other services often required by children on the autism spectrum (e.g., occupational therapy, speech therapy).

The handbook is broken into four sections. The first section of the book, "Conceptual Foundations of Evidence-Based Approaches for Autism Spectrum Disorder," provides an overview of the evidence-based interventions for children on the autism spectrum, all of which are derived from the science of behavior analysis. This section describes core characteristics of children with autism, the conceptual and scientific foundations of applied behavior analysis, effective models of treatment for youth with autism as well as unsubstantiated treatments for this population that are still present.

The second section of the book, "Evidence-Based Approaches to Treating Core and Associated Deficits of Autism Spectrum Disorder," reviews the evidence-based approaches to increase skills such as communication and social interaction and reduce problematic behavior such as self-injury or stereotypic behavior that interferes with learning. This is also includes a discussion of strategies for complex and challenging behaviors. The section concludes with specific and feasible recommendations for assessing potential treatments and determining whether a given intervention is both empirically supported and a good match for a particular child.

The third section of the handbook entitled "Parent-Child Interaction Therapy (PCIT) and Autism Spectrum Disorder: Theory and Research" gives an overview of PCIT, the theory behind using PCIT with an ASD population, and preliminary studies using PCIT for children with ASD. A training requirements chapter rounds out this section by detailing the steps needed to become a PCIT therapist or trainer, and the recommended qualifications or additional education needed by PCIT therapists who intend to work with ASD populations. This section elucidates the foundational principles and mechanisms through which PCIT has achieved such powerful effects with disruptive behavior (e.g., Cohen's d's of well over 1.0) for children with ASD.

The final section of the book focuses on clinical considerations when using PCIT for children on the autism spectrum. Adaptations for treatment implementation are highlighted as researchers and clinicians work to address the unique needs of these families and children. Considerations are presented for implementing this treatment based on the level of autism severity and comorbid conditions. Using a quick-reference, outline format, the final chapter (McNeil & Quetsch) brings together the most salient clinical takeaway messages from the handbook, providing numerous helpful hints for clinicians working with families of children on the spectrum. Additionally, the final chapter provides information regarding a novel Social-Directed Interaction phase that can be added to the protocol to address core ASD symptomatology.

This handbook summarizes recommendations for using PCIT with children on the autism spectrum that are based upon a growing body of literature and hundreds of clinical cases. It is our hope that this book will encourage current PCIT providers to expand their referral base to include children on the autism spectrum. We also hope that this handbook sparks interest in the community of providers using traditional treatments with young children on the autism spectrum to learn more about PCIT and consider including the service as part of an empirically supported continuum of care.

Given that caregivers report that their greatest source of parenting stress is the aggression, noncompliance, and tantrums often associated with autism, a short course of PCIT could enhance family wellness with quick, and often dramatic, improvements in disruptive behavior. In this way, PCIT could be an important preventive approach to reduce behavior problems and dysfunctional parent-child interaction patterns that can occur when families have little specialized training in how to parent children on the spectrum. Our vision is to develop a network of providers and researchers with expertise in PCIT-ASD who can provide and evaluate the impact of this treatment as a standard component of a “best practice” continuum of care. Ultimately, we hope to make PCIT readily available as a resource for families with young children on the autism spectrum.

Acknowledgments

This book is the embodiment of a lifelong dedication to young children and families across a number of incredible clinicians and researchers. In turn, this book would not have been possible without their tireless efforts to understand the unique needs of families who are often overlooked or misunderstood. We would like to thank our colleagues for lending their minds to help us build a foundation for clinical understanding while continuing to question our preconceptions about autism spectrum disorder. In turn, our colleagues in the PCIT community have been essential in helping us piece together the puzzle of adapting an evidence-based treatment to address the complex needs of children with ASD.

Specifically, we would like to thank Dr. Sheila Eyberg, the founder of PCIT, for developing this powerful and caring approach to helping families. Thanks also to Dr. Joshua Masse for his willingness to conduct pioneering research in the area of PCIT with ASD while a doctoral student at West Virginia University. To the ABA researchers and clinicians who developed the best practices in this field, we are grateful for your technological discoveries about behavior modification and communication training that are infused in this work. Thanks also to all of our overworked chapter authors who performed under tight deadlines to provide an important service to the profession. And, lastly, this book is dedicated to the loving families who have put their trust into our hands as we explored a new approach to working with young children on the autism spectrum. Please know that we send you a heartfelt "thank you" for informing all that is written in this text.

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Cheryl, Bodiford, McNeil, Ph.D. is a Professor of Psychology in the Clinical Child program at West Virginia University. Her clinical and research interests are focused on program development and evaluation, specifically with regard to adapting treatments and managing disruptive behaviors of young children in both the home and school settings. Dr. McNeil has coauthored several books (e.g., *Parent-Child Interaction Therapy, Second Edition, Short-Term Play Therapy for Disruptive Children, Parent-Child Interaction Therapy with Toddlers: Improving Attachment and Emotion Regulation*), a continuing education package *(Working with Oppositional Defiant Disorder in Children*), a classroom management program (*The Tough Class Discipline Kit*), and a Psychotherapy DVD for the American Psychological Association (*Parent-Child Interaction Therapy)*. She has a line of research studies examining the efficacy of Parent-Child Interaction Therapy and Teacher-Child Interaction Training across a variety of settings and populations, including more than 100 research articles and chapters related to the importance of intervening early with young children displaying disruptive behaviors. Dr. McNeil is a master trainer for PCIT International and has disseminated PCIT to agencies and therapists in many states and countries, including Norway, New Zealand, Australia, Taiwan, Hong Kong, and South Korea.

Lauren Borduin Quetsch, M.S. will complete her doctoral degree in the Clinical Child Psychology program at West Virginia University in 2019 under the mentorship of Dr. Cheryl B. McNeil. Mrs. Quetsch's research interests include the dissemination and implementation of evidence-based treatments (EBTs) in community settings as well as the adaptation of EBTs for young children with severe behavioral problems. As a research associate at West Virginia University, Mrs. Quetsch already has more than 20 publications and plans to continue in a research-focused faculty position after graduating from West Virginia University and completing her internship.

Cynthia M. Anderson, Ph.D., B.C.B.A.-D. is the Senior Vice President of Applied Behavior Analysis for the May Institute. She holds a joint appointment as the Director of the May Institute's National Autism Center. Dr. Anderson provides consultation and support to clinical staff supporting individuals exhibiting challenging behavior such as self-injury, aggression, and property destruction. In addition, she also promotes research in and dissemination of evidence-based practices through the National Autism Center. Dr. Anderson received her Ph.D. in Clinical-Child Psychology from West Virginia University. She is a licensed psychologist and a Board Certified Behavior Analyst at the doctoral level. Dr. Anderson currently serves as the Applied Representative on the Executive Council of the Association for Behavioral Analysis International and is the Representative at Large for Division 25 of the American Psychological Association. She has provided editorial support to numerous journals including serving as Associate Editor for *School Psychology Review* and *Journal of Behavioral Education*, and on the editorial boards of the *Journal of Applied Behavior Analysis*, *The Behavior Analyst*, and other journals.

Part I

Conceptual Foundations of Evidence-Based Approaches for Autism Spectrum Disorder

1

What Is Autism Spectrum Disorder?

Hannah Rea, Krysta LaMotte,
and T. Lindsey Burrell

Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder with social-communication deficits and restricted and/or repetitive behaviors and/or interests. The diagnostic criteria of the disorder have evolved over the years with new research on the features, associated symptoms, prevalence, and etiology of the disorder. This chapter offers an overview of the presentation, development, history, prevalence, and impact of ASD on the child and family. Research on the etiology of ASD, including potential risk factors and dispelled myths, is summarized.

1.1 The Diagnosis and Presentation of Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a neurodevelopmental disorder associated with deficiencies or excesses in two domains: social-communication and restricted, repetitive behaviors and interests (American Psychiatric Association [APA], 2013). Social-communicative skills and restricted and repetitive behaviors and interests vary across individuals with and without a diagnosis of ASD. These distinct domains can be atypical or normative depending on where an individual falls within the spectrum of the behavior. Behaviors of individuals with ASD and normative samples are etiologically and qualitatively related; however, individuals who do not meet the criteria for ASD may not demonstrate abnormalities in those domains, may exhibit abnormalities in a single domain, or may display minimal difficulties in both domains (Constantino & Todd, 2003). Individuals with ASD must exhibit impairment in social-communication and restricted, repetitive behavior and interest, but they are heterogeneous in presentation and severity of impairment. The purpose of this chapter is to describe the history and presentation of ASD by introducing the diagnostic criteria, common presentation and development of the disorder and comorbidities in children, and risk factors that contribute to the disorder.

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1.1.1 Diagnostic Criteria

The diagnostic criteria for ASD that are most commonly used by clinicians in the United States are derived from the American Psychiatric Association's Diagnostic Statistical Manual, Fifth Edition (DSM-5 2013). The DSM-5 states that ASD impairments in the domain of social-communication include failure to initiate and/or reciprocate emotional and social exchanges, abnormalities in nonverbal communication behavior and understanding, and/or difficulties forming and sustaining relationships. The DSM-5 criteria for restricted interests and repetitive behavior include the presentation of at least two or more of the following: stereotyped or repetitive movements or speech (e.g., flapping arms back and forth or repeating the same sentence/phrase), rigidity in routine, abnormalities in domain or intensity of interests, and/or abnormalities in reactivity to sensory input (APA, 2013). Despite these specific diagnostic criteria, consistency in presentation across and within individuals and reliability of diagnosis are fairly low (Falkmer, Anderson, Falkmer, & Horlin, 2013) depending on developmental period, severity of impairment, and genetic, medical, and psychosocial comorbidities, which are described below. See Table 1.1 for diagnostic criteria and examples.

1.1.1.1 Social-Communication Deficits

Social-communication deficits or excesses are often the first sign of ASD, and can appear within the first year of a child's life (Guthrie, Swineford, Nottke, & Wetherby, 2013; Richler et al., 2006; Sacrey et al., 2015). Early social-communication difficulties may include abnormalities in the use of nonverbal expressive and receptive communication, such as gestures and imitation of facial expressions. Before children can speak, most neurotypical children try to communicate with caregivers by pointing or reaching for things. When neurotypical infants see an object of interest, they may engage in joint attention by looking to the object, then the caregiver, and then back at the object, as if to direct their caregiver's attention to the item of interest (Baron-Cohen, Leslie, & Frith, 1985). When their caregiver points or looks at something, the infant likely follows the direction of the point. Similarly, when the caregiver smiles, the infant likely reciprocates the behavior and smiles back.

For children with ASD, however, many of those social and communicative behaviors are atypical or absent. Many children with ASD do not engage their parents in acts of joint attention, and may not attempt to gain a caregiver's attention (Charman, 2003; Macari et al., 2012), for example, by pointing or gesturing (Macari et al., 2012). Additionally, some children with ASD lack imitation skills (see review in Jones, Gliga, Bedford, Charman, & Johnson, 2014). For example, if a parent shakes a rattle or puts blocks together, a child with ASD may not imitate those behaviors. Other atypical behaviors include avoiding looking at faces, glancing at a face quickly, or focusing on parts of the face that do not communicate emotions (Jones et al., 2014). Because infants learn language, communication, and social behaviors through joint attention and imitation (e.g., Charman, 2003), infants and young children with deficits in these areas may miss valuable learning opportunities, which may contribute to more significant and more pronounced impairments at a later age (Dawson, 2008).

As children grow, neurotypical children begin to display interest in and then seek out peers to play with. Some children with ASD seem to avoid social play opportunities, whereas others may desire relationships but do not know how to initiate or maintain them. Such a child may hover on the outskirts of a peer group, but not ever integrate into the group, even when invited to do so. Some children with ASD spend more time in solitary play, even when peers are present (Zager, Cihak, & Stone-MacDonald, 2017), while other children with ASD may attempt to play with peers but do not exhibit the foundational social skills necessary to engage in reciprocal play behavior. For example, a child with ASD may not be skilled in sharing or turn-taking or may not pick up on verbal and nonverbal cues that guide interaction and indicate how a game should be played. A child with ASD may not understand the

Table 1.1 DSM-5 diagnostic criteria and examples

Domain	Diagnostic criteria	Examples
Social-communication Deficits	Failure to initiate and/or reciprocate emotional and social exchanges	• Looks down when someone says, “Hi” • Responds to a peer’s description of weekend activities with an off-topic monologue
	Abnormal nonverbal communication behavior and understanding	• Avoids eye contact • Facial expressions and/or tone of voice seem flat or robotic
	Difficulties forming and sustaining relationships	• Plays alone instead of with others • Avoids physical touch
Restricted, repetitive interests, behaviors, and activities (at least two)	Stereotyped or repetitive movements or speech	• Flaps hands repeatedly • Organizes toys instead of playing with them
	Rigidity in routine	• Throws a tantrum when a stop is added on the typical drive home • Insists on looking in every window he or she passes by
	Abnormalities in domain or intensity of interests	• Talks almost exclusively about a collection of old video game consoles • Stares at the wheel of a toy car, instead of the whole car
	Abnormalities in reactivity to sensory input	• Cries when in a place with bright lights or loud noises • Does not show a reaction to a sudden loud noise, like an alarm or clap of thunder

concept of a “do-over” and may become frustrated at the perception that another child is not following the rules. This unawareness or failure to comply with social norms can lead to peer rejection (Schroeder, Cappadocia, Bebko, Pepler, & Weiss, 2014).

Another key skill that most children with ASD lack is often labeled theory of mind (Baron-Cohen et al., 1985). Theory of mind is the ability to perceive or understand other people’s perspectives (Wellman, Cross, & Watson, 2001). Children with ASD are typically more concrete and often misinterpret others’ behaviors and miss important social cues. For example, children with ASD may not realize that it is inappropriate to enter into a conversation with a group of individuals who are talking to one another in a heated or an animated manner or may make a factual statement about another person that may be hurtful without considering the other person’s feelings. Children with ASD may also struggle to understand facial expressions and the cause of others’ emotions. For example, a child with ASD may, along with peers, learn that another child in the class was seriously injured. Most peers may cry or otherwise express distress yet the child with ASD may appear unaffected and may even question the behavior of peers, “Why are they crying?” (Bauminger, 2002). Many also struggle to identify, cope with, and appropriately express their own emotional states. For example, some children with ASD may not identify their feeling as “angry” despite yelling, hitting, and clenching their fists (Mazefsky, Borue, Day, & Minshew, 2014).

Additionally, many children with ASD struggle during play due to deficits in imitation, understanding of symbolism (i.e., use of objects, actions, or ideas to represent other objects, actions, or ideas; Prizant, Wetherby, Rubin, & Laurent, 2003), imagination, and social understanding (Bauminger, Shulman, & Agam, 2003). Most preschoolers engage in imaginative and symbolic play, such as pretending to make dinner in a toy kitchen and using the toy stove to “cook.” However, a child with ASD who has limited imitation or creative play may not know how to join the play. When children with ASD avoid, learn to avoid, or are rejected from play and social experiences, they miss important modeling and learning opportunities, which may exacerbate their deficits (Dawson, 2008). Children with ASD’s social difficulties are further compounded by excessive repetitive and restricted behaviors, interests, and activities, which may also impact their social engagement and opportunities.

1.1.1.2 Repetitive and Restricted Behaviors, Interests, and Activities

Repetitive and restrictive behaviors often become most apparent when a child begins to play with toys independently and develop language. There is some research reporting repetitive and restrictive behaviors in children with ASD by the second year of life (e.g., Wetherby et al., 2004), while other studies report that those behaviors only become atypical later in childhood (e.g., Werner & Dawson, 2005). The presentation, assessment, and treatment of repetitive and restricted behaviors, interests, and activities will be covered in greater depth in Chap. 9, so they are only briefly reviewed here.

Some repetitive and restricted behaviors change as children develop, as interests and skills change. For example, a young child may repeatedly line up blocks or other toys instead of building or playing with them, and then, in later years, begin to insist that his or her clothes be hung in a particular manner and that other precise organizational patterns are followed (Watt, Wetherby, Barber, & Morgan, 2008). Stereotyped behaviors can also appear in the use of language, such as repeating one word or phrase (echolalia) or only repeating information on one topic that is of interest to them, which may also make the individual seem “rigid” (APA, 2000).

Children with ASD can also exhibit rigidity in their adherence to routines, social flexibility, and understanding of rules. For example, some children with ASD have trouble adapting to unexpected changes to schedules. Some may become upset when other children want to invent new games or alter the rules in games because they do not understand that some rules can be flexible (Hobson, Lee, & Hobson, 2008). Children with

ASD may also display rigid and atypical interests such as in the mechanics of toys, rather than the function (Ozonoff et al., 2008). For example, while neurotypical children might roll a toy car on the floor and make car noises such as the noise of a horn, a child with ASD might be more likely to play with a toy car by staring at the spinning wheels, repeatedly opening and shutting the hood, or lining up all the toy cars in a row. Children with ASD may have very restricted interests, such as exclusive focus on batting averages in major league baseball, or in types and functions of different vacuum cleaners. Some children become focused on very specific environmental stimuli, such as a moving ceiling fan or reflections in car windows. Vocal children with ASD may focus most or all conversation on their restricted interests and fail to pick up on signals that their conversational partner has lost interest in the topic.

In addition to stereotyped behavior and restricted interests, many children with ASD have abnormal reactions to sensory stimuli that are considered repetitive and restricted behaviors (APA, 2013). Some children with ASD are hypersensitive to sensory experiences, such as reacting negatively to loud noises, bright lights, strong tastes, or physical touch. In contrast, some children with ASD are hyposensitive to sensory stimuli. This is referred to as sensory under responsivity and often manifests as failure to exhibit discomfort or to communicate pain (Hazen, Stornelli, O'Rourke, Koesterer, & McDougle, 2014). For example, a child with ASD may show no reaction when he or she bangs his or her head on the table yet demonstrate clear indicators of pain when he or she trips and falls. Some children with ASD don't react to even extreme temperatures, such as seeming not to be cold even when the temperature is quite low. Other children may not react to loud and sudden noises, even when the noise was so extreme that everyone around exhibits a startle response. As with other domains, the response to environmental stimuli is variable among children with the same diagnosis.

The range in presentation of DSM-5 criteria alone demonstrates the heterogeneity within the disorder. Deficits in both core domains can affect movement, speech, interests, and reactions, and children with ASD can present with any combination of types or presentations of abnormalities. Further contributing to differences in presentations is a variety of deficits that are commonly associated with ASD diagnoses.

1.1.2 Associated Deficits and Abnormalities

While not part of the diagnostic criteria, children with ASD often exhibit a range of cognitive, linguistic, and adaptive living deficits, as well (Ousley & Cermak, 2014). Deficits in these other domains are not currently included as core deficits in the diagnosis of ASD because it is unclear if they are caused by comorbid disorders, if they overlap with other disorders because the disorders are related, or if they are more central deficits of ASD (Mazefsky et al., 2014). These commonly co-occurring impairments are noteworthy as they affect presentation and treatment.

1.1.2.1 Cognitive Impairments

Both global cognitive functioning and specific cognitive abnormalities are common in children with ASD but there is no singular cognitive profile (Joseph, Tager-Flusberg, & Lord, 2002). Global cognitive ability can range from intellectual impairment to above-average intelligence, as will be discussed more in the section on comorbidities. But, even children with ASD with above-average intelligence often exhibit some specific cognitive deficit. Common cognitive abnormalities in this population include deficits in executive functioning, a bias towards details instead of the larger picture, the ability to process large amounts of information, cognitive flexibility, and learning and processing speed (DeMyer, Hingtgen, & Jackson, 1981; Minshew & Williams, 2007). Deficits in executive functioning will be reviewed more in the section on comorbidities because they often result in a diagnosis of attention-deficit hyperactivity impulsivity (ADHD) disorder, but the deficits may include problems with working memory and the ability to inhibit impulses, organize, plan, and execute strategies (Ozonoff & Stayer, 2001). All of these problems can make it difficult for children with ASD to organize large amounts of information together or to break large amounts of information down into manageable parts.

Relatedly, a bias towards focusing on details may make it hard for the child to take a broad perspective or to learn and process large amounts of information (Happé & Frith, 2006). Some children with ASD exhibit superior processing of details, such as the ability to detect modifications to melodies in music (Mottron, Peretz, & Ménard, 2000) or faster performance on spatial tasks, like map learning, because they have a preference for processing details (Caron, Mottron, Rainville, & Chouinard, 2004). The preference for details can be a strength that helps the child excel in fields that value details, like mathematics, engineering, or music. The processing bias can also detract from the child's perception of the larger picture, in some instances. It remains unclear if these children with ASD have true deficits in global processing, or if their global processing is just negatively impacted by the focus on details sometimes, but bias towards details should be considered as it can affect the child's social, emotional, and cognitive behaviors (Happé & Frith, 2006). The focus on details is not present in all children with ASD and given the heterogeneity in cognitive ability within and between children with ASD in all cognitive domains it is important to assess each individual's relative strengths and weaknesses to ascertain where they may excel and where they may need additional support.

1.1.2.2 Linguistic Deficits

Many children with ASD also need support and early intervention due to linguistic deficits beyond social-communication abnormalities (Kim, Paul, Tager-Flushberg, & Lord, 2014). A majority of children with ASD develop expressive and receptive language (Norrelgen et al., 2014), but they do so later and at a slower rate than neurotypical children do (Kim et al., 2014). Some children with ASD have relatively normal language development but make grammatical errors or exhibit abnormalities in prosody (speech rhythm, stress, and intonation; Charman, Drew, Baird, & Baird, 2003; Eigsti, de Marchena, Schuh, & Kelley, 2011). Finally, some children with ASD do not develop spoken communication or phrase speech at all (Kim et al., 2014; Norrelgen et al., 2014).

For children with ASD who do develop spoken communication, they may exhibit deficits in expressive language, receptive language, or both. Early signs of deficits and delays in receptive language include failure to respond to the sound of one's name (Nadig et al., 2007) or a mother's voice in infancy (Klin, 1991), and lack of understanding of instructions at an older age. Expressive language delays include a delayed average age of first word production; the average is 38 months for children with lower functioning ASD, compared to an average age of 8–14 months for neurotypical children (Howlin, 2003). Additionally, some toddlers and children with ASD produce noises that are inappropriate in content, volume, or clarity and some exhibit echolalia, or repetition of others' words, phrases, and/or intonation (Kim et al., 2014).

Other linguistic errors and oddities can be seen in children with ASD and language delays or normal language development (Kim et al., 2014). Some children make speech and grammatical errors, such as incorrect articulation of consonants (Shriberg et al., 2001), misuse of personal pronouns (e.g., "she wants water" instead of "I want water"), or make errors in other syntactical rules (Kim et al., 2014). These deficits may be related to cognitive ability, too, however (Eigsti et al., 2011). Some children also exhibit prosody oddities, like flat affect or tone (Diehl & Paul, 2013; Lord & Paul, 1997), misplaced stress, slowed phrasing (Shriberg et al., 2001), and/or inappropriate volume and alternation between volumes (Shriberg, Paul, Black, & Van Santen, 2011). These speech oddities can also affect comprehension, as children with ASD may have trouble understanding others' intonations, prosody marks of questions, or emotion, or they may struggle to integrate knowledge and context with verbal stimuli (Diehl & Paul, 2013; Kim et al., 2014). Again, there is heterogeneity in the domain of deficits and many of these deficits only apply to subsets of children with ASD.

As noted above, and contributing to heterogeneity in presentation, a subset of children with ASD do not develop spoken communication. Some children never develop spoken communication while others may have initially talked, and then ceased to do so. Cases of "regression," or lost skills, are commonly reported in the media, but, because studies are largely based on retrospective reports, more research is needed to examine the validity of these reports (Thurm, Powell, Neul, Wagner, & Zwaigenbaum, 2017). Importantly, many children who do not use spoken communication may be taught to communicate using sign language, pictures, or other methods of augmentative communication (Paul, 2009). For more information on teaching communication, see Chaps. 7 and 8.

1.1.2.3 Adaptive Functioning Deficits

In addition to the deficits that may disrupt social engagement, children with ASD may have motor delays and may be less likely to independently engage in daily living skills. The impairments in communication and social skills previously described likely contribute to adaptive skill deficits. Neurotypical children usually exhibit adaptive living skills that are aligned with their verbal or intellectual ability, but children with ASD may not (Klin et al., 2007). Children with ASD's adaptive functioning skills are often significantly below their measured cognitive ability (Kanne et al., 2011). The discrepancy between IQ and adaptive functioning is especially pronounced among individuals with high-functioning ASD, who often do not show improvements in adaptive living skills that are comparable to same-aged peers (Klin et al., 2007). These adaptive functioning deficits may manifest as an inability to independently dress, develop appropriate sleep hygiene, become toilet trained, or complete chores. Motor deficits often include difficulties with gross motor skills, like running or jumping, and fine motor abilities, like holding a pencil or tying shoes (Volkmar, 2013). Adaptive skills affect the everyday functioning of children with ASD across contexts including home, school, and the community.

In sum, children with ASD exhibit a wide array of difficulties in the two core domains that distinguish the diagnosis from others, but they also may demonstrate deficits in other areas, including cognition, language, emotion, and adaptive functioning. No two children with ASD have the same strengths, weaknesses, or presentations because even if they technically meet similar diagnostic criteria, the presentation and severity vary drastically. As our understanding of the presenting problems and the relation between deficits change, so too do the diagnostic criteria and diagnostic considerations. Many of the DSM-5 diagnostic criteria relate to the original case studies on ASD, but much of our understanding has and continues to change.

1.2 History

The current diagnostic criteria for ASD represent a historical development from the first case studies. ASD was first described in case studies by two independent researchers, Leo Kanner and Hans Asperger. In 1943, Austrian-American psychiatrist Leo Kanner met a 5-year-old child who took no interest in people around him, liked to spin around in circles, and threw tantrums when his typical schedule was interrupted (Kanner, 1943; Morrier, Hess, & Heflin, 2008). This case inspired Kanner to conduct 11 case studies, which he compiled into his groundbreaking paper, *Autistic Disturbances of Affective Contact* (1943). Kanner's paper was the first to differentiate "infantile autism" from "childhood schizophrenia," arguing this disorder was not "a departure from an initially present relationship" (p. 242). Rather, it was an "extreme autistic aloneness" (p. 242) in which the child does not respond to anything in the outside world. Kanner stated that the fundamental marker of autism was the "children's inability to relate themselves in the ordinary way to people and situations from the beginning of life" (Kanner, 1943 p. 242).

One year after Kanner's publication, Hans Asperger independently wrote about a comparable, yet higher functioning disorder that he called "autistic psychopathy." Asperger similarly described children with social impairments and repetitive and restrictive interests and behaviors, but the children in his case studies had average language ability and above-average intelligence. Asperger was also the first to note abnormalities in nonverbal communication, describing behaviors such as a lack of eye contact and oddities in speech tone (Frith, 1991). Asperger also distinguished the children he observed from those with "childhood schizophrenia, noting that children with 'autistic psychopathy' did not have periods of normal development and their social impairments were stable, unlike children with schizophrenia" (Klin, 2011). While Asperger's case studies were eventually integrated with Kanner's in diagnostic systems, Asperger's work was largely lost until after World War II because he had published it in German in Austria during the war (Klin, 2011).

Kanner and Asperger both chose variants of the word "autism" and compared their findings to schizophrenia because that terminology and disorder were foci of the psychiatric literature at that time. In the early 1900s, schizophrenia included diagnostic criteria of egocentrism and social detachment that were called "autism" from the Greek root *autos,* or "self." Kanner and Asperger believed that their discoveries were separate from schizophrenia, but when "infantile autism" was entered into the World Health Organization's diagnostic system, the International Classification of Diseases (ICD), in 1967, it was considered a type of schizophrenia (Sasson, Pinkham, Carpenter, & Belger, 2010). Similarly, in the United States, the American Psychiatric Association's (APA) Diagnostic Statistical Manual (DSM) included "autistic" behaviors as a sign of childhood schizophrenia, but not a separate disorder (APA, 1968).

It was not until the 1970s that researchers distinguished autism from childhood schizophrenia. The distinction was made because autism and schizophrenia rarely occurred in the same families (Rutter, 1968) and had different developmental trajectories (Kolvin, 1971). These empirical findings led to a novel category of "Pervasive Developmental Disorders (PDD)" with a diagnosis of "autism" in the DSM-III in 1980 (Sasson et al., 2010). The criteria were later refined and expanded beyond Kanner's descriptions to include a required onset before the age of 3 of limited social responsiveness, language deficits, and/or "peculiarities," and "bizarre" environmental responses. The disorder was also distinguished from schizophrenia by requiring that individuals did not exhibit delusions, hallucinations, loose associations, or incoherence (APA, 1987).

The DSM-III diagnosis of autism did not capture all individuals who presented with similar characteristics, so PDD not otherwise specified (PDD-NOS) and Asperger's syndrome were added to subsequent versions of the DSM (Klin, 2011). A diagnosis of PDD-NOS was given when children did not meet full criteria for autism but still displayed impairing and distressing social, communication, and restrictive, repetitive behaviors (Ousley & Cermak, 2014; Volkmar, 2013). Asperger's syndrome was added to capture higher functioning cases of children who met the same criteria for social impairment and restricted, repetitive behaviors or interests as children with autism, but in the absence of language, cognitive, and adaptive behavior delays (APA, 1994). While the increase in diagnostic specificity and categories helped individuals receive the services and treatment they needed, it also led to a stark increase in the prevalence of diagnosed developmental disabilities (Zablotsky, Black, Maenner, Schieve, & Blumberg, 2015).

Research on the DSM-IV, PDD diagnoses did not support the separation of three diagnostic categories, however, which is why the DSM-5 integrated autism, Asperger's syndrome, and PDD-NOS into autism spectrum disorder (ASD; APA, 2013). The ASD diagnostic label and criteria were created to reflect research revealing that individuals with any of these diagnoses demonstrated behavioral variations of the same difficulties, rather than categorically different problems (APA, 2013). Furthermore, research supported that separation of the disorders did not result in reliable diagnoses across sites and did not predict the degree and severity of the disorder, prognosis, and treatment needs (Wiggins, Robins, Adamson, Bakeman, & Henrich, 2012). Therefore, the diagnoses were combined but recognition of the variation and degree of severity was preserved by including ratings of severity that accompany the diagnosis. The severity rating system uses a three-point scale, with level one indicating lower levels of support and level three indicating "very substantial support" (American Psychiatric Association, 2013).

Of note, the ICD-10, which is used by American insurance companies, still includes social and communication as separate deficits and autism, Asperger's, and PDD-NOS as separate diagnoses because the ICD has not been updated since 1992. It is expected that the ICD-11 in 2018 will be similar to the DSM-5 (World Health Organization, 2017). And, even with different diagnostic systems, the presentation and prevalence of ASD are similar worldwide. However, the prevalence rates of ASD have fluctuated with variation in diagnostic criteria over time.

1.3 Prevalence

ASD is estimated to occur in 1% of the population internationally (American Psychiatric Association, 2013) and in about 1 in 59 people in the United States (Centers for Disease Control and Prevention (CDC), 2018). Boys are about four to five times more likely to be diagnosed with ASD than girls (APA, 2013), but girls are more likely to have a comorbid intellectual disability (ID) (Kirkovski, Enticott, & Fitzgerald, 2013). The male-to-female ratio difference has been consistent over the years, but the overall prevalence of the disorder has varied.

Estimates of ASD prevalence have increased substantially over the past several decades, from about 4.5 per 10,000 children in 1966 (Lotter, 1966) to about 146 in 10,000 children in 2006 (Centers for Disease Control and Prevention (CDC), 2015). The increase in prevalence rates is not thought to be due to an actual rise in the number of individuals diagnosed with the disorder; rather, it is hypothesized to be more due to modification of diagnostic criteria (King & Bearman, 2009) and an increase in knowledge and awareness of the disorder (Fombonne, 2005).

As previously described, the diagnostic criteria for ASD have changed over time, which affected both terminology and identification of individuals with ASD. As previously mentioned, the combination of autistic disorder, Asperger's syndrome, and PDD-NOS in the DSM-5 resulted in more individuals with an "autism" diagnosis (American Psychiatric Association, 2013). Additionally, diagnostic criteria for ASD, intellectual disability (ID), and other disorders were broadened, so more individuals met the criteria for ASD.

Changes to the ID diagnosis, formerly called mental retardation, may have also contributed to the rise in prevalence of ASD because the DSM used to specify that children could not have ASD and ID. Now, ID and ASD can be diagnosed together (APA, 2013), which directly increased the prevalence of ASD (King & Bearman, 2009). Some even hypothesize that individuals who currently meet the criteria for ASD were previously mislabeled as having ID, as evidenced by the fact that the prevalence of ID alone decreased while the prevalence of ASD increased. While support for the hypothesis that mislabeling contributed to prevalence changes is mixed due to the lack of causal data, it is clear that changes to diagnostic criteria for ASD and ID led to more ASD diagnoses (King & Bearman, 2009).

Another result and potential contribution to the increased prevalence was improved access to diagnostic and intervention services. These improvements were in part due to the already increasing prevalence, because public health initiatives, policy, and law were launched to increase knowledge, awareness, and acceptance of the disorder. Organizations such as the Centers for Disease Control (CDC) and Autism Speaks created initiatives to disseminate information on signs, treatments, and resources for the disorder. Other groups, such as the National Research Council (2001) and the American Academy of Pediatrics (Johnson & Myers, 2007), recommended screening tools to facilitate diagnostic evaluations at a younger age. ASD was also included as a category in special education law in

1991, which led to diagnoses and accommodations in school settings. School-based diagnoses and referrals are particularly important for families without regular access to healthcare (Gurney et al., 2003). Between the public health, policy, and legal initiatives, information on ASD is more readily available, which helps parents, doctors, school personnel, and others identify early signs and seek appropriate referrals for diagnoses of ASD and comorbid conditions (Wing & Potter, 2002).

1.4 Comorbidities

1.4.1 Psychiatric Conditions

Comorbid conditions affect the presentation, diagnosis, and treatment of ASD, so they are an important consideration when assessing the presentation and needs of children with ASD and their families. Current estimates suggest that approximately 70% of individuals with ASD have at least one comorbid diagnosis and about 40% of those individuals have more than two comorbid diagnoses (American Psychiatric Association, 2013). However, these statistics should be interpreted with caution as there are no current prevalence studies on comorbidities using DSM-5 criteria and diagnostic boundaries are not well understood. ASD behavioral indicators overlap with many psychiatric and medical signs and comorbid diagnoses have low reliability across practitioners. Therefore, it can be difficult to determine when an individual's behaviors indicate distinct conditions and when they are related to the core deficits of one disorder (Gurney, McPheeters, & Davis, 2006). For example, children with ASD may avoid or isolate themselves while in social situations. This presentation may be consistent with a peer's presentation of social anxiety, while a child with ASD's social impairment must be taken into consideration when determining if a differential diagnosis is appropriate.

Social anxiety and other anxiety disorders are some of the most commonly comorbid diagnoses with ASD, especially among school-aged children and adolescents. Estimates of anxiety among children with ASD range from 42 to 79% of children (Kent & Simonoff, 2017). The most common subtypes of anxiety in children with ASD are specific phobias, which are estimated to occur in about 31 to 67% of children with ASD, and social anxiety, which likely occurs in about 4 to 29% of children with ASD (Kent & Simonoff, 2017). Reports on the prevalence and presentation of anxiety with ASD are inconsistent, in part because anxiety disorders are difficult to diagnose in children in general and in children with ASD, specifically. Because children with ASD demonstrate deficits in emotional regulation and social-communication impairment is a core deficit in ASD, it can be difficult to differentiate when a comorbid anxiety diagnosis is warranted. Additionally, anxiety is also difficult to be identified by caregivers because it is more of an internal experience (Ryan, Kaskas, & Davis, 2017). As a result, diagnosis and research on anxiety in children with ASD are difficult and findings are inconsistent. But, when looking at reviews across studies, it seems most likely that individuals across the ASD spectrum are at risk for comorbid anxiety (e.g., Kerns & Kendall, 2012).

The type and severity of anxious thoughts and behaviors seem to be fairly similar between children with and without ASD, but there are a few differences. For example, the most common phobias among neurotypical children involve animals or death and injury. And, while some children with ASD share these fears, children with ASD are more likely to report phobias and fears about things such as mechanical objects (e.g., toilets) or the weather (e.g., refusal to go outside on cloudy days; Mayes et al., 2013). Another example is that some children with ASD and social anxiety report concerns about social evaluation that are similar to those of neurotypical children, but others are avoidant and meet the criteria for social anxiety without social evaluation concerns (Kerns & Kendall, 2012), which may be in part due to children's (with ASD) difficulty taking another person's perspective and interpreting their behaviors.

More obvious comorbid psychological conditions that co-occur with ASD at similar rates as anxiety are disruptive, externalizing behaviors, such as aggression, self-injury, noncompliance, or destruction of property, as will be covered in more detail in Chaps. 10 and 11. Disruptive externalizing behaviors and disorders, which are sometimes diagnosed as oppositional defiance disorder (ODD) or conduct disorder (CD), occur in approximately one-fourth (Hill et al., 2014) to one-half of children with ASD (Mazurek, Kanne, & Wodka, 2013). These disruptive behaviors pose physical and emotional risks for the child and others. Some children harm themselves through head-banging, biting their own skin, or other self-injurious behaviors. Some engage in aggressive hitting, kicking, or biting of others. Some are disruptive by throwing objects, breaking items, or throwing tantrums, while others may be noncompliant with directions or rules. Children may also exhibit several of these behavioral topographies.

Disruptive behaviors are especially important areas of intervention for children with ASD due to the risk of physical harm, destruction, and caregiver stress and burnout (Woodman, Mawdsley, & Hauser-Cram, 2015). Problem behaviors often do not decrease naturally with age for children with ID and ASD (Matson & Shoemaker, 2009), though such children are at higher risk for these co-occurring problem behaviors (e.g., Hill et al., 2014; McTiernan, Leader, Healy, & Mannion, 2011). Some also report that children with less verbal communication are at higher risk for aggression (e.g., Farmer et al., 2015), but that relation is not consistently found (Hill et al., 2014; Kanne and Mazurek, 2011), and may be accounted for by other characteristics (e.g., Mazurek et al., 2013). In general, children who are more likely to need long-term care and support are at higher risk for disruptive behaviors that interrupt daily life and learning opportunities, and can lead to further isolation for the child and family (Horner et al., 2002), which is why the behavioral interventions that will be covered in Sects. 1.1 and 1.2 of this book are a high priority.

Another common comorbidity is attention-deficit hyperactivity disorder (ADHD), which co-occurs with ASD in about 40–80% of cases (Reiersen & Todd, 2011). ADHD could not previously be diagnosed with ASD due to the overlap in executive functioning deficits that are common among children with ASD (APA, 2000). However, changes to the DSM-5 now provide the flexibility of the comorbid ASD and ADHD diagnoses. It is difficult to differentiate executive functioning deficits due to ASD and those due to ADHD, so a child is diagnosed with ADHD if they meet the criteria for inattention (e.g., trouble attending to or remembering lessons or instructions, difficulty with organization or planning), hyperactivity (e.g., frequent fidgeting or climbing), and/or impulsivity (e.g., interrupting conversations, trouble waiting turns) that are not developmentally appropriate (APA, 2013). For example, even though many children with ASD like to adhere to schedules, a child with ADHD and ASD may exhibit more trouble independently completing the schedule. The child may become distracted going between classes if they are unable to inhibit an impulse to join a more appealing activity. He or she may lose a schedule and forget what came next. Or, the child may have trouble completing activities because it can be hard to plan and execute multiple steps to reach a goal. Again, while ADHD and ASD deficits overlap, a comorbid diagnosis is often made to indicate that additional supports are needed.

As with ADHD, differential diagnosis with all psychiatric conditions is complicated due to limited understanding of the etiology, relation between disorders, and imprecise measurement. As a result, diagnosticians and clinicians should recognize the limitations and benefits to making comorbid psychiatric diagnoses. The diagnoses are likely to have low reliability and may not represent two separate disorders. The diagnostic criteria and practices are also continually improving as the research does, so it is important to stay current on changes in the field. Benefits include that identification of impairing and distressing psychological problems can help the child and family get needed services.

1.4.2 Developmental and Physical Conditions

Children with ASD may also require medical services to address commonly comorbid genetic and physical conditions, like genetic syndromes, motor deficits, feeding disorders, and medical diagnoses (e.g., gastrointestinal problems, epilepsy, sleep problems; APA, 2013). As with psychological disorders, the overlap between genetic and physical conditions with ASD is not well understood, but the medical diagnoses are more clearly differentiated from ASD.

Genetic disorders can be reliably diagnosed because there are clear biological markers. There is also a possible common etiology between the genetic disorder and ASD as children with ASD are at a higher risk for hundreds of genetic syndromes (Schaefer & Mendelsohn, 2008). Some of the most commonly known co-occurring genetic disorders are fragile X, tuberous sclerosis, Rett syndrome, Prader-Willi syndrome, Angelman syndrome, and Down syndrome. Many of these disorders also have co-occurring IDs, so genetics may account for the link between ASD and ID in some of these cases (Zafeiriou, Ververi, Dafoulis, Kalyva, & Vargiami, 2013). In addition to genetic syndromes, children with ASD are also at increased risk for other physical difficulties, such as motor impairments. Motor impairments in ASD include the ability to integrate information to plan and execute motor tasks (Gowen & Hamilton, 2013), low muscle tone, deficits in the execution of skilled movements (e.g., drooling, inability to use scissors), and intermittent toe-walking (Ming, Brimacombe, & Wagner, 2007). Motor deficits affect the child's adaptive living skills, like independently completing tasks, writing, or engaging in normal, childhood recreational activities.

In addition to genetic and motor impairments, children with ASD are also at an increased risk for feeding and gastrointestinal problems. Children with ASD have a fivefold increase in the odds of developing a feeding problem compared with peers (Sharp, Berry, McElhanon, & Jaquess, 2013). Feeding difficulty in children with ASD most commonly presents as food selectivity, involving strong preferences for starches and snack foods, limited consumption of fruits and vegetables, selectivity based on the texture of food, and mealtime difficulties like disruptive mealtime behavior. The feeding problems may be related to gastrointestinal problems, such as constipation and related discomfort (McElhanon, McCracken, Karpen, & Sharp, 2014), behavioral rigidity and sensory sensitivity (Ahearn, Castine, Nault, & Green, 2001; Provost, Crowe, Osbourn, McClain, & Skipper, 2010), or a learned pattern of escape and/or attention when refusing food during mealtimes (Piazza, 2008; Piazza et al., 2003).

Finally, other common medical problems in children with ASD include epilepsy and sleep problems. Epilepsy is estimated to occur in 5–38% of children with ASD. Seizures also require close parental and medical monitoring to ensure safety for the child. And, because seizures cause neurological deficits, they can also contribute to behavioral problems, like increased impulsivity (Levisohn, 2007). Maladaptive behaviors, like impulsivity, aggression, decreased adaptive functioning, and executive functioning deficits, are also exacerbated by commonly co-occurring sleep problems for children with ASD. Sleep problems that are elevated in children with ASD include difficulty falling asleep, less time spent sleeping due to frequent, long waking in the middle of the night and/or waking early, more frequent night terrors, and more anxiety about sleep (Souders et al., 2009). An estimated 50–80% of individuals with ASD have sleep problems, which increase the risk of aggression two- to threefold (Mazurek et al., 2013). As with the other comorbid conditions, child sleep problems also disrupt the families' sleep cycle and routines.

Mental and physical health comorbidities are important for clinicians to consider due to the impact they have on the child and family. Mental and physical health conditions contribute to the heterogeneity in presentation of ASD and they often exacerbate or contribute to the development of other presenting concerns. Therefore, identification of areas of impairment and/or distress is an important consideration for treatment. To improve identification of comorbid diagnoses, it is important to understand the underlying etiology of ASD that can lead to a wealth of knowledge and potentially contribute to a better understanding of related and/or comorbid behavioral indicators. To date, there are some hypotheses about the etiology that can be helpful in predicting the risk of ASD and other conditions.

1.5 Risk Factors and Etiology

While the etiology of ASD is not well understood, it is believed to be strongly genetically determined. But environmental factors also contribute directly and through their interaction with genetics and biology (Bailey et al., 1995; Lichtenstein, Carlstrom, Rastam, Gillberg, & Anckarsater, 2010). Risk factors have been more consistently identified than causes, so genetic and environmental risk factors with the most support are reviewed below.

1.5.1 Genetic and Biological Findings

Evidence for the genetic basis of ASD comes from studies documenting a higher risk for the disorder among family members of someone with ASD. Studies that demonstrated higher concordance rates for ASD in monozygotic twins, compared to dizygotic twins, estimated that genetic effects account for about 37 (Hallmayer et al., 2011) to about 90% of the proportion of variance in ASD (Geschwind, 2011). Siblings of a child with ASD are also 13–22 times more likely than the general population to also be diagnosed with ASD (Lauritsen, Pedersen, & Mortensen, 2005). In addition to higher rates of the disorder among close relatives, there are also higher rates of genetically and qualitatively related behaviors, labeled the “Broader Autism Phenotype” (Losh et al., 2009). The Broader Autism Phenotype consists of milder, subthreshold abnormalities in restrictive, repetitive behaviors and social-communication functioning, which manifest in characteristics that have been termed aloofness, rigidity, and pragmatic language (Seidman, Yirmiya, Milshtein, Ebstein, & Levi, 2012). About 12–30% of family members of individuals with ASD are estimated to be rated as high in the Broader Autism Phenotype (Cruz et al., 2013). But, some individuals with ASD are the only affected family members and the genetics and transmission patterns seem to be different dependent on whether one or many family members have the disorder (Sebat et al., 2007). In families in which multiple family members are affected, common variations of genes each has small additive impacts on the development of ASD (Constantino, Zhang, Frazier, Abbacchi, & Law, 2010; Gaugler et al., 2014). In families in which only one child has ASD, however, rare mutations to DNA sequence likely play bigger roles in risk for the disorder (Sebat et al., 2007).

The genetic etiology that contributes to ASD is as variable as the presentation. Thousands of candidate genes (segments of DNA that are risk factors), DNA sequence abnormalities, chromosomal rearrangements, and single-gene mutations have been identified as possible contributors to the etiology of ASD; however, each abnormality only accounts for approximately 1% of cases (Betancur, 2011; Marshall et al., 2008; Weiss, 2009). The identified susceptibility genes only account for about 10–20% of all ASD cases (Geschwind, 2011). Because the list of genetic findings is long and research is ongoing, a full list of genetic findings for ASD will not be included here. An up-to-date list of genetic findings and supporting research can be found at online databases by SFARI (http://www.gene.safari.org) or AutDB (http://www.mindspec.org). The current section focuses on remaining questions, overarching conclusions, and some of the genetic findings with the strongest, most consistent support.

The genetic abnormalities that are associated with ASD are believed to affect brain, physiological, and metabolic functioning, but the mechanism of contribution to the disorder and function of the mutations are unknown (Weiss, 2009). The identified and replicated genes associated with ASD are known contributors to neural connectivity (Persico & Napolioni, 2013) and physiological and metabolic systems, like immune and inflammation systems (Rossignol & Frye, 2012). The abnormalities are expected to combine and interact with each other and the environment to disrupt neural network (Geschwind & Levitt, 2007) and to cause damage to brain and cell tissues (Rossignol & Frye, 2012; Streit, Mrak, & Griffin, 2004). But, it remains unclear if the identified genes cause ASD, how large the effect has, if the genetic abnormalities are deterministic, or if the findings are due to chance (Geschwind, 2011). Therefore, more research on the role and function of the genetic findings is needed.

Further complicating genetic findings is the overlap in genetics between ASD and other psychological disorders. Genes that have been associated with ASD were also associated with schizophrenia (Kim et al., 2008), mental retardation, cardiac abnormalities, and abnormal head sizes (e.g., Brunetti-Pierri et al., 2008). Genetics also contribute to concordance in comorbidity for monozygotic twins. The overlap between disorders suggests a common genetic etiology underlying multiple disorders (Lichtenstein et al., 2010).

In sum, genetic research has identified some important genes that may contribute to ASD, but the impact of these mutations and gene variants is not well understood and requires further evaluation. The common variants of genes that are expected to play an important role have been challenging research and replicate (Geschwind, 2011). Thus, research on the genetic etiology of ASD is ongoing but guided by the findings that the genetic etiology is as heterogeneous as the presentation of the disorder and gene-environment interactions all need to be further explored.

1.5.2 Environmental Risk Factors

There are many possible environmental risk factors for ASD that have been identified, but the mechanisms of action are not yet well understood and the correlations with ASD are often weak. These environmental factors that have been documented to increase the risk of ASD can occur at conception, during pregnancy, and during birth. Many of these risk factors co-occur, so the interaction between them may also be important (Mandy & Lai, 2016).

Beginning at the start of the child's life, risk factors at conception and during pregnancy that affect fetal development include parental age, maternal mental and physical health, and maternal exposure to environmental and psychotropic substances. Risk factors during birth include birthing complications and physical health abnormalities (Mandy & Lai, 2016).

At conception, both parents' ages have been observed to have cross-sex effects on the risk of ASD. The risk of ASD increases twofold for every 10-year increase in paternal age, especially if the child is a female (Sandin et al., 2012). This means that children born to a father between the age of 30 and 39 are twice as likely to have ASD than if the father was between the age of 20 and 29. Children conceived by men over the age of 40 are 5.75 times more likely to develop ASD (Reichenberg et al., 2006). This effect is possibly due to a mutation in spermatozoa. Spermatozoon cells replicate every 16 days throughout the life span. Each cell division increases the possibility of a replication error and gene mutation, so a longer life span might mean more replication errors (Mandy & Lai, 2016). Similar to fathers, mothers over the age of 35 are twice as likely to have a child with ASD, especially if the child is male. This effect may be because older mothers have a longer history of exposure to other environmental risk factors that contribute to developmental delays (Sandin et al., 2012). In addition, a meta-analysis found increased ASD risk in first-born children compared to those born third or later (Gardener, Spiegelman, & Buka, 2011).

Other maternal characteristics that affect the risk of ASD include maternal mental and physical health. Maternal, but not paternal, history of psychopathology is associated with a twofold increased risk for ASD (Lauritsen et al., 2005). Intake of the psychotropic medications used to treat psychopathology while pregnant also increases the risk of offspring with ASD. For example, maternal intake of antiepileptic drugs or valproates during pregnancy increases the risk of having an offspring with a neurodevelopmental disorder, such as ASD. Valproates treat epilepsy, bipolar disorder, and migraines (Bromley et al., 2013). Selective serotonin reuptake inhibitors (SSRIs), which are medications for depressive disorders, also have a link to high-functioning ASD (Mandy & Lai, 2016). It is unclear if both medications increase the risk of ASD or if there is a common connection between maternal psychopathology and child ASD. The cause fueling the relationship between these medications and a diagnosis of neurodevelopmental disorders is still unclear, as is the effect on the level of functioning of the offspring (Bromley et al., 2013).

In addition to maternal mental health, maternal physical health affects the likelihood of offspring ASD. Maternal obesity (Li et al., 2016) and diabetes (Xu, Jing, Bowers, Liu, & Bao, 2014) during pregnancy also increase the risk for many psychosocial and developmental problems, including ASD. This connection could be linked to an increase in glucose levels in diabetic and prediabetic women that adversely affects fetal development. Prolonged fetal exposure to glucose causes the fetus to increase oxygen consumption and metabolism, which may result in a fetal iron deficiency and subsequent neurodevelopmental abnormalities. Fetal oxygen and neurodevelopment can also be affected by birthing events and traumas (Tanne, 2012).

Risk factors for ASD associated with birth include hemorrhaging, complications related to the umbilical cord, and multiple births. Additionally, children who are born at a low birth weight in general or for the baby's gestational age have abnormal breathing, birth defects, trouble feeding, anemia, hemolytic disease, and hyperbilirubinemia and are also at increased risk for ASD (Gardener et al., 2011). Again, these environmental factors are probabilistic, not deterministic, so not all children who experience these conditions will develop ASD. But, there are some known environmental factors that were originally called causal and have since been reported to be unrelated to the development of ASD. Because they have received so much attention in mainstream media, they will be described below.

1.5.3 Myths About Causes of ASD

Although there is still more to learn about the etiology and risk factors contributing to the development of ASD, we can dispel some previously believed myths, which will also be explored in more detail in Chap. 6. One of the first myths was that "refrigerator mothers," or emotionally unavailable mothers, caused ASD (Allen, DeMyer, Norton, Pontius, & Yang, 1971). This myth was formed by Dr. Leo Kanner, the first doctor to describe ASD in 1948. Kanner noted that the children he observed with his newly defined disorder seemed to have mothers who lacked warmth and attachment. He then concluded that these "refrigerator mothers" caused the social, communication, and behavioral abnormalities. What Kanner did not consider, however, was that his sample size was small; many "refrigerator mothers" did not have children with ASD, and the lack of warmth and attachment may have been a result of the ASD-related behaviors, instead of the cause (Laidler, 2004). Empirical research does not support Kanner's theory, but mother-blaming lasted for decades which as a result harmed countless families of children with ASD.

Another commonly cited myth is that measles, mumps, and rubella (MMR) vaccinations cause ASD (Wakefield et al., 1998). The myth arose when Dr. Andrew Wakefield published research linking the MMR vaccine to ASD and claimed the vaccine did not undergo proper safety testing (Wakefield et al., 1998; Wakefield & Montgomery, 2000). His articles caused a public health crisis in many countries because an international measles outbreak occurred, after parents refused to vaccinate their children (Flaherty, 2011). Dr. Wakefield came under investigation a few years later, when his findings failed to replicate and the rates of ASD diagnoses continued to increase in areas that did not administer vaccines (Honda, Shimizu, & Rutter, 2005). The investigation demonstrated that Dr. Wakefield falsified his data to personally benefit from the findings. And, even though he was found guilty of ethical, medical, and scientific misconduct, the article was retracted, and empirical research disproved his claims, some parents still believe that MMR vaccines cause ASD and refuse to vaccinate their children (Flaherty, 2011).

Finally, a more recent proposal that resulted in public action without empirical substantiation states that gluten and casein contribute to the development and severity of ASD. This theory is based on findings that children with ASD have higher levels of gluten and casein peptides in their urine. Normally, gluten and casein foods should be broken down into amino acids. If those foods are not properly broken down, then larger chains of amino acids, called peptides, remain. Because children with ASD seem to have higher levels of these peptides, some theorized that children with ASD lack the enzymes needed to break down gluten and casein foods. It was further proposed that the peptides build up, enter the bloodstream, cross the blood-brain barrier, attach to opioid neuroreceptors, and change the brain in ways that cause ASD (Reichelt, Knivsberg, Lind, & Nodland, 1991). This is a relatively new theory that received some support, but scientists are still skeptical because gluten and casein interventions have not been heavily, nor rigorously, researched. The few studies that exist did not include control groups, relied on small samples or anecdotal evidence, and had many risks of biases, such as confirmation bias or placebo effect. Despite the lack of evidence supporting this notion, some parents have been prescribing to these restrictive diets, which may negatively impact the child's health by depriving them of nutrients and may cause added stress to the family (Marí-Bauset, Zazpe, Mari-Sanchis, Llopis-González, & Morales-Suárez-Varela, 2014; Millward, Ferriter, Calver, & Connell-Jones, 2009). The gluten and casein intervention requires more rigorous study because, like all interventions, it can be time and resource intensive for families of children with ASD. Family factors are especially important to consider because ASD and related accommodations have a particularly high impact on families.

1.6 Impact on the Family

Because ASD is a lifelong disability, individuals on the spectrum need more intensive care for longer periods of time than individuals without ASD. The types of care include educational, occupational, medical, psychotherapeutic, and familial care to accommodate behavioral, social, and emotional difficulties (Symon, 2001). A review of longitudinal studies on adaptive living skills for individuals with ASD reported that daily living skills often improved, but social skills and communication did not. Fortunately, many individuals with ASD are able to achieve some degree of independence, to hold a job, and to make friends, but about 50% of adults with ASD remain dependent on caregivers and special services for living arrangements and employment (Magiati, Tay, & Howlin, 2014).

The cost for caregivers and on society is substantial, with estimates reaching 17,000 dollars more per year for a child with ASD than without (Lavelle et al., 2014) and about 3.2 million dollars over the life span (Ganz, 2007). The largest expense for children with ASD is school services as children with ASD are approximately nine times more likely to need an individualized education program (IEP) and about eight times more likely to need some form of special education compared to children without ASD (Lavelle et al., 2014). Another substantial expense for children with ASD is medical care, particularly between the ages of 3 and 7. Direct medical care for the first 5 years can cost on average $35,000 per year, not including the cost of alternative treatments or adverse outcomes due to failed treatments (Ganz, 2007).

Lost productivity for parents is a major concern because it can lead to decreased income and increased stress level. Mothers of children with ASD report spending more time and money to obtain care for their children than parents of children with other special healthcare needs (Kogan et al., 2008). One study found that mothers of children with ASD who were eligible for higher paying jobs (e.g., had the highest educations and were older) earned approximately 35% less than mothers of children with other health limitations and about 56% less than mothers of children with no health limitations. Fathers' work schedules were less likely to be impacted, but families of a child with ASD still had a lower household income than families with neurotypical children (Cidav, Marcus, & Mandell, 2012). And, unfortunately, despite the extra time and effort, parents of children with ASD were less likely to report that their healthcare needs were met or to feel satisfied with services than mothers of children with other special healthcare needs (Kogan et al., 2008).

The dissatisfaction with care, increased need for care, child's behaviors, and contextual factors contribute to higher levels of stress for parents of children with ASD than for parents of neurotypical children (Duarte, Bordin, Yazigi, & Mooney, 2005), parents of children with other psychopathological disorders (Lee, Harrington, Louie, & Newschaffer, 2008), and parents of children with other developmental delays (Estes et al., 2009). In addition to the extra money, time, and energy needed to care for and provide services for the child, the child's comorbid diagnoses (Bebko, Konstantareas, & Springer, 1987; Plant & Sanders, 2007) and adaptive functioning deficits have also been reported to contribute to parental stress (Hall & Graff, 2011). Parental stress also may further exacerbate difficult behaviors associated with ASD, resulting in a bidirectional, perpetuating cycle (Karst & Van Hecke, 2012).

Other outcomes of and contributors to parent stress are physical, emotional, and psychological problems for the parent, which results in more stressors to the family (Brobst, Clopton, & Hendrick, 2008). While the direction of effects is unclear, parents of children with ASD, especially mothers, have higher levels of depression and anxiety (Olsson & Hwang, 2001; Hastings, 2003), and physical health problems, even compared to parents of children with other disabilities (Mugno, Ruta, D'Arrigo, & Mazzone, 2007). These psychological and physical health conditions can make it harder to care for the child and can also have a negative effect on the family.

Fortunately, stress associated with parenting a child with ASD does not generally affect parent's perceived closeness of the relationship with the child, but it may affect marital satisfaction and status (Hoffman, Sweeney, Hodge, Lopez-Wagner, & Looney, 2009). Parents of children with ASD are twice as likely to get divorced as parents of neurotypical children (Hartley et al., 2010). Parents of children with ASD who stay married report lower levels of marital satisfaction compared to parents of children with other developmental delays or no disabilities (Santamaria, Cuzzocrea, Gugliandolo, & Larcan, 2012). Further, divorce and marital discord often result in lower levels of financial and social support, which are protective factors against stress and psychopathology (Bromley, Hare, Davison, & Emerson, 2004).

Some research has identified protective factors that minimize stress for parents of children with ASD. For example, parental use of coping strategies that focus on seeking social support, problem-solving, focusing on the positive, expressing emotions in a constructive way, and compromising has been shown to improve mood and minimize stress (Pottie & Ingram, 2008). Additionally, parents who are lower in the Broader Autism experience lower levels of stress (Ingersoll & Hambrick, 2011). Thus, it can be important to increase parent's utilization of and/or access to social support and coping strategies to decrease stress.

The impact of ASD on siblings has received less research attention and extant studies differ somewhat in outcomes. For example, in some studies siblings report overall positive relationships with their sibling with ASD and positive self-concepts (e.g., Macks & Reeve, 2007) and are not at increased risk for adjustment difficulties (e.g., Kaminsky & Dewey, 2002), yet other studies suggest that siblings are at risk for internalizing and externalizing problems, and report negative relationships with their sibling with ASD (e.g., Meadan, Stoner, & Angell, 2010; Ross & Cuskelly, 2006), and increased risk of adjustment difficulties (Fisman, Wolf, Ellison, & Freeman, 2000). Some of the variability in findings may be due to methodological differences between studies and small samples, but some may be due to differences depending on the severity of the child with ASD's presentation, the sibling's characteristics, and family functioning (Meadan et al., 2010). Therefore, further research on the family system and impact on siblings is needed to understand factors that influence family functioning and sibling outcome. This research should lead to interventions to help families remain intact, support one another, and access needed resources.

1.7 Conclusions

The criteria and our understanding of the etiology of ASD have changed over time, but with a wealth of past and ongoing research there are promising implications for future discoveries related to ASD. Improved understanding of and awareness for the disorder have resulted in a higher number of children diagnosed with ASD with 1 in every 59 children diagnosed with ASD in the United States. Boys are more likely to receive the diagnosis compared to girls and there are substantial variations in the presentation of the disorder across the sexes and within ASD more broadly. Children with ASD do not only face the abnormalities associated with their ASD diagnosis, but they are at an increased risk for other mental health and medical diagnoses as well. The etiology of the disorder may also encompass genetic, mitochondrial, or other medical diagnoses that further affect their presentation and affect the individual and his or her family. Families of children with ASD display higher stress, lower incomes, and many related psychosocial stressors associated with caring for a child with special needs. More research is needed to continue to learn about the heterogeneous diagnosis of ASD, but the recent influx of research on this population has led to many new discoveries and new pathways for investigation.

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Applied Behavior Analysis: Foundations and Applications

2

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Abstract

Applied behavior analysis (ABA) is a science that involves applying interventions based on the principles of behavior analysis to change socially significant behavior. ABA is often erroneously viewed as an intervention, as opposed to a science. In this chapter, we discuss the science of ABA using the framework of the seven defining characteristics of the science, as described by Baer, Wolf, and Risley. We also provide a historical account of the science, focusing on its foundation in experimental analysis of behavior. As we discuss the defining features of ABA, we also identify some of the common misconceptions about ABA and attempt to clarify so as to dispel these misconceptions. Finally, given that therapies based on the principles of behavior analysis are the crux of evidence-based treatment for autism, we discuss the role of practicing behavior analysts in the treatment team. Because behavior analysis is a relatively young field, and there has recently been very large growth in the number of behavior analytic practitioners, known as Board Certified Behavior Analysts (BCBAs). We provide information on what a BCBA is, what their training consists of, and what skills they bring to the treatment team. It is our hope that this will assist the practitioner of parent–child interaction therapy (PCIT) in determining how behavior analysts can collaborate with them in the treatment process.

Applied behavior analysis (ABA) emerged as a distinct discipline in 1968, with the formation of the discipline's flagship journal, the *Journal of Applied Behavior Analysis*. ABA is a science that involves applying interventions based on the basic principles of behavior analysis to change socially significant **behavior**. This field is based on foundational research referred to as "basic research" (i.e., with nonhuman animals) from which the principles of behavior analysis were derived. In the area of autism treatment, interventions based on the principles of behavior analysis are considered evidence-based treatment (National Autism Center, 2015). Thus, a field of practice known as "ABA" has also arisen. It is not uncommon for this form of treatment to be referred to as "ABA treatment" or "ABA therapy." However, it is important to understand that

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ABA is not a "treatment" or a "therapy." Rather, ABA is a science and a discipline. ABA is connected to the science of behavior the same way the practice of medicine is connected to research in chemistry and biology. The purpose of this chapter is to provide a primer on the science of ABA. To that end, we begin with a review of the basic science that laid the foundation for the origins of ABA. In this section, we distinguish more clearly the science and practice of ABA.

In addition to the misunderstanding that ABA is a treatment as opposed to a science, there are several other myths about ABA that exist. These myths often arise from a misunderstanding of what ABA is and what it is not. Baer, Wolf, and Risley (1968) identified the hallmark features of ABA in the inaugural issue of the *Journal of Applied Behavior Analysis*. We review those features and discuss them in the context of common myths about ABA. Embedded in this discussion are examples of the key terms and principles of behavior analysis. Definitions of these key terms and principles can be found in Table 2.1. (The first time one of these key principles or terms is used in the chapter, it is printed in boldface type to indicate that the definition can be found in the table.)

Finally, because this book is practice oriented, we discuss clinical practice based on the principles of ABA. Behavior analysis is a broad field. After all, many problems people experience are behavioral in nature. For example, the problem of obesity is often due to individuals consuming too many calories and/or leading a sedentary lifestyle. Consuming food and exercising are behaviors in which people engage and, therefore, are controlled by the basic principles of behavior. Likewise, recycling and living a "green lifestyle" consist of behaviors controlled by basic principles of behavior, as do parenting skills and child-appropriate and -inappropriate behaviors.

Individuals who study the science of behavior analysis are called behavior analysts. As stated earlier, some behavior analysts focus their work on basic science. Others work in the applied arena. Broadly speaking, applied behavior analysts are interested in understanding how a person's environment affects their behavior

Table 2.1 Selected behavior analytic key terms and definitions

Term	Definition
Behavior	Movement of some part of an organism that changes some aspect of the environment (Johnston & Pennypacker, 1993). An observable act of an individual (Alberto & Troutman, 1990). A **response** is a single instance of behavior.
Stimulus	Energy change that affects an organism through its receptor cells (Michael, 2004).
Antecedent	A stimulus change existing or occurring prior to a behavior (Cooper, Heron, & Heward, 2007).
Consequence	A stimulus change that follows a behavior (Cooper et al., 2007).
Respondent behavior	Behavior that is elicited by antecedent stimuli (Cooper et al., 2007); these behaviors are typically reflexes.
Operant behavior	Behavior that is selected, maintained, or brought under stimulus control as a function of its consequences (Cooper et al., 2007); these behaviors are typically voluntary.
Reinforcer	A consequence stimulus that increases or maintains the future rate and/or probability of occurrence of a behavior (Alberto & Troutman, 1990).
Punisher	A consequence stimulus that decreases the future rate and/or probability of a behavior of the occurrence of a behavior (Alberto & Troutman, 1990).
Functional relation	Causal relation between a dependent and independent variable(s). This relation is said to exist if the dependent systematically changes as a result of the manipulation of the independent variable (Alberto & Troutman, 1990).
Contingency	A dependent and temporal relation between operant behavior and its controlling variables (Cooper et al., 2007).
Negative reinforcement	The contingent removal of an aversive stimulus immediately following a response that increases the future rate and/or probability of the response (Alberto & Troutman, 1990).
Positive reinforcement	The contingent presentation of a stimulus immediately following a response which increases the future rate and/or probability of the response (Alberto & Troutman, 1990).
Extinction	The discontinuation of reinforcement for a previously reinforced behavior. The primary effect is a decrease in the future probability of the behavior (Cooper et al., 2007).

and designing behavior-change interventions based on this understanding. Many treatment technologies based on principles of behavior analysis have emerged, and these technologies continue to evolve and improve as lessons from the laboratory are translated to practice (Mace, 1994; Mace & Critchfield, 2010; Neef & Peterson, 2005). Applied behavior analysts take these technologies into natural settings and work with a wide variety of populations on intervention goals, including teaching new skills (e.g., language development), increasing adaptive and healthy behavior (e.g., physical activity), and treating challenging behavior (e.g., aggression). A subset of those behavior analysts become certified to provide clinical services to individuals seeking treatment for problems such as those described above. These individuals are known as Board Certified Behavior Analysts (BCBAs). BCBAs are certified by the Behavior Analyst Certification Board (BACB) after they complete specific education requirements, specific field experiences, and take a qualifying exam. The BACB is a relatively young organization, established in 1998 (see https://www.bacb.com/about/), and BCBA certification is relatively new. Thus, many people outside the field of behavior analysis are unaware of what a BCBA is and what their practice involves. We conclude this chapter with a discussion of BCBAs and what their role might be as a member of a team working with parents and children diagnosed with ASD who are experiencing behavioral challenges.

2.1 The Origins of Applied Behavior Analysis

Behavior analysis as a clinical practice emerged in the 1960s, but its roots can be traced back to the early 1900s. The philosophy of behavioral science is called behaviorism, which was first introduced in its early form by John B. Watson. Watson laid the groundwork for classical behaviorism in his article, “Psychology as the Behaviorist Views It.” He was skeptical of psychology’s reliance on introspection as a means of research, and he believed that the field should follow the lead of other natural sciences (Moore, 2008). In pursuit of this goal, Watson implored psychologists to use rigorous research methodology and abandon introspection in favor of collecting objective data for events that are both observable and measurable.

Watson’s brand of behavioral science is known as **stimulus-response** (S-R) psychology. This approach focused on **antecedent** stimulus-eliciting—that is, triggering—behavior. Watson and other early behaviorists asserted that all behavior, even complex human behavior, is caused by preceding events, a conclusion that would later be rejected by B. F. Skinner and other modern behaviorists (Skinner, 1974). S-R psychologists studied only publicly observable events and behavior, and they notably rejected internal events such as thinking and feeling (Moore, 2008). By the 1930s, some psychologists were becoming skeptical of classical S-R behaviorism as a sufficient framework for analyzing and explaining all behavior. Two of the main criticisms of Watson’s behaviorism were related to insufficiency for predicting and controlling “voluntary” behavior and lack of concern for mental events (Moore, 2008).

B.F. Skinner, who is credited with developing contemporary behaviorism and the modern field of behavior analysis, was an influential critic of classical behaviorism. Skinner was influenced by Watson and Pavlov early in his career, but the course of his research took a significant turn when he discovered that behavior can be modified by the events that follow it (i.e., **consequences**; Dixon, Vogel, & Tarbox, 2012; Skinner, 1938). This finding contrasted the S-R model that behavior is modified by antecedent events only (respondent behavior), and Skinner criticized classical behaviorists for overstating the significance of S-R conditioning (Skinner, 1974). Consequence-based learning became known as operant conditioning, and operant research has shown the importance of both the antecedent (events preceding) and consequence of (events following) behavior.

In 1938, Skinner published *The Behavior of Organisms*, in which he outlined his early work in behavior analysis and distinguished between **respondent** and **operant behavior** (Cooper et al., 2007).

Skinner coined his philosophy of behavior as radical behaviorism. He chose the word *radical* to highlight its distinction from classical behaviorism and to indicate a "thoroughgoing" of the behavioral philosophy (Moore, 2008). Besides its focus on operant behavior, one of the most notable differences between classical and radical behaviorism is that radical behaviorism considers mental events within bounds of a scientific analysis of behavior. Private events, such as thinking and feeling, are usually not considered causes of overt behavior, but forms of behavior themselves (Skinner, 1953). Skinner's new brand of behaviorism and his research on operant conditioning launched the field of behavior analysis and popularized the study of behavioral principles.

Researchers took strides toward a clinical practice of behavior analysis in the 1940s and 1950s when they began to replicate principles of operant learning in human subjects (Azrin & Lindsley, 1956; Bijou, 1958; Ferster & DeMyer, 1962; Long, Hammack, May, & Campbell, 1958; Michael, 2004). A few years later, Ayllon and Michael (1959) published one of the first studies using a clinical application of behavior analysis. They showed that nurses in a psychiatric hospital could use a behavioral approach to decrease psychotic talk for some patients, and increase self-feeding in other patients. Other early research on therapeutic applications included the use of behavioral principles to increase social behavior (e.g., Allen, Hart, Buell, Harris, & Wolf, 1964), decrease challenging behavior in individuals with intellectual and developmental disabilities (e.g., Wolf, Risley, & Mees, 1963), and design behavioral approaches to education (e.g., Keller, 1968). In the 1960s, Ivar Lovaas pioneered behavioral interventions for children diagnosed with autism. He developed behavioral treatments to decrease problem behavior and teach language and social skills (Smith & Eikeseth, 2011). Lovaas' work on early intervention at the University of California Los Angeles (UCLA) was pivotal for shifting the treatment model for children with autism from institutionalization toward skill building at home and in clinic settings.

The field of applied behavior analysis has continued to evolve since the early years of clinical applications. Interventions have been applied to a wide range of new settings, target behaviors, and populations. Although the basic principles behind intervention technologies have largely remained the same, the methods employed by practitioners continue to become more sophisticated. For example, before there was the technology to identify the variables contributing to a given behavior, practitioners often attempted to change behavior by superimposing large consequences (**reinforcers** and **punishers**) without adjusting other aspects of the natural environment (Mace, 1994). Some of the methods used in behavior analysis in its early years were blunt tools for changing behavior known as "behavior modification." Behavior modification is a term used for changing behavior without an understanding of the behavior-environment interactions. Behavioral treatments have evolved significantly as researchers have developed and refined new approaches. Contemporary behavior analysis attempts to understand **functional relations** between the environment and behavior before developing a treatment for that particular behavior (Mace, 1994). For example, there was a shift in methods for decreasing challenging behavior in the 1980s and 1990s with the development of functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1994/1982; Neef & Peterson, 2007, Chap. 10 of this text). With this new technology, practitioners were able to assess the precise variables affecting behavior and use this information to plan individualized treatments that affect behavior with greater precision. This is seen by many as the turning point away from the practice of behavior modification to a contemporary practice of applied behavior analysis (Mace, 1994). This contemporary view focuses more on behavior *analysis* as opposed to behavior *modification* in that environmental variables affecting behavior are carefully analyzed prior to treatment development. Thus, the recommended treatment or therapy is more precisely matched to the reason problem behavior is occurring or the reason desired behavior is not. However, not everyone outside of behavior analysis recognizes this shift in applied practice, resulting in the persistence of myths and misunderstandings about behavior analytic practice. A review of the defining characteristics of ABA, from both a historical and contemporary perspective, may be helpful in understanding this contemporary view of behavior analysis and dispel the lingering myths about the science and practice of behavior analysis.

2.2 Defining Characteristics of ABA: Myths and Realities

Baer et al. (1968) offered seven defining characteristics of applied behavior analysis, which still define the field to this day. Any behavior analyst worth his or her salt clearly understands these defining characteristics; however, few outside the field of behavior analysis are familiar with them. Behavior analysis, like many fields (e.g., medicine), has its own vernacular. Some of the words behavior analysts use in a very technical manner (i.e., to refer to very specific procedures or effects on behavior) are also commonly used by the lay person to mean something different. Perhaps due to the relative youth of the field or as a result of poor communication between behavior analysts, other professional disciplines, and the broader community, several myths about behavior analysis have arisen and continue to persist to this day. In this section, we review the defining features of behavior analysis and attempt to put some of this vernacular into context in an attempt to bring about a better understanding of behavior analysis and avoid perpetuating myths.

2.2.1 Behavioral

Applied behavior analysis is pragmatic and centers around the study *of* behavior, rather than *about* behavior (Cooper et al., 2007). In other words, behavior analysts select measurable behaviors to target (i.e., goals to increase or decrease), and they take direct data on these behaviors before, during, and after treatment to directly assess change. For example, when working with a child who engages in physical aggression toward a caregiver, a behavior analyst specifically focuses on the physical aggression, current environmental **contingencies** that influence that behavior, and strategies to prevent or reduce the future frequency of that response. Behavior analysts do not focus on measuring speculative explanations for the behavior such as the child's level of anxiety, impulsivity, or emotion regulation. The rationale for this distinction is explained in three points outlined in the seminal article by Baer et al. (1968).

First, the behavior that is measured and studied must be the behavior that needs improvement. Behaviors that are similar or serve as proxies to the behavior of interest do not demonstrate the same applied value of actually changing the behavior. For instance, measuring a reduction of anxiety reported by the aggressive child is an example of a proxy, but changes in anxiety do not necessarily mean that he/she will engage in less dangerous behavior. Therefore, unless anxiety is the main target behavior, the behavior analyst does not prioritize this measurement and instead focuses on directly tracking instances of aggression. However, this is not to say that verbal reports or verbal responses are not of interest to behavior analysts. In fact, this is a persistent myth about behavior analysis. On the contrary, many behavior analysts focus a great deal on verbal responding; for example, behavior analysts often work with clients who have difficulties with communication, so targeting verbal responses specifically is a requisite. It is also worth noting that while behavior analysts avoid measuring proxy behaviors to judge the effects of intervention, they are sometimes measured for other reasons. For instance, behavior analysts value the satisfaction of stakeholders and recruit feedback regularly during treatment (social validity measures; Wolf, 1978; BACB, 2014). For example, even when a practitioner has data showing that the intervention has reduced aggression, they will assess whether the child's caregivers are satisfied with the treatment techniques being used and with the changes in behavior.

Second, due to behavior analysts' foundational belief that scientific study requires precise measurement, Baer et al. (1968) asserted that the behavior of interest must be observable and measurable. For instance, the previous example described a child who aggressed toward his/her caregiver. Some may attribute the aggression to constructs that are not observable, such as problems with emotion regulation. Emotion regulation can be difficult to measure, and thus proxies for emotion regulation (e.g., deep breathing, appropriately removing themselves from a situation, change in heart rate) are measured instead. Improvement in these proxy behaviors is then presumed to show improvements in emotion regulation. Measuring only such proxies for emotion regulation without also taking direct data on aggression would be problematic. Although strategies like deep breathing and appropriately removing oneself from a problematic situation may be of interest to behavior analysts as potential interventions, these strategies do not guarantee that aggression will decrease. Thus, it is essential that the target behavior—aggression—is directly measured because it is the primary behavior of concern. A behavior analyst may measure other behaviors as "replacement behaviors" for aggression as part of treatment. For example, intervention components could include teaching deep breathing and removing oneself from a difficult situation, and these coping skills are observable and measurable. But, even if improvements in these coping skills are observed, the behavior analyst would be cautious to assume that the client has improved his/her "emotion regulation." Emotion regulation is not observable and therefore requires assumptions on the part of the observer—something behavior analysts avoid. Baer, Wolf, and Risley (1987) stated that direct observation of the behavior is the standard measurement method for applied behavior analysts. This is not to say that behavior analysts ignore private or internal events (i.e., emotions, thoughts, feelings), but instead view those events similarly to public events and treat them accordingly (Baer et al., 1968; Skinner, 1957). In other words, private events (i.e., "thoughts") are treated as behaviors that are unobservable by those other than the client himself/herself.

Finally, it is important to ensure that any measured changes in behavior are actually changes in the behavior of the client and not an accidental measurement artifact. Small changes in the behavior of individuals involved in treatment or the data collection system itself can produce artificial changes in measurement of the behavior. In keeping with our previous example, the caregiver at whom aggression is directed may unwittingly begin to avoid being in close physical proximity to the child. As a result, the child may not have as many opportunities to engage in aggression. This reduces the overall amount of behaviors recorded, but not necessarily because the behavior is less likely in circumstances similar to earlier conditions (i.e., frequent close proximity to an adult). Additionally, the method of collecting data can produce invalid results. For example, trained observers may experience observer drift, where they unintentionally deviate from the original definition of the behavior of interest, producing inaccurate data (Kazdin, 1977). Therefore, explicit and precise measurement of an appropriate behavior in an appropriate context, along with checks to ensure that data are collected in a consistent manner, is essential to the behavioral approach. These checks are called "interobserver agreement checks," and are an important part of the behavior analytic approach (see Vollmer, Sloman, & St. Peter Pipkin, 2008).

2.2.2 Applied

As indicated in the title, *applied* behavior analysis is a discipline that prioritizes socially significant behaviors. With a commitment to improve the lives of the individuals receiving services, pioneers of applied behavior analysis translated the basic principles studied in behavioral laboratories to interventions for socially important behavior in the real world. Even today, basic researchers study behavior in well-controlled laboratory settings while their work continues to inform the practices of applied researchers and practitioners (see Neef & Peterson, 2005 for a complete description of how basic research, applied research, technology, and applied practice inform each other). ABA is the part of behavioral science oriented toward helping society and solving immediate problems. In contrast to myths that behavior analysts control behavior for the sake of controlling behavior or select arbitrary behaviors to improve, applied behavior analysts are obligated to select behaviors for study/intervention that have direct relevance to improving the daily life experiences of those involved in treatment. This is accomplished by talking with care providers prior to intervention to determine behaviors they view as important to change, being culturally sensitive, and selecting target behaviors that will unlock more resources for clients. For example, one practical problem for many parents is potty-training their child. This can be difficult with a nondisabled child, but it can be even more challenging when the child has a disability. In some communities, if a child is not potty-trained by a certain age, the child cannot attend daycare or even a general education classroom. Thus, lacking the skill of appropriate toileting can severely limit one's access to community and educational settings. Thus, teaching appropriate bathroom behaviors not only helps the immediate concern of eliminating problems associated with individuals urinating and defecating on themselves, but it also allows the child access to natural environments and opportunities to learn and receive positive reinforcers. As a result, behavior analysts consider this a socially significant behavior to target.

2.2.3 Effective

In conjunction with the focus on socially significant behaviors, behavior analysts also judge the success of their interventions based on the clinical significance of the change. Clinical significance, similar to social significance, is determined by assessing the social validity of the intervention. That is, in order to call an intervention effective, it must produce meaningful change in the life of the persons of interest. As a field, behavior analysis has developed many effective procedures and tactics for individuals across the life span with a variety of problem behaviors. However, behavior analysts do not assume that interventions for one client are effective for another client. Instead, behavior analysts determine the effectiveness of interventions individually using ongoing data collection and social validity measures from stakeholders. For instance, a family with a child who screams daily up to 3 or 4 h without interruption would likely perceive meaningful change to be reducing the duration of the screaming to less than 5 s and the frequency to once or twice a week. While the child still screams, the quality of life for the child and family has noticeably improved and, therefore, the intervention would be deemed effective. In contrast, if screaming is reduced to 2 h a day, but it still occurs daily, this would not be considered clinically significant, although a reduction in screaming was observed. Although screaming was reduced, the reduction was not to a level that produced meaningful change for the family. The intervention is only clinically significant (i.e., effective) to the extent that it decreases to a level that is socially important for that family. Behavior analysts determine these criteria for "success" individually for their clients.

There is a common misconception that the principles of behavior analysis are effective with only individuals with autism and developmental disabilities. In fact, within the 50-year history of ABA, autism has only recently become a major interest (Axelrod, McElrath, & Wine, 2012). Behavior analytic strategies and assessments have demonstrated effectiveness with many populations including typical children, specific issues related to mental illness, those addicted to drugs (e.g., cocaine), typical adults (e.g., how we drive our cars, whether we recycle), and more.

2.2.4 Analytic

Fundamentally, behavior analysts are scientists who must demonstrate a causal relation between interventions and changes in behavior; in other words, there must be a functional relation between the behaviors of interest and environmental events (oftentimes an intervention) to determine effectiveness. In any science, controlled research designs and data analysis are important in demonstrating the effectiveness. In the practice of applied behavior analysis, close, continual contact with the data is important in achieving high-quality services and significant outcomes for clients. Applied behavior analysts collect repeated measures of behavior over time while carefully holding constant the environmental conditions or systematically manipulating environmental conditions to observe and measure the effect on behavior. By controlling the environment around the behavior (i.e., antecedents and consequences) and systematically measuring the behavior of interest on numerous occasions, the behavior analyst can determine reliable environmental influences on the behavior of interest. Once these relations are determined, the behavior analyst can help arrange the environment to support and teach adaptive behaviors while decelerating inappropriate behaviors. A common myth is that behavior analysts control behavior. Behavior analysts do not control behavior. Rather, they study how environmental variables impact the behavior of interest and arrange environments to reliably influence the behavior in socially valid ways—that is, to create contexts in which clients are likely to behave in the most adaptive ways so as to maximize reinforcement and independence.

2.2.5 Technological

Any successful science or practice has guidelines for appropriately sharing and replicating procedures of interest. The science develops a technology for implementation (see Neef & Peterson, 2005). "Technological," as described by Baer et al. (1968), means identifying and sufficiently describing techniques that make up a behavioral application. This does not necessarily mean "manualizing" applied behavior analytic procedures. Behavior analysts are often reluctant to "manualize" their treatments because doing so means treating each client with a standardized treatment. This flies in the face of studying the effects of specific variables on an individual's behavior and providing individualized treatment. Instead, technological descriptions of the intervention are provided for the purpose of identifying replicable behavioral tactics. In doing so, all of the "salient ingredients" of an application are described so that multiple care providers can implement the treatment consistently and so the relevant variables responsible for behavior change are clear. For example, stating social reinforcement was provided to a child for intervention is not sufficiently technological. It is not clear what social reinforcement consists of in this situation. A more appropriate description of "social reinforcement" as an intervention would be delivering a praise statement, such as enthusiastically stating "great job raising your hand," along with brief physical contact, such as tousling the child's hair. Being technological is important not only for sharing information with other practitioners, but also for sharing information with the caregivers we train. The best way to determine if procedures are adequately technological is to ask someone to implement a procedure based solely on the written description, observe them doing so, and measuring the individual's accuracy of implementation. These are referred to as "treatment fidelity checks" and are used to measure whether the treatment is being implemented as prescribed (see Vollmer et al., 2008). Implementing treatments with high fidelity both within and across care providers and environments is an important hallmark of behavior analytic practice.

2.2.6 Generality

A primary responsibility of a behavior analysts is to ensure that behavior change occurs across important care providers, environments, behaviors, and time. Behavior analysts are concerned that a generalization of effect occurs across care providers, environments, behaviors, and time. If behavior change only occurs in a controlled context, meaningful change has not occurred. Behavior change must generalize to natural settings, with multiple people, and under multiple circumstances over time. For instance, if a behavior analyst teaches a child adaptive behaviors to replace physical aggression with deep breathing and removing himself/herself from the situation, these new behaviors must occur in non-treatment settings in the absence of the therapist (i.e., they must "generalize") to be considered important changes in behavior. Behavior analysts consider generalization strategies from the beginning stages of intervention so that generalization can be measured and, if it does not occur, systematically taught. It is not acceptable to simply teach a behavior and hope that behavior generalizes, across people, settings, and time. Rather, programming for generalization is intentional (see Stokes & Baer, 1977). It is also expected that behavior analysts arrange interventions and supports to fade systematically until natural contingencies support adaptive behavior appropriately.

2.2.7 Conceptually Systematic

A scientific discipline requires consistency in the conceptual approaches and explanations practiced. The field of ABA has observed this and been devoted to a conceptually systematic approach. In doing so, ABA has successfully maintained as a *discipline* over time, recently experiencing growth and rapid expansion. This means the field carefully maintains its roots in behavior principles and continues to train practitioners to base their interventions on behavioral analyses of behavior. Without conceptual systems, ABA would not be a science but would instead be a vaguely related collection of behavior modification tricks. For instance, a token economy is a common behavioral intervention. A token economy involves delivering a token of some sort (e.g., a poker chip, a point) as a reinforcer immediately following a behavior. After some period of time, these tokens are exchanged for a "backup reinforcer," such as tangible items (e.g., pencils, edible items). This common behavioral intervention can be construed as a "behavioral trick," because its implementation is often inconsistent with behavioral principles. That is, it is applied without an understanding of the underlying behavior-environment interactions. The "trick" might be very effective, however, in that it may change behavior in the desired direction. On the other hand, if the underlying behavior-environment interactions are not understood, the trick may not be effective because the backup reinforcers for token exchanges may be irrelevant. This "trick" is only behavior analytic if it is implemented in a manner consistent with the principles of behavior and encompassing all seven dimensions of behavior analysis. The key to being conceptually systematic is maintaining relevance to principle in all respects.

2.3 Relevance of ABA in PCIT

At the core of ABA is a fundamental reliance on basic principles of behavior. Occasionally, approaches from other disciplines that are not presented as behavior analytic, per se, are remarkably consistent with ABA. Behavior analysts recognize and appreciate these points of convergence across disciplines. For example, behavior analysts embrace important aspects of Patterson's (1982) coercive family process model, in which Patterson describes caregivers inadvertently reinforcing progressively more aggressive behaviors in their children by terminating events that evoke problem behavior. Because the child removes an aversive stimulus (i.e., problem behavior) when the caregiver removes the aversive stimulus (e.g., a demand), the caregiver's behavior is also negatively reinforced. Thus, an unhealthy cycle of inappropriate behaviors that produce **negative reinforcement** for both parties commences. Some behavior analysts use different terminology to describe this model. For example, Malott and Shane (2015) describe this as the "sick social cycle." Although Patterson's model is not fully behavior analytic, behavior analysts are likely to embrace it because of its clear foundation based on negative reinforcement.

Similarly, much of PCIT is consistent with behavior analytic concepts. A PCIT therapist providing services to a child and caregiver with a coercive relationship will begin with teaching child-directed interaction (CDI) skills. Doing so may interrupt the coercive relationship previously established by making the parent interaction/attention less aversive and potentially even **positively reinforcing**. Establishing reinforcers for appropriate behavior is certainly consistent with the behavioral approach. Likewise, the use of time-out in PCIT can also be consistent with the behavioral approach *assuming that "time-in" is reinforcing*. Similar to the token economy example provided earlier, time-out is an intervention that is often used as a "trick" and is not always conceptually systematic in its implementation. Time-out is a procedure that involves removing a child from the current context for a brief period of time. Often, it is implemented with the intention of decreasing the problem behavior that occurred immediately before the time-out commenced (i.e., as a punishment procedure). What we know from behavioral principles is that such a procedure is only effective to the extent that the initial context (i.e., "time-in") is desirable, thus making removal from that context undesirable. However, time-out poses a threat of negatively reinforcing problem behavior if the "time-in" consists of an aversive stimulus (i.e., it consists of demands and is unpleasant). For example, consider a situation in which a parent is instructing a child to complete his/her homework (a situation the child might find aversive). Let's assume the child responds to this instruction with a tantrum, and the parent subsequently places the child in time-out. Even though the parent was attempting to decrease tantrums, it is possible the parent may accidentally reinforce the problem behavior. By allowing the child to escape a situation or demand, even for a brief time, time-out could function as a negative reinforcer rather than a punisher.

If specific aspects of an intervention such as PCIT are implemented as "tricks" outside the parameters of the behavior analytic conceptual system, the therapist runs the risk of implementing counter-therapeutic interventions. Because behavior analysts adhere to a conceptual system, they are very cautious about implementing time-out (or any other intervention) in the absence of an understanding of the behavior-environment interactions. Consequently, they will typically only implement time-out after first assessing the function of the problem behavior. If a context exists where the child is being asked to engage in a demanding task or nonpreferred situation, the child may be motivated to escape. In this case, time-out is contraindicated as a treatment component. In some cases, however, parent attention can successfully be conditioned as a positive reinforcer. In this case, the positive reinforcement available from parent attention may decrease the child's motivation to escape, despite the continued demands. In this context there exists a competition between two reinforcers (i.e., positive and negative), which creates a choice context for the child. Behavioral researchers (e.g., Lalli et al., 1999; Peck et al., 1996) have shown that positive reinforcers can be arranged to "beat out" the negative reinforcers in such a choice context. Teaching CDI skills may be a way to condition parent attention as a reinforcer and may help change the coercive interaction cycle such that complying with parent requests is more reinforcing than escaping task demands. However, PCIT therapists may wish to evaluate whether the time-out component of the intervention should be implemented (at least initially) for any given child if there is a risk that it will reinforce problem behavior. This is an area where a behavior analyst may play an important role in assisting with PCIT.

2.4 Role of a Behavior Analyst on Treatment Teams

Behavior analysis is a growing field, and as a result the Board Certified Behavior Analyst (BCBA) credential is being encountered more frequently by other professionals (Stratton & Gadke, 2016). A BCBA is a professional who utilizes the principles of behavior analysis, as described within this chapter, to improve the human condition. Behavior analysts are credentialed to practice independently at the masters or doctoral level. The general requirements of the BCBA credential are a graduate degree in behavior analysis, psychology, or education with explicit training in behavior analytic principles; supervised professional experience; and passing a knowledge-based exam (see www.bacb.com for further information).

The BCBA credential arose from a series of events, which included alleged abuses of individuals with disabilities by professionals claiming application of behavior analytic principles (Johnston & Shook, 1987). As a result of those events over 30 years ago, behavior analysts created a certification process to help insure a standard of practice to protect consumers. Advocates then pushed the BCBA credential from a state-sponsored credential to an internationally recognized credential with over 20,000 certificants. Although the overall number of BCBAs is small compared to other professionals (Carr & Nosik, 2017), the number of behavior analysts is increasing rapidly (Deochand & Fuqua, 2016).

BCBAs work across a variety of fields/settings including schools, autism and developmental disability treatment, residential treatment, and parent training. Thus, it is not uncommon for individuals working with individuals or families with behavioral needs to encounter a BCBA on a treatment team. One of the benefits of working with BCBAs in any setting is the BCBA's skill set in performing functional behavior assessments (FBAs). An FBA is a method for obtaining information about the environment and the behavior to determine the purpose a behavior serves for an individual (Neef & Peterson, 2007). In other words, it is an assessment method for determining functional relations between behavior and environmental variables. Thorough FBAs can help treatment teams select effective interventions and rule out potentially counter-therapeutic interventions. For example, a PCIT practitioner might work with a BCBA to assess a child's problem behavior at the start of PCIT. Information gathered in the FBA by the BCBA could then be used by the PCIT practitioner to determine the appropriateness of time-out and other consequences planned as part of the treatment protocol.

In addition to evaluating problem behavior, a BCBA can also help to identify skill deficits and create plans for skill acquisition. For example, if a PCIT therapist is attempting to implement CDI with a parent, the therapist may notice that the child does not have a well-developed play repertoire. The behavior analyst could help pinpoint play skills that need to be developed, explicitly identify those targets for the parent, and make suggestions for how to prompt (VanDerHeyden, Snyder, DiCarlo, Stricklin, & Vagianos, 2002) and reinforce displays of those play behaviors (Stahmer, Ingersoll, & Carter, 2003). Similarly, if the child is lacking the skills to engage in appropriate social interaction with the parent, the behavior analyst could help identify targeted social skills or verbal interactions and teach them using direct instruction (Englemann, 1968) or scripts (Krantz & McClannahan, 1993).

Behavior analysts also bring to the table skills in coaching parents to implement treatments for problem behavior and skill acquisition in naturalistic settings such as homes. With respect to treatments for problem behavior, there exist several studies that describe procedures for coaching parents to implement interventions based on ABA in their own homes, even when the behavior analysts are not present and are providing coaching via telemedicine technologies (e.g., Lindgren et al., 2016; Suess et al., 2014). Behavior analysts are often knowledgeable about technologies for training parents, child care workers, and other care providers to teach desired skills as well. For example, there is evidence that pyramidal training can be effectively used to teach others to implement effective practices (see Andzik & Cannella-Malone, 2017 for a review).

A BCBA can play an important role on the intervention team, from helping to assess and pinpoint skills for improvement, designing effective intervention strategies for developing those skills, and training parents to implement intervention strategies. Given their expertise in operationalizing target behaviors, behavior analysts can also be instrumental in working with the team to identify and define the socially meaningful outcomes desired as a result of PCIT. This can allow the team to obtain direct measures of the desired outcomes produced through PCIT.

2.5 Summary

ABA is often misunderstood as a “therapy,” when in fact it is a science and a philosophy. The purpose of this chapter is to help readers understand the roots and underpinnings of applied behavior analysis, as well as the field’s hallmark features and key terms. It is our hope that providing an overview of the field will be beneficial to practitioners of PCIT in at least a couple of ways. First, understanding key terms of the field may help establish shared vernacular. Second, understanding the defining features of the science may help dispel some of the common misconceptions and myths about the science.

When solving problems, behavior analysts typically rely on the foundational and core principles of the science—reinforcement, punishment, and **extinction**—as well as specific environmental contingencies. Some might view this approach as rigid. However, what may appear to others as rigidness may simply be the behavior analyst attempting to remain conceptually systematic, which is consistent with the behavior analyst’s training and the ethics codes to which the behavior analyst is bound. Having said that, it is important to understand that practitioners from different disciplines often have much in common. We have provided a couple of examples above (e.g., Patterson’s coercive family process, PCIT). We encourage members of all professions to look for points of convergence in their disciplines and work from there, rather than look for points of divergence. Working from points of convergence focuses on the commonalities across professions and may provide a better basis for collaboration.

Behavior analysts can play an important role in the treatment team for a child who is experiencing problem behaviors and may be a candidate for PCIT. Perhaps because the field of behavior analytic practice is relatively new, behavior analysts and what role they may play in a treatment team are often not well understood. We have attempted to describe what we see as the role of a behavior analyst in the treatment team. We provide this in hopes that professionals implementing PCIT can find points of convergence with behavior analysts and that this will encourage productive work together that ultimately benefits the children and families engaged in PCIT.

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Evidence-Based Models of Treatment

3

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Abstract
Evidence-based treatments are interventions that have been validated through methodologically sound studies and shown to produce significant and/or clinically meaningful effects on behavior. There are many treatments for autism spectrum disorders (ASD); however, only a handful of these treatments are evidence based. This chapter discusses the main components of several evidence-based treatment models for individuals with ASD including (a) Early Intensive Behavioral Intervention, (b) Pivotal Response Treatment, (c) Early Start Denver Model, (d) Learning Experiences and Alternative Program for Preschoolers and their Parents, and (e) Treatment and Education of Autistic and Communication Handicapped Children.

3.1 Evidence-Based Treatments

Across fields, there is a consistent gap between findings from published studies and implementation of practices. For example, Kazdin (2000) reported that fewer than 10% of mental health treatments for children and adolescents have been systematically evaluated. Said another way, interventions that do not have any demonstrated efficacy are more likely to be implemented in practice. Due to the prevalence of this research-to-practice gap (e.g., Goodman, 2003; Kodak, Cariveau, LeBlanc, Mahon, & Carroll, 2018), many fields have implemented policies to increase the use of evidence-based practices.

One aspect of evidence-based practice is the implementation of evidence-based treatments. Evidence-based treatments are interventions that have been evaluated in methodologically sound studies and shown to produce significant and/or clinically meaningful effects on behavior. Many studies documenting the efficacy of interventions were conducted using randomized controlled trials and large sample sizes. These studies provide empirical support for an intervention when the outcomes of individuals assigned to the treatment group are statistically significant from the outcomes of individuals assigned to the control group. In autism research, interventions often are evaluated using single-subject designs, which allow for an experimental demonstration of intervention effects with fewer participants. Due to differences in methodology and sample size, methods to identify well-supported treatments utilizing single-subject research design have been developed (e.g., Horner et al., 2005; Reichow, Volkmar, & Cicchetti, 2008). These methods

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allow professionals from within and outside of the field of applied behavior analysis (ABA) to evaluate the strength of evidence for behavior-analytic interventions. One of the primary methods for evaluating the evidence for an intervention is a meta-analysis. Meta-analyses evaluate the effectiveness of a specific intervention by synthesizing data from relevant studies and serve as a mechanism by which professionals can identify evidence-based treatment. A meta-analysis collects data from all relevant studies on a topic, recodes data to identify the effect size, and conducts statistical analyses on aggregated data. The results of the meta-analysis, in combination with objective criteria, are used to determine if an intervention has sufficient support to characterize the intervention as an evidence-based treatment. For example, in a meta-analysis of the literature on comprehensive applied behavior analytic (ABA) intervention for young children with autism, the results showed that comprehensive ABA intervention produced positive outcomes in multiple domains (e.g., language, adaptive behavior, and intellectual functioning) for children with ASD (Virués-Ortega, 2010).

Evidence-based treatments are particularly important to identify for individuals with ASD, because an abundance of treatments have been developed and marketed to this population; yet, only a proportion of treatments have been scientifically evaluated to determine the efficacy of the intervention (see Chap. 6 for an in-depth discussion of nonevidence-based approaches). Caregivers of children with ASD may be likely to select nonevidence-based treatments (Green et al., 2006) because many of these interventions claim to cure ASD and/or may require little effort. In addition, caregivers may not be familiar with the distinction between scientific evidence and testimonials nor are they likely to investigate the evidence for putative claims of efficacy made on websites or in promotional materials. Thus, “fad” treatment developers make false claims for their products that may be difficult to distinguish from claims of evidence-based treatment from reputable sources (see Chap. 6).

The use of nonevidence-based treatments can be harmful. For example, allocating considerable time and resources to a treatment that is unlikely to result in an improvement in behavior or reduction in symptoms may prevent the individual from receiving other, effective interventions. When resources are limited, it is ideal to maximize the likelihood of benefit to the individual by selecting a treatment that has been shown to produce improved outcomes with similar populations. Also, some nonevidence-based treatments have produced physical harm to individuals, including those with ASD. For example, holding therapy (Welch & Chaput, 1988), which is a treatment that involves an adult physically restraining a child until the child engages in emotional responding, at which point the adult provides nurturing, has been used with children with ASD and other diagnoses. This therapy is based on the premise that the parent and child have a broken bond and holding therapy repairs this bond. Several children have died during the implementation of this intervention, leading numerous organizations to write position statements describing forms of coercive interventions as contraindicated (e.g., American Academy of Child and Adolescent Psychiatry, 2003).

Delaying the onset of evidence-based treatment through the use of nonevidence-based treatments may prevent children from achieving the best possible outcome. For example, if a young child with ASD does not receive evidence-based treatment until he or she is enrolled in elementary school, there may be a large gap between his or her skills and those of his or her typically developing peers. In this case, treatment will need to be highly effective as well as efficient in order to resolve this gap. Further, the child may have a several-year history of engaging in problem behavior to communicate his or her basic wants and needs rather than using appropriate forms of communication. Thus, additional behavioral concerns may need to be addressed, which could have been avoided had he or she received evidence-based treatment that targeted functional communication at an earlier point in his or her development. Similarly, concurrent use of evidence-based treatment and nonevidence-based treatment also may prevent positive outcomes because this combination may slow a child’s progress and make it difficult to determine the aspects of intervention that are leading to positive treatment outcomes.

There are several ways that caregivers, practitioners, researchers, and community stakeholders can identify evidence-based treatments for individuals with ASD. We review these here; however for additional guidance please see Chap. 6. Organizations have developed rigorous criteria to assess the quality of evidence used to determine the efficacy of an intervention and published their findings on websites. For example, National Professional Development Center (NCPD) on Autism Spectrum Disorder (http://autismpdc.fpg.unc.edu/) lists 27 interventions that they identified as evidence based for individuals with ASD. The website provides a summary of each treatment, step-by-step instructions to implement the treatment, and a list of references that demonstrate the evidence for the intervention.

Reports from agencies investigating the efficacy of treatment for individuals with ASD are also available to the public and can be used by laypeople and professionals to determine whether an intervention has sufficient evidence to support its use. For example, the National Autism Center's National Standards Project (National Autism Center, 2009) produced a report on the status of the evidence for interventions from research published within specific timeframes, which is available to download from their website (http://www.nationalautismcenter.org/reports/).

Researchers seeking to determine the evidence for treatment can apply criteria developed to analyze the methods and outcomes provided by studies. Criteria for identifying evidence-based treatment using single-subject research have been developed, due to the prevalence of this type of research in certain fields (e.g., behavior analysis, speech therapy) and with specific populations (e.g., children with ASD). For example, Horner et al. (2005) describe the criteria for evidence-based practice in single-subject research. The provision of specific definitions and criteria for determining evidence-based treatments is beneficial to the field, as they allow other researchers and practitioners to use these criteria as guidelines for determining the evidence for treatments not yet subjected to scrutiny based on these criteria.

3.1.1 Comprehensive Treatment Models for Children with ASD

Treatments based on principles and practices from the field of ABA are among the most effective interventions for individuals with ASD (Rogers & Vismara, 2008; Smith & Iadarola, 2015). Based on the specific goals of treatment, intervention is typically characterized as either focused or comprehensive. Focused intervention typically addresses one or a small number of treatment goals (e.g., the reduction of problem behavior, increasing peer interaction) and occurs over a relatively short duration with a lower level of intensity (e.g., 6 months of intervention with 6 h of intervention per week). In comparison, comprehensive intervention addresses multiple domains (e.g., social skills, communication, cognitive skills) and has an extended duration of services that occur at a high level of intensity (e.g., 3 years of intervention with 40 h of intervention per week). Approximately 40% of children who are diagnosed with ASD receive behavioral intervention prior to and during their early elementary school years (Zablotsky et al., 2015). Although comprehensive intervention is defined in terms of its range of targeted goals and treatment intensity, the model of comprehensive service delivery for children with ASD may vary depending on their treatment provider.

Smith and Iadarola (2015) reviewed comprehensive treatment models for children with ASD. These models have key similarities as well as unique characteristics. The models are similar in that they all include individualization of programming based on the needs of the child; thus, the programs are designed to be implemented with a degree of flexibility. In addition, all models introduce intervention at the earliest possible age, operate on a full-year basis, have services directed by at least one doctoral-level professional with expertise in the treatment of ASD, have systems of ongoing assessment of child progress, have a custom-designed curriculum, and acknowledge that caregivers play a crucial role in treatment and include caregivers in intervention. Differences in these treatment models relate to the specific needs addressed within intervention, the theoretical approach upon which these models are based, and the role of the clinicians in the intervention. A proportion of the treatment models reviewed by Smith and Iadarola are described in more detail in the remainder of this chapter.

3.1.1.1 Early Intensive Behavioral Intervention (EIBI)

Based on the University of California at Los Angeles Young Autism Project model (UCLA YAP; Lovaas, 1981, 1987, 2003), EIBI is a widely investigated, frequently used, and commonly requested model of intervention for children with ASD (Stahmer, Collings, & Palinkas, 2005). This model of treatment is considered intensive (e.g., 25–40 h of intervention per week) and occurs over several years. Intervention is based on principles of operant conditioning (e.g., stimulus control, reinforcement) and targets acquisition of adaptive skills as well as reductions in problem and stereotyped behavior. A number of treatment manuals have been developed to guide the sequence of skills targeted during EIBI (e.g., Leaf and McEachin, 1999; Lovaas, 2003; Maurice, Green, & Foxx, 2001). The focus and structure of intervention change as treatment progresses within this model. In the first year of treatment, complex skills are broken down into component skills which are targeted through carefully arranged and highly structured instruction that includes repeated learning opportunities (e.g., discrete trial instruction). Intervention typically occurs in a one-to-one format and is delivered by therapists who work in the child's home or school, or in a clinic. The initial goals of intervention are to decrease challenging behavior and barriers to learning, build functional communication and language, teach imitation, establish early play behavior, and teach pre-academic skills. The second year of intervention continues with the development of skills through structured teaching and also incorporates naturalistic teaching procedures and group instruction. Intervention goals expand to teaching more advanced language, teaching adaptive skills, following classroom rules, developing friendships, and imaginative toy play.

The initial success of studies investigating EIBI (Lovaas, 1987; McEachin, Smith, & Lovaas, 1993) led to further investigation of this model and widespread dissemination of these practices. Studies have demonstrated the efficacy of EIBI in settings other than the child's home, such as in schools (Eikeseth, Klintwall, Jahr, & Karlsson, 2012; Eikeseth, Smith, Jahr, & Eldevik, 2002) and treatment centers (Cohen, Amerine-Dickens, & Smith, 2006). In addition, meta-analyses of the EIBI literature have investigated factors correlated with better treatment outcomes, which include parent training (Makrygianni & Reed, 2010), a longer duration of treatment (Makrygianni & Reed, 2010; Virués-Ortega, 2010), more intense treatment (Makrygianni & Reed, 2010; Virués-Ortega, 2010), and supervisor training with the UCLA model (Reichow & Wolery, 2009).

3.1.1.2 Pivotal Response Treatment (PRT)

PRT is a naturalistic behavioral intervention that uses procedures from ABA and developmental approaches. In comparison to traditional ABA treatment approaches (e.g., EIBI), which tend to be adult directed, PRT takes a child-directed approach to intervention by using a child's motivation to present learning opportunities in the natural environment (Koegel & Koegel, 2006; Koegel, O'Dell, & Koegel, 1987). The hallmark of PRT is a focus on teaching *pivotal responses*, which once learned might produce widespread and rapid treatment gains across other nontargeted behaviors (Koegel, Koegel, Harrower, & Carter, 1999). Common pivotal areas that are targeted during PRT include (a) motivation, (b) responsivity to multiple cues, (c) self-initiations, and (d) self-management (Koegel, Openden, Fredeen, & Koegel, 2006).

PRT incorporates a number of strategies to enhance a child's motivation to learn (e.g., Koegel, Singh, & Koegel, 2010). First, during

PRT a teacher incorporates the child's choice into learning opportunities (e.g., letting the child choose the order in which they complete academic tasks). Second, during PRT direct and natural reinforcers are used (e.g., if a child correctly labels a toy he or she is given access to that toy). Third, mastered tasks are interspersed with acquisition tasks during a teaching session and multiple skills are targeted during a single teaching session. Finally, a teacher reinforces a child's attempts to respond correctly, instead of only providing reinforcement if the child engages in the exact target behavior.

Responding to multiple cues in the environment is another pivotal area targeted during PRT for children with ASD who display abnormalities in attention, characterized by responding to only a subset of cues in the environment (i.e., stimulus over-selectivity; Lovaas & Schreibman, 1971; Reith, Stahmer, Suhrheinrich, & Schreibman, 2015). Stimulus over-selectivity can interfere with an individuals' development of important social, language, and academic skills. For example, when teaching a child to label clothing items, the child with ASD may overly focus on an irrelevant aspect of the skill being taught, such as the color of the clothing items. Thus, the child may learn to label a red shirt "shirt" or a black hat "hat"; however, correct responding may decrease once the child is presented with a blue shirt and a white hat. Commonly used strategies to teach children with ASD to respond to multiple cues include (a) within-stimulus prompts, which consist of exaggerating the relevant components of a stimulus and gradually fading out those prompts (e.g., when teaching a child to discriminate between the letters "p" and "b" the teacher may initially make the stem of each letter bold with a large font and then gradually fade the prompt); (b) orienting cues, which consist of requiring a child to make an overt response to demonstrate that he or she is attending before making a target response (e.g., when teaching a child to discriminate between a picture of a dog and a cat the teacher may present the instruction, "touch dog," and require the child to say "dog" before making a target response); and (c) direct treatment of over-selectivity (e.g., teaching a child a series of discriminations that require the child to respond to multiple stimulus components; Dunlap, Koegel, & Burke, 1981).

Another important pivotal skill that is taught to children with ASD through PRT is self-management skills. Children are taught to identify and record the occurrence or nonoccurrence of a specific target behavior (e.g., social behaviors; Koegel, Koegel, & Parks, 1992; Koegel & Frea, 1993). For example, Koegel and Frea (1993) taught two adolescents with autism to identify and record the occurrence of their own appropriate or inappropriate social behaviors (e.g., intensity of voice volume) while talking to a communication partner. Following training in the self-management procedures, both participants showed an immediate increase in appropriate social behavior. The treatment also led to improvements in untargeted social behavior (e.g., eye gaze).

The effectiveness of PRT as a treatment model for ASD has been demonstrated in numerous single-case design studies as well as in larger clinical trials (Duifhuis et al., 2017; Hardan et al., 2015; Mohammadzaheri, Koegel, Rezaei, & Bakhshi, 2015; Mohammadzaheri, Koegel, Rezaee, & Rafiee, 2014; National Autism Center, 2009; Smith, Flanagan, Garon, & Bryson, 2015). In a randomized controlled trial, Mohammadzaheri et al. (2014) compared outcomes for two groups of children with ASD ($N = 30$; 6–11 years) who received either PRT or structured ABA in a school setting. Participants in both groups received two 60-min sessions twice weekly over a 3-month period (i.e., total of 24 h of treatment). For all participants the target behavior consisted of increasing the participants' mean length of utterance (MLU) when asked to describe a series of pictures. The two interventions were identical with the exception of four procedural differences. First, in the structured ABA sessions, the teacher chose the instructional materials; in the PRT sessions, the child chose the instructional materials or activities. Second, in the structured ABA sessions, the teacher worked exclusively on the target behavior; in the PRT sessions, the teacher interspersed work on the target behavior with maintenance tasks. Third, in the structured ABA sessions, the teacher provided reinforcers during the session that were not related to the target behavior (e.g., if the child correctly labeled a teddy bear, he or she would be given praise and a favorite food or toy); in the PRT sessions, the teacher used reinforcers that were directly related to the target behavior (e.g., if the child correctly labeled a teddy bear, he or she would be given praise and access to the teddy bear). Finally, in the structured ABA sessions, the teacher only provided a reinforcer for utterances that were successively longer than previously reinforced utterances; in the PRT sessions, the teacher provided reinforcers for both long and short utterances. Following the intervention, children in the PRT group demonstrated statistically significant improvements in both targeted (MLU; $F(1, 27) = 6.97$, $p = 0.01$) and untargeted areas (i.e., pragmatic language skills; $F(1, 26) = 6.38$, $p = 0.01$) relative to the children in the structured ABA group.

Parent involvement is a critical part of the effectiveness of PRT; however, Mohammadzaheri et al. (2014) did not incorporate caregivers into the treatment. In comparison, Hardan et al. (2015) conducted a randomized controlled trial examining the effects of PRT taught to caregivers in a group format. Caregivers and their child with ASD were assigned to one of the two groups, a pivotal response treatment group (PRTG; 25 subjects completed the study) or a psychoeducation group (PEG; 22 subjects completed the study). Caregivers in both groups received training once a week for 12 weeks. Parents in the PRTG group received training based on a standard set of PRT training materials. Training consisted of eight parent-only group sessions and four individual training sessions with the parent-child dyad and a clinician. Caregivers in the PEG group received training based on materials from an existing autism parenting education program. Training consisted of ten parent-only group meetings and two individual training sessions with the parent-child dyad and a psychologist. One of the primary outcome measures in this study was the child's frequency of utterances obtained during 10-min observations of the caregivers and child during baseline, week 6, and week 12 of the intervention. The results of this study showed that children from the PRTG group showed a significantly higher frequency of utterances during both the 6- and 12-week observations when compared to children from the PEG group ($F(2, 43) = 6.12$, $p = 0.005$). Additionally, a significant treatment effect was observed for the Vineland-II Communication scale (Sparrow, Cicchetti, & Balla, 2005), with children from the PRTG group showing greater improvements in communication compared to children from the PEG group ($F(2, 19) = 3.08$, $p = 0.041$). The findings from this study were consistent with those of Mohammadzaheri and colleagues and support the use of group-based parent PRT training methods.

3.1.1.3 Early Start Denver Model (ESDM)

The ESDM is a comprehensive treatment model that integrates empirically supported ABA techniques with relationship-based, developmental, and play-based approaches (Rogers & Dawson, 2010). Several approaches have influenced the underlying principles and practices of the ESDM including (a) the original Denver model (Rogers, Hall, Osaki, Reaven, & Herbison, 2000), (b) Rogers and Pennington's (1991) model of interpersonal development in autism, (c) the model of autism as a disorder of social motivation (Dawson et al., 2004), and (d) pivotal response training (Koegel & Koegel, 2006).

The ESDM was designed for young children between the ages of 12 and 60 months, and is a manualized treatment with a curriculum that covers all domains of development (Rogers & Dawson, 2010). In the ESDM, children's skills are regularly assessed using the ESDM Curriculum Checklist, which includes specific skills sequenced developmentally within domains that are critical to early social learning (e.g., nonverbal and verbal communication, joint attention, imitation, social development, and play). Teaching is individualized for each child by selecting specific learning objectives based on the results of the ESDM Curriculum Checklist. Clinicians typically embed teaching within play activities and use established teaching strategies from ABA (e.g., prompting, prompt fading, shaping, chaining), techniques from pivotal response training (e.g., following the child's lead, turn taking), and developmentally oriented strategies to promote positive emotional exchanges between children and adults. Finally, there is a focus on parent and family involvement with the ESDM. Caregivers are trained to incorporate the strategies and techniques outlined in the ESDM manual throughout their child's waking hours.

The ESDM is currently the only comprehensive treatment model that has been empirically evaluated with children under the age of 30 months (Dawson et al., 2010). In a randomized controlled trial, Dawson and colleagues assigned 48 children with ASD between 18 and 30 months of age to one of the two groups. One group received 2 years of intervention using the ESDM, and the other group received 2 years of intervention using services commonly available in the community. The results showed that participants provided with the ESDM showed statistically significant improvements on outcome scores from baseline to 2 years on the Mullen Scales of Early Learning (MSEL; $F = 4.31$, $p = 0.044$), adaptive behavior ($F = 7.05$, $p = 0.011$), and diagnostic status (Fisher's exact test, $p = 0.041$) when compared to the community intervention group. Cognitive abilities were measured by the MSEL composite standard score, and children in the ESDM showed an average increase of 17 points compared to an average of 7 points in the community intervention group. Additionally, only 56% of the children from the ESDM group retained their diagnosis of autistic disorder following 2 years of intervention, as compared to 71% of children in the community intervention group. The original randomized control trial on the ESDM was conducted in a university clinic setting; more recent studies suggest that this model may also be effective when implemented in community-based group settings (e.g., Vivanti et al., 2014) and when implemented by trained caregivers in the home (e.g., Vismara et al., 2016).

3.1.1.4 Learning Experiences and Alternative Program for Preschoolers and Their Parents (LEAP)

The LEAP Preschool Model, founded in 1981 by Phillip Strain, is one of the only evidence-based inclusion models for educating children with ASD in a public school setting. This treatment model was one of the first to include children with autism in a classroom with typically developing peers. The typical LEAP classroom consists of a minimum of a 2:1 ratio of typically developing peers to children with autism. The theoretical and conceptual foundation of LEAP is based on ABA and developmental theory. The LEAP program is based on the premise that the primary learning difficulty for children with ASD is with the generalization of newly acquired skills across appropriate settings or people. Thus, this approach incorporates multiple learning opportunities across settings and across service delivery agents in the natural environment.

The key components of the LEAP model include (a) peer-mediated social skill instructions, (b) selection of functional goals and treatment objectives for each child, (c) embedding learning opportunities into typical preschool routines (e.g., circle time, snack time, free play), (d) ongoing data collection and progress monitoring, (e) use of a broad array of evidence-based behavioral interventions (e.g., errorless learning, picture exchange communication system (Frost and Bondy, 2002), pivotal response training), f) a transdisciplinary model of service delivery (i.e., collaboration among all professionals working with a particular child), and (g) a structured parent skill training curriculum (Strain, 1987a; Strain & Bovey, 2011).

A unique feature of the LEAP model is the use of peer-mediated instructional strategies. With this model, typically developing children as young as 36 months receive comprehensive social skill instruction that prepares them to facilitate the social and language skills of children with ASD (Goldstein & Wickstrom, 1986; Strain

& Bovey, 2008; Strain & Danko, 1995). For example, in an early study conducted by Goldstein and Wickstrom (1986), two typically developing preschoolers were taught to use strategies to promote communicative interactions with three of their classmates with intellectual disabilities. Specifically, the typically developing preschoolers were taught how to initiate interactions, establish eye contact, establish joint attention, respond to the speech of a peer, prompt the peer to request items or activities, and redirect a peer's play to a joint play activity. The results showed that the typically developing preschoolers learned to implement the teaching strategies independently with peers with intellectual disabilities. Additionally, all three children with intellectual disabilities engaged in higher rates of communicative interactions (i.e., responding to a peer and initiating an interaction with a peer) after the typically developing peers were taught how to promote communicative interactions. Overall research findings suggest that peer-mediated instructional strategies result in higher rates of communicative and social interactions for the preschoolers with ASD (e.g., Goldstein & Wickstrom; Kohler & Strain, 1992; Strain, 1987b). In addition to the positive outcomes for the individuals with ASD, research findings demonstrate that the typically developing preschoolers who serve as peer trainers also experience positive outcomes (Strain, 2001). Specifically, when compared to similar children, who did not participate in the peer-mediated interventions, peer trainers have been shown to engage in fewer disruptive or inappropriate behaviors, be more socially competent with other typically developing peers, and be more positive and accepting of disabilities.

There has been extensive research conducted demonstrating the effectiveness of specific components of LEAP (e.g., Cordisco & Strain, 1986; Goldstein & Wickstrom, 1986; Odom, Hoyson, Jamieson, & Strain, 1985; Sainato, Strain, Lefebvre, & Rapp, 1987) as well as large-scale randomized controlled trials (Strain & Bovey, 2011; Strain & Hoyson, 2000). In one of the largest randomized controlled trials of an intervention for children with autism to date, Strain and Bovey (2011) examined outcomes for 177 children with ASD in a LEAP training classroom compared to 117 children with ASD in comparison classrooms. After receiving 2 years of LEAP, Children in the treatment classroom made significantly greater progress than the comparison class on all measures with statistically significant effect sizes ranging from 0.59 to 1.22 ($p < 0.05$). Children in the treatment classrooms made, on average, twice the developmental gains on measures of cognitive and language development as compared to the children in the comparison classrooms. When compared to children in the comparison classrooms, children in the treatment classrooms also showed greater reductions in the severity of autism symptoms and problem behavior and showed more gains on standardized measure of social behavior growth. Following the 2-year intervention period, lead teachers in each of the intervention classrooms were asked to complete a social validity questionnaire that assessed their satisfaction with LEAP. Overall, teachers rated their experiences with implementing LEAP very high, and they attributed positive changes in child behavior to the LEAP program.

3.1.1.5 Treatment and Education of Autistic and Communication Handicapped Children (TEACCH)

TEACCH is a comprehensive treatment approach, based out of the University of North Carolina Chapel Hill, which was started in 1972 by Dr. Eric Schopler. The TEACCH model provides intervention to individuals with ASD of all ages and ability levels. The main components of TEACCH include (a) understanding and appreciating the commonalities of people with ASD (i.e., a "culture of autism"), (b) individualization of goals and teaching strategies based on ongoing assessment of an individuals' strengths and weakness, and (c) use of caregivers as co-therapists.

The "culture of autism" refers to a set of neuropsychological strengths and weaknesses that individuals with autism share (Mesibov & Shea, 2010; Mesibov, Shea, & Schopler, 2005). Common characteristics of a culture of autism include (a) strengths in visual processing relative to auditory processing, (b) strengths in detail-focused attention versus integrating multiple details to derive meaning, (c) variability in attention (i.e., distractible at times and highly focused with difficulty shifting attention at other times), (d) communication deficits (e.g., impairments in the social use of language), (e) difficulties with concepts of time, (f) difficulties with generalizing skills to novel settings, (g) intense interests in preferred activities with difficulties transitioning to new activities, and (h) unusual response to sensory stimulation (Mesibov & Shea).

Intervention goals and teaching strategies used during TEACCH are individualized for each person with ASD based on an understanding of a "cultural of autism" and the use of ongoing assessments (Mesibov et al., 2005; Schopler, Lansing, Reichler, & Marcus, 2005). Structured teaching is the primary educational method used during TEACCH (Schopler, Mesibov, & Hearsey, 1995). The underlining principles of structured teaching include (a) organizing the physical environment to improve learning (e.g., limiting distractions, incorporating visual cues), (b) including a predictable sequence of activities so an individual knows what activities are coming up next and when an activity is done, (c) use of visual schedules to communicate a sequence of upcoming activities, (d) teaching individuals with ASD routines (in addition to visual schedules) for daily activities, (e) use of work/activity systems that tells an individual how to complete a specific work task independently (e.g., visual cues for completing a toothbrushing routine), and (f) incorporating a visual component into all activities to clarify expectations (Mesibov et al., 2005). A number of research studies have been conducted examining the effectiveness of different components of structured teaching (e.g., Bennett, Reichow, & Wolery, 2011; Hume & Odom, 2007; MacDuff, Krantz, & McClannahan, 1993). For example, Bennett and colleagues evaluated the use of a structured work system on engagement, task completion, stereotypic behavior, and escape attempts for three preschoolers with ASD or a developmental delay. The structured work system included three plastic baskets (baskets for the activities and a "finished basket") and a visual activity schedule with photographs of each activity to be completed (e.g., puzzle, sorting task, matching game). Participants were taught to complete the steps of the visual activity schedule using a graduated guidance prompting procedure. During structured teaching, task completion increased for all participants, and participants engaged in fewer escape attempts and lower levels of stereotypic behavior.

Family collaboration is an important component of the TEACCH model. Caregivers of individuals with ASD are viewed as experts on their children and the information gathered from caregivers is used by professionals to design individualized interventions. TEACCH was one of the first treatment approaches that used caregivers as co-therapists (Schopler, Brehm, Kinsbourne, & Reichler, 1971). Previous research has demonstrated that caregivers can be successfully trained to teach their children a range of skills (e.g., Probst & Glen, 2011; Short, 1984). Additionally, including caregivers as co-therapists has been shown to decrease parental stress and improve parent-child interactions (D'Elia et al., 2014).

There have been a number of studies conducted that evaluate the effectiveness of individual components of TEACCH (e.g., structured teaching, visual schedules), as well as studies evaluating the TEACCH approach as a whole. Virues-Ortega, Julio, and Pastor-Barriuso (2013) conducted a meta-analysis of intervention studies using the TEACCH program. The meta-analysis included 13 studies with 172 individuals with ASD. The results showed that TEACCH effects on adaptive behavior, communication, activities of daily living, and motor skills were of small magnitude. In comparison, there were moderate-to-large gains in social and maladaptive behaviors. Additionally, the effects of the intervention across all outcome measures were moderate, and adults with ASD received the greatest benefits from participating in the TEACCH program. Overall, the results of the meta-analysis suggest that TEACCH may lead to modest positive outcomes in some domains (e.g., social behavior); however, as noted by the authors additional studies are needed to help identify any factors that might be driving the magnitude of intervention effects with TEACCH (e.g., intensity of the intervention).

3.2 Summary

Clinicians and caregivers need to take special care when identifying treatments to use with individuals with ASD. Using nonevidence-based treatments has the potential to slow progress and cause harm to an individual with ASD. In this chapter, we reviewed evidence-based comprehensive treatment models for individuals with an ASD. These models vary in relation to the specific needs addressed within the treatment, the theoretical approach, and the role of clinicians and caregivers within the treatment. However, these effective evidence-based treatments for ASD share common core components, including starting the intervention with the child as soon as he or she receives a diagnosis of an ASD, providing intensive intervention (e.g., 25 h a week, 12 months a year), individualization of treatment goals based on the needs of the child and family, use of comprehensive assessment-based curricula, ongoing measurement and assessment of a child's progress, and inclusion of caregivers in the intervention. Overall, ongoing research is needed to evaluate the effectiveness of proposed treatments for ASD.

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4

The Importance of Parent-Child Interactions in Social Communication Development and Considerations for Autism Spectrum Disorders

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Abstract

Interactions between caregivers and their children play an important role in the development of social communication skills. Features such as contingent parent responsiveness, infant-directed speech, and gesture use are associated with language learning and use in infants and toddlers. Children diagnosed with autism spectrum disorder (ASD) often exhibit delayed language development and struggle with both verbal and nonverbal social communication skills. Evidence-based interventions, particularly those based in applied behavior analysis, promote pragmatic use of language and improve social communication in children with ASD.

Human beings are often described as social beings, hardwired to engage in social interactions with a natural inclination to seek out and respond to social stimuli (Frith & Frith, 2010). Research has shown that within 1 h of birth babies track moving face-like stimuli longer than they follow nonface-like stimuli using eye gaze and head turning (Johnson, Dziurawiec, Ellis, & Morton, 1991). Neonates also tend to look significantly longer at pictures of faces with eyes open compared to those with eyes closed, suggesting a preference for looking at the eyes (Batki, Baron-Cohen, Wheelwright, Connellan, & Ahluwalia, 2000). Additionally, newborns as young as 3 days old can not only discriminate their mother's voice but also engage in higher rates of a sucking response to produce the mother's voice over a non-maternal voice (DeCasper & Fifer, 1980). It is easy to acknowledge that these inclinations toward social stimuli play a significant role in social development given how seemingly easy it appears to be for babies to transform from neonates with little control of motor movements to fully functioning social adults. By adulthood, humans understand and use upwards of 60,000 words (Turnbull & Justice, 2017) and spend anywhere from four and half to five and half hours each day engaged in social interactions (Reis & Wheeler, 1991). However, this propensity to spend time with other people engaging in activities and communicating with one another is well developed long before adulthood. Observations of preschoolers during snack time showed that they spent over half of their time engaged in conversation with others and more than three-quarters of their communication topics related to themselves or other people rather than just objects or events (O'Neill, Main, & Ziemski, 2009). Researchers and those involved in the care of infants and toddlers have long been interested in how babies

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develop these complex social interaction skills in just a few short years and have been even more concerned with what variables either promote or inhibit these achievements.

Widely recognized developmental milestones involve not only particular motor and language skills, but also involve achievements in how those skills are used to interact and respond to others. Although often discussed as distinct processes, the development of language and social communication are intertwined and develop concurrently. Infants between 0 and 2 months emit early vocalizations that are primarily reflexive in nature (Turnbull & Justice, 2017). These sounds may include speech sounds, called cooing, but often consist of crying, fussing, and coughing. Although these early speech sounds are reflexive, parents tend to attribute communicative intent to these sounds and respond in a conversational manner (Miller, 1988). Between 1 and 3 months, infant vocalizations consist mostly of vowel sounds and by 6 months babbling will emerge (Turnbull & Justice, 2017). At the same time babies begin to orient more toward sounds, attend more to faces, and engage in spontaneous smiling. By 9 months infants begin to imitate the sounds and gestures of others and begin to point at things in the environment. Between 6 months and 1 year of age, joint attention skills emerge. Joint attention is defined as two people (e.g., a child and parent) sharing attention to the same object or event in a coordinated manner through the use of gestures, vocalizations, and eye gaze (Beuker, Rommelse, Donders, & Buitelaar, 2013). Infants and toddlers engage in joint attention by initiating bids for other's attention and by responding to bids from others. Thus, joint attention may be demonstrated by bringing items such as toys or books to a parent, a child pointing at an interesting item to direct his or her parent's attention to something, such as an airplane flying over, or the child following the point or gaze of the parent, such as when a parent gestures toward the door and says, "look who's here." The use of gestures for the purposes of directing someone else's attention or to share engagement in an event should be differentiated from using gestures to request things from others. Gestures and eye gaze are also used for this purpose and typically emerge during the same time frame. By 1 year, babies follow simple instructions, use gestures such as waving bye bye, and attempt to imitate words. Also by 1 year, many babies begin to utter their first spontaneous words. Eighteen-month-olds typically use several single words to request and label, engage in back-and-forth social play and simple pretend play, and can follow many instructions without gestures. Their joint attention skills are well developed and the use of coordinated gaze, gestures, and vocalizations to engage with others occurs frequently. By 2 years, children combine words into phrases and short sentences and rapidly add new words to their vocabulary. Although the achievements in language and social development by certain ages are widely recognized, it is also widely recognized that there is variability within typical development. Whether or not infants arrive into the world primed to become social beings, it is clear that environmental variables, such as interactions with caregivers, play a role in the acquisition of language and social communication.

4.1 Quantity and Variety of Language Exposure

In 1995, Hart and Risley published a book called *Meaningful Differences*, recounting a 2.5-year-long longitudinal study of 42 families in which the spoken communication between a parent and child was recorded and analyzed. Researchers began observing 7–9-month-old babies on a monthly basis until the age of 3 years. During these hour-long observations, virtually every interaction between the parent and child, with a particular focus on the words spoken, was recorded. Results of this study support the contention that interactions with caregivers shape language development. Specifically, they found that 86–98% of the words recorded in each child's vocabulary were words that had previously been spoken to them by the caregiver.

The most striking finding by the authors was the differences in the exposure to language and how that relates to vocabulary growth in children. Children categorized as coming from families with professional careers and higher socioeconomic status (SES) emitted an average vocabulary size of 1116 words. Children categorized as coming from working-class families and middle/lower SES emitted an average vocabulary size of 749 words. Children categorized as coming from families on welfare emitted an average vocabulary of 525 words. Notably, the researchers also found that these children were exposed to dramatically different amounts of spoken language. Professional families spoke to their children using more utterances per hour and used a wider variety of words compared to both the working-class families and those families on welfare. The authors concluded that by the time children reached kindergarten, children in lower SES families were exposed to 30 million fewer words over the course of their lifetimes compared to children in higher SES households. These results are compelling; however, research now indicates that the amount of spoken language one is exposed to during the language-learning years is just one important variable and that quality and type of interaction also affect the development of language and social communication skills (Zauche, Thul, Mahoney, & Stapel-Wax, 2016). For example, in a study of children aged 2–36 months, researchers found that although a greater number of words spoken by the parent to the child was associated with increased scores on a standardized measure of words understood by the child, these associations were mediated by back-and-forth exchanges between the parent and child rather than merely child-directed speech alone (Zimmerman et al., 2009). Thus, the social interaction as well as the quantity of words appear to be important.

4.2 Infant-Directed Speech

Infant-directed speech, also called motherese or parentese, has also been shown to affect the development of social communication and language (Turnbull & Justice, 2017; Zauche et al., 2016). Infant-directed speech is described as speech used when interacting with infants and toddlers that consists of higher pitch, slower tempo, exaggerated sounds, shorter mean length of utterance (MLU), and more repetition (Turnbull & Justice, 2017). It is suggested that infant-directed speech aids in language learning in a few ways. First, research has shown that infants attend more to infant-directed speech compared to adult-directed speech and, therefore, may aid in the development of early joint attention skills. Children who exhibit longer durations of joint attention have larger vocabularies compared to children who engage in less joint attention. Using infant-directed speech, caregivers can attract the baby's attention and more easily direct it toward the object or event in the environment to which the parent is referring. Infant-directed speech can then maintain the child's attention to the object of shared attention. It is easy to see how jointly attending to the same object in the environment aids in language learning. As caregivers say the names of objects and describe ongoing events, if the child is oriented to irrelevant stimuli, he or she will miss out on opportunities to pair words with objects to which they refer (Turnbull & Justice, 2017). Thus, jointly attending to an object and simultaneously hearing the word associated with the object referent, a process sometimes referred to as word-object mapping (Beuker et al., 2013), has been suggested as critical to language learning. Hearing words paired with the visual presentation of the objects to which they refer has been shown to result in learning the names of those objects without direct instruction in 2-year-old children (Gilic & Greer, 2011).

Preference for motherese relative to adult-directed speech suggests that motherese may also affect language development by reinforcing vocalizations emitted by the infant. In a study of vocalizations in infants between 3 and 8 months of age, researchers examined the effect of motherese when it was provided either contingently on infant vocalizations or noncontingently (Pelaez, Ortega, & Gewirtz, 2011). Infants subsequently emitted significantly more vocalizations in the contingent condition relative to the noncontingent condition suggesting that motherese in and of itself may not increase vocalizations but does so when provided in response to infant-produced speech sounds. Another way in which infant-directed speech may aid in language learning is that the exaggerated pitch and elongated sounds may aid in the infant's learning of when words begin and end (Song, Demuth, & Morgan, 2010).

Lastly, motherese is typically observed during positive interactions between a parent and child such as when providing comfort, during play, or when praising or otherwise responding to the infant's behaviors. The combination of these interactions makes it challenging to determine whether motherese itself or the inherent reinforcing nature of positive attention and comfort influence the development of social communication and language skills.

4.3 Gestures

Children use gestures long before they utter their first words to communicate (Bates, 1976). Gestures have been divided into varying types and include deictic, conventional, and iconic (Özçalışkan, Adamson, & Dimitrova, 2016). Deictic gestures are used to indicate to objects or people. They are subdivided into proto-imperative and proto-declarative gestures. Proto-imperative gestures are gestures that are used to request such as pointing, reaching, or giving an item to gain assistance (e.g., pointing to a desired toy). Proto-declarative gestures are those that are used to direct attention to an object to comment on it or show it to another person (e.g., pointing to a passing airplane). Conventional gestures are those that convey a meaning such as nodding head to mean "yes," or shrugging shoulders to mean "I don't know." Iconic gestures are movements that are associated with an action or a feature such as making a throwing motion to convey throwing.

Child use of gestures as well as caregiver use of gestures when interacting with their children are associated with the development of social communication skills (Thal & Tobias, 1992; Zauche et al., 2016). Infant imitation of the gestures of others has been shown to occur in babies as young as 1–2 months of age (Legerstee, 1991). Throughout infancy we see babies start to emit behaviors similar to those they have observed. A study of 60 9-month-old babies demonstrated that infants were more likely to engage in certain behaviors with objects if the behaviors had first been modeled by an adult (Meltzoff, 1988). Thus, it is easy to see the link between parental use of gestures and development of gesture use in children. Parental use of gestures when interacting with their children may exert influence on language outcomes in a few ways. A few studies have shown that gestures used by parents that function to direct and focus the child's attention are associated with better expressive language (Hahn, Zimmer, Brady, Swinburne Romine, & Fleming, 2014; Schmidt & Lawson, 2002). As with infant-directed speech, gestures may capture and maintain the child's attention to a shared object of interest promoting the learning of spoken words and their referents. Another study, however, found that the impact of parental use of gestures is mediated by child use of gestures (Topping, Dekhinet, & Zeedyk, 2013). In other words, parental use of gestures may promote child use of gestures and more child use of gestures influences that child's achievement in language development. Some evidence supporting the contention that child gesture use may facilitate language learning is shown in a study of late talkers (Thal & Tobias, 1992). Researchers followed a group of children with delayed expressive language for 1 year. Their analyses showed that a subgroup of the later talkers caught up and were no longer language delayed and a subgroup continued to show significant language delays. When examining their use of gestures, the subgroup that was no longer language delayed had 1 year earlier been shown to use more communicative gestures. Although there is consensus that children learn to imitate the gestures of those in their environments, the exact role gesture use plays in the development of language is an area in need of additional investigation.

4.4 Responsiveness

Although the quantity and variety of words that a child is exposed to and the use of infant-directed speech have been shown to be associated with greater language skills, more recent research has shown that parental responsiveness may be a more important variable (Rollins, 2003). As was highlighted in the study on contingent versus noncontingent use of motherese (Pelaez et al., 2011), it appears that responding in a contingent manner is a key feature during parent–child interactions. Research indicates that contingent responsiveness to a range of social behaviors emitted by infants and toddlers contributes to later social communication development. Orienting to others and making eye contact is an important social communication skill that is seen soon after birth and continues to increase early in infancy. One study showed that adult responsiveness to eye contact resulted in increased eye contact in babies as young as 1–3 months (Pelaez-Nogueras et al., 1996). In this study, adults responded to infant eye contact with smiles, vocalizations, and gentle touch on the legs and feet. Infants engaged in more eye contact during the responsive condition with touch when compared to a condition in which touch was not included and a condition in which only neutral adult responding was provided. In addition to examining the effects of contingent motherese, Palaez and colleagues also showed that contingent maternal imitation of infant vocalizations resulted in significantly more infant vocalizations compared to noncontingent maternal vocalizations. In fact, both vocal imitation and motherese increased infant vocalizations as long as they were provided contingently.

In a recent review of the literature, Zauche and colleagues (2016) found numerous studies indicating that responding with joint attention or speech contingent upon vocalizations or attention from the child promotes acquisition of language and is associated with better receptive and expressive language vocabularies. For example, in a prospective longitudinal study of 40 parent–child dyads, researchers found that maternal responsiveness to their children at 9 and 13 months was predictive of five language milestones: (1) first imitations, (2) first words, (3) 50 expressive words, (4) first word combinations, and (5) use of language to talk about the past (Tamis-LeMonda, Bornstein, & Baumwell, 2001). An important feature of this study is that the authors examined maternal responsiveness to more than just the child's verbalizations. Responsiveness also included responding contingently to bids or looks toward the mother, play behaviors, and exploration of objects. The authors concluded that overall maternal responsiveness to social exchanges (i.e., vocalizations, gestures, and orienting to others) plays a role in the development of later language milestones. The authors also examined differing types of maternal responsiveness such as affirmations (e.g., praise), imitation and expansions (e.g., repeating "cup" or saying "that is a cup" when the child says cup), prompts to play, and questions. The authors found that different types of contingent responding at different ages were associated with later language outcomes. For example, affirmation and descriptions of behavior at 9 months but not 13 months were predictive of language milestones and vocal imitations and expansions at 13 months but not 9 months were predictive of language milestones. These results suggest that parental responsiveness changes as the child develops new skills. At 9 months there are likely fewer words for a parent to imitate or expand upon. Thus, the parent responds to the behaviors that the child is emitting by describing what the child is doing and praising good behavior. As the child begins to emit more vocalizations at 13 months, the parents' responding may start to shift to include more imitation and expansion. In this way, parental responsiveness is differentially reinforcing and, thus, increases language skills in much the same way that maternal contingent responsiveness increased eye contact and vocalizations in infants (Pelaez et al., 2011; Pelaez-Nogueras et al., 1996). Numerous other studies have examined effects of parental responsiveness on later language learning and general findings suggest that contingent responsiveness in the form of imitations, interpretations and expansions, questions, descriptions, and praise are all correlated with greater vocabulary size, more language output, and greater complexity of speech in children (Zauche et al., 2016).

4.5 Behavior Analytic Conceptualization of Social Communication Development

Numerous theories on language acquisition exist such as Vygotsky's social-interactionist theory (Vygotsky, 1978) and Tomasello's usage-based theory (Tomasello, 2003). Researchers from a variety of disciplines have contributed to our knowledge of how children learn language. The behavior-analytic conceptualization suggests that the development of language and social communication are the result of respondent and operant conditioning (Bijou & Baer, 1965; Schlinger, 1995; Skinner, 1957). Newborns emit reflexive vocal sounds as they explore movement of the tongue, lips, and other speech organs. As described previously, this often occurs during crying, coughing, and fussing. With the production of these sounds vocal muscles are strengthened, allowing the infant to produce more frequent and varied vocal sounds (Bijou & Baer, 1965; Schlinger, 1995). Caregivers frequently talk to their infants during activities such as comforting, feeding, and diaper changing, responding in a conversational back-and-forth exchange (Miller, 1988) despite the reflexive nature of the infant's responses. Infant vocalizations are, therefore, directly reinforced during these activities by caregiver responsiveness (e.g., attention, food) or removal aversive stimuli (e.g., changing a wet diaper). Even if the infant is not vocalizing, the caregiver's speech sounds are repeatedly being paired with reinforcing stimuli. As a result of this pairing process, the caregiver's speech sounds may be established as conditioned reinforcers. Subsequently, when the infant babbles and his or her vocal output is acoustically similar to a sound that has become a conditioned reinforcer, the resulting auditory stimulation may automatically reinforce that specific way of vocalizing (Bijou & Baer, 1965; Schlinger, 1995) resulting in increased babbling over time. Increased babbling offers more opportunities for caregivers to respond and differentially reinforce vocalizations.

Although the process sounds somewhat straightforward, the complex processes of operant and respondent conditioning occur concurrently and constantly throughout development and involve more than just infant vocalizations. Gestures, facial expressions, eye gaze, and posture are all forms of communication that emerge early in infant development and are likely responded to in much the same way as caregivers respond to vocalizations (i.e., with direct reinforcement). As more behavioral variability is emitted by the infant, the caregiver's responding may shift to directly reinforce a wider array of behaviors or more complex behaviors from the developing child. Words and sentences are more precise than other forms of communication and, therefore, result in more productive and exact communication with social partners (Turnbull & Justice, 2017). From a behavioral perspective the more precise the communication, the better able the caregiver is to respond. Thus, spoken communication is shaped and reinforced by responsiveness from others and becomes the predominate mode of communication.

4.6 Social Deficits and Autism

Autism spectrum disorder (ASD) is a developmental disorder characterized by deficits in social communication and social interaction skills and the presence of restricted, repetitive behaviors (American Psychiatric Association, 2013). Social communication deficits consist of difficulties in joint attention and social reciprocity, as well as deficits in verbal and nonverbal communicative behaviors used for social interaction. Restricted, repetitive behaviors and interests include stereotyped, repetitive speech and motor movements, inflexible adherence to routines, and restricted interests. The language and social deficits associated with autism can range from mild to severe. Approximately 65–75% of children with ASD exhibit moderate-to-severe language delays (Anderson et al., 2007; Tager-Flusberg & Coronna, 2007). In contrast, approximately 25% of children with ASD are considered fluent talkers with minimal to no language impairment.

Despite this variability, all individuals with ASD exhibit difficulties with the pragmatic use of language skills. Depending on the severity of these challenges, some individuals may experience difficulties in the development of relationships and positive social interactions. Not surprisingly, language skill deficits and communication impairments are among the most common complaints of parents of children with ASD (Coonrod & Stone, 2004; Guinchat et al., 2012). Language impairments in children with ASD typically do not improve without intervention (Law & Conti-Ramsden, 2000) and are predictive of negative long-term outcomes (Prelock & Nelson, 2012).

Social deficits associated with ASD have long been an interest of researchers and studies have tried to elucidate how deficits in social interest affect the development of social communication skills. As we have seen, orienting to social stimuli occurs early in infancy and is considered important for the development of joint attention, imitation, and language. The social motivation hypothesis of ASD suggests that impairments in social attention and social interest that occur early in life result in cascading effects that impede social learning opportunities causing disruptions in the development of social communication (Chevallier, Kohls, Troiani, Brodkin, & Schultz, 2012). This lack of social motivation is thought to stem from reduced reward value of social stimuli, which leads to less attention to social stimuli. A few studies have begun to investigate behavioral and neural correlates of reward processing in response to social stimuli using brain imaging. Results support the contention that children with ASD do not find social stimuli rewarding as evidenced by reduced neural responses (Scott-Van Zeeland, Dapretto, Ghahremani, Poldrack, & Bookheimer, 2010).

In a study comparing children with autism to children with Down syndrome or typical development, researchers found that children with autism failed to orient to social stimuli more frequently and took longer to respond to social stimuli relative to the other two groups (Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998). Research using eye-tracking technologies has shown that children with ASD spend more time looking at the background rather than the characters when viewing social photographs (Riby & Hancock, 2008) and adolescents and young adults with ASD fixate less on people, faces, and eyes than on other aspects of the scene relative to matched controls (Klin, Jones, Schultz, Volkmar, & Cohen, 2002). We now know that differences in orientation to social stimuli in individuals with ASD can manifest very early in life. Around 2–3 months of age, infants scan faces and fixate on the eyes of caregivers; however, infants who later were diagnosed with ASD showed a decline in eye fixation between 2 and 6 months of age that differentiated them from infants who were not later diagnosed with ASD (Jones & Klin, 2013). Although more research is needed into how diminished attention to social stimuli beginning in infancy exerts its influence on the development of social communication, it is clear that deficits in key social communication skills differentiate children with autism from those of typical development.

4.7 Social Communication Development and Autism

One of the areas in autism research that has received a significant amount of attention is the development of joint attention. Deficits in joint attention are one of the first recognizable overt signs of autism, often evident before the first year of life (Jones & Carr, 2004). Children with autism have difficulty initiating joint attention with others using both gestures and eye gaze and have difficulties in responding to bids for joint attention from others. When examining joint attention and the use of gestures more closely, researchers have found differences in the types of gestures and social initiations used by children with ASD. For example, in a study of children with and without autism who were matched in terms of language skills, researchers found significant differences in gesture use (Özçalışkan et al., 2016). Specifically, compared to typically developing children, children with autism produced significantly fewer deictic gestures (i.e., gestures that indicate toward objects in the environment) to both comment and request. Other researchers, however, have found more pronounced deficits in gestures used to direct attention (i.e., joint attention) relative to gestures used to request (Paparella, Stickles Goods, Freeman, & Kasari, 2011). In this longitudinal study, the sequence and timing of the development of gestures used for joint attention and gestures used to request were examined. Overall results indicated deficits in both types of gestures. Interestingly, the authors found that, although gestures used to request (e.g., reaching, giving, pointing) developed later for those diagnosed with autism, the order in which specific skills used to request emerged occurred in the same sequence as that seen in typically developing children. In contrast, skills used for joint attention developed in a different sequence from that seen in typically developing children. Responding to bids for joint attention by following another person's gaze and initiating bids for attention by showing and sharing with others developed later in the sequence of joint attention skills in children with autism relative to those without the diagnosis (Paparella et al., 2011). It could be that the difficulty in following the gaze of others is due to the propensity of individuals with autism to orient to other parts of the face or environment rather than the eyes. Additionally, showing and sharing objects to others for the purposes of shared enjoyment rely on some level of experiencing social interaction and attention as reinforcing, which may not be fully intact in children with ASD.

In addition to deficits in joint attention and gestures used to request, differences in overall social initiations have been observed in infants at risk for developing autism. In a study of high-risk (HR) baby siblings of children with autism, researchers found that HR babies spontaneously initiated using all forms of communication at lower rates compared to low-risk controls (Winder, Wozniak, Parladé, & Iverson, 2013). In light of the impact parental responsiveness has on language learning in typical development, these lower rates of overall initiations become a critical variable. Researchers examining parental responsiveness have highlighted that parental responses to their children are, in some way, determined by the child's initiations; that is, maternal responsiveness is dependent upon the demonstration of initiation by the child (Tamis-LeMonda et al., 2001). Additionally, it has been noted that synchronization of parental verbal and nonverbal responses to their child with ASD's attention during play is more challenging (Siller & Sigman, 2002). Although initiations may be overall lower in children at risk for or diagnosed with autism, the importance of parental responsiveness remains the same. Studies have shown that long-term language outcomes are better among children with ASD whose mothers are more responsive (Haebig, McDuffie, & Ellis Weismer, 2013) and parental responsiveness is significantly associated with social initiations in their children with autism (Ruble, McDuffie, King, & Lorenz, 2008). What is not clear is whether greater social initiations allow parents to be more responsive or whether more responsive parenting style helps to improve social initiations with this population. Regardless, teaching mothers of children with ASD to use responsive strategies has resulted in improvements in communication (Aldred, Green, & Adams, 2004).

4.8 Behavior Analytic Approaches to Improving Social Communication

Much of the research on early social communication development focuses on caregivers, typically mothers, and their interactions with their infant or toddler. Although early infancy and toddler caregiving are typically provided by a parent, early interventionists, daycare staff, preschool teachers, and other important care providers can also play a role in improving social communication development, especially in young children who have been identified as having autism or a related disability. Intervention based in applied behavior analysis, also referred to as Early Intensive Behavioral Intervention (EIBI; LeBlanc & Gillis, 2012), is the most evidence-based method to promote language, adaptive, and social skills in children with autism (Eldevik et al., 2009; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005;

Howlin, Magiati, & Charman, 2009). Both structured and naturalistic interventions are empirically supported and are implemented to meet a variety of treatment goals. Naturalistic interventions, such as incidental teaching, often focus on increasing social initiations and social communication skills (Cowan & Allen, 2007). Although variations of specific behavioral practices exist, common components include identifying potent reinforcers to use during intervention, contriving motivating situations to promote initiations, prompting communicative responses when motivation arises, and reinforcing appropriate approximations. Numerous studies have shown that behavioral interventions can improve joint attention, requesting, speech production, and complex social communication skills such as initiating and maintaining conversations and expressing empathy. In addition, behavioral strategies can be used to assess preferences for social interactions and identify highly preferred items to promote language acquisition and assist in conditioning social reinforcers.

4.9 Assessing Preferences

It is clear that interest and engagement are critical features of language learning. As we have seen, shared interest in objects and events and back-and-forth exchanges between caregivers and their children as they engage in activities can promote language learning. Parental verbal responsiveness to gestures aids in the development of early single-word requests. In typical development, initiations toward people and objects of interest (e.g., toys) occur frequently and using these initiations to engage others seems effortless. For parents of infants and toddlers showing signs of autism, however, it may be more difficult to determine the focus of their attention or the object that they desire due to reduced use and delayed development of gestures. Additionally, children with autism often show restricted interests leaving parents wondering what toys their child might like. Thus, it may be harder to engage them in play (Freeman & Kasari, 2013). One important strategy to help caregivers enhance play and engagement is the use of structured preference assessments (Hagopian, Long, & Rush, 2004). Structured preference assessments allow a caregiver or an interventionist to directly assess whether or not a particular item or activity is preferred by a child. Given that eye gaze or pointing may not be well established or reliable, preference assessments that allow a child to engage with items or approach and select items can help caregivers better select toys and snacks to make available, which subsequently can be used to increase initiations.

The two primary types of preference assessments are approach-based measures and engagement-based measures (Hagopian et al., 2004). In approach-based measures single items (Pace, Ivancic, Edwards, Iwata, & Page, 1985), pairs of items (Fisher et al., 1992), or an array of items (e.g., DeLeon & Iwata, 1996) is presented to the child and data are recorded regarding the choices that the child makes. These choices then yield a ranking of most preferred to least preferred items. In engagement-based measures, noncontingent free access to items and activities is offered and the duration of engagement with each item is measured (Roane, Vollmer, Ringdahl, & Marcus, 1998). Numerous studies have shown that preference assessments are effective at identifying items and activities that will function as reinforcers to teach appropriate adaptive and communication skills (see Tullis et al., 2011 for a review). Research also shows that correct implementation of preference assessments can be taught to special education teachers (Pence, St. Peter, & Tetreault, 2012), direct care staff (Lavie & Sturmey, 2002), and parents (Loughrey et al., 2014).

4.10 Developing Requesting Skills

Once preferences are identified, caregivers can be taught to use these highly preferred items to enhance social communication opportunities for their child in motivating contexts. Essentially, parents are taught to arrange the environment so that highly preferred toys, activities, and snacks are available, usually in sight, but out of reach (Drasgow, Martin, Chezan, Wolfe, & Halle, 2016). When the child shows interest or exhibits any type of initiation toward the item (e.g., approach, reach, placing an adult's hand on the item), an opportunity to teach is signaled. Creating these motivating opportunities evokes more social initiations and gestures and allows parents to be responsive to their child's initiations more often, subsequently strengthening that behavioral repertoire. In addition to reinforcing the occurrence of social initiations, these motivating opportunities allow caregivers and interventionists to teach new communicative responses. For example, if a pop-up toy was identified in a preference assessment as highly preferred, the caregiver could then place the pop-up toy slightly out of reach on a shelf in the playroom. The parent then pauses for the child to show interest. When the child reaches toward the toy, the caregiver then prompts the child to say "pop" or "pop-up" or some other word approximation and then immediately responds to attempts to communicate by providing access to the toy. In some cases, prompting a better gesture (e.g., shaping a reach into a point) may be the first goal of teaching. In other cases, an augmentative and alternative communication (AAC; Ganz, 2015) system is used in which pointing to pictures or signed language may be the target of these intervention trials. After playing with the toy for a period of time, the caregiver would attempt to contrive motivation for an alternative toy or activity and repeat the procedures, each time waiting for an initiation from the child and then responding to it (Cowan & Allen, 2007). By regularly assessing the child's preferences, contriving motivation to initiate for preferred items, responding contingently to those initiations or prompting better communicative responses, and responding contingently to child attempts, caregivers can significantly improve social communication skills. Studies have shown that parents (Loughrey et al., 2014) and interventionists (Dyer & Karp, 2013) can be trained to proficiency with these strategies and that child spontaneous requesting increases as a result.

4.11 Developing Social Interest and Joint Attention Skills

Although gestures and language are used in social communication to request, we also know that these behaviors are used to gain attention, share enjoyment, and comment on interests. In these cases, the function of the behavior is not to gain access to a toy or an item, but to engage in a social interaction and draw social attention from others. These responses may not develop as expected for children with ASD due to diminished level of social interest. However, not all children with ASD exhibit the same levels of social aloofness. Therefore, it may be advantageous to assess preference for social interaction, and research has shown that similar procedures used to identify preference for toys and items can be used to do so. For example, approach-based measures can be used to assess preference for social interactions by presenting an array of pictures or icons representing various social interactions and ranking selections (Nuernberger, Smith, Czapar, & Klatt, 2012). In addition, engagement-based measures can examine response allocation to various social interactions to assess preference for those social interactions (Call, Shillingsburg, Bowen, Reavis, & Findley, 2013; Gutierrez, Fischer, Hale, Durocher, & Alessandri, 2013). Preferred social interactions can then be used to reinforce alternative appropriate behavior (e.g., Nuernberger et al., 2012). For some children with ASD, however, it may be difficult to identify any consistent preferred social interactions, which suggests that social interactions may not be reinforcing. To mitigate these concerns, research has demonstrated that social interactions can be conditioned as reinforcers by pairing identified preferred items, such as toys with social interactions (Dozier, Iwata, Thomason-Sassi, Worsdell, & Wilson, 2012; Holth, 2007). For children with ASD who exhibit significantly diminished interest in social stimuli, conditioning social reinforcers should be an important component of any intervention plan.

Promoting functional and sustainable joint attention skills involves setting up teaching opportunities and using potent social reinforcers to strengthen responding. Therefore, once social interactions and social responsiveness function to reinforce behaviors, interventions can focus on teaching joint attention such as showing and sharing. Taylor and Hoch (2008) demonstrated the effectiveness of a behavioral intervention in teaching joint attention skills to children with ASD. In this study, the authors arranged the environment to present novel and visually interesting situations to increase salience. Using physical, gestural, and verbal prompts and social reinforcement, participants were taught to respond to adult-initiated bids for joint attention and to initiate a bid for joint attention by commenting about an object (Taylor & Hoch, 2008). Children with ASD who have been taught joint attention skills have been shown to generalize these skills to novel settings and with novel stimuli. For example, Buffington, Krantz, McClannahan, and Poulson (1998) taught children with ASD to gain attention using gestures with language (e.g., pointing at an object while saying "look") and to comment about and describe objects. Observations of generalized use of the new skills lend support that they may further develop in the natural environment for children with ASD following training.

4.12 Considerations for Minimally Verbal Children with ASD

Recent studies have found that between 26 and 29% of children with ASD are minimally verbal, defined as using fewer than five spoken words (Anderson et al., 2007; Rose, Trembath, Keen, & Paynter, 2016). Interventions based on applied behavior analysis have been shown effective in promoting spoken language in some individuals with ASD who had not previously learned to speak. For example, research has shown that prompting speech sounds and using differential reinforcement to shape better approximations can increase verbal imitation skills in children with ASD and related disabilities (e.g., Butz & Hasazi, 1973; Hung, 1976; Tarbox, Madrid, Aguilar, Jacobo, & Schiff, 2009). For children who are emitting some vocal imitation skills, operant conditioning has been successful in transferring those skills to functional requesting (e.g., Bourret, Vollmer, & Rapp, 2004; Thomas, Lafasakis, & Sturmey, 2010), expressive labeling (e.g., Barbera & Kubina, 2005; Marchese, Carr, LeBlanc, Rosati, & Conroy, 2012), and answering questions (Goldsmith, LeBlanc, & Sautter, 2007). AAC systems are also used to increase communication skills in children with ASD and research suggests that AAC can also promote the development of spoken communication (e.g., Schreibman & Stahmer, 2014). Although it is clear that behavioral interventions can be effective in promoting spoken communication in children with ASD, a recent review of the literature suggests that more research is needed to determine what interventions are most efficacious and to establish additional interventions to promote language when those available are ineffective (Mulhern et al., 2016).

4.13 Complex Speech and Advanced Social Communication Skills

Not all children with autism exhibit significant difficulties with language acquisition and many children with language delays will go on to make substantial improvements in language development (Pickett, Pullara, O'Grady, & Gordon, 2009). Acquisition of verbal imitation skills, early requesting, and foundational vocabulary use are substantial achievements; however, complex social communication remains a goal for many children with ASD. Behavioral interventions have been shown to promote more complex speech and advanced social communication skills in children with autism. For example, in a study of 30 children diagnosed with autism and related disabilities, a behavioral intervention consisting of vocal prompts and differential reinforcement resulted in increasing the mean length of utterance of spontaneous requests from 1.41 words to 2.61 words, which equates to a

12-month improvement in age equivalence (Yosick, Muskat, Bowen, Delfs, & Shillingsburg, 2016). There are clear benefits to requesting using phrases and sentences, such as clarifying the intent of the utterance to the listener, which can result in a better interaction. The speaker's communication is more precise, and the listener is better able to respond appropriately. Behavioral interventions have also been used to promote other kinds of phrase and sentence use involving word combinations including labeling and commenting on events using noun-verb combinations (Frampton, Wymer, Hansen, & Shillingsburg, 2016; Kohler & Malott, 2014). Although there is still much to learn on interventions to promote complex social interaction skills (White, Keonig, & Scahill, 2007), researchers are beginning to show the robust effects of interventions based on applied behavior analysis on skills such as responding to the nonverbal cues of conversational partners (Peters & Thompson, 2015), question-asking within a conversational exchange (Swerdan & Rosales, 2015), and developing empathy (Argott, Townsend, & Poulson, 2017).

In conclusion, although there is a significant range of presenting challenges exhibited by children with autism, an underlying feature involves difficulties with pragmatic use of language skills in social interactions. At the center of these challenges appears to be deficits in social interest and reduced reward value of social interaction. Interventions that incorporate strategies to enhance social initiations and contingent responsive interactions from caregivers may help to promote social communication skills. It should be noted that children with ASD often have a variety of significant challenges in other areas as well, such as toileting and other adaptive skills, significant challenging behavior, stereotypy, and challenges learning conditional discriminations. Therefore, in addition to incorporating interventions to promote social communication, it is important that interventions for children with ASD provide comprehensive care to address these important areas as well.

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5

Measuring the Effects of Medication for Individuals with Autism

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Abstract

Psychotropic medication is often prescribed for individuals with autism spectrum disorders (ASD) for a variety of behavioral concerns. These concerns can include problem behaviors such as aggression, self-injury, or property destruction, as well as repetitive and compulsive behavior. Other concerns such as impulsivity, inattentiveness, and mood disturbances may also be targeted by psychotropic medication. Unfortunately, medical providers often have to rely on caregivers to report changes in behavioral outcomes rather than gathering the information directly from the person taking the medication. Thus, the goal of this chapter is to help guide clinicians and educators to work collaboratively with medical providers to assist in measuring the effects of medications on the behavior targeted. In addition, information on collateral effects of the medication on other behaviors as well as side effects of medication can be monitored. Information on the drug development process, physiological measures that can be used to assess therapeutic outcomes, and tools for clinicians and families to use to measure medication effects are also described. Finally, guidelines for enhancing collaboration between patients, families, educators, and providers on treatment plan development are emphasized.

Psychotropic medications are used extensively in individuals with autism spectrum disorders (ASD) and other disabilities. For some, these medications are prescribed for behavioral concerns such as problem behavior like aggression, self-injury, or repetitive behavior and for others they are prescribed for concerns such as impulsivity, anxiety, and/or ritualistic behavior. Langworthy-Lam, Aman, and Van Bourgondien (2002) surveyed members of the Autism Society of North Carolina to determine to frequency of medication use by members. Of the 1538 families who responded, 45.7% of individuals with ASD were taking psychotropic medication. Of that group, antidepressants were the most commonly prescribed (21.7%), then antipsychotics (16.8%), followed by stimulants (13.9%). This study relied on parents volunteering to participate and thus, to get a more objective measure, Mandell et al. (2008) reviewed 60,641 national Medicaid claims and found that 57% of children with ASD were prescribed at least one psychotropic medication. Houghton, Ong, and Bolognani (2017) found that 64% of children with ASD enrolled in commercial insurance programs and 69% of children

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enrolled in Medicaid programs were prescribed psychotropic medication, indicating a growing trend in the use of psychotropic medication even within the past 10 years.

Studies have identified that the age that medication is being prescribed for children with ASD is getting younger and younger. For example, Mandell et al. (2008) found that 18% of children 0–2 years of age and 32% of children 3–5 years were prescribed medication. Finally, polypharmacy was also common in that 20% of the children studied by Mandell et al. were prescribed three or more medications. Individuals with ASD and intellectual disabilities (ID) are at even greater risk for polypharmacy (Straetmans, van Schrojenstein Lantman-de, Schellevis, & Dinant, 2007).

Although it is not always clear what behaviors are targeted for medication, there is evidence that children with ASD are more likely to have comorbid psychiatric disorders than their peers with ID only (LoVullo & Matson, 2009) or their neurotypical peers (Stortz, Lake, Cobigo, Ouellette-Kuntz, & Lunsky, 2014). Houghton et al. (2017) found that individuals aged 3–50 years with ASD who had a psychiatric comorbid condition were more likely to be prescribed medication, with attention-deficit hyperactivity disorder and anxiety disorder being the most common conditions. Other psychiatric conditions commonly associated with ASD include bipolar disorder and depression. The authors also found that a large proportion of people with ASD without a comorbid psychiatric condition were also prescribed medication (i.e., 31% for commercial insurers, and 33% for those on Medicaid).

Characteristics most commonly associated with medication use for individuals with ASD include greater age, more severe autism symptoms, more severe intellectual disability, and more restrictive housing arrangements (Langworthy-Lam et al., 2002). This was particularly true for individuals taking antipsychotic medication. Interestingly, these authors also found that antidepressants were more likely to be prescribed for females with autism, individuals who were white, and those who had a higher paternal education level. Houghton et al. (2017) also found that medication was more likely to be prescribed for older children, with the highest likelihood being just before adulthood.

Given that there are limited guidelines for prescribing medication for children with ASD and/or ID, it's important to consider how a provider determines when medication is needed and when it's not. Much of a provider's prescription practices develop through experience and training history, and based on patient response or caregiver's opinion of their response to the medication. As clinicians and educators working with children with ASD, what is our role? How can we help inform prescription practices for our patients and students, and how do we navigate the complicated system of effective collaboration with other clinicians, providers, and the child's parents?

5.1 Medication Development and Prescription Guidelines

The first step in developing a new medication is to conduct a series of clinical trials which initially involve preclinical testing with nonhumans for safety and toxicity. This is followed by a series of phase trials that involve testing for safety in human volunteers without the targeted behavioral or medical issue, and then doing a series of larger scale trials with adults with the disorder. Once the medication is reviewed and approved by the US Food and Drug Administration (FDA), additional clinical trials with children and other vulnerable populations, such as individuals with ASD, can be conducted (e.g., Aman et al., 2004; Handen, Johnson, & Lubetsky, 2000; McCracken et al., 2002; McDougle et al., 2005). To find a list of current clinical trials available for individuals with autism, the website clinicaltrials.gov is sponsored by government agencies such as the National Institute of Health and can identify medication trials (and other behavioral or medical intervention studies) currently being conducted.

The gold standard for evaluating medication is to conduct a randomized clinical trial (RCT;

Sprague & Werry, 1971). This has several key characteristics including the following: (1) it is double blind and placebo controlled so neither the participant nor the prescriber know when the person is taking active medication versus a placebo; (2) all other interventions are kept constant with no change in behavioral interventions or placement; (3) well-validated instruments are used to evaluate the efficacy of the medication; and (4) participants are randomly assigned to study conditions. Napolitano and her colleagues (1999) suggested that RCTs with participants with disabilities also include evaluations to determine the social validity of the intervention being assessed (to determine if there was a clinically significant change in the behavior), and the level of client satisfaction. The authors also suggested that the separate and combined effects of medication and behavioral interventions should be evaluated by conducting RCTs using multiple sites or centers (e.g., Aman et al., 2009; Handen et al., 2015; Scahill et al., 2012).

While many clinical trials include Sprague and Werry's (1971) guidelines and use random assignment to a placebo or medication test group (sometimes referred to as a two-arm study), alternative clinical trial designs may also be considered. One design is the crossover design in which all study participants receive the active treatment (medication) and placebo (e.g., Zarcone et al., 2001), sometimes using multiple, or escalating doses. One concern with using a crossover design (sometimes referred to as a case crossover design) is that there can be carryover between phases; thus washout periods between placebo and medication phases are often recommended to control for these effects (Mills et al., 2009). Another concern is that these trials tend to take longer, even though more information can be obtained from each study participant, because all participants can serve not only as their own control but as a group control as well (e.g., Arnold et al., 2006; Hollander et al., 2005; Zarcone et al., 2001).

Given that it is often difficult to conduct clinical trials with the experimental rigor required of a RCT, the idea of evaluating the clinical effectiveness of an intervention (medication or otherwise) under more naturalistic conditions is called a practical clinical trial (PCT). An RCT is characterized by evaluating whether the intervention works under ideal circumstances of a very selective group of people under controlled conditions. A PCT evaluates whether the intervention works best under practical conditions with a more diverse, heterogeneous group of individuals using less controlled conditions (Brass, 2010). While a PCT is often less costly and the outcomes more variable, the results are possibly more generalizable to the larger clinical group.

Once a medication is approved by the FDA based on their safety trials, it can be prescribed immediately. Unfortunately, because clinical trials have often not yet been conducted with children or individuals with disabilities, nearly all psychotropic medications for that population are prescribed "off label" (i.e., not fully tested or approved by the FDA). Several medications have been approved for use in children such as Prozac (fluoxetine), Zoloft (sertraline), and other selective serotonin reuptake inhibitors (SSRIs) for the treatment of obsessive compulsive disorder. Many stimulants and other medications have been approved for the treatment of attention-deficit/hyperactivity disorder in children and adolescents as well. But it is very rare for the FDA to approve psychotropic medications in children with ASD or other developmental disabilities. Currently, there are only two medications approved for use in the treatment of irritability in children and adults with autism, Risperdal (risperidone) and Abilify (aripiprazole). The reason that "irritability" was specifically targeted for approval was based on the initial clinical trials that primarily relied on the Aberrant Behavior Checklist Irritability Subscale (Aman, Singh, Stewart, & Field, 1985) as the primary outcome measures. The ABC is often used as a measure for clinical trials and the Irritability Subscale includes several items that address problem behavior including "injures self on purpose," "aggressive to other children and adults (verbally and physically)," and "temper tantrums/outbursts" in addition to "irritable and whiny." So while both of these medications are used for the treatment of a variety of problem behaviors including aggression, property destruction, and self-injury (Pandina, Bossie, Youssef, Zhu, & Dunbar, 2007), the FDA chose to identify irritability as the primary target (see more in the section Outcome Measures, below).

In addition to reviewing the literature on case studies and RCTs, providers also have practice parameters and clinical guidelines provided by groups such as the American Academy of Child and Adolescent Psychiatry (AACAP) to guide medication selection. The most recent guidelines by the AACAP for children and adolescents with ASD provide a broad range of recommendations for conducting diagnostic assessments, and using evidence-based behavioral and educational treatments but there is also a detailed list of the medications that have undergone clinical trials with individuals with ASD (Volkmar et al., 2014). The authors also recommended that pharmacotherapy should be offered to children with ASD only when there is a specific target symptom or comorbid condition that the medication would target. In addition, the review provides a list of commonly used instruments for measuring different aspects of behavior related to autism. Most of these rating scales are completed by parents to indicate their child's behavioral response to their medication as primary measure of treatment efficacy (e.g., Arnold et al., 2000; Marcus et al., 2009). Rarely are direct observation data used to evaluate the effects of the medication across time.

5.2 Outcome Measures

There are a variety of ways that medical providers determine whether there has been a positive or negative effect in behavior due to the medication. These can vary from asking the caregivers their opinion as to whether the medication is working to reviewing graphs of the frequency of the target behavior. In addition, there are also physiological measures that may be used to determine whether a medication is working optimally or not. Below is a description of some of these measures.

5.2.1 Therapeutic Drug Monitoring

Some medications can have the amount of active medication measured via levels in the patient's blood. This level can provide an indication of whether the medication is being absorbed adequately and is within a specific therapeutic range. Therapeutic drug monitoring can be helpful to determine if medication is at the recommended plasma level. While this can be a good guideline for dosing, without concurrent behavioral data, the information may not be very meaningful and should not be the primary measure of efficacy. Although therapeutic levels are becoming more common, there are still many medications for whom these data are not yet available or for whom levels have not been standardized. For example, valproic acid is often used for agitation and mood stabilization in individuals with autism (Hellings et al., 2005) and a blood level near 100 is considered to be within the therapeutic range and within safety standards (Allen, Hirschfeld, Wozniak, Baker, & Bowden, 2006). But the efficacy of the medication is not necessarily synonymous with a medication being within a therapeutic range. It is also unclear whether metabolic issues (or how quickly the medication is metabolized) can affect therapeutic blood levels.

Recent research in pharmacogenetics, or the study of the genetic differences in drug metabolism that affects an individual's response to medication, is now being used more often to not only evaluate the therapeutic effects but also adverse side effects of medications (Klotz, 2007; Smith, Sharp, Manzardo, & Butler, 2015). A person's sensitivity to certain genetic polymorphisms in the medication can have a significant effect on how a medication is metabolized. Fortunately, there are a relatively small number of enzymes that are used to metabolize psychotropic medications. For individuals whose genotype for a particular enzyme is typical, in that they have functional copies of the gene on both chromosomes, they are considered "normal metabolizers." For those that are identified as "fast metabolizers," there may be the presence of extra copies of the gene for that enzyme. "Slow metabolizers" carry mutations in one or both copies of the gene for the enzyme that may reduce or even eliminate the function or expression of the enzyme (Meyer, 2000). As a result, the individual who is a slow metabolizer may experience an "overdose" by a normal dose of medication because they cannot metabolize the medication quickly enough. In addition to determining whether one is a fast or slow metabolizer, it may be possible to identify gene polymorphisms that are associated with specific side effects or adverse drug reactions. For example, Sleister and Valdovinos (2011) demonstrated that several gene polymorphisms or variants may be related to weight gain resulting from the use of atypical antipsychotic drugs.

The study of pharmacogenetics may eventually lead to the identification of who might show side effects or be the best responders to psychotropic medications (Schroeder, Hellings, & Courtemanche, 2013). Pharmacogenetics has become a growing part of the precision medicine or personalized medicine approach which is a developing trend in health care that takes into account the differences in individual genes, environments, and lifestyles to determine medication (and other treatment) efficacy (US Food and Drug Administration, 2017).

5.2.2 Side Effects or Adverse Drug Reactions

Although there are not a lot of data to support this view, several authors have suggested that compared to psychiatric patients without ID, patients with ID may be more sensitive to adverse drug reactions and side effects and may be treatment effects with lower doses of medication (Arnold, 1993; Kalachnik, 1999). Sometimes side effects can be measured physiologically (e.g., labs, blood pressure, electrocardiogram, or EKG) or using therapeutic blood levels as described above. In addition, general behavioral observations can be made and changes from an individual's "baseline" can be noted, including changes in irritability or other dimensions of mood, sleep (increased or decreased), changes in appetite, and extrapyramidal symptoms.

There are several rating scales that have been developed to measure medication side effects in individuals with disabilities including individuals with ASD. These scales can be comprehensive (e.g., the Matson Evaluation of the Drug Side Effects; Matson et al., 1998), medication specific (e.g., the Stimulant Drug Side Effects Scale; Barkley, McMurray, Edelbrock, & Robbins, 1990), or side effect specific like the Abnormal Involuntary Movement Scale (AIMS; Guy, 1976) or the Dyskinesia Identification System Condensed User Scale (DISCUS; Kalachnik & Sprague, 1993). Kalachnik (1999) and Matson and Mahan (2010) provide an excellent review of commonly used rating scales and measures for individuals with ID.

Kalachnik (1999) also provides a clarification in the formal terminology used in relation to side effects that may lead to confusion during patient care. Specifically, *side effects* are the unintended effects of a medication (or other "agent") that occur at normal doses like a hand tremor in a person taking lithium. *Adverse drug reactions* (ADRs) or "adverse reactions" or "adverse effects" are more uncharacteristic or unexpected reactions to drugs. Specifically, they can vary from allergic reactions to toxic reactions and can occur due to the effect of a single medication or a drug-drug interaction. Finally, there are *adverse drug events* in which an injury occurs that is related to the medication. According to the FDA, a serious adverse event is considered anything that is fatal, life threatening, and permanently or significantly disabling; requires hospitalizations or prolongs it; causes a congenital anomaly or birth defects; or requires intervention to prevent permanent impairment (FDA, 2016). Examples include serious breathing issues requiring an emergency room intervention, a seizure, or development of a blood disorder.

5.3 Behavioral Measures

5.3.1 Rating Scales/Indirect Assessments

Rating scales are a common method for measuring treatment effects, and are used in both clinical trials and treatment settings (Matson & Neal, 2009). There is no single or "best" assessment for measuring changes in *core* symptoms of ASD, just as there are no medications currently approved to directly treat the *core* symptoms of ASD. There are, however, several interviews, rating scales, and questionnaires available to measure changes in the frequency and severity of *related* symptoms targeted in pharmacological treatment in ASD. Completed by caregivers or treatment providers working directly with the child, these measures can be helpful in estimating treatment effects.

5.3.1.1 Aberrant Behavior Checklist (ABC)

The ABC is a standardized rating scale used to measure treatment effects, including psychotropic medication, for people with ID; it is widely used in medication trials and clinical settings (Aman et al., 1985). It was originally developed for adult patients in residential setting with the intended purpose of evaluating treatments in like settings, but is now used in home, community, and residential settings. The 58-item rating scale is organized into 5 subscales: irritability, agitation, and crying (15 items); lethargy/social withdrawal (16 items); stereotypic behavior (7 items); hyperactivity/noncompliance (16 items); and inappropriate speech (4 items). All items are scored on a 4-point scale (0 = not a problem to 3 = severe problem). Individual subscale items are scored and summarized to give an overall subscale score; a total score is not calculated. The assessment is designed to be completed by a person who knows the individual well, such as a parent, teacher, case worker, or therapist within 10–15 min (Farmer & Aman, 2017). It has been extensively evaluated in the experimental literature and is considered one of the most valid and reliable rating scales for this population (Aman, 2012b; Aman, Burrow, & Wolford, 1995; Kaat, Lecavalier, & Aman, 2014; Karabekiroglu & Aman, 2008; Marshburn & Aman, 1992). It is available in 40 languages and has been used in over 325 empirical evaluations (Aman, 2012a). The ABC was used as an outcome measure in the original clinical trials of risperidone in children with autism, which contributed to the FDA approval of the drug for treatment of irritability and later approval of aripiprazole for severe behavior problems for people with ASD.

5.3.2 Nisonger Child Behavior Rating Form (NCBRF)

The NCBRF (Aman, Tassé, Rojahn, & Hammer, 1996) is an adapted version of the Child Behavior Rating Form (CBRF; Edelbrock, 1985). The purpose of adapting the CBRF was to create a rating scale that was brief (i.e., completed in fewer than 10 min), could be reliably completed by parents and teachers, valid for use among child within a broad age range of presentations, and appropriate for the assessment of a variety of symptoms including stereotypy and self-injury. It is intended for use with children aged 3–16 years old, to assess behavior during the past month, and includes items that address both the child's strengths and challenges (Hastings, Brown, Mount, & Cormack, 2001).

There are two versions of the scale: parent and teacher. Both versions contain two subsections: social competence (10 items) which is rated on a 4-point scale (0 = not true to 3 = always true) and problem behaviors (60 items across 6 subscales: conduct problem, insecure/anxious, hyperactivity, self-isolated/ritualistic, overly sensitive, self-injurious/stereotypy) which are rated for both frequency and severity on a 4-point scale (0: does not occur/not severe to 3: occurred a lot/severe problem) (Aman et al., 1996; Tasse, Aman, Hammer, & Rojhan, 1996). Psychometric elevations of the scale have shown high levels of construct validity (Lecavalier, Aman, Hammer, Stocia, & Mathews, 2004; Rojahn et al., 2010). It has been used to determine the efficacy of risperidone (e.g., Aman, Alvarez et al., 2002; Biederman et al., 2006; Findling et al., 2004; Reyes, Croonenberghs, Augustyns, & Eerdekens, 2006; Shea et al., 2004; Snyder et al., 2002; Turgay, Binder, Snyder, & Fisman, 2002) and quetiapine (e.g., Findling et al., 2006, 2007) in children with ID.

5.3.3 Clinical Global Impressions Scale (CGI)

The CGI was initially developed for use in federally funded clinical trials to assess global functioning throughout medication treatment in patients across all psychiatric disorders (Guy, 1976). It is organized into two subscales: severity (CGI-S) and improvement (CGI-I). Severity is rated by a single item on a 7-point scale (1 = normal to 7 = extremely ill). Improvement is assessed by comparing the patient's overall condition to his/her condition 1 week prior to initiating treatment and again scored on a 7-point scale (1 = very much improved to 7 = very much worse). The assessment should be administered by a trained professional, someone who is very familiar with the condition and the individual (Busner & Targum, 2007). It is the most widely used measure of medication effects in individual with ID, but has been criticized for its lack of specificity at the individual behavior level and vague descriptions of level of severity and degree of change (Zarcone, Napolitano, & Valdovinos, 2008). Another consideration is that there is no universal system for interpreting the scores or changes in scores across time; interpretation of the meaningfulness or magnitude of change relies on clinical judgment alone (Busner & Targum, 2007).

For medication studies with individuals with ASD and ID, the CGI has been used to evaluate the effects of risperidone (e.g., Aman, Alvarez, et al., 2002; Buitelaar, van der Gaag, Cohen-Kettenis, & Melman, 2001; RUPP Autism Network, 2002; Shea et al., 2004; Snyder et al., 2002; Van Bellinghen & De Troch, 2001), aripiprazole (e.g., Marcus et al., 2009; Owen et al., 2009), and citalopram (e.g., King et al., 2009).

5.3.4 Children's Psychiatric Rating Scale (CRPS)

The CPRS was originally designed as a 63-item scale for federally funded research programs as a general, broad-ranging rating scale for the evaluation of symptoms and behaviors related to childhood psychopathology in clinical medication trials (Guy, 1976). It was not designed to be used as a diagnostic tool but rather a way to quantify the severity of presenting symptoms and is therefore useful in measuring treatment effects in therapeutic settings as well as clinical trials. There are two parts of the scale. First, the clinician rates both observed and reported behaviors. Second, the clinician rates an overall impression based on data from multiple sources including teacher reports, school records, etc. A rating from 0 to 9 is scored, based on the severity of the problems reported and observed (Robinson, 2013).

Overall and Pfefferbaum (1984) abbreviated the scale to a subset of 14 items specific to individuals with ASD (CBRF-14). The ASD-specific subscale includes a direct assessment of the patient's behaviors and symptoms during the visit or from a videotaped observation of the child and might therefore be considered more of a direct measure than an indirect rating scale. Initial evaluations of the psychometric properties of the CPRF-14 have found the scale to be valid and reliable for measuring treatment effects in individuals with ASD (Overall & Campbell, 1988). Examples of the CPRF/CPRF-14 used in the psychotropic medication literature include measurement of the effects of risperidone (Gagliano et al., 2004; Nicolson, Awad, & Sloman, 1998), clomipramine and desipramine (antidepressants; Gordon, State, & Nelson, 1993), and haloperidol (Anderson et al., 1989) with individuals with ASD.

5.3.5 Yale-Brown Obsessive Compulsive Scale (Y-BOCS)

The Y-BOCS is a well-known clinical measure used to evaluate the severity of symptoms of obsessive-compulsive disorder (OCD; Goodman et al., 1989). The scale contains two distinct sections: Symptom Checklist and Severity Scale. The Symptom Checklist is used to evaluate 54 obsessions and compulsions for two criteria: current (i.e., occurred within a week of assessment) and past (i.e., occurred in the past but is no longer occurring). The Severity Scale contains 10 items, rated on a 5-point Likert scale, that further assess the items indicated as a current obsession or compulsion on the Symptom Checklist. As clinical judgment is incorporated into the scoring of the Y-BOCS, administration is usually provided by a trained clinician.

The Y- BOCS was revised and a second edition is available (Y-BOCS-II; Goodman, Rasmussen, Price, & Storch, 2006). Revisions include updated items and scoring for the Severity Scale, adding consideration of avoidance behaviors to the Severity Scale items, and modified content and format of the Symptom Checklist. The Y-BOCS-II has shown to have strong internal consistency, test–retest and interrater reliability, and construct validity (Storch et al., 2010). For children aged 8–17 years old, the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS; Scahill et al., Scahill et al., 1997) is administered to both parent and child. This version of the measure allows for clinical judgment regarding additional items such as insight, avoidance, and overvalued sense of responsibility. Among youth with ASD, the CY-BOCS has shown good internal consistency, good-to-excellent interrater reliability, and satisfactory convergent and divergent validity (Wu et al., 2014). Versions of the Y-BOCS have been used to evaluate the effects of several medications with individuals with ASD including memantine (Hage et al., 2016), risperidone (McDougle et al., 1997), levetiracetam (Wasserman et al., 2006), citalopram (King et al., 2009), fluoxetine (Hollander et al., 2005; Hollander et al., 2012), and fluvoxamine (Buchsbaum et al., 2001; McDougle et al., 1996).

5.3.6 Direct Observation Measures

Direct observation is another method of assessment that can be particularly useful in the evaluation of the effects of psychotropic medications, for both targeted behavioral effects and those that may be unintended (Schroeder et al., 2013; Zarcone et al., 2008). Direct observations require the careful definition of the targets to be observed and the development of measurement systems to track their occurrence (Zarcone et al., 2008). Because direct observations yield quantitative data, the information that they provide reflects the actual occurrence of behavior and is inherently more objective than information that may be gleaned from sources that rely on opinion or on memory of past events, such as rating scales or other indirect assessments (Alter, Conroy, Mancil, & Haydon, 2008).

Although studies examining the effects of psychotropic medications for individuals with disabilities have relied primarily on the use of rating scales and biological measures (Matson & Neal, 2009; Schroeder et al., 2013; Unwin & Deb, 2011), research has demonstrated the value of direct observation as a primary method of data collection for determining not just changes in the occurrence of target behaviors following the introduction of a medication but also the changes that may occur in motivating operations and behavioral function (e.g., Carlson, Pokrzywinski, Uran, & Valdovinos, 2012; Valdovinos, Henninger-McMahon, Schieber, Beard, & Haas, 2016). These findings support the assertion that direct observation can be a valuable tool in both research and clinical settings.

There are a variety of techniques that can be employed to measure behavior that is observed using direct observation (Matson & Neal, 2009). Typically these data collection methods focus on gathering information on the frequency or duration of a behavior and can include methods such as event recording, duration and latency recording, time sampling, and interval recording. Although a detailed description of each of these methods is beyond the scope of this chapter, a variety of resources are available that outline how each method can be used, the associated benefits and challenges, and the ways that data collected via these methods can be evaluated for the purposes of decision-making (see Johnston, Pennypacker, & Green, 2010; Ledford, Lane, & Gast, 2018).

Regardless of the specific techniques used to measure behavior during direct observations, there are important logistical issues that must be considered, namely what specific target behaviors to observe, when and where to observe, and how to observe (Ledford et al., 2018). This is true for both research and clinical settings.

When determining the specific target behaviors to observe and measure, it is beneficial for considerations to be made to assess both the intended effects of the medication and the potential unexpected effects (Zarcone et al., 2008). Measurement of the intended effects is necessary to evaluate whether or not the medication is working in the way it was intended; however, measurement of other behaviors can also provide valuable information that may help in the overall evaluation of the medication. Although medications for individuals with autism and IDD are typically prescribed to address specific problem behaviors (e.g., aggression, self-injury), observational data can also provide information about the effects that medications may have on a variety of related behavior (Van der Oord, Prins, Oosterlaan, & Emmelkamp, 2008). For instance, research has incorporated direct observation to examine effects of medication on on-task behavior in classroom settings (e.g., Sibley, Kuriyan, Evans, Waxmonsky, & Smith, 2014), academic skills (e.g., Ballinger, Varley, & Nolen, 1984; Benedetto-Nasho & Tannock, 1999), and prosocial behaviors, such as sportsmanship (e.g., LaRue et al., 2008). For each behavior, be it a behavior specifically targeted by the medication, or one that may be unexpectedly affected, it is important that careful definitions be created to ensure that the behaviors are both observable and measurable (see Ledford et al., 2018).

Once the target behaviors have been identified and defined, decisions must then be made regarding when and where to observe and collect data (Cooper, Heron, & Heward, 2007). The location and timing for direct observations will often be based upon the specifics of the target behavior, namely what is already known about the occurrence of the behavior and when direct observation and data collection are likely to yield information that will be useful for evaluation (Ledford et al., 2018). When direct observations are being conducted to assess the effects of medications, however, additional factors related to the specific medications themselves should also be taken into consideration. For example, the pharmacokinetics of a medication, which loosely refers to the time it takes for medications to be absorbed into the body or excreted from the body, will impact the ways in which medications may be expected to impact behavior at differing points in time (Singh, Singh, Lancioni, & Adkins, 2010). As a result, it will be important that timings of direct observations be scheduled to ensure that medications are assessed at various levels of concentration, and particularly when they have reached therapeutic, steady-state levels. This will increase the likelihood that the full effects of the medications, both intended and adverse, can be determined. Because this is information that is typically outside of the scope of training and practice for many clinicians, close collaboration with prescribers will be necessary to ensure that data collection represents the true effects of a medication.

Often the observation techniques that are selected for a particular study or clinical evaluation are specifically identified to adequately capture the target behaviors in the specific research or clinical setting; however, standard procedures, such as those employed during analogue functional analyses (FAs; Iwata, Dorsey, Slifer, Bauman, & Richman, 1994), have been shown to be beneficial for determining the impact of psychotropic medications on behavior in a manner that allows for comparison across studies (Schroeder et al., 2013). FAs involve the systematic manipulation of specific variables in the environment, allowing for the assessment of potential functional relations between those variables and the target behaviors (Iwata et al., 1994). Although FAs were not intended to be tools for the evaluation of treatment effects (Johnson et al., 2007), it has been recommended that FAs be conducted prior to medication evaluations (Danvo, Tervo, Meyers, & Symons, 2012; Thompson, Zarcone, & Symons, 2004) and any time that there is a change to the medication regimen (Valdovinos, Nelson, Kuhle, & Dierks, 2009; Valdovinos et al., 2016). Although they can be difficult to implement, due to the time and training that are required (Danvo et al., 2012), several studies have indicated that FAs can provide important information about both rates of behavior and behavioral function. When FAs are conducted at key points in time, data can allow for comparisons and hypotheses to be made about the effects of medications and medication changes (Schroeder et al., 2013; Valdovinos et al., 2009, 2016; Zarcone et al., 2008). The inclusion of an assessment procedure that can capture information about the amount of the behavior that occurs, in addition to information about behavioral function, is particularly beneficial for the development of function-based behavioral interventions that may need to be adapted over time as changes are made to medication regimens. Although research has indicated that behavioral function tends to be fairly static over time (Kearney, 2008), additional studies have suggested that changes to medication regimens have correlated with changes in the functions of target behaviors (Valdovinos et al., 2009, 2016).

Although there are several advantages of the use of direct observation for the evaluation of psychotropic medication effects, there are also several limitations that should be noted. First, data collection that is required to document observed behavior can be complex and time intensive. Individuals responsible for data collection are often frontline staff and/or caregivers, who may have limited training related to data collection and who may also have a multitude of additional responsibilities (Madsen, Peck, & Valdovinos, 2016). This is problematic, as each of these factors may increase the likelihood that behavior analysts may have to expend a large amount of time to provide initial and ongoing training and support, yet there remains a high risk that data may still be inaccurate or incomplete (Madsen et al., 2016). Second, it can be difficult to collect data that accurately and thoroughly reflect the occurrence of the target behaviors, particularly if the target behaviors occur at a low frequency or if they are covert (Madsen et al., 2016; Zarcone et al., 2008). This is also true of behaviors for which there may be ethical issues with observation, such as private behavior (e.g., sexual behavior, hygiene-related behavior) or very dangerous behavior (e.g., setting fires, severe SIB).

There are a variety of methods for assessing the effects of psychotropic medications for individuals with ASD. Each of these methods contributes valuable information to the medication management process, yet none are without their limitations. It may be the most advantageous approach to use both indirect and direct observation methods to evaluate the true effects of a medication based on the context, target behavior, and resources available.

5.4 Collaborating with Providers

Volkmar et al. (2014) and the AACAP recommend that clinicians maintain an active role in the long-term treatment planning and support for the family and the individual. The goal of ongoing and long-term collaboration for behavioral, education, and psychopharmacological interventions is particularly important for adolescents with ASD. While there are guidelines for prescription practice, there doesn't exist clear guidelines for how parents or other providers work in an interdisciplinary way to evaluate medication effects.

Schall (2002) provided a good guide for parents as consumers to help them monitor the effects of medication on their child's behavior. She provided a series of questions or concerns that parents might ask or consider before starting a medication with their child. Many of these concerns are probably shared by educators and clinicians providing care for the child as well. These issues include asking why the medical provider recommended a particular medication, what behavior(s) it is expected to change, how long it will take before effects will be observed, what are the possible adverse side effects, and what to do if they observe these side effects.

These questions will help parents make more informed decisions regarding the efficacy of the medication, but they also allow educators, in home support staff, and other clinicians to gather critical information parents need to be informed in the decision-making process (Tsai, 2000). For example, if a medication is being given for "mood stabilization," what does that translate to in terms of observable behavior (e.g., positive or negative affect, a decrease in crying)? Or would they expect changes in the frequency of problem behavior such as aggression or SIB? Asking questions during the medication management appointment can help guide the family and those providing care to the individual to ensure that they are looking for behavioral changes that match what the prescribing provider is targeting with the medication.

5.5 Summary

De Kuiper and Hoekstra (de Kuijper & Hoekstra, 2017) recently evaluated the reasons that physicians gave for discontinuing long-term use of antipsychotic medication. They reviewed the medical and pharmaceutical records of 3299 adults with disabilities receiving services in the Netherlands. The authors found that of the 30% of individuals prescribed antipsychotic medication, 51% of the time the physicians were willing to discontinue their prescription if the person lived in an environment that provided ongoing care and support. In other words, the individual had other treatment options that could preclude the use of medication. Physicians also cited either the ongoing presence of problem behavior or a recent increase in problem behavior as a likely reason that they would not discontinue medication. Interestingly, reasons given for not discontinuing antipsychotic medication also included the presence of ASD, previous unsuccessful attempts to discontinue medication, or lack of consent from legal guardians as reasons to discontinue the medication. While these decisions were primarily made based on information from the caregivers and/or changes in problem behavior, for some individuals, simply having a diagnosis of ASD may have biased the physicians towards keeping an individual on a medication when otherwise they might consider discontinuing it. This implies that having a diagnosis of ASD may be a risk marker for being more likely to receive a prescription for psychotropic medication. While it is clear that medications are an important form of intervention for individuals with ASD and many have been demonstrated to be effective, with the extensive use of medication comes a number of risks. We hope that this review will provide clinicians, educators, and families with resources to be informed and empowered when evaluating the effects of medication so that their effects can be objectively evaluated.

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6 Unsubstantiated Interventions for Autism Spectrum Disorder

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Abstract

Autism spectrum disorder (ASD) is characterized by deficits in communication and social interactions, as well as repetitive patterns of behavior (American Psychiatric Association [APA], *Diagnostic and statistical manual of mental disorders* (5th ed). American Psychiatric Association, Washington, DC, 2013). Much effort has been invested into identifying the etiology of, and effective treatments for, ASD. Although many treatments are available to individuals with ASD, only some are based on sufficient scientific research to be considered evidence-based (Offit, *Autism's false prophets: Bad science, risky medicine, and the search for a cure*, Columbia University Press, New York, NY, 2008). Thus, there exists a need to make a distinction between evidence-based and unsubstantiated treatments. Unsubstantiated interventions for ASD are characterized by weak methodological rigor, and poorly defined procedures and measures, and generally have insufficient or no supporting evidence for their effectiveness. Many factors help explain why caregivers sometimes pursue unsubstantiated interventions, and it is our responsibility as health service providers and educators to advocate for caregivers and inform them of the benefits of selecting evidence-based interventions for their children. This chapter reviews the defining features of evidence-based practice and contrasts characteristics of unsubstantiated treatments. Additionally, we review factors that may lead caregivers to choose treatments that lack evidence, provide resources to help caregivers and practitioners recognize and select efficacious interventions, and describe three case reviews of common unsubstantiated treatments to illustrate key limitations that impact the believability of their efficacy.

Autism spectrum disorder (ASD) is a diagnosis characterized by deficits in communication and social interactions, as well as repetitive patterns of behavior (American Psychological Association [APA], 2013). Prevalence estimates of ASD have increased significantly from 1 in 150 in 2002 to today's current estimates of 1 in 59 according to the most recent numbers from the Center for Disease Control and Prevention (CDC, 2016a, 2018), and it is diagnosed in boys 4.5 times more often than in girls (CDC, 2016c; Christensen et al., 2016). Although the reason(s) behind this substantial increase in the prevalence of ASD is unclear, it remains critical to address the

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challenges faced by individuals with ASD. A substantial effort has been dedicated to research with the aim of understanding the etiology of ASD and to identify treatments for individuals identified as having ASD. Although many treatments have been identified, only some are based on sufficient scientific research to be considered evidence-based (Offit, 2008). Thus, there exists a need to make a distinction between evidence-based and unsubstantiated treatments.

The purpose of this chapter is to describe characteristics that distinguish unsubstantiated interventions from evidence-based treatments. Case reviews are presented in which these characteristics are highlighted. Next, we describe factors that have led and that continue to lead to the proliferation and adoption of unsubstantiated interventions by caregivers. Finally, we offer resources for practitioners to use when attempting to distinguish between substantiated and unsubstantiated interventions, and to help them be more effective advocates for the importance of selecting evidence-based interventions.

6.1 Drivers of Research, Clinical Decisions, and Funding

To date, no single etiological variable causing ASD has been isolated, nor is one likely to be identified soon. As is the case for many disorders, the interplay between biological, genetic, and environmental factors almost certainly plays a role in the development and expression of behavioral patterns that permit detection of the disorder and for a formal diagnosis to be made (CDC, 2016b).

Modern medicine provides numerous examples of physical conditions for which, when clear causes are specified, effective interventions can readily be researched and disseminated for the benefit of those affected by the condition. For example, strep throat is an illness characterized by high fever, inflammation of the lymph nodes around the throat area, and pain (i.e., sore throat). Strep throat is a bacterial infection which a physician can formally diagnose via a throat culture to test for the presence of specific bacteria called streptococcus. If the diagnostic results indicate the presence of streptococci bacteria, the physician can prescribe an antibiotic designed to eliminate the harmful bacteria from the body. Although complications can occur, antibiotic drugs are generally effective in treating the condition and the patient begins feeling better within a couple of days of initiating treatment. As this example highlights, when a specific cause is identified, treatments that directly target causal variables can be very effective. In some cases, a scientific understanding of causal factors for certain conditions has even allowed researchers to develop vaccines that, when administered, prevent the onset of illnesses (e.g., polio). It is important to note that the cause (perceived or actual) naturally drives research and treatment, and it helps secure funding for both. *Actual* causes are those which the research and clinical community has identified and understand well; in other words, there is supporting empirical evidence. *Perceived* causes are those which the research and clinical community does not have a clear understanding (i.e., insufficient or inconclusive evidence) but for which opinions and conjectures often abound. Because the etiology of ASD is unclear, and because it has received increased attention in recent years due to the remarkable advocacy work of caregivers and to various agencies, groups, and institutions that have partnered with them, the disorder has not been spared from speculations on causes.

Unfortunately, given our current state of understanding of ASD, most of these speculative causes would best be categorized as *perceived* causes. The health-related ramifications of acting on perceived, rather than actual, causes can be catastrophic—particularly when it comes to treatment selection. A recent and unfortunate example may help illustrate this point. In the late 1990s, Wakefield et al. (1998) published a report linking the measles, mumps, and rubella (MMR) vaccine to the onset of autism. The sample size used in Wakefield et al.'s report was small ($n = 12$), the study suffered from a lack of methodological rigor that would otherwise permit strong conclusions, and the alleged link between MMR vaccines and autism was correlational (not causal). After the allocation of substantial time, money, and resources trying to replicate Wakefield et al.'s results, the relationship between vaccines and ASD has ultimately been disproven (Rao & Andrade, 2011). Wakefield et al.'s study was eventually fully retracted in 2010 (12 years after the original publication), but the damage was done. When news of these findings reached beyond the research community, caregivers and health providers logically responded in kind. Following the dissemination of Wakefield et al.'s research findings, an existing "anti-vaxer resistance" grew stronger and more vocal, admonishing caregivers not to vaccinate their children. And, unfortunately, that is exactly what many caregivers did. In recent years, outbreaks of measles—a disease that was well controlled when inoculation of children with the MMR vaccine was systematically recommended—have been observed in North America and the UK and are largely attributed to Wakefield et al.'s report (Rao & Andrade, 2011). In the absence of known causes, guidelines for effective preventative measures and interventions are not always available. The misguided anti-vaxer movement illustrates the point that when our understanding of certain disorders is incomplete or lacking, such environments are breeding grounds for speculation, conjecture, and false theories on the etiology of autism.

6.2 Separating the Wheat from the Chaff: Interventions for Autism Spectrum Disorder

Ideally, the identification of *actual* causal variables associated with ASD may eventually lead to the emergence of interventions that will prevent, or at least mitigate, the expression of the disorder. Fortunately, the absence of known causes does not equate to the absence of effective interventions for autism. Indeed, Chap. 3 of this book provides an overview of the most well-established treatments for children with ASD and delineates the active ingredients of those interventions—explaining why these interventions are effective in producing positive outcomes. Further, Sections I and II of this book review evidence-based approaches in some detail.

However, a similar cautionary note as expounded upon in the above discussion on the etiology of disorders (i.e., perceived vs. actual) can and should be made about effective interventions for ASD. With the proliferation of treatments aimed at addressing the core features of ASD, or even claiming cures, an increasing need for clarity regarding interventions that are effective and those that are not is necessary to inform caregivers and practitioners about what constitutes evidence-based procedures. Furthermore, because information about ASD treatments abound, there is a need for guidelines to help caregivers narrow their selection of interventions to those showing the most promising outcomes, as opposed to treatments that have not been validated through rigorous scientific research. It is in this effort that organizations such as the National Autism Center (NAC), Association for Science in Autism Treatment, and What Works Clearinghouse (WWC), among others, have emerged. The scientific community has also contributed to the growing body of evidence-based treatments for ASD by reviewing and summarizing the existing empirical literature. For instance, Wong et al. (2015) conducted a comprehensive review of the literature on treatments for individuals with ASD and identified 27 procedures that met their criteria for being evidence-based (see Table 6.1). The Wong et al. review provides overwhelming support in favor of interventions that are primarily grounded in applied behavior analytic principles (e.g., reinforcement-based techniques, prompting, functional communication, task analysis). Resources like these have been instrumental in providing clear guidelines to caregivers and healthcare providers for identifying and selecting effective treatments for ASD when few existed before. The value of such contributions goes beyond merely delineating what interventions are supported by strong empirical evidence. Indeed, the accumulated body of research also helps shed light on fad interventions that are ineffective or lack empirical evidence of effectiveness, but which are still

Table 6.1 Evidence-based interventions for individual with autism spectrum disorder

Wong et al. (2015)
Antecedent-based intervention
Cognitive behavioral intervention
Differential reinforcement of alternative, incompatible, or other behavior
Discrete trial teaching
Exercise
Extinction
Functional behavior assessment
Functional communication training
Modeling
Naturalistic intervention
Parent-implemented intervention
Peer-mediated instruction and intervention
Picture exchange communication system
Pivotal response training
Prompting
Reinforcement
Response interruption/redirection
Scripting
Self-management
Social narratives
Social skill training
Structured play groups
Task analysis
Technology-aided instruction and intervention
Time delay
Video modeling
Visual supports

Note: Twenty-seven interventions met the author's criteria for being evidence based
Modified from Wong et al.'s (2015) Literature Review

commonly recommended by professionals and utilized by caregivers (see Tables 6.2 and 6.5).

Table 6.2 Reported use of treatments for individual with autism spectrum disorder

Carlon, Stephenson, and Carter (2014)	Hess, Morrier, Heflin, and Ivey (2008)
Speech therapy	Gentle teaching
Occupational therapy	Sensory integration
Complementary alternative medicine (CAM)	Cognitive behavioral modification*
Medication	Assistive technology
TEACCH	Social stories*
Applied behavior analysis (ABA)*	Floor time
Social skill training*	Social decision-making
Sensory integration therapy	TEACCH
Picture exchange communication system (PECS)*	Music therapy
Antidepressant medication	Picture exchange communication system (PECS)*
Vitamins	Discrete trial training*
Dietary restrictions	Incidental teaching*
Gluten-free diet	Art therapy
Physical therapy	Facilitated communication
Casein-free diet	Relational development intervention
Music therapy	Learning experiences: An alternative program for preschoolers and parents
Floortime	Holding therapy
Homeopathy	Augmentative alternative communication (AAC)
Chelation	Fast ForWord
Auditory integration training	Pivotal response training (PRT)*
Dimethylglycine (DMG)	Cartooning
Melatonin	Power cards
Secretin	Pet/animal therapy
	Auditory integration training

Notes: Treatments are listed in the order presented by the authors. Carlon et al. (2014) is ordered by the total number of studies reporting current, past, and lifetime usage of treatments. Hess et al. (2008) is ordered by the percent of reported use in classrooms. There are more treatments reported in the table versus the text. This is because not all reported treatments were categorized in a research category. An * denotes that reliable sources have identified the intervention as efficacious
Modified from Carlon et al. (2014), and Hess et al. (2008)

6.3 Detrimental Effects of Unsubstantiated Treatments

The impact of adopting unsubstantiated treatments may range from minor (e.g., inefficient allocation of resources) to more severe (e.g., risk of harm). First, time allocated in the implementation of ineffective interventions can delay or decrease the time that could be spent implementing effective interventions. Delay in accessing effective interventions may have a significant impact on outcomes and prognosis, particularly for interventions that have been shown to produce the most beneficial results when implemented intensively and when accessed early (e.g., Early Intensive Behavioral

Intervention; Green, 2011). For instance, Howard, Stanislaw, Green, Sparkman, and Cohen (2014) published a follow-up study (for the earlier study, see Howard, Sparkman, Cohen, Green, and Stanislaw, 2005) in which they reported outcomes for three groups of children diagnosed with ASD over the course of 3 years who had received either intensive behavior treatment (IBT, which is a form of early intensive behavioral intervention) or two forms of eclectic treatments—namely autism programming (AP) and generic programing (GP). Howard and colleagues found that children in the IBT group were more than twice as likely to score in the normal range for measures of cognitive, language, and adaptive functioning compared to their peers in the two other eclectic treatment groups, even when these treatments (i.e., AP) were implemented intensively (i.e., 25–30 h/week). Unsurprisingly, children with ASD are at higher risk of falling behind across academic, functional, and adaptive skills compared to their typically developing peers. In fact, Howard (2014) suggested that by 36 months of age, it may take the equivalent of 2 months' worth of intensive and effective instruction to remediate the lack of progress made per month due to ineffective or absent interventions. The implication is that the longer the implementation of intensive early behavioral interventions is delayed, the more challenging it is for individuals to achieve scores within the range of normal functioning.

Additionally, not only are individuals served adversely affected by unsubstantiated treatments but there is also a financial burden to payers, be it family or third-party payers (e.g., tax payers via government programs, insurances), and an unproductive use of human resources (e.g., researchers). The MMR vaccine study example expounded upon earlier provides a case in point. It took 12 years for the Wakefield et al.'s (1998) study to be fully retracted. During this time, funding and research expertise were funneled into further studies attempting to replicate or repudiate the findings. These same resources could have been invested to further move our understanding of the etiology of ASD or into research evaluating evidence-based interventions.

Further, some unsubstantiated interventions not only delay access to effective treatments and jeopardize optimal treatment gains, but they are also potentially harmful. That is, individuals receiving these treatments as well as their caregivers are either physically or emotionally harmed because of the intervention, or symptoms (e.g., aggression) targeted for treatment may become worse as a function of the treatment. For example, facilitated communication is a controversial approach that has been advocated as a treatment for individuals with disabilities (including ASD) and which consists of a set of procedures theorized to promote the development of communicative skills (Jacobson, Mulick, & Schwartz, 1995). Specifically, it involves a facilitator assisting a nonverbal client to communicate by manually prompting their hand over a keyboard or by pointing to words or letters, but supposedly without influencing the key or word selection (Jacobson et al., 1995). It is easy to imagine the hope families must experience when seeing their loved ones putting sentences together and expressing thoughts and feelings they were never able to express before. However, the scientific evidence does not support this intervention and has demonstrated that not only individuals do not respond to stimuli presented but also the act of communication is, in fact, controlled by the facilitator (Jacobson et al., 1995). In a 2015 *New York Times Magazine* article by Daniele Engber, the author recounts the story of D.J., a nonverbal, 33-year-old man who was diagnosed with a developmental disability. D.J. was introduced to Anna Stubblefield who became his facilitator. D.J. reportedly made astonishing progress with verbal fluency using facilitated communication, and he was even invited to speak as a panelist at a conference. It was later discovered that D.J. and Anna had a sexual relationship, and Anna was convicted of aggravated sexual assault as it was discovered that she may not have been facilitating D.J.'s thoughts and consenting voice—they were her own. D.J. and Anna's story is only one of many examples of the harm caused by facilitated communication, but it provides an illustration of the potential damage caused by unsubstantiated treatments.

6.4 Differentiating Between Substantiated and Unsubstantiated Treatments

Evidence-based medicine emerged from England in the 1960s by the formation of the Cochrane Collaboration which hosted reviews of literature about scientifically supported practices in medicine (Cochrane, 1972; Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). In the 1990s, the American Psychological Association Division 12 set a precedent by establishing criteria for classifying an intervention as effective, or "probably efficacious." Other professional organizations such as the National Association of School Psychologists, the American Speech and Hearing Association, and the Council for Exceptional Children followed suit and developed standards for the level of evidence that an intervention required to be called evidence-based (Wong et al., 2015) (for further examples of criteria defining established treatment efficacy, see Aljadeff-Abergel et al., 2015; Chambless et al., 1998; and NAC, 2009/2015).

Together, these efforts have contributed to the delineation of an evidence-based practice model which strives for the implementation of treatments that yield desirable effects based upon rigorous research (Spring, 2007). In the most rigorous review of interventions for ASD to date Wong et al. (2015) reported that "evidence-based practices consist of interventions that are fundamental applied behavior analysis techniques" (p. 1957), and this was further highlighted in a recent review of interventions for young children with ASD (Smith & Iadarola, 2015). Behavior analysts are the most frequent providers of evidence-based interventions to individuals with ASD, and they are bound by their code of ethics (see the Behavior Analysis Certification Board) to select and use evidence-based (or substantiated) procedures (Baer, Wolf, & Risley, 1968; Van Houten et al., 1988; Behavior Analyst Certification Board [BACB], 2014).

Substantiated treatments have key characteristics that make them stand out among other treatments with limited efficacy and/or validity. These characteristics include a rigorous research design that permits the demonstration of a causal relation between the independent and dependent variables and which controls for confounding variables, a clear description of the independent variable(s) and its application, and a clearly defined and measurable dependent variable that is preferably obtained via direct and repeated observations. Treatment outcome studies that utilize rigorous research methodologies produce increased confidence in, and a stronger believability of, their results, and thus increase the utility of their findings in the applied setting. For example, Wong et al. (2015) and Smith and Iadarola (2015) are two recent extensive literature reviews that have further shed light on evidence-based treatments for ASD. Wong and colleagues updated and elaborated upon a previous review of evidence-based treatments for ASD by Odom, Collet-Klingenberg, Rogers, and Hatton (2010). Their review was more comprehensive and utilized a more rigorous review process compared to previous reviews. Wong et al. identified 27 practices that met their stringent criteria for being evidence-based. All identified procedures are rooted in applied behavior analysis. In addition, Smith and Iadarola provided an update of the current evidence for ASD treatment for children 5 years old or younger. As in the Wong et al.'s review, interventions based on applied behavior analytic procedures were identified as well supported by the existing empirical evidence.

In contrast, unsubstantiated treatments tend to lack one or more of these key characteristics. Lilienfeld (2005) operationally defined unsubstantiated treatments "as interventions that have been promoted as efficacious in the absence of adequate supporting evidence." Similarly, NAC's (2009/2015) National Standard Projects defined unsubstantiated interventions as "those for which there is little or no evidence in the scientific literature that allows us to draw firm conclusions about their effectiveness with individuals with ASD." Proponents and developers of unsubstantiated treatments often rely on testimonials, not research or systematic data collection. Testimonials are recommendations, usually from a celebrity or satisfied customer, affirming the performance, quality, or value of a product or service. Testimonials are one of the most potent tools used in marketing, but they fall short as a reliable source of evidence for establishing treatments as efficacious. When unsubstantiated interventions do claim empirical evidence, the studies that emerge are often characterized by poor research methodologies which in turn severely undermine the believability of the results and their implications. For example, unsubstantiated interventions often rely on weak experimental designs that do not permit a conclusive demonstration of experimental control between independent and dependent variables. Insufficient experimental control calls into question the extent to which the independent variable (treatment) under investigation has a demonstrable impact on the dependent variable (outcome). Second, procedures, dependent measures, and constructs under investigation are often not clearly defined, making replication difficult. Indeed, a key characteristic of science is that it is a self-correcting enterprise. That is, a single scientific finding is insufficient to be considered conclusive evidence. It is not until other scientists are able to replicate and extend the procedures under similar conditions as the original study and find similar results that a finding may contribute to a body of research that composes an evidence base (e.g., Kratochwill et al., 2010). Third, research articles reporting on unsubstantiated treatments may not always be published in peer-reviewed journals. Publication in a peer-reviewed journal requires researchers to submit their work for scrutiny by independent experts in their field. These experts are gatekeepers of the research literature who ensure that only high-quality research that meets certain standards is ultimately disseminated to the scientific community and to the public. Their task is to evaluate the scientific merit of a study and determine if it makes an important contribution to the literature based on the quality of the research, whether the study demonstrates compelling results, and whether clear conclusions can be drawn. Naturally, if unsubstantiated treatments often lack methodological rigor, it is not surprising that they are often absent from peer-reviewed journals that publish research of a higher quality. The case examples that follow later in this chapter will highlight characteristics that are inherent in unsubstantiated interventions.

6.5 Why Do Families Seek Out Treatments Lacking in Evidence?

Treatment selection is informed by both professional expertise as well as client characteristics and values. Yet, treatments that lack research support are often implemented. For example, Hess et al. (2008) surveyed educators and found that only 3 of 24 reported treatments in sampled schools were scientifically based (see Table 6.2). Furthermore, when ranking the treatments based upon reported frequency of use, the scientifically based treatments were 11th, 16th, and 20th. Although 9 of the utilized treatments were categorized as a promising practice, 12 of the treatments were categorized as limited support or not recommended. That is, treatments with the best evidence were underutilized. Carlon et al. (2014) provide further evidence of treatments being utilized by caregivers. The authors reviewed the published literature on caregiver reports of treatments used with their children with ASD. They found that many families report selecting interventions that are minimally supported by empirical evidence, or even treatments that have no known support. Despite the existence of numerous interventions for individuals with ASD that are evidence based or at least supported by emerging evidence (NAC, 2011; Wong et al., 2015), such interventions are not always utilized by caregivers. Table 6.2 shows two lists of interventions reportedly used by parents (Carlon et al., 2014; left side) and by teachers in the state of Georgia (Hess et al., 2008, right side) in treating individuals with ASD. Evidence-based strategies identified in the Wong et al.'s (2015) review are denoted with an asterisk. In their study, Hess et al. (2008) reported that less than 10% of strategies used by teachers were based on empirical evidence. Evidently, the emerging data on parents and educators' treatment selection for ASD suggest that they are more inclined to administering interventions that are unsubstantiated. Furthermore, there is evidence to suggest that utilization rates of unsubstantiated treatments are higher among children with ASD than other populations (Wong & Smith, 2006).

Intervention selection for individuals diagnosed with ASD is a complicated process, even when caregivers are supported by teams of professionals. Part of the complexity is related to the core and associated features of ASD itself. While the disorder is characterized primarily by deficits in social communication and presence of restricted and repetitive behaviors, individuals with ASD may also exhibit challenging behavior and experience academic difficulties, in addition to gastrointestinal problems, challenges with sleeping and eating, fine- and gross-motor deficits, and fixations or aversions to various sensory stimuli. Further, ASD commonly co-occurs with intellectual disability, epilepsy, genetic disorders (e.g., tuberous sclerosis, fragile X, Down syndrome), and other psychiatric disorders (e.g., attention-deficit/hyperactivity disorder, obsessive-compulsive disorder, schizophrenia) among others (Bauman, 2010; Doshi-Velez, Ge, & Kohane, 2014; Zafeiriou, Ververi, & Vargiami, 2007). Although a multidisciplinary approach to ASD treatment can be beneficial in addressing the complex and varied presentations of the diagnosis, not all disciplines use empirically grounded interventions. As we have already seen, procedures delineated in both Carlon et al. (2014) and Hess et al. (2008) are delivered by professionals representing different disciplines (many included in an interdisciplinary team), all of which purporting to treat certain dimensions of ASD. But, the current evidence suggests that not all procedures are efficacious. As such, parents may find it challenging to only select evidence-based interventions because they must navigate treatment recommendations from "experts" while also doing the research to ensure that these recommendations line up with evidence-based practices supported in the research literature. Some parents may not have the required skills to research and advocate for empirically grounded methods and thus choose to defer to an authority figure's (i.e., professionals) recommendation.

Survey research has elucidated trends in caregivers' selection of various treatments for ASD. Goin-Kochel, Mackintosh, and Myers (2009) provided caregivers of children with ASD with an online survey that examined the treatments that caregivers of children with ASD selected and found that on average caregivers use 7–9 different treatments. Similar surveys of caregivers (e.g., Green et al., 2006; Pituch et al., 2011) have found that they often employ multiple treatments for ASD at once, likely due to the diverse presentation of ASD and the associated challenges among individuals with the disorder. While there is nothing inherently wrong with utilizing multiple treatments to address the complex needs of children with ASD, surveys also indicate that caregivers employ a mix of both evidence-based treatments and those that are unsubstantiated (Carlon et al., 2014; Hess et al., 2008). In fact, in another survey of caregivers, Miller, Schreck, Mulick, and Butter (2012) found that less than half reported selecting a treatment that was supported by research. Although caregivers' specific selection process for treatments is opaque, there are many factors that may influence caregivers to select unsubstantiated treatments over those with documented efficacy.

The first barrier to selecting effective treatments is that unsubstantiated and fad treatments for ASD tend to appear and multiply faster than can be addressed and evaluated by health professionals and researchers. Evidence-based treatments take a substantial amount of time and resources to be developed, tested, and extensively researched (i.e., replicated). Then, when validated and published, caregivers may not know how to access information about evidence-based treatments as it takes a specialized set of skills to efficiently and effectively sift through the available information and evaluate differential outcomes published in the literature (Weinberger, 2012). In contrast, unsubstantiated treatments are inherently easy to produce since they are characterized by a dearth of supporting research, and thus the total number of unsubstantiated treatments is potentially limitless. Moreover, evidence-based treatments are somewhat constrained by dissemination outlets in comparison to non-evidenced based interventions. That is, evidence-based treatments are disseminated through peer-reviewed journals that are difficult to access for caregivers, and even some practitioners (Carr & Briggs, 2010), and are made known to caregivers only after filtering through healthcare and community providers or through the efforts of nonprofit organizations (i.e., *A Caregiver's Guide to Evidence-Based Practice and Autism*, NAC, 2011). Conversely, unsubstantiated treatments may be championed by sources that range in credibility and accuracy, such as self-help books, parenting blogs and other Internet sources, and celebrities (Miller et al., 2012), and as noted earlier they are generally not scrutinized through the peer-review process. Caregivers may also learn about different treatments based on the type of professionals they consult with, ranging from psychologists and applied behavior analysts to pediatricians and speech pathologists. Unfortunately, even professionals have been documented to provide inaccurate information regarding treatments for ASD, including making recommendations based on personal or professional beliefs rather than evidence, or recommending treatments that are not supported by evidence (Miller et al., 2012). Clearly, it can be a challenge for caregivers to navigate the various and often contradictory sources of information. Hall and Riccio (2012) found that caregivers' level of education is associated with the selection of complementary and alternative medicine (i.e., herbal remedies, acupuncture). However, perhaps surprisingly, caregivers with graduate-level degrees were more likely to report the use of complementary and alternative medicines to treat ASD than were caregivers who had not obtained graduate training. While one may assume that caregivers with lower levels of educational attainment would be less likely to evaluate treatments based on available evidence, it appears that caregivers with advanced degrees may be more likely to seek opinions from multiple professionals or partake in their own research using the Internet or other media sources.

Caregivers' mindset regarding ASD and their child's diagnosis may also influence their treatment decisions. Altiere and von Kluge (2009) interviewed caregivers of children with ASD to examine the challenges they face and found that many caregivers reported feelings of loss and devastation after receiving a diagnosis, and that researching the disorder and possible causes was one method of coping that caregivers relied upon. As outlined in the beginning of this chapter, research pertaining to the precise causes of ASD is emergent, yet many caregivers continue to believe that vaccines are the cause of the disorder (Altiere & von Kluge, 2009; White, 2014). Not only such beliefs undermine caregivers' trust in medical professionals, but also their perceptions of the cause of the disorder may influence their outlook on treatment. Namely, caregivers that believe ASD is caused by chemical imbalances in the brain or illnesses during pregnancy are more likely to rely upon special diets and medication, respectively, whereas caregivers that attribute the disorder to genetic causes are more likely to rely on behavioral or educational methods (Dardennes et al., 2011). Such beliefs are in direct contrast with evidence-based treatments for ASD, which do not attempt to "cure" ASD, but rather address the presence of problematic behaviors and skill deficits (i.e., communication, adaptive skills) to help promote independence among individuals with the disorder. Unfortunately, many caregivers simply believe that unsubstantiated treatments work, and have less confidence in evidence-based treatments (Christon, Mackintosh, & Myers, 2010; Wong & Smith, 2006).

Caregivers' experience of stress also influences treatment selection in similar ways. Caregiver stressors related to ASD are likely to begin even before a formal diagnosis has been made, as caregivers are likely to be acutely aware of differences present in their children. Moreover, since ASD is a lifelong condition and often characterized by challenges associated with independent living and adaptive functioning, it is likely that many individuals with ASD will require ongoing support from their caregivers in some capacity throughout their lives (Karst & Van Hecke, 2012). Thus, although obtaining a formal diagnosis can alleviate caregiver stress (Karst & Van Hecke, 2012), caregivers are likely to experience a diminished sense of parenting self-efficacy and higher levels of stress as compared to caregivers of neurotypical children (Duarte, Bordin, Yazigi, & Mooney, 2005), as well as feelings of isolation (Woodgate, Ateah, & Secco, 2008), and increased rates of mental health concerns such as anxiety and depression (Karst & Van Hecke, 2012). While this perspective may highlight caregivers' apparent need for effective interventions, it is important to note that caregivers experiencing high levels of stress may be more desperate for *any* type of treatment that alleges to help, or even cure, their children. If caregivers are more familiar with unsubstantiated treatments or they are more readily available to them, they may be less likely to pursue other evidence-based treatments.

Caregivers of individuals with ASD may also face several barriers to adopting evidence-based practices, which ultimately increases the likelihood that they will use unsubstantiated treatments that are more easily accessible. First, since evidence-based treatments are typically provided by, or under the guidance of, health or education professionals, their utilization requires access to various resources. Evidence-based treatments for ASD often require a substantial time commitment, especially given the lifelong nature of ASD, which may be a burden for caregivers, particularly those who have conflicting work schedules. This barrier may be compounded when a treatment is delivered in an outpatient setting that requires transportation to and from the treatment setting. Further, as service providers are not evenly distributed across geographic locations, families in rural areas may face additional challenges with obtaining treatment (Anderson, Martin, & Haynes, 2017). Evidence-based treatments can also be expensive. On average, treatment for children with ASD costs three to ten times more than children without ASD annually (Parish, Thomas, Williams, & Crossman, 2015). While many of the associated costs of treatment for ASD may be covered by insurance, obtaining insurance is itself a barrier to many families in countries without universal healthcare (Johnson, Danis, & Hafner-Eaton, 2014).

It is evident that there are multiple factors that may influence caregivers to adopt unsubstantiated treatments. While these factors may vary from caregiver to caregiver, it is perhaps most useful to consider that caregivers are influenced by environmental contingencies that have an impact on their behavior, namely, the type of treatment they ultimately select. Specific examples of this phenomenon are outlined by Allen and Warzak (2000) in the context of caregivers' nonadherence to behavioral interventions. For instance, extinction procedures for challenging behaviors that are maintained by caregiver attention may be very difficult for caregivers to implement, simply because withholding attention from one's child is counterintuitive to many caregivers and can produce feelings of discomfort. Therefore, providing attention in the presence of an attention-maintained challenging behavior (i.e., nonadherence to the intervention) may be negatively reinforcing to a caregiver in the short term (i.e., immediate termination of the challenging behavior), despite the long-term consequences of doing so (i.e., maintenance of challenging behavior). Similarly, caregivers may be more willing to attempt unsubstantiated treatments that promise extraordinary results and require less effort or discomfort on their part than an intervention that is supported by evidence but for which there is no proffered guarantee and that will require substantive time and effort. Additionally, caregivers may be influenced by social contingencies, wherein they may feel pressure (whether real or perceived) to adopt treatments that are being used by other caregivers or recommended by an authority figure (e.g., a physician), in particular, unsubstantiated treatments that are considered less intrusive or more "natural," as has been a leading factor in many caregivers' recent rejection of vaccines (White, 2014).

While there are no easy solutions to these problems, practitioners must remain current with research findings pertaining to evidence-based practices and assist families in the selection of treatments for individuals. This process will not only involve curating the available treatments and introducing caregivers to them, but also addressing the multitude of factors that influence caregivers to adopt less established treatments in place of those with sufficient evidence of efficacy. Health providers can be instrumental advocates to help caregivers take the first steps in identifying and selecting substantiated interventions. Caregivers should be encouraged and empowered to "screen" potential treatments they are considering to promote the adoption of evidence-based treatments. For example, Table 6.3 is a resource we encourage providers to share with caregivers that can help guide them through questions to ask themselves when evaluating a given intervention and before deciding to adopt it (also see Shermer, 2009, for additional questions providers and caregivers can ask in evaluating the evidence for treatments and other truth claims). In addition, Table 6.4 delineates a list of questions caregivers should be encouraged

Table 6.3 Quick reference guide for parents

Questions to ask:	Things to consider:	Proactive strategies:
1. How did I hear about this treatment?	• Where is the information coming from? • Was it a primary source (scientific journal) or secondary source (news article, book, or chapter)? • Or was it an informal source (a friend, relative, etc.) or professional source (healthcare providers, professional organizations, etc.)?	• Seek out original research that has been published about the treatment. • Differentiate between media sources that reference original research and those that do not. • Verify information obtained from informal sources with professional sources.
2. Is the treatment supported by research?	• How much research has been conducted? • Have research findings been positive? • Have positive outcomes been replicated across different contexts with different individuals?	• Seek out treatments that have produced positive results in studies published in peer-reviewed scientific journals. • Substantiated treatments will have demonstrated effectiveness across multiple studies and multiple samples of individuals with similar needs. • Professional organizations and healthcare professionals can help identify and summarize research findings.
3. What do I want out of this treatment?	• What is the desired outcome of using this treatment? • Will this be the only treatment or will it be used in conjunction with others?	• Avoid treatments that promise a cure. • Assess both the risks and benefits of a treatment when making decisions. • Consider the role emotions may play in making decisions. • Make decisions after taking the time to do so, with the after consulting with professionals and with support from trusted friends, relatives, etc.

Table 6.4 Is a treatment substantiated? Questions to ask your service provider

Questions
1. Is there research available on [treatment]? If so, can you send me the information? If so, has this research been published in a peer-reviewed journal?
2. Will [treatment] target my child's specific needs? If so, what area(s) will it target? Can you send me the research or other documents that support this?
3. Has [treatment] been used on other children who are developmentally similar to my child? Can you send me the research or other documents that support this?
4. Will [treatment] build on my child's strengths? Can you send me the research or other documents that support this?
5. In the research, who typically implements [treatment] (e.g., researchers, parents, hospital staff)?
6. How would my child's progress be monitored during [treatment]? How has progress been monitored in the literature?
7. What are the risks and benefits of [treatment] for my child? How did you arrive at these conclusions?

to ask providers or other proponents of treatments for ASD to initiate a dialogue about the evidence for, the goals, and the anticipated outcomes of specific treatment options.

6.6 Case Reviews

The following case reviews highlight some of the main challenges discussed above which characterize unsubstantiated interventions, namely, weak research designs, poorly defined independent variables and constructs, ill-defined or subjective dependent variables, and insufficient or inconclusive evidence to make strong conclusions. We first describe a brief overview of the treatment. Then, we provide a brief description of the mechanism of change that is generally agreed by proponents of the intervention. Finally, we review the current evidence for the intervention and support why each treatment falls short of meeting the standards for evidence-based interventions.

6.6.1 Animal-Assisted Therapy Case Review

Animal-assisted therapy is a practice in which an animal is purposefully included in a therapeutic treatment plan (Nimer & Lundahl, 2007). Human-animal interaction theorists purport that animals can facilitate nonjudgmental, and calm social interactions (e.g., Kruger & Serpell, 2010). This pleasant social interaction between client and animal is argued to enhance clients' social interaction skills (a core deficit for many people with ASD). Animal-assisted therapy is focused on the interaction between the client and an animal with the therapeutic goals linked directly to this interaction (e.g., Chandler, 2005). There are many variations of animal-assisted therapy that have been used with individuals who have ASD and which typically target social- and communication-related challenges. Specifically, animal-assisted therapy research examining challenges faced by individuals with ASD has included intervention with horses (e.g., Borgi et al., 2015; Gabriels et al., 2015), dogs (e.g., Fung & Leung, 2014; Stevenson, Jarred, Hinchcliffe, & Roberts, 2015), cats (e.g., Tomaszewska, Bomert, & Wilkiewicz-Wawro, 2017), dolphins (e.g., MdYusof & Chia, 2012), and even guinea pigs (e.g., Krskova, Talarovicova, & Olexova, 2010). Despite the large number of studies related to animal-assisted therapy, sound empirical evidence is nonexistent.

First, there are inconsistencies in terms of beneficial effects reported in the current animal-assisted therapy literature, thus making it difficult to make strong conclusions about animal-assisted therapy's effectiveness in treating ASD. Second, despite the relatively recent creation of certification systems to qualify animals as "official" therapy animals, there are no clearly defined experience standards or requirements for either the human therapist or the therapy animal. Third, the animal therapy literature consists of a myriad of procedural manipulations that differ in significant ways from one study to the next which makes it challenging to evaluate systematically or to determine the relevant variables that might be responsible for beneficial outcomes, if observed. As indicated in O'Haire's (2013) systematic review of the animal-assisted therapy and autism literature, the animal-assisted therapy literature contains substantial methodological limitations (e.g., insufficient repeated measures for single-case designed studies, or not enough power to detect significant changes in large sample studies) that may weaken the studies' reported positive outcomes. This has been demonstrated in recent studies exploring the enhancement of social communication skills for individuals with ASD using animal-assisted therapy. Although 22 studies have indicated that animal-assisted therapy may enhance these skills, the methodological rigor of these studies is questionable as they did not use explicit treatment protocols that would allow for replication (O'Haire, 2017). In addition, animal-assisted therapy is often delivered in conjunction with existing therapy (e.g., Fung & Leung, 2014). Treatment packages can often produce beneficial outcomes, but unless each treatment component is evaluated systematically (e.g., in a component analysis), the individual effects of a treatment component (here, animal-assisted therapy) cannot be specified with any degree of confidence. The general lack of procedural consistency across studies on animal-assisted therapy is a critical problem to establish this intervention as evidence based. To exemplify these challenges, the following is a comparison of two animal-assisted therapy studies that are arguably similar (i.e., share the same treatment animal and general dependent variable).

Studies by Grigore and Rusu (2014) and Fung and Leung (2014) both utilized dogs as their therapy animals in animal-assisted therapy. Both studies explored the use of therapy dogs to generally increase children with ASD's social interaction skills. In Grigore and Rusu's (2014) study, the procedures for implementing animal-assisted therapy were generally described as (a) introducing the participant to the therapy dog, which was certified with his handler by the Romanian Association of Animal Assisted Therapy and Activities; (b) having the dog sit down next to the participant who knew that the dog was there but was instructed not to interact with the dog until after the story's completion; (c) having a therapist read the social story; and then (d) allowing the participant to interact freely with the dog upon the story's completion. Methodologically, the study compared the social story intervention alone and the social story in conjunction with animal-assisted therapy. Animal-assisted therapy was not evaluated as its own condition but only in conjunction with a social story. This methodological omission makes it impossible to determine the specific effects of animal-assisted therapy on the dependent variables (i.e., frequency of appropriate social interactions relevant to the target social skill, level of prompt needed to provide expected social responses, and frequency of the initiations of social interactions relevant to the target skill) when administered alone (Grigore & Rusu, 2014). Further, any positive effects of the social story plus animal-assisted therapy may be attributed to an opportunity to play with a dog serving as a reinforcer for listening to the story.

In Fung and Leung's (2014) study, animal-assisted therapy was used only in conjunction with play therapy. A treatment manual was created with the procedures for animal-assisted play therapy for the study, which incorporated components of play therapy (e.g., incorporating games such as basketball and puzzles) and interactions with the dog (e.g., the therapy dog, which was certified by the Animal Asia Foundation, "kicking" a ball to the participant with the assistance of the therapist) (Fung & Leung, 2014). Again, because animal-assisted therapy was only utilized in conjunction with play therapy, it is impossible to determine the effects of animal-assisted therapy alone on the dependent variables (i.e., coded social behaviors, which were operationally defined as "behaviors that included social targets") (Fung & Leung, 2014). Additionally, although a treatment manual was developed for the study, the manual was not made available within the study, thus limiting the study's replicability.

Despite their similarities (i.e., use of dogs and targeting the area of social interaction), the studies' procedural descriptions are vague and differ drastically. Additionally, the target-dependent measure is broadly identified as increasing participants' social interaction skills, but in each study different aspects of this dependent variable are examined. This inconsistency and lack of an operational definition of the dependent variable severely limit the external validity of these studies. Although the issues pertaining to these two examples may seem extreme, similar procedural challenges are noted throughout the animal-assisted therapy literature. Thus, animal-assisted therapy is not considered an evidence-based treatment for targeting challenges associated with ASD.

In summary, although the animal-assisted therapy literature generally reports positive outcomes of its effects on target variables, the methodological inconsistency makes it difficult for animal-assisted therapy alone to be considered as an evidence-based intervention. To reach the level of empirical support needed to establish animal-assisted therapy as evidence based, it would be critical for animal-assisted therapy to develop treatment protocols that are implemented with integrity across multiple studies and that lend themselves for independent scrutiny and evaluations (i.e., replicability). Upon demonstrating the replicability of animal-assisted therapy's effectiveness across methodologically sound studies using similar treatment protocols, then this intervention could be examined further for possible inclusion as an evidence-based procedure.

6.6.2 Gentle Teaching Case Review

Gentle teaching was developed by John McGee. It is based upon his training and professional experiences supporting individuals with disabilities. McGee (n.d., 1990) contends that challenging behavior (e.g., self-injury, aggression, drug use) is a result and manifestation of underlying emotional and psychological conditions (e.g., abuse, racism, mental illness), and the focus of treatment should be a resolution of the emotional and psychological condition (van de Siepkamp, 2010). Jones, McCaughey, and Connell (1991) acknowledge the difficulty of simply defining gentle teaching and its therapeutic practices, but offer some guidance. The three core principles are the following (see Kelly & Stone, 1989 for further discussion):

1. A human being has inherent value that is not contingent upon deeds done.
2. A person's participation with another has value that is not linked to nor contingent upon the person's ability to complete a structured task.
3. Human interaction is reciprocal and individuals can be taught a process of reciprocity.

Jones, McCaughey, and Connell argued that the techniques supporting these principles are ignore-redirect-reward; interrupt-ignore-redirect-reward; environmental control; stimulus control; errorless learning; shaping and fading; teaching quietly; assistance envelope; and reward envelope. However, the authors minimally describe (e.g., paragraph) each of these techniques, giving loose parameters of what these techniques may or may not be. The minimal description and possible confusion with other well-established procedures (see Cooper, Heron, and Heward, 2007, for a description of environmental control, stimulus control, errorless learning, shaping, and fading) create doubt regarding the actual intervention to be utilized, when to utilize each procedure, and how to utilize each procedure.

As identified in Table 6.2, gentle teaching has been implemented for individuals with ASD. Multiple literature reviews have questioned the effectiveness of gentle teaching as a treatment for multiple clinical presentations (e.g., Bailey, 1992; Cullen & Mudford, 2005; Cuvo, 1992; Jones & McCaughey, 1992). The recurring critiques of gentle teaching as a therapeutic approach are as follows: (a) the procedures are repackaged behavior analytic procedures, (b) procedures have varied over time, (c) the procedures are ill defined and do not allow for robust research, and (d) there is a dearth of rigorous published research on gentle teaching. In a recent review, Otte et al. (in press) utilized a published scoring system (NAC, 2009/2015) to more objectively review the gentle teaching literature. Gentle teaching publications were located, reviewed, and assigned a merit score between zero and five. The higher the score, the more scientific merit the publication had. The authors noted an inverse relationship between the score and conclusions regarding the effectiveness of gentle teaching. Specifically, publications where authors indicated favorable effects of gentle teaching had lower merit scores, whereas publications where authors indicated non-favorable effects of gentle teaching had higher merit scores. This pattern of results suggests that gentle teaching is not supported by available empirical research. These results are limited by few publications ($n = 10$) fitting the inclusion criteria. Although gentle teaching supports desirable interpersonal outcomes (e.g., compassion, love, safety), there is little evidence to suggest that the procedures produce these desired outcomes, or help mitigate observable symptoms (e.g., challenging behavior).

6.6.3 Sensory Integration Case Review

Sensory integration therapy was proposed by Ayres (Ayers, 1972a, 1972b; see Bundy, Land, & Murray, 2002 for an updated discussion) as a method to remediate dysfunctional sensory processes that prevent effective use of the body within the environment. The proposed dysfunctional sensory processes lead to problems with learning, development, and behavior (Stock Kranowitz, 1998). As stated by Bundy et al. (2002), the link between the observed behavior (e.g., increased motor movement, impaired learning, aggression) and the underlying cause (i.e., dysfunctional sensory system) is hypothetical because the sensory system cannot be directly observed. The entire theory and practice rely on observing, measuring, and intervening on secondary characteristics (i.e., observable behavior) hypothesized to be manifestations of the underlying causal mechanisms. Sensory integration therapy is only concerned with dysfunctional sensory systems and not sensory systems that are clearly damaged (e.g., traumatic brain injury) or abnormal (e.g., hearing loss).

As reported by Watling, Deitz, Kanny, and McLaughlin (1999), 82% of occupational therapists "always" utilize a sensory integration approach when working with individuals on the autism spectrum. This is an extremely high percent of occupational therapist practitioners given the evidence to support sensory integration therapy. A recent literature review of the application of sensory integration therapy with individuals on the autism spectrum found that 3 of 25 reviewed studies reported positive results, 8 reported mixed results, and 14 reported no benefit (Lang et al., 2012). Lang et al. (2012) further evaluated the three studies reporting positive results to determine the methodological rigor. Further analysis revealed confounded independent variables (e.g., concurrent treatments, treatment defined in a similar manner to other treatments) and poorly defined independent variables that would not allow for replication. Treatment definitions were also problematic, in a different manner, in some studies with high research rigor. For example, the studies implementing a weighted vest included replicable descriptions of the interventions. However, the amount of weight and duration of exposure differed across the studies (see Quigley, Peterson, Frieder, and Peterson, 2009, and Stephenson and Carter, 2009, for further discussion). A more recent literature review of sensory integration therapy with children with disabilities found similar results (Barton, Reichow, Schnitz, Smith, & Sherlock, 2014), suggesting no evidence supporting sensory integration therapy.

In a third review, Case-Smith, Weaver, and Fristad (2014) evaluated the evidence of sensory integration therapies and sensory-based interventions separately. Sensory integration therapies are "clinic-based, child-centered interventions originally developed by Ayres, that provide play-based activities with enhanced sensations to elicit and reinforce the child adaptive responses." Sensory-based interventions are structured, adult-directed sensory strategies that are integrated into the child's daily routine to improve behavioral regulation. Case-Smith et al. report that a review of these two paradigms of interventions yields different results. Specifically, sensory integration therapy has some evidence for positive outcomes although limited (e.g., minimal publications), whereas sensory-based intervention does not. In addition to clarifying different paradigms, the authors call for better identification of dysfunction and better measure of neurophysiological components. Each of these calls to action is in line with previous critiques of improved measurement of the dependent variables. In conclusion, these recent reviews indicate a lack of compelling evidence for utilization of sensory integration therapy or sensory-based interventions.

These three case reviews highlight different aspects that characterize most unsubstantiated interventions currently available to individuals with ASD and their families. There are numerous other treatments that have been shown to fall short of the minimum requirement needed to be categorized as effective (e.g., NAC, 2009/2015; see Table 6.5).

6.7 Conclusion

In this chapter, we have suggested that unsubstantiated interventions for ASD are generally characterized by a lack of convincing evidence

Table 6.5 Ineffective treatments for individual with autism spectrum disorder

NAC (2009/2015)	WWC (n.d.)
Animal-assisted therapy Auditory integration training Concept mapping DIR/floortime Facilitated communication Gluten-free/casein-free diet Movement-based intervention SENSE theatre intervention Sensory intervention package Shock therapy Social behavioral learning strategy Social cognition intervention Social thinking intervention	Alphabetic phonics Barton Reading & Spelling System® Check & connect Dyslexia Training Program Fundations® Herman method™ Play-based interventions READ 180® Reciprocal teaching Second step Tools for Getting Along Unbranded Orton-Gillingham-based Voyager Reading Programs Wilson Reading System®

Note: List from NAC (2009/2015) was categorized as Unestablished. List from WWC (n.d.) was categorized as No Evidence and was assessed for children and youth with disabilities (not only ASD)

Modified from the NAC's (2009/2015) National Standards Project and What Works Clearinghouse (WWC, n.d.)

or significant limitations in the research methodologies utilized to evaluate their efficacy. These limitations severely undermine the confidence that can be placed in the utility of these treatments. Three examples of unsubstantiated interventions (i.e., animal-assisted therapy, gentle teaching, and sensory integration) were presented and used to illustrate the range of issues that are inherent with other types of unsubstantiated interventions (e.g., facilitated communication, gluten diets). Unfortunately, due to several factors such as ease of access or caregivers' assumptions about the etiology of ASD, many caregivers (and providers) opt for unsubstantiated interventions in lieu of effective interventions. Finally, we suggest resources and tools to help caregivers and providers be more cautious and effective in sifting through the available treatment options and select interventions that are evidence based.

Individuals with ASD and related disorders have a right to effective treatments (Van Houten et al., 1988). As health providers, we are accountable to our clients and their families who trust their care and future into our hands; we are accountable to payers (e.g., caregivers, insurance companies, tax payers) who fund goal-directed services to produce meaningful differences in the lives of individuals being served; and we are accountable to society and our communities who trust in our commitment to promoting the welfare of the weakest members of our society. Accountability is a necessary component in today's autism-aware environment where stakes are high, stakeholders are many, and a plethora of "autism interventions" are readily available on the market of treatment options. Established interventions are categorized as *substantiated* because they have met the minimum requirement accepted for believability among clinical experts and researchers. There is a kind of transparency inherent with substantiated interventions—which is absent in unsubstantiated treatments—because their methods, procedures, and dependent measures are clear and amenable to independent scrutiny, and positive and beneficial outcomes have been observed and verified using the best standards currently available to support these conclusions. More transparency is ultimately what we owe individuals and their families who access our services.

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Part II

Evidence-Based Approaches to Treating Core and Associated Deficits of Autism Spectrum Disorder

7

Behavioral Approaches to Language Training for Individuals with Autism Spectrum Disorder

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Abstract

Behavior analysis is among the most sought-after early-intervention programs for children with developmental disabilities, with language training being a common primary objective. Many early-intervention programs subscribe to a traditional conceptualization of language skills and focus on developing a robust vocabulary. Conversely, Skinner's (*Verbal behavior*. Prentice Hall, Englewood Cliffs, NJ, 1957) conceptualization of language emphasized the function of an individual's language use rather than the topography. To assist in understanding Skinner's conceptualization, this chapter is designed to introduce readers to four elementary verbal operants (i.e., mands, tacts, echoics, and intraverbals). In doing so, we provide a definition for each operant, outline the importance of and specific environmental variables responsible for each, provide some basic guidelines for teaching, and discuss their implications for practitioners.

Lovaas (1987) published the results of an extensive investigation into the effects of behavior analytic intervention on outcomes for individuals with autism spectrum disorder (ASD). Results of the investigation showed that, when 40 h of treatment per week began prior to age 4, many individuals with ASD demonstrated improvements across all areas of functioning; some even "lost" their diagnosis. As such, Lovaas set the precedent for desired early-intervention treatments. Now behavior analysis is among the most sought-after early-intervention programs for children with developmental disabilities (Sundberg & Michael, 2001).

One of the most important findings of Lovaas (1987) was that children with ASD could demonstrate communicative skills on par with typically developing peers following intensive intervention. Missing milestones in language development is a commonly reported "red flag," and deficits in this area can inform a diagnosis (American Psychiatric Association, 2013). According to Sundberg and Michael (2001), language is a cornerstone deficit among the ASD population, and it is critical that therapists intervene as language facilitates further learning and interactions with individuals and the environment. Given the widespread importance of language in development and overall functioning, early intervention programs often include language training objectives (Sundberg & Michael, 2001).

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Despite the success of behavior analysis in teaching language, not all early-intervention language-training programs adhere to the functional approach to language proposed by B.F. Skinner (Sundberg & Michael, 2001). Rather, many programs align with a traditional linguistic conceptualization of language. The traditional conceptualization of language, and consequently these language-training programs, focuses primarily on the topography of a child's communication. As such, linguists study the words and grammatical structures used to communicate across forms (e.g., writing, speech, sign language; Skinner, 1957). Further, linguists typically study the practices of communities rather than individuals, which may prove problematic when developing individualized treatment goals.

Traditional linguistic conceptualizations of language also separate communication skills into two categories: receptive and expressive (Skinner, 1957). Sundberg and Michael (2001) explain that receptive skills are those that occur when an individual behaves because of something they read or heard, while expressive skills are those that occur when an individual conveys a message to another individual. As such, a basic underlying assumption of this approach is that the individual can emit each topography, or word, across contexts after using it in one context (Sundberg & Michael, 2001). For example, if a child says "cookie" following a model by his mother while she holds up a cookie, traditional linguists expect the child can then say cookie when shown a picture of a cookie, when only the cookie is present, when only the model is present, and when the child is hungry but neither the cookie nor the model are present.

Skinner (1957) expressed concern that language skills, when interpreted via the traditional framework, appear as though they are the result of private processes within the individual; moreover, traditional linguistics does not address individual language practices, only those of larger communities. Additionally, traditional linguistics emphasize the role of speech and written text in communication, effectively excluding other modalities from examination. In response, Skinner proposed a functional approach to language in which the function of language is analyzed across all possible modalities. Further, Skinner avoided the terms receptive and expressive, instead proposing several verbal operants (discussed below) to explain the functionally specific ways in which individuals communicate. For example, Skinner's functional approach assesses the controlling variables associated with an individual's use of the word "cookie"—does he say it when cookies are present? When he has not eaten for several hours? After his mother says it first? And what happens following his use of the word cookie? Given this focus on function, Sundberg and Michael (2001) suggest that instructors carefully target and assess each word a child emits across various contexts, rather than assume that the child has interdependent use of a word until the child demonstrates functionally different uses.

Given this focus on function and the environmental variables surrounding language, Skinner's functional approach provides instructors with observable measures of language and a means of intervening upon language responses. As Sundberg and Michael (2001) explain, looking at external variables rather than assuming language originates within the child allows instructors to arrange the environment in ways to promote language. This allows instructors to systematically intervene across all functions of language, or verbal operants. These include mands, or, in common terms, requests for items, activities, and termination of events; tacts, or labels of items and actions currently in the individual's environment; echoics, or directly repeating a vocalization made by another individual; intraverbals, wherein individuals respond to what another person says without directly repeating it; copying a text, involving individuals' copy-written words; transcriptives, wherein an individual converts spoken words to written text; and textuals, or reading written language (Skinner, 1957). Each operant serves a separate function, and has different effects on the individual's environment, which instructors can analyze and use for language training.

Though Skinner did not devise the verbal operants with the intention of remediating language deficits, the implications and applications of this approach to language training have been suggested and evaluated (Sundberg, 2008; Sundberg & Michael, 2001; Sundberg & Partington, 1998). To assist in the training of language skills, this chapter is designed to introduce readers to four of the elementary verbal operants (i.e., mands, tacts, echoics, and intraverbals) and provide suggestions for effectively teaching these responses to children with ASD. This chapter provides definitions for each operant, outlines the importance of and specific environmental variables responsible for each, provides some basic guidelines for teaching, and discusses their implications for practitioners. While it is possible to establish the verbal operants across communication modalities (e.g., sign language, speech, voice output devices, picture exchange), our chapter will focus primarily on vocal responses for ease and consistency. See Table 7.1 for a list of behavioral terms and their definitions.

7.1 Mand Overview

The mand is a type of verbal operant that is reinforced by a characteristic reinforcer and is evoked by the establishing operation for that reinforcer. Establishing operations (EO) refer to variables such as deprivation and aversive stimulation that momentarily alter the reinforcing effectiveness

Table 7.1 Basic behavioral terminology

Term	Definition	Example
Antecedent	An environmental condition or stimulus change existing or occurring prior to a behavior of interest (Cooper, Heron, & Heward, 2007)	His stomach growls, and then he asks for a cookie
Reinforcer	A stimulus change immediately follows a response and increases the future frequency of that type of behavior in similar conditions (Cooper, Heron, & Heward, 2007)	Receiving a cookie after asking, "Can I have a cookie, please?"
Verbal behavior	Behavior that is reinforced through the mediation of another person's behavior (Skinner, 1957)	One person says, "Water please" and someone else brings the water
Speaker	Someone who gains access to reinforcement and control their environment through the behavior of listeners (Michael, 2007)	The person saying, "Water please"
Listener	Someone who provides reinforcement for verbal behavior (Michael, 2007)	The person bringing the speaker water
Establishing operation (EO)	A motivating operation that establishes (increases) the effectiveness of some stimulus, object, or event as a reinforcer (Cooper, Heron, & Heward, 2007)	A person has not had any water for several hours, thereby making water more valuable
Echoic	An elementary verbal operant involving a response that is evoked by a verbal discriminative stimulus and that has point-to-point correspondence and formal similarity with the response (Skinner, 1957)	A mother says, "Moo," and her child says, "Moo," immediately after
Mand	An elementary verbal operant is evoked by a motivating operation and followed by specific reinforcement (Skinner, 1957)	Asking "Can I have a snack?" when he has not eaten in a few hours, and then receiving a bag of chips
Tact	An elementary verbal operant evoked by a nonverbal discriminative stimulus and followed by generalized conditioned reinforcement (Skinner, 1957)	A child saying "Puppy!" when a dog is present
Intraverbal	An elementary verbal operant that is evoked by a verbal discriminative stimulus and that does *not* have point-to-point correspondence with that verbal stimulus (Skinner, 1957)	A child saying "boat" when her mother sings, "Row, row, row your …"

of other events and momentarily alter the frequency of responses that have been reinforced by those events (Michael, 1982, 1988; Sundberg, Loeb, Hale, & Eigenheer, 2002). That is, the mand is a verbal operant in which motivation determines what is said and the consequence of the mand is specific to what is said. In common terms, the mand is often referred to as a demand or request to obtain objects or bring about conditions that are not present (Sundberg & Michael, 2001). For example, if a child has not eaten for a few hours (EO), she may say "food please" (mand) to her mother. Her mother will then give her food (reinforcer) following this request. The mand is the only verbal operant that results in specific reinforcement, which refers to a consequence that is directly related to an individual's verbal behavior. The consequences for the other verbal operants are not specific to the individual's verbal behavior, meaning other verbal operants are reinforced via social praise and attention (Braam & Sundberg, 1991; Sundberg & Michael, 2001).

7.2 Importance and Implications

When considering that the mand is the only verbal operant that specifies its consequence, it is also the only verbal operant that directly benefits the speaker (Sundberg & Michael, 2001). Researchers and clinicians recommend that the mand be taught first in language training programs for children with ASD. According to Sundberg and Michael (2001), there are a variety of reasons to target the mand before other verbal operants, including the fact it is typically the first verbal operant acquired by children of typical development (Schlinger, 1995). It gives children control over their environment as it allows them to ask for items they desire. Mand training may establish the value of effective verbal behavior since children learn that engaging in a verbal response can directly benefit them. Due to the mand's relation to EOs, it is also the verbal operant that is most likely to be emitted spontaneously and result in generalization to untrained items and conditions (Miguel, 2017). First, mands may generalize across EOs, with mands occurring in the presence of different motivating variables. Second, Miguel (2017) notes that mands may also generalize across different responses, when a child engages in new mand topographies in the absence of direct training. For example, if a child learns that asking for food results in access to food, the child may begin asking for water and other items without any training for those particular responses. Third, mands are subject to stimulus generalization, wherein children mand in the presence of people and environments not associated with training (Miguel, 2017).

Parents have also reported that they prefer mand training to teaching other operants, and that children are more willing to participate in this type of language training (Sundberg & Michael, 2001). It is also possible that teaching the mand first will make further language training easier. This claim was supported by a study conducted by Carroll and Hesse (1987), which demonstrated that teaching children with ASD to mand for items might facilitate the learning of a tact repertoire. Researchers also found that children with ASD may engage in problem behavior (e.g., aggression, tantrums) that functions as mands (Carr & Durand, 1985). For example, a child may cry or hit his mother when he is hungry because doing so has resulted in access to food in the past. Teaching alternative, appropriate mands that result in desired consequences may decrease the occurrence of such problem behavior. Such decreases lead to widespread benefits and gains, including improved quality of life for the individual and significant others in his life. Therefore, behavior interventions often include some formal mand training to bring about the desired behavior change (Geiger, Carr, & LeBlanc, 2010).

7.3 Types of Mands

There are categories of mands that require special consideration and ways of arranging the instructional environment. One of the simplest mand types, often acquired first, is the mand for tangible items. These types of mands involve the presence of an item. Children may reach for the item or say its name, which results in access to the item. The variable common to these mands is deprivation (an EO). If a child has not played with a particular toy, its reinforcing value may be increased and the child is more likely to mand for that toy. Mands for missing preferred items are similar to mands for tangibles because these mands result in access to tangible items or conditions. Mands for missing preferred items occur in the absence of items or conditions in the environment. If there is an EO for a particular item or condition that is not currently present, a child may mand for it, which results in access to that item.

Another type of mand that is often learned in early development is the mand for the removal of aversive stimuli. This mand type is categorized by the presence of an aversive stimulus (another EO), which is terminated when a mand occurs (Sundberg & Michael, 2001). For example, a child may say "stop" to her mother when she attempts to remove a toy she is playing with. Other common mands for the removal of aversive stimuli may include "no," "go away," or "don't."

Another category of mands is the mand for information, which involves asking questions. Questions are defined as mands that are reinforced by the verbal behavior of someone else who supplies useful information about the environment and are under the control of EOs that make that information valuable (Sundberg & Michael, 2001). The specific reinforcer for mands for information is verbal information, rather than tangible items or conditions which reinforce other types of mands (Sundberg et al., 2002). Two EOs are involved in asking "Wh" questions, which include a need or want for an item or a person, and the absence of that stimulus. To teach mands for information, the instructor must make information regarding a stimulus valuable (Sundberg et al., 2002). In other words, the instructor must make obtaining the information reinforcing. This could be accomplished, for example, by placing a preferred toy out of sight (prompting "where is it?") or giving a needed item to another person (prompting "may I have___ ?"). Information regarding the item's location, or the identity of who possesses it, will reinforce that response and allow the child to acquire the item. Similarly, children can be taught to mand "how" when an EO is in place for information about how to extend nonverbal repertoires and contact new reinforcers (Lechago, Howell, Caccavale, & Peterson, 2013). For example, the instructor would present the materials needed to complete a behavior chain the child cannot complete independently (e.g., volcano kit) and provide an instruction to complete the activity (e.g., "Make the volcano"). When the outcome of a chain of behaviors is reinforcing, but the child lacks the skills or information to complete that chain, they may ask "how" to complete that chain of behaviors. See Lechago and Low (2015) for a review of the mand-for-information research literature.

7.4 Teaching Mands

When teaching children to mand, there are a variety of teaching procedures instructors can choose from.

7.4.1 Transfer of Stimulus Control

As with all of the verbal operants, mand training may involve a transfer of stimulus control procedure. In fact, many of the strategies outlined below include the transfer of stimulus control. Typically, this will involve presenting the mand via an echoic prompt (LeBlanc & Dillion, 2009). When using an echoic prompt, the instructor presents a vocal model of the target response (e.g., saying "water" while teaching the child to mand for water) in the presence of an EO (e.g., when the child has eaten salty foods and not drank water for some period of time). While mands may be established under multiple sources of control (e.g., echoic and EO control), the supplemental forms of control are eventually removed and only the EO exerts control. For example, an echoic prompt is faded through either increasing the delay between the EO and the prompt or gradually removing words or phonemes from the prompt.

7.4.2 Capture EOs

One option is to capture EOs in the child's natural environment. Hart and Risley (1975) described a procedure called incidental teaching, which involves an interaction between an instructor and a child that arises naturally in an unstructured situation. The instructor uses the interaction to transmit information or give the child an opportunity to practice a skill. These interactions involve a child-selected activity. Instructors should begin by waiting for the child to initiate for an item by reaching for or looking at it. The instructor should respond by making eye contact. If the instructor's presence and eye contact do not evoke the response of asking for the item, they can provide a nonspecific prompt (e.g., "What do you want?"). If the child still does not respond with the name of the item, or an approximation of the name, the instructor can prompt the name of the item (e.g., say, "truck"). If the child imitates the mand, the item should be delivered immediately. The main advantage of this teaching procedure is that there is a naturally occurring EO (e.g., hunger, thirst) in place at the time of teaching (LeBlanc, Esch, Sidener, & Firth, 2006). However, waiting for child initiations may be time consuming, so it is often necessary to use alternative procedures to teach children to mand.

7.4.3 Contrive EOs

Rather than using procedures that capture existing EOs, instructors can contrive the EO. Instructors can contrive motivation to mand for tangible items by manipulating the environment in a way that makes mands more likely to occur. For example, highly preferred toys can be placed out of the child's reach or moved from their typical locations. When teaching mands under these conditions, there are a variety of teaching procedures to choose from. Prompts and prompt fading may be used. If the response is already in the child's repertoire, a prompt to engage in that mand can be provided (Bourret, Vollmer, & Rapp, 2004). That prompt can then be faded by systematically decreasing the number of words in the prompt phrase (e.g., "cookie," "cook-," "coo-," "c-"). A progressive prompt delay, in which the prompt is delivered after an increasing number of seconds, can also be used to fade the prompt (Albert, Carbone, Murray, Hagerty, & Sweeney-Kerwin, 2012). Under these types of prompt fading procedures, the mand contacts reinforcement and should begin to occur independent of the prompt (Bourret et al., 2004).

7.4.4 Shaping

If the response is not already in the child's repertoire, using a shaping procedure is recommended (Baer, Peterson, & Sherman, 1967). This procedure involves reinforcing successive approximations to the target mand and can be used when the child can imitate parts of a phoneme prompt, but not the full topography (Bourret et al., 2004). Reinforcement in the form of the item or condition the child manded for is provided based on the child's current level of responding, until reinforcement is provided only for saying the full name of the item or condition. For example, if a child is manding for a toy car, the initial response "c-" can result in access to the car. Next, only the response "ca-" will result in reinforcement. Finally, only the full response "car" will result in reinforcement in the form of access to the car.

7.4.5 Chaining

Teaching more complex mands for information involves similar procedures. When teaching the "where" mand, the instructor should move the item from its typical location and then instruct the child to get the item. When the child cannot find the item, the instructor should model the mand "where is ___?" and then reinforce imitative or echoic responses with information about where the item is located (Sundberg et al., 2002). Mands involving the word "who" can follow the same procedure, although the item should be given to a different instructor. After the child mands for the location of the item, the instructor should tell the child that another instructor has it. The instructor should then prompt the mand "who?" if necessary and reinforce imitative responses with information about the instructor who has the item. "How" mands can be taught by exposing the child to the terminal reinforcer at the end of a chain of responses the child cannot perform independently. The necessary materials can then be provided to the child and the teacher should tell them to complete the chain of responses. The mand "How ___?" should then be prompted and reinforced with information about how to complete the chain (Lechago et al., 2013).

7.4.6 Interrupted Chain Procedure

The interrupted chain procedure is an alternative teaching procedure that involves contriving EOs when teaching mands for missing items or information (Albert et al., 2012; Hall & Sundberg, 1987). First, an instructor should teach the child to complete a chain of behavior that leads to a terminal reinforcer. Then, the instructor should provide the child with all but one of the required materials and tell them to complete the chain. The instructor can prompt the mand for the missing item and reinforce the response by providing the item. For example, if a child learned how to make a bowl of cereal when all the materials are provided, the spoon can be moved from its usual location so that the child must mand for the spoon. This procedure can also be used for teaching "where" and "who" mand frames by either putting in the item in a different location or giving it to another instructor.

7.5 Clinical Guidelines and Recommendations

Through reviewing the literature on mands and mand training, we provide the following recommendations for establishing a manding repertoire with a child with language delays:

1. Target the manding repertoire first, before addressing other verbal operants (Sundberg & Michael, 2001). If the first strategy you select is not effective, attempt to use another strategy until you determine what works best for the child (Cividini-Motta, Scharrer, & Ahearn, 2017).
2. While transfer of stimulus control procedures is common in establishing a mand repertoire, always include a prompt fading strategy to remove the other forms of control over time (LeBlanc & Dillion, 2009).
3. When possible, capitalize on current EOs in the child's environment as this will help establish the mand under the appropriate control (Hart & Risley, 1975; LeBlanc et al., 2006). However, it is often necessary to contrive EOs to provide enough opportunities for the child to mand (Bourret et al., 2004).
4. Begin mand training with simpler responses and gradually shape mands to the desired utterance length or pronunciation (Bourret et al., 2004).

7.6 Echoics Overview

Skinner (1957) defined an echoic as a verbal operant that is under the influence of a verbal stimulus with formal similarity and point-to-point correspondence. In other words, an echoic occurs when a speaker repeats sounds of another speaker or himself (i.e., an auditory verbal stimulus; Sundberg, 2008). The echoic is maintained by generalized conditioned reinforcement (such as social attention). For example, a mother says the word "milk" and the child repeats the word "milk." In this example, the mother saying the word "milk" would be the auditory verbal stimulus, and the child repeating the word "milk" would be the echoic. Echoics are also referred to as verbal imitation.

7.7 Importance and Implications

Echoics are an important verbal operant because they are typically used to teach other verbal operants (e.g., mands, tacts, intraverbals; Kodak & Clements, 2009; Lovaas, 2003; Sundberg & Partington, 1998; Watkins, Pack-Teixeira, & Howard, 1989; Williams, Donley, & Keller, 2000).

For example, when teaching a child to label a cup, the instructor may hold up a cup and present the vocal model, "cup," and provide reinforcement when the child repeats the word. This process can be used to teach responses to social questions (e.g., "How are you? Good") and requests for items (e.g., after denying the child access to a cookie, saying, "What do you want? Cookie"). Echoics are also important for listener responding. Listening involves responding to the verbal stimuli that have been emitted by a speaker (Schlinger, 2008). In addition, when a person is listening they are typically repeating the verbal stimuli to themselves (i.e., engaging in a self-echoic).

Not only do echoics serve as a means of teaching other verbal operants, but they also help individuals achieve parity. Palmer (1996) defines parity as when a speaker abides by the verbal practices of her community, or, in common terms, sounds like the people around her. This match between the model and the individual's response eventually reinforces language use resembling larger community practices (Palmer, 1996). Echoics are necessary in achieving parity as they allow a speaker to practice responses in the presence of a model and contact reinforcement for point-to-point correspondence.

Echoics may also serve as a foundation for problem-solving skills. Skinner (1957) explains that individuals can emit covert echoics following a verbal model, and these covert echoics can prompt other responses. Palmer (1991) extended this discussion to the analysis of problem solving from a behavioral perspective; individuals emit mediating responses between the presentation of a problem and the final solution because they cannot immediately emit the terminal response. In other words, people emit chains of responses to solve problems, and some responses may be covert. One example is emitting covert echoics until the terminal response is achieved (Palmer, 1991). For example, if an instructor tells a child, "Go to the kitchen and grab me a cup," the child may repeat "kitchen, cup, kitchen, cup," as a self-echoic until he retrieves the cup. As such, covert echoics may serve as the foundation for more complex problem-solving skills, such as visual imagining (e.g., picturing the kitchen in his mind; Kisamore, Carr, & LeBlanc, 2011) and covert intraverbals (e.g., asking and answering, "What am I grabbing? A cup from the kitchen"; Palmer, 1991; Sautter, LeBlanc, Jay, Goldsmith, & Carr, 2011).

7.8 Teaching Echoics

In the following section we review strategies to establish an echoic repertoire with children with ASD. The basic and more widely used strategies include vocal imitation training, stimulus-stimulus pairing, and mand-model. Other strategies include chaining and rapid motor imitation antecedent training.

7.8.1 Vocal Imitation Training

Vocal imitation training is typically used with children who emit vocalizations, but the child's vocalizations may not reliably occur under echoic control (e.g., following a verbal stimulus presented by an instructor). During vocal imitation training, the instructor presents a target verbal stimulus, and allows the child a short period of time (e.g., 5 s) to imitate the response. If the child imitates the response, reinforcement is provided. For example, the instructor says, "ah"; the child immediately repeats, "ah"; and the instructor delivers praise. Several studies have shown the effectiveness of this procedure (e.g., Baer et al., 1967; Lovaas, Berberich, Perloff, & Schaeffer, 1966).

7.8.2 Stimulus-stimulus Pairing

Stimulus-stimulus pairing is a procedure that involves presenting a verbal stimulus with a reinforcer and is used with children who produce minimal vocalizations. During this procedure, the instructor emits an utterance several times (e.g., "ba, ba, ba"), and then provides the child a preferred item (e.g., a favorite toy or snack). Conceptually, stimulus-stimulus pairing may lead to an increase in vocalizations because by pairing a verbal stimulus with a reinforcer, the target verbal stimulus itself may come to function as a reinforcer (Shillingsburg, Hollander, Yosick, Bowen, & Muskat, 2015). In a review of the stimulus-stimulus pairing literature, Shillingsburg et al. (2015) documented a moderate intervention effect for children with language delays (i.e., effective for two-thirds of participants); additionally, stimulus-stimulus pairing was most effective for participants without functional language (i.e., verbal behavior that produces reinforcement). Further, stimulus-stimulus pairing has been more effective with younger (ages 5 and under) versus older (ages 6 and over) learners. Procedurally, stronger effects have been documented when delayed pairing was used. In delayed pairing, the verbal stimulus is followed by a reinforcer presented simultaneously with or upon completion of the final vocal model (Shillingsburg et al., 2015). For example, the instructor says "ba," "ba," "ba," and then gives the child a piece of candy. In the studies, the number of times the experimenter emitted the target sound varied between one and three times.

7.8.3 Mand-model

The mand-model is another strategy to increase vocalizations through teaching echoics wherein instructors capitalize on EOs. When using the mand-model, the instructor identifies items the child prefers, makes them available throughout a teaching session, and determines a starting point for the name of the item (e.g., "bun" for a preferred toy bunny). During a teaching session the instructor will first review the target sound (e.g., the instructor holds up the toy bunny and says, "This is bun"), holds up the preferred item (e.g., the toy bunny), and provides a prompt (e.g., "What do you want?"). If the target response is emitted (i.e., the child mands, "bun") the item is immediately presented; if the child does not mand for the item, the instructor provides an echoic prompt (e.g., "say, bun") (Cividini-Motta et al., 2017; LeBlanc et al., 2006). Research using this method has been effective for some, but not all, participants (e.g., Nigam, Schlosser, & Lloyd, 2006).

7.8.4 Chaining

Chaining has been used to increase the complexity of echoics in children with ASD (Tarbox, Madrid, Aguilar, Jacobo, & Schiff, 2009). Tarbox et al. (2009) demonstrated the effectiveness of chaining when teaching echoics involving one to three syllable words. First the target is divided into two components (e.g., "orange" is divided into "or" and "ange"; "ball" is divided into "b" and "all"). One echoic is targeted in three sequential trials as quickly as possible while delivering reinforcement for correct imitations. During the first trial, the instructor models the first component (e.g., "say, b"). If the child imitates the first trial within 5 s of the model, the instructor immediately models the second component (e.g., "say, all"). If the child imitates the second trial within 5 s of the model, the instructor models the entire target echoic (e.g., "say, ball"). If the child engages in an incorrect response during any trial, the instructor repeats that trial, and then resumes the sequence.

7.8.5 Rapid Motor Imitation Antecedent Training

In rapid motor imitation antecedent training (i.e., high-probability sequencing), the instructor presents a series of rapid nonvocal imitation models ending with the target echoic model. The sequence is typically six fine and gross motor responses currently in the child's imitative repertoire, and then the target echoic model (Tsiouri & Greer, 2007). The instructor should conduct a preference assessment prior to rapid motor imitation antecedent training and select preferred items for the echoic models. For example, imagine a truck was selected as a highly preferred item. The echoic target would be "truck." An instructor would then present a series of rapid nonvocal imitation models (e.g., touching the head, waving a pinkie), ending with the target echoic model (e.g., "truck"). If there are two incorrect responses to the echoic model, the target word can either be changed (e.g., "truck" can be changed to "uck") or an instructor can add more motor responses to the sequence.

7.9 Clinical Guidelines and Recommendations

After reviewing the extant literature, we offer the following recommendations when establishing an echoic repertoire with an individual with ASD:

1. When establishing echoics, it is best to provide direct reinforcement of a target sound following a vocal model (Carroll & Klatt, 2008).
2. If the child already emits vocalizations, try using vocal imitation training (Baer et al., 1967; Lovaas et al., 1966).
3. If the child emits no vocalizations, vocal imitation training and stimulus-stimulus pairing will not likely be effective (Shillingsburg et al., 2015).
4. If the first strategy you select is not effective, attempt to use another strategy with the child until you determine what works best (Cividini-Motta et al., 2017).
5. Attempt to use one of the basic teaching strategies (i.e., vocal imitation training, stimulus-stimulus pairing, mand-model) before trying a more complex strategy that incorporates some of the basic strategy (i.e., chaining, rapid motor imitation antecedent training).
6. If you want to increase the complexity of echoics, try using chaining (Tarbox et al., 2009).

7.10 Tacts Overview

Skinner (1957) defined the tact as a verbal operant occasioned by a nonverbal discriminative stimulus and maintained by generalized conditioned reinforcement (such as social attention). For example, if a child says "Dog!" when a dog is nearby, this would be praised; conversely, if the child says "Lizard!" in the presence of a dog, this will not be praised as it does not correspond with the nonverbal stimulus in the environment. Tacts specify stimuli or properties of stimuli in our environment, and it is important to note that tacts can be occasioned by auditory, tactile, visual, olfactory, and gustatory stimuli.

7.11 Importance and Implications

Skinner (1957) indicated that tacts are the most important verbal operant, and as such are critical in the early development of social and communicative behaviors for children. While mands benefit the speaker, tacts benefit the listener by providing specificity of information needed for conversational skills and general educational environments (LeBlanc & Dillion, 2009). This may include verbal behavior that is under the control of private stimuli such as emotions, pain, hunger, and nausea (Sundberg & Michael, 2001). Further, tacts can promote safety skills such as identifying food burning in the oven and facilitate useful nonverbal behavior such as refraining to touch a hot stove after tacting a parent's social cue (e.g., parent gasps paired with disapproving facial expression).

A developed and robust tact repertoire is necessary for a number of reasons. One, the tact helps a listener to attend to the same stimuli as a speaker and facilitates further communication between the two. This is in direct contrast with the mand, which specifies a reinforcer for the speaker. Moreover, the tact provides a listener with more information about the environment (Skinner, 1957). Two, a tact repertoire may serve as a foundation for the speaker to develop more complex skills such as naming and emergence of listener responses (Skinner, 1957).

7.12 Types of Tacts

The environment can consist of an endless number of nonverbal stimuli and possible relations among stimuli that a child may respond to, and thus there are many different types of tacts that can be taught.

Basic tacts, which should be targeted first, consist of labeling three-dimensional objects and people the child interacts with. After the child develops a robust repertoire, the instructor can introduce two-dimensional representations of objects and locations. Following these, instructors may begin targeting more complex tacts, such as actions and functions of objects. Finally, instructors can address relational and descriptor tacts, such as prepositions, adjectives, and adverbs.

Modality of the nonverbal stimuli should also be taken into consideration. Increased awareness of our environment emerges from the use of our senses, so nonverbal stimuli should include auditory, tactile, visual, olfactory, and gustatory items. For example, sounds of common household items can be taught (i.e., auditory stimuli). A predetermined number of sound clips can be used and while playing with a dollhouse the instructor can play the doorbell sound clip and ask the child “What’s that?” to evoke the tact. Although a bulk of the tact literature has focused on examining strategies to teach visual stimuli, researchers have begun examining effective procedures to teach tacts of other modalities (Dass, Kisamore, Vladescu, Reeve, & Reeve, 2018). When conducting tact training, therapists should be sure to address tacts from all sensory modalities, as well as take measures to present the stimuli in isolation. For example, strawberry scent bottles can be purchased and tact training consists of bringing the scent bottle to the individual’s nose, rather than presenting an in vivo strawberry in the kitchen where other olfactory stimuli may be more salient to the individual (Dass et al., 2018).

7.13 Teaching Tacts

The literature on tact training demonstrates a couple strategies that have been effective in establishing a tact repertoire. While the specific procedures of a tact training program should be individualized, there are two basic approaches to teaching tacts: the natural language paradigm and transfer of stimulus control procedures.

7.13.1 Natural Language Paradigm

In a study conducted by Gillett and LeBlanc (2007), parents implemented an intervention consisting of modeling appropriate play actions with moderately preferred toys, followed by waiting for 5 s for the child to independently vocalize or comment about the event. If the child did not emit a comment, the parent continued to play and tact the event up to three times (Gillett & LeBlanc, 2007). Once the child imitated the response, the parent provided social attention and gave the child a turn to play with the toy. This approach is considered more naturalistic as it can be integrated into and mirrors the teaching processes through which typically developing children learn language skills.

7.13.2 Transfer of Stimulus Control Procedures

Discrete trial instruction can be used to transfer the control of one verbal response to an additional stimulus. However, the strict definition of the tact specifies that the controlling antecedent variable is a nonverbal stimulus. In research and applied settings, the target item is often paired with a question or an instruction to evoke the tact. Miguel and Kobari-Wright (2013) taught children with ASD to tact nine pictures that fell under three different categories (i.e., clothing, vehicle, animals) via a transfer of stimulus control procedure from an intraverbal prompt. Sessions consisted of nine trial blocks where the instructor presented one target picture and asked “What is it?” and modeled the correct response. A progressive prompt delay procedure gave participants the opportunity to respond independently across sessions. Sundberg, San Juan, Dawdy, and Arguelles (1990) used echoic prompts to teach tacts (i.e., stating the correct verbal response and reinforcing the child’s echoic) and gradually faded reinforcement so only responses that followed the nonverbal stimuli rather than the echoic prompt resulted in praise. Marchese, Carr, LeBlanc, Rosati, and Conroy (2012) compared two teaching procedures where one condition included the supplemental question and the other condition only presented the item. Results showed mixed results where half of the participants acquired tacts more efficiently without the supplemental question and the others with the question. Moreover, Sundberg, Endicott, and Eigenheer (2000) taught two nonvocal children to reliably tact with signs. Changing the instruction from "What is that?" to "Sign (object)" resulted in increased correct responding. In sum, the child's learning history should be assessed prior to the initial tact training. Studies have shown that adding the standard question asking to identify an object may enhance attending for some learners, yet reduce attending for others. Given these considerations, instructors should carefully probe a child's performance across instructional methods to ensure that nonverbal stimuli exert control over tacts.

7.14 Clinical Guidelines and Recommendations

Given the current literature on developing a tact repertoire, we recommend the following techniques:

1. Wait to begin tact training until the individual has established echoic and mand repertoires (Sundberg & Partington, 1998).
2. Teach tacts with multiple exemplars, rotated during each teaching session, to promote generality of the tacts to the natural environment.
3. Focus primarily on familiar three-dimensional objects and people before targeting pictures of these same stimuli (LeBlanc & Dillion, 2009).
4. During teaching, present the nonverbal stimulus and a supplemental question only if needed. Be sure to conduct pure tact probes (i.e., trials without the supplemental question) to ensure that the nonverbal stimulus develops control over the tact.
5. Reinforce correct tacts with social reinforcers.

7.15 Intraverbal Overview

Skinner (1957) defined the intraverbal as a verbal operant evoked by a verbal discriminative stimulus lacking point-to-point correspondence with the antecedent verbal stimulus and maintained by generalized conditioned reinforcement (such as social attention). In other words, an intraverbal (e.g., answering "Fine") is made in the presence of another verbal stimulus (e.g., the question "How are you?") that does not match (i.e., does not have point-to-point correspondence with) the preceding stimulus.

While seemingly complicated, intraverbals account for the majority of our daily conversations including answering questions, making small talk, reciting trivia, telling stories, and more (Michael, 2007). Further, intraverbals allow individuals to discuss and think about stimuli not currently found in the environment. According to Michael (2007), individuals begin differentially responding to the verbal behavior of others through a history of reinforcement and shaping; for example, instructors will praise correct answers and punish or extinguish those deemed off topic. Skinner (1957) explains that novel verbal stimuli may evoke intraverbals due to their similarity to other verbal stimuli. Multiple stimuli may evoke the same intraverbal, and one verbal stimulus may also come to control multiple intraverbals.

7.16 Importance and Implications

Given the variety of responses that can be classified as an intraverbal, this repertoire is important for the development of many academic and social skills. It is likely that instructors prioritize this skill when determining goals for child with ASD. The intraverbal functions as the basis of conversation beyond present stimuli or EOs; therefore, it is necessary to have a well-developed intraverbal repertoire to succeed academically and socially.

As Skinner (1957) writes, the intraverbal repertoire facilitates the acquisition of many other responses, both verbal and nonverbal. Some responses taught through traditional education paradigms (e.g., reciting dates of historical events) are typically acquired through intraverbal training. According to Michael (2007), an intraverbal repertoire enables children to "learn to learn," or talk to themselves about their current repertoire and prepare to practice new skills. For example, when an instructor tells her class, "Today we're learning about the American Revolution," the child likely emits a number of covert intraverbals listing what he knows about the topic and what he would like to know. This may include asking himself "What have I learned about this before?" and responding "Oh, I remember! That's the one with George Washington" and so on. In this way, intraverbals help prime the child for the upcoming lesson.

Another important aspect of the intraverbal is its function as a transition from the listener to speaker role. As explained by Aguirre, Valentino, and LeBlanc (2016), the ability to respond to one's own questions is crucial for problem-solving skills wherein the individual must mediate her own responding until reaching a solution. A variety of problems involve complex verbal stimuli evoking covert intraverbals. Covert intraverbals are when a child thinks to herself, asking and answering questions or planning other behaviors. Without the intraverbal, though, the child could not do this and would require additional strategies to problem solve.

Given the complexity and variety of these responses, an intraverbal repertoire can be difficult to establish in children with ASD. Sundberg and Sundberg (2011) explain that many children with ASD struggle to acquire verbal conditional discriminations, or the ability to respond correctly and appropriately when the response depends upon two or more parts of the evocative verbal stimulus. These include questions such as "What's your mother's name?" which requires the individual to attend to both "your mother" and "name" to respond and contact reinforcement. Both portions of the antecedent must exert control over the response, though this will be discussed further in the following section. The majority of daily conversations consist of verbal conditional discriminations, yet children with ASD often struggle to acquire them; moreover, Sundberg and Sundberg (2011) found that even those children who do acquire verbal conditional discriminations often emit them with qualitative differences than their typically developing peers. Rote responding or providing invariant responses each time the verbal stimulus is presented makes up a common difference seen in children with ASD.

Similarly, intraverbals appear to be one of the more complex and challenging verbal operants for typically developing children to acquire. Sundberg and Sundberg (2011) conducted a study wherein children of typical development and those diagnosed with ASD were given an intraverbal assessment. They concluded that children might develop intraverbal repertoires in a given sequence. Generally, the intraverbal repertoire of 2-year-olds consists of fill-in-the-blanks, songs, animal sounds, and some one-word responses to personal information questions. Two-and-a half-year-olds start acquiring more intraverbals, but they rely on echoic responding or attend only to the last word in a question; as such, there are almost no verbal conditional discriminations in their repertoire. By the time the child is 3 years old, he begins answering WH questions with some accuracy, but with evidence of rote responding and restricted stimulus control when verbal conditional discriminations are presented. Overall, Sundberg and Sundberg (2011) demonstrate a potential developmental sequence to intraverbal repertoires, with verbal conditional discriminations being among the final skills to be acquired. Such information should inform programming when working with children with ASD.

7.17 Types of Intraverbals

While all intraverbals are controlled by an antecedent verbal stimulus, different categories exist depending on the specific stimulus control involved. Simple intraverbals are those where one verbal stimulus controls responding (Sundberg & Sundberg, 2011). In common terms, the child needs to attend to only one component of the verbal stimulus to respond. Examples of simple intraverbals include word associations and fill-in-the-blanks with nursery rhymes (e.g., “The itsy bitsy-” or “Humpty Dumpty sat on a-”; Sundberg, 2016).

Compound intraverbals are those in which multiple vocal stimuli, presented together, evoke certain responses; however, each vocal stimulus evokes different intraverbals on its own (Sundberg, 2016). For example, “red” and “white” each evokes numerous responses when presented individually, yet the phrase “Red, white, and-” evokes “blue” in American communities. According to Sundberg (2016), the compound intraverbal allows for more complex language use as the number of verbal stimuli presented increases.

Verbal conditional discriminations consist of two or more verbal stimuli, and one stimulus alters the evocative effects of the other (Sundberg, 2016). As a result, the child must attend to both stimuli to respond. With respect to intraverbals, this means the child emits a response specific to this combination of verbal stimuli because one stimulus alters the function of another within the antecedent. Many questions fall under the category of verbal conditional discriminations, such as “What do you eat with?” versus “What do you drink with?” (Sundberg, 2016). “Eat” and “drink” alter the function of “with,” and thus the child emits different intraverbals.

Verbal function-altering intraverbals are those where one verbal stimulus alters the function of another verbal stimulus presented later; the intraverbal is emitted following this altered verbal stimulus. Often these come in the form of rules (Sundberg, 2016). For example, an instructor says, “Count to ten when I say your name,” thereby altering the function of hearing one’s name because, in other contexts, hearing one’s name would evoke different responses.

7.18 Teaching Intraverbals

As for developing a teaching sequence, Sundberg and Sundberg’s (2011) findings suggest that easier intraverbals include fill-in-the-blanks, nursery rhymes, and one-word answers. Next, they recommend targeting common animal sounds and WH questions, beginning with “what.” Also, common word associations strengthen intraverbal repertoires, so exposure to various word associations and verbal stimuli is key to developing a robust intraverbal repertoire. After the child acquires simpler intraverbals, instructors may begin training verbal conditional discriminations.

Researchers have evaluated a variety of prompting procedures when teaching children with ASD an intraverbal repertoire. Axe (2008) explains that overselectivity or responding to only one of the relevant antecedent stimuli often becomes a problem during this process. Axe recommends requiring differential observing responses (having the child demonstrate attending to both relevant verbal stimuli), using within-stimulus prompts (exaggerating those relevant stimuli), and altering schedules of reinforcement (varying questions with one or multiple relevant antecedent stimuli) to help overcome this barrier. Michael (2007) also suggests using expansion prompts, or asking the child to keep responding, to increase response variability.

Aguirre et al. (2016) conducted a review of the research on teaching intraverbals and reported that echoic prompts, tact prompts, differential observing responses, and textual prompts were commonly used during transfer-of-stimulus-control procedures. Prompts were often faded with a constant or progressive prompt delay, meaning the time between the verbal antecedent stimulus and the prompt increased based on a predetermined criterion. With respect to trial presentation, Dickes and Kodak (2015) highlighted the importance of varying the antecedent topography because in the natural environment individuals produce verbal stimuli differently. For example, both “What is your mom’s name?” and “Your mom’s name is?” may occur. Another option is the blocked trial procedure. Blocked trials consist of consecutive presentations of the same question before presenting another question multiple times; gradually, the number of trials per question is reduced. Ingvarsson, Kramer, Carp, Petursdottir, and Macias (2016) explain that blocked trials assist with acquisition of verbal conditional discriminations by slowly requiring the child to attend to all of the relevant features of the verbal antecedent stimulus as the blocks shift. Ingvarsson et al. found the procedure to be effective, and participants acquire subsequent intraverbals more efficiently.

7.18.1 Differential Observing Responses

Differential observing responses verify the discrimination of critical features of antecedent stimuli; in other words, these responses help instructors ensure that the child attends to the important parts of an instruction. For example, when asking "What do you eat with?" the instructor may require the child to repeat "Eat with" before providing an answer (e.g., spoon, fork). Kisamore, Karsten, Mann, and Conde (2013) taught typically developing preschoolers to emit a differential observing response of repeating the adult's question. All participants acquired intraverbals acquired via the differential observing response. The authors also conceptualized this differential observing response, repetition, as a form of problem solving, meaning this technique may have ancillary effects. Similarly, Dube and McIlvane (1999) demonstrated that a differential observing response and delayed matching-to-sample skills may improve intraverbal performance because they counteract restricted stimulus control.

7.18.2 Textual Prompts

A textual prompt consists of a stimulus with the correct response written out. During a trial, the instructor will present the verbal antecedent, and then hold up the textual prompt for the child to read. Finkel and Williams (2001), in a comparison of textual and echoic prompts on the rate of intraverbal acquisition, found textual prompts to be more effective, though participants acquired responses with both prompts. Vedora and Meunier (2009) replicated these findings when fading the textual prompt on a progressive prompt delay. Valentino, Conine, Delfs, and Furlow (2015) found that backward chaining with textual prompts embedded within an activity (i.e., reading a book) paired with echoic prompts was effective for teaching storytelling intraverbals.

7.18.3 Tact Prompts

Typically, a tact prompt consists of the instructor presenting a visual stimulus, usually an image, in the same manner as a textual prompt. For example, the instructor may say, "Woof woof goes the," and hold up a picture of a dog for the child to tact. Ingvarsson and Hollobaugh (2011) found that tact prompts using pictures were more effective for training intraverbals than echoic prompts, but participants acquired intraverbals under both procedures. Miguel, Petursdottir, and Carr (2005) found that the students acquired intraverbals trained via tact prompts; previously, Miguel et al. probed for emergence after multiple tact training and listener responding, but found that these procedures were not effective. Partington and Bailey (1993) found tact training insufficient for intraverbal emergence. However, the authors concluded that expansion prompts and tact prompts were effective for intraverbal acquisition. These studies emphasize that, while an intraverbal repertoire may emerge following the establishment of a tact repertoire, this may not occur for all children with ASD. Additionally, the presence of the prompt must be faded so the response comes under intraverbal control rather than remaining solely under tact control (Belloso-Diaz & Perez-Gonzalez, 2015; May, Hawkins, & Dymond, 2013).

7.18.4 Echoic Prompts

An echoic prompt consists of the instructor presenting a vocal model of the correct response following the verbal antecedent. To demonstrate, the instructor may say, "How old are you?" followed immediately by the child's age. The instructor may present the echoic prompt by speaking or playing a recording (Allan, Vladescu, Kisamore, Reeve, & Sidener, 2015). Vedora and Conant (2015) compared the effects of echoic and tact prompts, and found no meaningful difference in the rate of acquisition across the two prompting procedures. Sundberg et al. (1990) used echoic prompts with adults diagnosed with traumatic brain injury, and found these prompts to be effective. Sundberg et al. differentially reinforced unprompted and prompted correct responses and faded the echoic to the initial sound during intraverbal training. Ingvarsson, Tiger, Hanley, and Stephenson (2007) effectively used echoic prompts to teach the intraverbal response, "I don't know, please tell me," to novel questions. Allan et al. (2015) provided the echoic prompt via a voice recording; this may help prevent inappropriate echoic control wherein the child responds, "say__." It is recommended that instructors do not include the instruction "Say" when presenting the echoic prompt.

7.19 Clinical Guidelines and Recommendations

After reviewing the research on teaching intraverbal responses, here are some recommendations for targeting this verbal operant:

1. When beginning intraverbal training, follow the sequence reported by Sundberg and Sundberg (2011) as simpler intraverbals may serve as prerequisite skills for complex intraverbals.
2. Wait until the child has generalized tact, mand, and listener repertoires to begin intraverbal training (Sundberg & Sundberg, 2011).
3. During intraverbal training, vary the exact wording when targeting answers to questions to avoid restricted stimulus control (Dickes & Kodak, 2015). Similarly, be sure to ask the reverse form of the verbal stimulus. For example, "The dog goes" and "Woof goes the."
4. When selecting prompting strategies, begin with those that have successfully helped the child acquire other skills in the past (Dickes & Kodak, 2015).
5. As the targeted intraverbals become more complex, reinforce multiple appropriate responses to reduce the likelihood of rote responding. Also, reinforce responses with praise and continued social interaction so the child's intraverbal repertoire is maintained by naturally occurring reinforcers (Sundberg & Sundberg, 2011).
6. Assess the child's intraverbal repertoire regularly and track the types of errors they emit to inform your programming. For example, is the child consistently responding only to the last word in the question? Are all questions including "your" followed by the child's name? (Kisamore, Karsten, & Mann, 2016; Sundberg & Sundberg, 2011).

7.20 Summary

A functional approach to language considers the antecedents and consequences surrounding language responses, which allows instructors to arrange the teaching environment to target specific operants, as well as capitalize on naturally occurring teaching opportunities. Moreover, instructors can observe and measure the occurrences of verbal behavior, allowing instructors to make data-based decisions regarding their teaching. Across verbal operants, some practices are standard within a verbal behavior language-training program. To begin, identify a variety of reinforcers, including social reinforcers (e.g., praise). As Skinner (1957) noted, the majority of the elementary operants are maintained by social interactions in the natural environment, so using these classes of reinforcers may facilitate response generalization and maintenance outside of the teaching environment. At this time, instructors should also assess the child's existing verbal behavior repertoires so training targets only those operants the child needs to establish (Sundberg & Michael, 2001). Sundberg and Michael (2001) recommend establishing the mand repertoire first as this operant allows the child to directly meet his needs and produces specific reinforcement. Research supports the use of transfer of stimulus control procedures to establish many verbal operants, and instructors must be sure to remove variables that should not ultimately control responding. Finally, instructors must collect data and use those data to inform decisions regarding the continuation or discontinuation of a teaching procedure.

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Behavior Analytic Perspectives on Teaching Complex Social Behavior to Children with Autism Spectrum Disorder

8

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Abstract

Social behavior ranges from simple responses (e.g., making eye contact when speaking to another, imitating the behavior of others, initiating conversations) to complex responses such as understanding and taking the perspective of others, empathizing with others, maintaining conversations, using and understanding figurative language, understanding when someone is lying or being deceitful, and also knowing when to lie. Children with autism spectrum disorder often demonstrate deficits in social behaviors, thus requiring intervention. Although there is a growing body of behavior analytic literature related to teaching the simple, early social skills, behavior analysts have only recently begun discussions related to the component skills involved in complex social behavior and conducting research on strategies for teaching these advanced social skills. In this chapter, behavior analytic perspectives on perspective taking, empathy, advanced conversation skills, figurative language, and lying and deceit are described. Recent research and clinical recommendations for teaching each of these complex social behaviors to children with autism spectrum disorder are also described.

Social behavior produces stimuli (e.g., facial expressions, body posture, tone of voice, eye gaze, gestures) that effect the behavior of others (Schlinger, 1995). Social behavior includes a broad range of responses such as eye contact, imitation, joint attention, perspective taking, sarcasm, and lying. Understanding how to teach social behavior is particularly important when working with children with autism spectrum disorder (ASD) because a diagnosis of ASD is associated with core deficits in social communication and social interactions (American Psychiatric Association, 2000). These deficits manifest in the ways children with ASD engage in and respond to vocal (e.g., tone of voice) and nonvocal social stimuli (e.g., facial expressions, body posture) and social–emotional reciprocity (e.g., joint attention, affect). These types of social behavior impairments appear to be unique to ASD (Baron-Cohen, Leslie, & Frith, 1985). In fact, when compared to children of typical development and children with other developmental disabilities, children with ASD have fewer interactions with their caregivers, make less eye contact, show less sensitivity and affection to other people, are less likely than other children to comfort another child, share objects of interest with their parents

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less often, and fail to reciprocate affective expressions as often (Gena, Couloura, & Kymissis, 2005; Weiss & Harris, 2001a, 2001b). A child's proficiency in these areas may be correlated with indices of social competence and acceptance by others (Lovaas, Koegel, Simmons, & Long, 1973).

A lack of effective social communication skills combined with atypical interests and/or behaviors often shown by children with ASD (American Psychiatric Association, 2000) increases the likelihood that children with ASD will be victims of bullying (e.g., Cappadocia, Weiss, & Pepler, 2012; Gray, 2004). A diagnosis of ASD is typically made by the time a child is 4 years old (Baio, 2014), and although deficits in social communication (e.g., eye contact, joint attention) are frequently targeted in school programming, deficits in more complex social behavior (e.g., perspective taking, empathy, advanced conversation skills) often continue into adulthood (e.g., Howlin & Yates, 1999; Jennes-Coussens, Magill-Evans, & Koning, 2006). One likely reason that social behavior deficits persist throughout development is that as individuals age, social demands change, and social situations increase in complexity (e.g., nuances of dating, peer pressure; Baker, 2005; Smith Myles, Trautman, & Schelvan, 2013). Interventions for social behavior of children with ASD must go beyond teaching basic social communication skills such as eye contact and imitation to more complex social behavior such as taking the perspective of others, empathy, advanced conversation skills, understanding and using figurative language, and identifying and telling lies.

8.1 Types of Complex Social Behavior

8.1.1 Perspective Taking

One complex social behavior that poses a particular challenge for children with ASD is perspective taking (Baron-Cohen et al., 1985; Bauminger & Kasari, 1999; Gómez-Becerra, Martín, Chávez-Brown, & Greer, 2007; Weiss & Harris, 2001a, 2001b). Perspective taking involves knowing that other people might have differing beliefs from one's own and that their differing beliefs will affect their behavior (Schlinger, 2009; Sigman and Capps, 1997). From a behavior analytic perspective, perspective taking involves observing the behavior of another person and then (a) predicting their subsequent behavior, or (b) responding to private thoughts and emotions that another individual might typically experience in similar situations (LeBlanc et al., 2003). Individuals who lack perspective taking might not exhibit other social behaviors such as sharing, turn taking, empathy, responding to social cues, understanding figurative language, or comprehending lies and deceit (LeBlanc et al., 2003; Reed, Hirst, & Hyman, 2012). Deficits in perspective taking might make children with ASD appear rude or insensitive and discourage others from interacting with them and developing intimate friendships (Peters & Thompson, 2015; Weiss & Harris, 2001a, 2001b). Some studies show that early language development and later perspective-taking abilities are positively correlated (e.g., Astington & Jenkins, 1999) indicating that language likely plays a large role in taking the perspective of another person.

8.1.1.1 Component Skills of Perspective Taking

Simply observing another person's behavior and labeling it is likely not sufficient for then predicting future behavior or responding to relevant private events. To really begin taking the perspective of another person, one must first realize that his or her own experiences with the environment (what one senses) may differ from that of another person (Spradlin & Brady, 2008). For instance, as I sit here writing this, the stimuli I see, smell, hear, taste, and feel likely differ from my colleague who is sitting across the room because I am looking at my laptop screen, smelling the grape scent of the bubble gum that is in my mouth, listening to music through my headphones, tasting the grape flavor of the bubble gum in my mouth, and feeling the cool breeze of the ceiling fan that is right above me. My colleague does not have direct access to any of these stimuli. Recognizing that others might have access to different stimulation via their senses (e.g., visual) is considered a component skill of perspective taking (Flavell, 1977; Gould, Tarbox, O'Hora, Noone, & Bergstrom, 2011; Hahs, 2015). After a child understands that his or her experiences with the environment differ from others, either the child can learn to predict other people's behavior by making a logical connection between the behavior and reinforcing outcome or the child can think about how he or she felt and subsequently behaved in similar situations (Spradlin & Brady, 2008). For instance, if I hear a song that was playing on the first date I had with my boyfriend, I might smile and be in a good mood. I might even get up and begin dancing around the room. My colleague, who is also working diligently on his own project, might look at me and ask, "What in the world are you doing?" He does not have access to the music playing through my headphones, does not know the song reminds me of my first date with my boyfriend, and is not feeling the need to "dance it" out at that moment. If I share the song with him and tell him the background information, he might relate it to a similar experience of his own and instead of thinking I am a very strange person, he might think about how he feels when he hears a particular song and smile and dance along with me.

Perspective taking is often assessed via false-belief tasks. There are three different types of tasks commonly used to assess false belief: (a) *the unexpected transfer*, (b) *the false identity*, and (c) *the misidentified object* (Spradlin & Brady, 2008). The *unexpected transfer* task consists of a participant watching or listening to a vignette that describes Person A placing an object in Location A, and then leaving the room. While Person A is gone, Person B moves the item to Location B. The experimenter asks the participant where Person A will look for the item when Person A returns. To pass this test, the participant must indicate that Person A will look for the object where Person A left it, in Location A. The *false identity* test consists of showing the participant a container that typically holds Item A (e.g., an M&M's® box is likely to hold M&Ms®). The experimenter asks the participant what he or she thinks is in the box, the correct answer being the item typically found in the container, Item A. The experimenter then shows the participant that the container does not hold Item A, but instead contains Item B (e.g., pencils). The participant is then asked what Person B, who has not seen the unusual contents of the container, will think it contains. To pass the *false identity* test, the participant must say Person B will think the container holds Item A, its usual contents. The *misidentified objects* task tests identification of a false belief by showing the participant an object that appears to be a common item (e.g., a rock). Upon further investigation, the participant learns that the item is not, in fact, Item A (the rock), but instead is actually Item B (e.g., a sponge). The participant is then asked what Person B, who has not had the opportunity to investigate the item, will call the item. To pass this test, the participant must say Item A, the item the object appears to be. It is thought that false-belief tasks test for all component skills of perspective taking.

8.1.1.2 Teaching Component Skills of Perspective Taking

Researchers have evaluated strategies to teach children with ASD to identify what others see (Gould et al., 2011) and how to respond on false-belief tasks (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003).

Both Gould et al. (2011) and Hahs (2015) taught children with ASD who ranged in age from 3 to 13 years old to identify what characters in pictures could see. The pictures had embedded stimulus prompts (red lines) to teach the children to follow the eye gaze of characters in the pictures and multiple exemplars of the pictures were used. During teaching the participants were presented with a picture and the instruction, "What does he/she see?" The stimulus prompts (red lines) were faded in length using most-to-least prompting from 7.2 cm, 3.3 cm, 0.5 cm, and then no visual prompt. This strategy was used to help transfer stimulus control from the direction of the line to the natural cue of the direction of the character's eyes. Access to a preferred item was delivered contingent on correct labels of what the character was seeing. Error correction was implemented only if the training procedures did not result in desirable skill acquisition and was only necessary for one participant. All children learned to identify what the characters could see and generalization to other pictures was observed to some extent, for most participants. However, limited generalization was observed to natural situations.

Both Charlop-Christy and Daneshvar (2003) and LeBlanc et al. (2003) successfully used video modeling with embedded stimulus cues to teach correct responding to false-belief tasks. In both studies, participants were three males with ASD, who ranged in age from 6 to 13 years old. In the LeBlanc et al. study, participants watched a video of an adult correctly completing false-belief tasks. The video highlighted critical visual cues, and the adult modeled and explained the appropriate strategy. For example, a video demonstrating an unexpected transfer task would show a puppet leaving footprints in the sand leading to a box marked "1" where he put a treasure. Then the puppet would move the treasure to a box marked "2," this time not leaving any footprints. The video would focus in on the footprints and the adult model would explain the strategy (e.g., "he looks in Box 1 because the footprints lead to Box 1"). After the correct answer was modeled, the experimenter paused the video and presented perspective-taking questions to the participant. Praise and preferred items were delivered contingent on correct answers. Contingent on incorrect answers, the video was replayed and prompts to pay attention were provided until a correct answer occurred. Generalization across variations of the same type of task (e.g., false identity) was demonstrated; however, generalization across tasks (i.e., false identity and unexpected location) was not. Charlop-Christy and Daneshvar used similar procedures except that the video was presented twice before the participants were presented with perspective-taking questions and the experimenters also asked a control and memory question. The control question assessed understanding of the situation (e.g., "Where is the cookie?") and the memory question assessed whether the participant remembered where the item was at the beginning (e.g., "Where was the cookie at the beginning?"). Both within and across task generalization was observed for two of the three participants, while generalization of the skill was not observed for the third participant. Following additional training with different props and more detailed scenarios, the third participant still did not correctly respond to two of the five generalization tasks.

8.1.1.3 Recommendations for Practice

Teach children with ASD to identify what others sense in the environment as an initial step in helping children realize that others experience private events (e.g., teaching to follow eye gaze). Then teach more complex skills such as responding to false-belief tasks. Teach perspective taking using a variety of situations in which perspective taking is necessary. One way to do this is by using video-based instruction. Video-based instruction is a way that you can teach with a variety of situations (e.g., vignettes) without having to create teacher-arranged situations in the classroom or other settings (Luiselli, Russo, Christian, & Wilczynski, 2008). Instead, video-based instruction uses prerecorded video examples to teach skills. This also allows for consistent presentation of instruction within and across learners (Luiselli et al., 2008). To ensure accurate responding to both false-belief and shared-belief tasks, we also recommend that you include some examples in which the shared belief is true (e.g., the rock-looking object really is a hard rock).

8.1.2 Empathy

According to Baron-Cohen et al. (1985), children who cannot take the perspective of another person will be unable to predict the behavior of others. Thus, some researchers (e.g., Baron-Cohen et al., 1985; Gena et al., 2005; Lawson & Walsh, 2007) argue that perspective taking is an essential component for the development of empathy. Empathy is commonly described as showing concern and interest in others. Children with ASD who show empathy when others are sad, happy, angry, or hurt increase the likelihood of ongoing and future interactions with peers, family members, and others in their social community (Schrandt, Buffington Townsend, & Poulson, 2009).

Although the early development of empathy in children of typical development is well established, less is known about the development of empathy in children with ASD (McDonald & Messinger, 2012). Children with ASD have been described as expressing emotions, particularly excitement and frustration, in unusual ways that often involve whole body or arm movements rather than the facial expressions or vocalizations observed in children of typical development (Carr & Kologinsky, 1983). Deficits in empathetic behavior by children with ASD might result in a lack of reinforcement for parent affection and thus might discourage further interactions (Charlop & Walsh, 1986). This may in turn decrease children's opportunities for learning appropriate and meaningful social interactions. Empathy has been said to control much of human social interactions (Vaish, Carpenter, & Tomasello, 2009). Some researchers have stated that empathy may lead to prosocial behaviors such as sharing and helping and may be incompatible with antisocial behaviors such as aggression (e.g., Hoffman, 1982; Vaish et al., 2009).

Empathy has been a topic of research in developmental psychology for decades (e.g., Hoffman, 1975; Knafo, Zahn-Waxler, Van Hulle, Robinson, & Rhee, 2008; Sagi & Hoffman, 1976; Zahn-Waxler & Radke-Yarrow, 1990); however, behavior analysts have only recently begun to evaluate procedures effective for teaching empathetic behavior. Unlike developmental psychologists who examine empathy as a response that emerges as a function of development, behavior analysts are interested in identifying the component skills involved in empathic behavior.

8.1.2.1 Component Skills of Empathy

Perspective taking seems to be a critical skill for empathetic behavior. Labeling, responding appropriately to, and displaying affective behavior are also critical component skills for empathy. Affective behavior includes vocal and motor responses such as facial expressions, verbal statements, body postures, and gestures (Gena, Krantz, McClannahan, & Poulson, 1996; Schrandt et al., 2009). Affective behavior signals not only the availability of reinforcement if a particular behavior is emitted, but also the availability of punishment for other behavior. The ability to identify affective behavior and how it relates to the private events of another and to modify one's own affective behavior accordingly is fundamentally important for social interactions (Gena et al., 2005). For example, as I am writing this, my colleague is preparing a cooler with refreshing adult beverages. I look at him and say, "You are going to do fun things instead of working?" while also making an angry face and crossing my arms. He effectively identifies my affective behavior as jealousy and responds with appropriate affect by saying, "Yeah, I'm sorry. It's for just a short period of time and then I have work to do too." while he shrugs his shoulders.

Children with ASD demonstrate deficits related to identifying, responding to, and making affective responses (McGee, Feldman, & Chernin, 1991). This is not surprising given that children with ASD have been reported to develop a social smile at a later age, show a narrower range of facial expressions than children of typical development (Le Couteur et al., 1989), and show more frequent inappropriate facial expressions than children of typical development (Konstantareas & Homatidis, 1989). Difficulties understanding and making appropriate facial expressions seem to be particularly associated with a diagnosis of ASD (Lord, 1993). Furthermore, studies have suggested that children with ASD have difficulty matching gestures, vocalizations, and contexts with appropriate facial expressions related to specific emotions (e.g., Hobson, 1986).

8.1.2.2 Teaching Component Skills of Empathy

Gena et al. (1996) taught affective behavior in the form of eye gaze, vocal statements, and facial expressions to four adolescents with ASD who ranged in age from 4 to 11 years old using modeling, prompting, and reinforcement. The affective responses were taught in response to five response categories including talking about favorite things, laughing about absurdities, showing sympathy, indicating dislike, and showing appreciation. The experimenter presented a scenario relevant to one of the five response categories and the participant was required to emit the appropriate affective response. Tokens were delivered contingent on appropriate affective responses and error correction was implemented for incorrect responses. During error correction, the experimenter modeled the appropriate affective response and provided a verbal prompt for the participant to match the model. For example, if the participant responded "that's sad" while smiling, the experimenter said, "Show me a serious face and say, 'that's sad,'" while modeling a serious facial expression. The authors programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. There was an increase in appropriate responding across participants and generalization occurred to untrained scenarios, therapists, and settings.

Argott, Townsend, Sturmey, and Poulson (2008) used a script fading procedure combined with multiple exemplar training to teach three adolescents with ASD to make an empathetic response to three categories of affective stimuli that consisted of specific motor responses and facial expressions (hurt, tired, happy/excited). Generalization of empathetic behavior was assessed across untrained stimuli and with novel instructors. All participants showed an increase in responding across all the categories upon implementation of the intervention. By the end of the study, all participants engaged in empathetic responding across untrained stimuli and instructors.

Schrandt et al. (2009) used in vivo vignettes with dolls and puppets to demonstrate various types of affect and then taught empathetic responding consisting of both a vocal and motor response via modeling, prompting, and rehearsal to four children with ASD who ranged in age from 4 to 8 years old. The affective behavior in this study included a vocal statement and a motor response to three categories of affective stimuli including sadness/pain, happiness/excitement, and frustration. For example, the experimenter used a doll to act out a vignette, having the doll say "I hurt my elbow" while touching its elbow. Manual and auditory prompts were provided by a prompter who sat behind the participant and were faded across sessions as the participant began engaging in correct responses. Tokens were delivered if the participant engaged in the correct vocal and motor response (e.g., saying, "Are you okay?" and patting the arm of the doll) and behavioral rehearsals were conducted if the participant either didn't respond or responded incorrectly (e.g., made an appropriate vocal statement but did not make a motor response). The authors programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. All four participants learned empathetic responding across all trained categories and responding generalized from trained to untrained categories for all participants. For two participants, empathetic responding generalized to people in a non-training setting.

Sivaraman (2017) used prompting and reinforcement to teach empathetic responding to three categories of affective stimuli to two children with ASD who were 5 years old. For each category, the experimenter presented a nonverbal, verbal, and affective stimulus. For example, in the frustration category, the experimenter would hold an object (or part of an object) in each hand (i.e., nonverbal stimulus that signaled availability of reinforcement for appropriate response), say, "It is so hard to fix" (i.e., verbal stimulus that signaled availability of reinforcement for appropriate response), and display a frowning expression (i.e., affective stimulus that signaled availability of reinforcement for appropriate response). Praise and access to preferred toys and activities was given, if the participant engaged in the correct empathetic response. There were no programmed consequences for incorrect responses. The author programmed for generalization of affective responding by teaching to some scenarios and then testing responding to other, untrained scenarios. Results of the study showed that the procedure was effective and that responding generalized to novel affective stimuli.

8.1.2.3 Recommendations for Practice

Teach a variety of vocal, motor, and affective responses to a variety of affective categories (e.g., happiness/excitement, pain/sadness, frustration). Video modeling is a procedure that has been successfully used to teach children with ASD a variety of social behaviors including social initiations (e.g., Nikopoulos & Kennan, 2007), helping (Reeve, Reeve, Townsend, & Poulson, 2007), sharing (Marzullo-Kerth, Reeve, Reeve, & Townsend, 2011), perspective taking (Charlop-Christy & Daneshvar, 2003; LeBlanc et al., 2003), and conversational skills (e.g., Charlop & Milstein, 1989). Video modeling involves an actor modeling a desired behavior with a subsequent opportunity for the viewer to imitate the desired behavior. Video modeling maximizes consistency of intervention and may also help remediate difficulties with stimulus overselectivity often displayed by children with ASD (Lovaas, Koegel, & Schreibman, 1979). For example, facial expressions, gestures, and actions can be made more salient in video by exaggerating the behaviors and even pausing or re-watching a particular scene.

8.1.3 Advanced Conversation Skills

During a typical conversational exchange, there is a speaker and one or more listeners (Skinner, 1957; for further elaboration see Chap. 7). The behavior of the listener(s) serves as a consequence for the speaker's behavior and should have some effect on the likelihood that the speaker continues to speak or ceases conversation. Listener behavior that should control speaker behavior includes several nonvocal cues such as affect, tone of voice, and gestures. Children with ASD are often less sensitive to these nonvocal social cues than typically developing individuals (Neuringer, 2002; Volkmar & Klin, 2000; Waltz & Follette, 2009); thus, they might continue to speak about their own special topics of interest with no regard to the social cues displayed by their conversation partner(s). In an ideal conversational exchange, the behavior of the speaker would be reinforced in a multiple-schedule arrangement in which the listener's interest in the topic controls reinforcement (Peters & Thompson, 2015). When the listener is interested, continued speaker behavior will be reinforced and when the listener is no longer interested, speaker behavior will not be reinforced. Most research on restricted and repetitive behavior of individuals with ASD has focused on lower order forms of stereotypy, such as repetitive motor movements and vocalizations (Boyd, McDonough, & Bodfish, 2012; Patterson, Smith, & Jelen, 2010; Reed et al., 2012). Very few studies have addressed higher order forms of restricted behavior, such as preoccupation with highly circumscribed interests, and perseverative commenting (Koegel & Frea, 1993; Marriage, Gordon, & Brand, 1995; Peters & Thompson, 2015). In addition to difficulties with speech about special interest areas, children with ASD might not ask questions, they might interrupt, and they might not provide reinforcing motor responses (e.g., nodding head in agreement).

8.1.3.1 Component Skills for Advanced Conversation Skills

To effectively engage in a conversational exchange, a speaker must label and respond appropriately to listener behavior. The types of listener behavior that should be noted include affect, body orientation, and physical activity. For instance, my colleague attempted to speak with me while I am writing, and I made a grimace, turned away from him, and continued typing. These activities should indicate that conversation is not available or welcome at the moment. A speaker must also reinforce listener behavior by asking questions, adding more detail, switching topics, or ending conversations based on listener behavior. For example, if I am speaking to my colleague about the complexity of perspective taking, I might ask questions to ensure that he follows what I am saying, add more details to my description of it if he is not able to answer my questions, switch from talking about perspective taking to talking about what's for dinner if he appears uninterested, or cease conversation altogether if he starts looking at his phone instead of at me.

8.1.3.2 Teaching Component Skills for Advanced Conversation Skills

Koegel and Frea (1993) used in vivo modeling and self-management procedures to teach two adolescents with ASD social communicative skills including facial expressions and affect, nonverbal mannerisms, decreasing perseveration of topic, intensity of voice volume, and eye gaze. The researchers first taught the children to differentiate appropriate from inappropriate instances of social behavior by modeling both appropriate and inappropriate behavior and teaching the children to label the behaviors as such. Self-management involved giving the participants a digital watch and a sheet of paper with numbered boxes. The participants were instructed to place a mark on the sheet, beside the appropriate numbered box; each time the alarm sounded if the participant had made only appropriate social behavior during the interval. If participants were successful during the interval, they earned access to video games. Interval length was systematically increased from 1 min up to 9 min throughout the intervention. They also asked observers to rate the overall appropriateness of the children's social behavior pre- and post-intervention. The subjective ratings increased from "very inappropriate" at pre-intervention to "very normal" at post-intervention.

Davis, Boon, Cihak, and Fore (2012) used Power Card scripts (a task analysis regarding how to initiate and maintain conversations with peers) and Power Cards (brief written rules and pictures) to increase others-focused conversation (greet them by name, make eye contact, ask about conversation partner's interests, listen to the response, comment on their statement) with three adolescent males diagnosed with ASD. During pre-training, the instructor modeled and provided a rationale for each step/skill involved in others-focused conversations. Participants wrote the steps down on a worksheet and skills were assessed with peers in a small-group setting. Prompts, in the form of questions (e.g., "What did I forget to do?"), were provided if the participant made incorrect or incomplete responses. Once these skills were mastered, the Power Card procedure was implemented. The participant reviewed the Power Card script and card prior to engaging with a conversational partner. Results showed that others-focused conversation increased for all participants and that responding generalized to a novel peer for two of the participants.

Peters and Thompson (2015) used behavioral skill training to teach conversation skills to three children diagnosed with ASD. Behavioral skill training involves providing instructions, modeling a desired behavior, rehearsal of the desired behavior, and corrective feedback. In the first experiment, the authors targeted labeling listener behavior as interested or uninterested. Teaching this skill alone did not result in a significant increase in appropriate conversation behavior; thus, participants were taught to ask questions of the listener. This did result in an increase in conversational exchange. In the second experiment, the authors targeted labeling listener interest, asking questions of an uninterested listener, and changing the topic if the listener remained uninterested. In the third study, the authors targeted how to further vary their response if the question or change in topic did not result in listener interest. The results from all three experiments demonstrate that behavioral skill training was effective for teaching children with ASD to identify listener interest and disinterest and change their behavior accordingly.

8.1.3.3 Recommendations for Practice

A strategy for promoting variability in the behavior of individuals with ASD is to (a) teach new responses not currently in their repertoire (e.g., create a list of potential conversation topics), (b) reinforce the new appropriate responses and stop reinforcing the old inappropriate responses, and (c) prompt varied responding (e.g., say, "Try talking about one of your other topics."; Wolf, Slocum, & Kunnavatana, 2014). Video modeling (Bellini & Akullian, 2007) is a procedure that can be used to accomplish (a) and (b). During video modeling, an actor (child or adult) can model the occurrence and nonoccurrence of a target behavior that helps the participant learn the difference between appropriate and inappropriate responses (Leaf et al., 2012). When you make the videos for video modeling you can make natural cues (e.g., gestures, facial expressions) more salient than live performances. In addition, videos can be paused and replayed, and specific images can be enlarged. Incorporating video feedback into teaching also allows you to prompt varied responding (c). Video feedback involves participants observing themselves and the naturally occurring listener cues in the context in which the behavior should occur (Deitchman, Reeve, Reeve, & Progar, 2010; Kern-Dunlap et al., 1992).

In addition to video modeling, consider incorporating a strategy for teaching children to monitor their own behavior. Self-monitoring has been used to teach a variety of complex social behaviors (Chung et al., 2007; Deitchman et al., 2010; Koegel & Frea, 1993; Maione & Mirenda, 2006; Thiemann & Goldstein, 2001) and has also been used to increase response variability (Newman, Reinecke, & Meinberg, 2000; State & Kern, 2012) of individuals with ASD.

8.1.4 Figurative Language

Much of our language has meaning beyond the words uttered said and sentences stated. Figurative language comes in many forms including metaphors, irony, metonymy, rhetorical questions, understatements, hyperbole, and indirect requests. Children with ASD have difficulties with each of those (MacKay & Shaw, 2004). Metaphorical reasoning involves the application of unconventional concepts to objects or events. For example, a child might say “I feel like I have butterflies in my stomach” before giving a presentation in front of class. The child with ASD might respond “There’s no way you have butterflies in your stomach!” if the child with ASD takes the statement literally. To comprehend what is meant by a statement such as this, the child with ASD must attend to contextual cues and use those cues to reason what is meant by the statement. Compared to children with intellectual disabilities, Down’s syndrome, ADHD, and individuals with brain injury, children with ASD perform more poorly on tasks involving metaphorical reasoning (Baron-Cohen, Leslie, & Frith, 1985; Happé, 1994).

Sarcasm is a form of verbal irony that generally involves statements such as praise that are really meant as insults; in other words, there is a discrepancy between what is said and what is meant (Capelli, Nakagawa, & Madden, 1990). When the speaker speaks sarcastically, the speaker intends to communicate a message that contradicts its literal meaning (Skinner, 1957). If the listener is to respond appropriately, the listener must reason that there is a difference between the literal meaning and the intended meaning. Sarcasm and irony are often used to indirectly convey attitudes and beliefs or to induce humor (Harris & Pexman, 2003; Pexman et al., 2011). Understanding sarcasm requires identifying the social cues necessary to differentiate between the speaker’s intended meaning and the literal meaning of the utterance (Persicke, Tarbox, Ranick, & St. Clair, 2013). A perspective-taking repertoire is required to infer the speaker’s intended meaning. Although children of typical development learn to respond to sarcasm around 5 or 6 years old and this behavior continues to develop throughout adolescence (Harris & Pexman, 2003; Pexman et al., 2011), children with ASD tend to be distinctively deficient in the perspective-taking abilities necessary for the comprehension of sarcasm and irony (Filippova & Astington, 2008; Happé, 1994; Pexman et al., 2011). These deficits may have a significant impact on social functioning because children might not understand common social interactions. For example, if a child with ASD drops his lunch tray on the floor and food goes everywhere, a peer might sarcastically say, “Good job carrying your lunch.” The child with ASD might respond as though the peer is being literal (e.g., “No, it wasn’t a good job. I dropped my tray.”). This type of misunderstanding might result in the child with ASD becoming the subject of ridicule and even possible victimization (Van Roekel, Scholte, & Didden, 2010).

Another type of nonliteral language that many individuals with ASD have difficulty with is indirect requests (Paul & Cohen, 1985). Indirect requests can be conceptualized behaviorally as disguised mands (Skinner, 1957). A mand is a response ("Can I have a piece of pizza?") controlled by an establishing operation (e.g., deprivation from pizza) and a discriminative stimulus (e.g., presence of a person holding a pizza box). Disguised mands ("Wow, that pizza smells good!") are responses that are under the control of an establishing operation (e.g., deprivation from pizza) and a discriminative stimulus (e.g., the presence of a listener) but in this instance the response does not specify the reinforcing consequence (e.g., access to pizza). Disguised mands often develop because mands specifying the consequence are punished by the social community (e.g., directly asking for food might be considered rude); thus, the person learns to make varied responses and these new varied responses (disguised mands) are reinforced. Not all listeners reinforce disguised mands. For example, a listener eating pizza might respond to the statement "Wow, that pizza smells good!" by simply saying, "Yes, it's very good." If the listener does not reinforce the speaker's disguised mand, the speaker may be less likely to mand in the presence of this listener in the future. The speaker may also be less likely to engage in other social interactions with a listener who does not reinforce disguised mands; thus, responding appropriately as a listener to disguised mands is a social skill that is critical to everyday social functioning.

8.1.4.1 Component Skills of Understanding and Using Figurative Language

There are a few common skills required to identify and respond appropriately to figurative language. For instance, perspective taking is a component skill required so that the listener adopts the speaker's viewpoint. Rule-governed behavior plays an important role in developing an understanding for relations between nonliteral speech and its intended meaning. Specifically, rule-governed behavior can be acquired by contacting rules that describe contingencies and not necessarily due to contacting the specific contingencies described (Skinner, 1969). My colleague is likely to respond effectively to the rule, "If you touch my food in the fridge, I will hurt you", without experiencing said pain.

Each type of figurative language may require different critical component skills. Specific to metaphorical language, an important skill is differentiating between same and different and identifying symbolic similarities between the nonliteral statement and the actual meaning of the metaphorical phrase. Identifying opposites (e.g., messy and clean) is a component skill for sarcasm where the speaker communicates a contradictory meaning of a statement and the listener must interpret the literal meaning. Additionally, identifying social cues such as facial expressions, preferences, prosody, tone of voice, and emotions is necessary to respond to sarcasm appropriately and also to convey sarcasm (Persicke et al., 2013).

To recognize disguised mands the listener needs to label private events based on observable speaker behavior (Najdowski, Bergstrom, Tarbox, & St. Clair, 2017). For example, while my colleague is drinking his adult beverage, I might say, "That looks yummy" while drooling, making big eyes, and holding my drinking glass tightly. He might then make me an adult beverage or offer me a taste of his after identifying my disguised mand through the vocal and nonvocal cues.

8.1.4.2 Teaching Component Skills for Understanding and Using Figurative Language

In the behavior analytic literature, only a few studies have attempted to teach figurative language to children with ASD. Persicke, Tarbox, Ranick, and St. Clair (2012) used multiple-exemplar training to teach metaphorical speech to three children with ASD ranging from 5 to 6 years old. Stories consisting of simple descriptions of characters and events were read out loud followed by corresponding metaphorical questions. For example, one sentence in the story read, "The cake had fluffy frosting, and smelled really good, but the cake was really hard on the inside." A corresponding metaphorical question was "If I say the cake was a rock, what do I mean?"

During multiple-exemplar training, the experimenter used leading questions to help the participant identify relations between the target items and its features. Modifications were made for two of the participants due to variable responding. A visual aid was provided consisting of two columns so that they could write features of the people and events of the story that matched with the metaphors. Novel exemplars were presented in each session to evaluate the generality of skills. Results demonstrated that one participant responded correctly to the metaphorical questions through the initial multiple-exemplar training and the remaining two participants acquired the skill with the addition of the visual aid. Further, all participants correctly identified the meaning of metaphors for novel stories.

Persicke et al. (2013) used rules, role-play, and feedback, across multiple exemplars, to teach three adolescents with ASD to identify and respond appropriately to sarcastic comments. In the first training phase, the participant was presented with a rule (i.e., "When someone says the opposite of what they mean, they are probably being sarcastic") and shown brief video models consisting of salient cues, followed by the experimenter stating a sarcastic or sincere comment. The experimenter helped the participant to answer a series of questions identifying relevant components of the video and comment. Similar questions were asked across sessions so that the participant could develop a problem-solving strategy to determine the meaning of the sarcastic comments.

Once participants demonstrated accurate identification between sarcastic and sincere comments, in vivo training was implemented across multiple exemplars. The session began with the experimenter stating the rule and asking the participant to repeat the rule. Procedures were similar to the first training phase; however, sarcastic and sincere comments were presented during natural conversation. Generalization was also programmed for by including novel exemplars, conducting sessions in different settings and implemented by different people. Further follow-up sessions were conducted up to 3 months of the completion of training for two of the participants. Procedures were effective for teaching all participants to identify and respond appropriately to both trained and untrained sarcastic comments. Behavior maintained during follow-up sessions.

Najdowski et al. (2017) extended previous studies using rules, role-play, and feedback as part of a multiple-exemplar training package to teach three adolescent boys with ASD to correctly respond to disguised mands. Training began with stating the rule, "Sometimes when a person wants something, they give hints about what they want instead of just asking for it," providing the rationale of why it is important to determine when someone is indirectly asking you for something, and role-playing. During training, if the participant did not correctly respond to a disguised mand, the experimenter asked a series of questions to prompt the correct response. A rotation of 20 disguised mand exemplars were targeted across different instructors and settings. The presentation of the rule was faded out to reach independent mastery of the target skill. Results demonstrated that the treatment package was effective in developing a generalized repertoire of disguised mands for all participants.

8.1.4.3 Recommendations for Practice

An abundant amount of behavior analytic research has shown the effectiveness of multiple-exemplar training for establishing complex social behaviors in individuals with ASD (Gena et al., 1996; Gould et al., 2011; Najdowski et al., 2017; Persicke et al., 2012, 2013; Reeve et al., 2007). Presenting multiple exemplars of stimuli has shown to promote generalization of the target skill and reduce the likelihood of rote memorization. When choosing exemplars it is recommended that you use stimuli to which the learner has no previous exposure; this is typically done to control for learning history or previous associations with stimuli. Further, exemplars can be presented through video or in vivo models. Videos can be prepared in advance to be more readily accessible, can be individualized for the child, and provide the ability to review clips if needed. On the other hand, in vivo models are more representative of scenarios the child may be exposed to in the natural environment. Whichever modality you choose to use to teach the skill, initially the model should make relevant features salient by emphasizing words and exaggerating facial expressions. Be sure to fade exaggerated cues to match what is more commonly observed in everyday social interactions.

8.1.5 Lying and Deceit

Lying is a normal part of everyday interactions between individuals. Generally speaking, lying is a type of nonliteral language where the actual meaning of a phrase or story is different from the literal meaning of what is said (Ranick, Persicke, Tarbox, & Kornack, 2013). Lying occurs for many reasons (e.g., to avoid hurting other's feelings, to take advantage of others, or to embellish past experiences).

Although lying is typically considered to be problem behavior, there are social situations in which lying or deceit may be appropriate (Bergstrom, Najdowski, Alvarado, & Tarbox, 2016). For example, individuals may lie to avoid hurting other's feelings (e.g., complimenting a co-worker's dress, when in fact you may not like it), for keeping secrets (e.g., withholding a surprise birthday party date or promising a friend you will keep his or her "crush" a secret), or while playing games (e.g., lying about your hand while playing poker).

There is a dearth of research on how to teach deception skills to individual with ASD. This may be due to the fact that lying continues to be perceived as problematic and therefore is not targeted during skill acquisition for individuals with ASD. Deficits in other social behavior such as perspective taking are also likely barriers to teaching children with ASD how to identify and tell socially appropriate lies (Bergstrom et al., 2016).

8.1.5.1 Component Skills of Lying and Deceit

Bergstrom et al. (2016) suggest several component skills that may be necessary to have in one's repertoire to successfully engage in socially appropriate lying and deceit. Let's say, for example, your friend models a new lipstick color and asks your opinion on what you think is a highly unattractive shade of pink. First, you must (a) assess the appearance of the individual, then (b) envision the emotional effect on your friend if you state the truth, and (c) envision the consequences for your friend if you tell the truth verses lying. The types of responses associated with telling a lie depend on the environmental context and often require perspective taking (Baron-Cohen, 1993).

8.1.5.2 Teaching Component Skills of Lying and Deceit

Researchers have evaluated procedures to teach children with ASD to detect and respond to deceptive statements and to tell socially appropriate lies. Ranick et al. (2013) evaluated the use of behavioral skill training (rules, modeling, role-play, immediate feedback) on the identification of and responses to deceptive statements by three children with autism who ranged in age from 6 to 9 years old. The session began with a rule, "People lie when they don't want another person to know the truth. They say something that isn't true to make another person think what they are saying is true and to cover up the real truth." The child and therapist engaged in play activities during each session and the therapist presented deceptive comments in the context of conversation. If the child labeled the statement as a lie, the therapist provided verbal praise. If the child did not accurately label the lie, the therapist asked a leading question (e.g., "Wait a minute, was I telling the truth just now?"). If the child was still unable to identify the statement as a lie, the therapist restated the lie and asked the child if the statement seemed to be true or a lie and to explain why he chose truth or lie. If this did not work, the therapist told the child the correct answer and gave an explanation as to why that was the correct response. Teaching was conducted with multiple exemplars of deceptive statements. Each session included two novel deceptive statements (lies) and at least two previously trained deceptive comments. Probe sessions were conducted with peers or siblings to assess generalization of lie detection.

Generalization was also assessed with novel exemplars of deceptive statements. Results showed that the procedure was effective for all three participants. Each child learned to identify and respond to deceptive statements and responding generalized to novel, untrained lies and to same-age peers not involved in training.

Bergstrom et al. (2016) evaluated the use of rules, role-play, and feedback for teaching young children with ASD to tell socially appropriate lies. Participants were taught to tell lies when they were given an undesired gift and when another person's appearance changed in an undesired way during gift sessions and appearance sessions. During gift sessions, participants were presented with a wrapped gift containing either a non-preferred or an already owned toy (as per parent report). During appearance sessions, an adult's appearance was altered in a way that the participant did not prefer (based on parent report). During teaching, the participants were presented with rules, role-playing opportunities, and corrective feedback. For example, during gift sessions the participants were told, "Sometimes you might get a gift you don't like or already have, and you won't like it. It was nice of the person to give you a gift, and you don't want to hurt their feelings, so even though you are not happy you should smile and say something nice like, 'Thanks! I like it!'" During appearance sessions the participants were told, "If someone is wearing something you don't like or changes how they look, you need to make sure not to hurt their feelings by saying something nice if they ask what you think. Something like, 'it looks good,' or 'that's cool.'" After stating the rule, the participant and therapist engaged in role-playing opportunities. Praise was delivered if the participant engaged in the lie and corrective feedback was delivered if the participant either did not respond at all or responded incorrectly (e.g., did not smile or sound sincere). Reponses were scored using a 1- to 3-point scale. To receive three points the participant was required to tell a lie expressing approval, with a sincere tone, while smiling. The results demonstrated that all participants effectively learned to tell socially appropriate lies. In addition, generalization to untrained people and stimuli was observed.

Reinecke et al. (1997) taught three adolescents with ASD to engage in lies while playing a game. During Condition 1 of treatment, participants were taught to "guess," which was defined as pointing to or touching one of the experimenter's closed fists. In Condition 2, the participants were taught deception, which was defined as engaging in five separate, defined responses per trial of hiding an object (i.e., object occlusion, hidden transfer, empty fist closed, hiding fist closed, not indicating). During treatment in Condition 1, the experimenter hid a ball under a table and asked the participant "which hand is it in?" The participant was then asked to guess. Reinforcement was provided for independent guessing made by the participant. Incorrect responses resulted in verbal and, if necessary, physical prompts. In Condition 2, the participant was asked to hide the object while the experimenter guessed. Reinforcement was delivered if the participant engaged in all five independent deceptive responses (i.e., object occlusion, hidden transfer, empty fist closed, hiding fist closed, not indicating). The results demonstrated that two out of the three participants acquired the deceptive skills, with effects observed in baseline (before the introduction of treatment). Although these results suggest that the change in behavior was likely a result of some confounding variable, such as exposure to carefully crafted sessions, and not the intervention itself, it still indicates that individuals with ASD are capable of learning deceptive behavior.

8.1.5.3 Recommendations for Practice

Because telling socially appropriate lies involves perspective taking, many of the recommendations to teach lying are similar to those of perspective taking (e.g., video-based instruction; Luiselli et al., 2008). During video-based instruction an actor can model the target behavior under conditions in which it would be socially appropriate to tell a lie (e.g., during a game, keeping a secret, or receiving a non-preferred gift).

In addition to video-based instruction, strategies for promoting lying and deceitful behavior of individuals with ASD include (a) teaching rules about when you might tell a lie, (b) using role-play and feedback, and (c) teaching with multiple examples of social situations. Behavioral skill training has been shown to be effective in teaching social behavior to individuals with ASD (Bergstrom et al., 2016). Specifically, behavioral skill training has been used to teach individuals with ASD to detect and respond to deceptive statements of others (Ranick et al., 2013) and to teach advanced conversation skills (Peters & Thompson, 2015). When using behavioral skill training to teach individuals with ASD, provide instructions on what to say when lying and also give instructions related to the social contexts in which these lies should occur, model the social situation, practice it together, and then provide feedback on what the individual did correctly or incorrectly.

8.2 General Recommendations for Teaching Complex Social Behavior

A therapeutic behavior change is demonstrated only when behavior occurs over time, across persons and settings, and when the effects of the change spread to a variety of related behaviors (Stokes & Baer, 1977). One of the fundamental deficits demonstrated by children with ASD is the lack of generalization from trained locations, stimuli, and situations, to novel locations, stimuli, situations, and related responses. Children with ASD should be taught the types of social skills noted in this chapter and strategies should be used to promote the generalization of these responses across time, persons, and settings, and also to promote varied topographies of responding. In this section, we provide some general recommendations regarding strategies that should be incorporated from the onset of social skill training to enhance generalization and maintenance of the newly learned skills.

8.2.1 Generalization

You can plan to maximize the potential for generalization by incorporating common stimuli into training, teaching with multiple exemplars, ensuring skills contact natural consequences, reinforcing generalized responding, and teaching strategies to mediate generalization (Stokes & Baer, 1977). Training that requires varied response forms helps to ensure the acquisition of varied responding and also increases the likelihood that untrained topographies will emerge (Cooper, Heron, & Heward, 2007).

It can be difficult to identify common stimuli, relevant exemplars, natural consequences, appropriate and inappropriate contexts for behavior, and appropriate topographies of responses. One way to identify these variables is by using a general case analysis (Cooper et al., 2007; Ducharme & Feldman, 1992). It is important to note that with the general case model, you plan for and program for generalization from the beginning of training rather than after some set criterion is met (O'Neill, 1990). Steps in the general case analysis include (a) defining the instructional universe (identifying where, with whom, and with which stimuli the behavior should occur); (b) defining the range of relevant stimulus and response variations within the instructional universe (determining variability desired in conditions under which the behavior occurs and variability in the types of responses made, including exceptions); (c) selecting examples for teaching and testing (ensuring that examples represent the variability noted in b); (d) sequencing teaching examples (using multiple exemplars, teaching to opposing examples, reviewing previously taught exemplars, teaching exceptions last); (e) teaching the examples (use techniques demonstrated effective in the literature); and (f) testing for generalization with novel examples (Horner & Albin, 1988; Horner, McDonnell, & Bellamy, 1986; Horner, Sprague, & Wilcox, 1982; O'Neill, 1990). General case analysis has been used as part of the process to plan for and program for generalized repertoires of prosocial behavior (Marzullo-Kerth et al., 2011; Reeve et al., 2007) and language skills (Garcia-Albea, Reeve, Brothers, & Reeve, 2014). It has not yet been applied to the types of complex social behaviors noted here, but considering the intricacy of social contexts and interactions it seems that general case analysis would prove useful for identifying nuanced variables critical for inclusion in effective training programs.

8.2.2 Maintenance

In addition to generalization across environments and behaviors, think about how you can create lasting changes in behavior; otherwise, the intervention is not truly effective (Baer, Wolf, & Risley, 1968). Self-management strategies might prove useful for enhancing generalization and maintenance (Ninness, Fuerst, Rutherford, & Glenn, 1991) of social skills. If behavior change does not maintain, ask yourself if the new behavior is being supported in the environment outside of your intervention (Kennedy, 2002). If support is not present, it is necessary to determine if the target behavior is of importance to the individual and others in the environment. Kennedy (2002) suggested that maintenance of skills might be used as an index of social validity. When skills are used regularly (due to multiple opportunities in daily life), they are more likely to be maintained than skills that are used rarely.

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9

Assessment and Treatment of Stereotypical Behavior Displayed by Children with Autism Spectrum Disorders

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Abstract

This chapter provides definitions for various forms of motor and vocal stereotypy and describes some characteristics of individuals who display problematic levels of stereotypy. Thereafter, the chapter describes procedures for measuring, assessing, and treating stereotypy. Specifically, the chapter outlines several behavioral procedures for decreasing or eliminating stereotypy during leisure or free periods and academic work periods. In part, each procedure requires practitioners to identify one or more preferred items that either (a) compete directly with the client's engagement in stereotypy or (b) are provided as a consequence for the client's appropriate behavior. This chapter concludes by highlighting several practical limitations of each intervention and considerations for practitioners when selecting behavioral interventions to treat stereotypy.

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9.1 Stereotypy

9.1.1 What Is Stereotypy?

Stereotypy is a class of behaviors that can be broken down into two major subtypes: motor and vocal. Common examples of stereotypy may include hand flapping, toe walking, spinning, incessant pacing, body rocking, limb posturing, object spinning, surface rubbing, finger flicking, vocal humming, and reciting vocal scripts (see Table 9.1; DiGennaro-Reed, Hirst, & Hyman, 2012; Rapp & Vollmer, 2005). Although there is not universal consensus among researchers about how to define this class of behavior, stereotypy is generally defined as noncontextual, repetitive, and or invariant motor or vocal responses that persist in the absence of social consequences (Lanovaz & Sladeczek, 2012; Rapp & Vollmer, 2005). Because stereotypy results in some form of sensory stimulation, it is often referred by practitioners or caregivers as a "self-stimulatory" or "sensory" behavior, or sometimes it is simply called "stimming." However, we shall refer to the technical term, stereotypy, throughout this chapter.

In behavioral science, identifying consequences that support or maintain problem behavior is a critical component to provide an effective intervention. This is done using a functional analysis (e.g., Iwata & Dozier, 2008), and behavior is then categorized as either social or nonsocial (sometimes called "automatic" reinforcement,

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Table 9.1 Examples of response definitions for stereotypy

Response form	Response definition
Vocal stereotypy	• Noncontextual vocal utterances, including unintelligible sounds, or words, excluding coughing and sneezing
Mirror viewing	• Oriented towards a mirror while standing within 60 cm
Object banging	• Hitting a surface with an object he or she is holding in his or her hand
Pacing	• Two or more walking steps in a forward motion
Hand flapping	• Moving hand up and down two or more times bent at the elbow
Surface hitting	• Contact of any part of his or her body with another item or surface two or more times
Face expressions	• Any repetitive (minimum of two instances within 2 s) lip movements such as repetitive puckering (excluding chewing), blowing/sucking air with rigid or stationary lips, repetitive blinking minimum of two times within 2 s, or squinting eyes for more than 2 s
Spinning	• Full rotation (360 degrees) of own body while standing or sitting on the floor
Spitting/saliva play	• Expelling saliva past the plane of the lips, or making contact with the saliva once expelled
Finger movements	• Any repetitive or invariant fine motor movements, two or more repetitive movements within 3 s or lasting longer than 3 s
Object tapping	• Touching an object using one or both hands and removing the hand within 1 s excluding rubbing the surface of objects, drumming the fingers on objects, and tapping self
Hand gesturing	• Straightening and flexing the fingers accompanied by holding them in various positions, including holding the hand or fingers still or flexing or tapping the fingers against objects
Finger spelling	• Extending one or more fingers in the air with elbow bent or waving hand or having a limp wrist suspended in the air
Body rocking	• Two or more forward and backward torso movements for 2 s or more
Jumping	• Two or more instances of both feet leaving the ground for 2 s or more
Ear covering	• Contact of one or both hands with one or both ears for 2 s or more
Hand gazing	• Rotation of a hand in front of face for 2 s or more

Vollmer, 1994), both of which can involve positive or negative reinforcement. Examples of social positive consequences include events that are added following the occurrence of behavior such as access to attention, tangible items (e.g., toys), or edible items. By contrast, social negative consequences are those that include termination or delay of unpleasant environmental events. Automatic positive consequences often include stimulus events generated directly by behavior such as sensory products (e.g., visual, auditory, or proprioceptive stimulation). Rapp and Vollmer (2005) concluded that a preponderance of studies show that stereotypy was maintained by some form of automatic positive reinforcement. For example, a child with autism spectrum disorder (ASD) may engage in hand flapping that generates visual stimulation, which then functions as an automatic positive reinforcer for engaging in hand flapping (e.g., Rapp, 2008). A note of caution: Practitioners should only consider categorizing behavior as stereotypy if it meets both the *structural* and *functional* definition. In other words, behavior must both structurally look like stereotypy (noncontextual, repetitive, and invariant) and be identified in a formal assessment to function as a non-socially reinforced behavior. This assessment will be discussed in more detail in the section below (*Process of Treating Stereotypy*). If assessment results indicate that repetitive and invariant behavior is maintained by social consequences (e.g., repeating words or nonsense phrases to obtain adult attention, a tangible item, or escape from a situation), then practitioners should not refer to the response(s) as "stereotypy," but rather treat it as a socially maintained behavior (see Chap. 11 for assessment and treatment of socially reinforced problem behavior). Though a response might look like stereotypy, referring to it as such can lead a practitioner to treatment options that will likely be ineffective. In summary, the descriptor *stereotypy* connotes that the behavior (a) is repetitious and invariant in form and (b) produces its own source of reinforcement (Rapp & Lanovaz, 2016; Rapp & Vollmer, 2005).

9.1.2 Who Displays Stereotypy?

In a review of the literature, Chelbi, Martin, and Lanovaz (2016) found that stereotypy was reported in 61% of participants diagnosed with a developmental disability (DD) and 88% of participants diagnosed with ASD. From a developmental standpoint, engaging in some repetitive motor responses (i.e., stereotypical behavior) is typical for most children (e.g., Smith & Van Houten, 1996); however, these otherwise developmentally typical behaviors can evolve somewhat differently for children with ASD. Smith and Van Houten (1996) compared the repetitive behavior of typical children to that of children diagnosed with DD. Specifically, the two groups of children were observed as they watched television, conversed, waited, and played with Legos™. Although the percentage of time children in each group engaged in stereotypy was similar (comparisons were made with both developmental and chronological age matches), observer rated the stereotypy displayed by the children with DD as strange or bizarre. That is, children with DD displayed more obvious repetitive behavior that involved gross-motor movements. Moreover, the children with DD allocated more visual focus to their stereotypical movements than did their age-matched peers.

In a similar study, MacDonald et al. (2007) tracked stereotypy displayed by typically developing children and compared those levels to stereotypy displayed by children with ASD. On the whole, MacDonald et al. found that levels of stereotypy were greater for children with ASD compared to their age-matched typical peers. Notably, the gap across groups widened as they grew older from 2 to 4 years old. Specifically, 4-year-olds with ASD displayed more stereotypy than (a) their same-aged typical peers and (b) 2- and 3-year-olds with ASD. This finding suggests that stereotypy will likely become more problematic if left untreated.

9.1.3 Treating Stereotypy

As a common behavioral feature of ASD and other neurodevelopmental disabilities, stereotypy has been a subject in over 30 years of research across health disciplines. Nevertheless, it remains a difficult class of behavior to treat with either behavioral or pharmacological interventions. From a conceptual standpoint, one reason why stereotypy is particularly difficult to manage stems from the client's ability to freely access the sensory stimulation produced by it (Lanovaz & Sladeczek, 2012; Rapp, 2008; Rapp & Vollmer, 2005; Stangeland, Smith, & Rapp, 2012). In other words, a client can experience the reinforcing stimulation at any time by simply engaging in stereotypy; the stimulation he or she seeks to obtain and behavior he or she emits to obtain it are inextricably linked. Another difficulty in treating this behavior is that the specific stimulation (auditory, proprioceptive, tactile, etc.) produced by engaging in stereotypy is not often clear. This makes the reinforcing consequence (i.e., the type of stimulation produced) difficult for practitioners to manipulate. By contrast, when treating problem behavior maintained by social events, practitioners can identify the specific maintaining consequence (e.g., attention, escaping from a task). Thereafter, a practitioner can arrange to withhold that social consequence contingent on the problem behavior, provide that social consequence contingently upon the occurrence of a more socially appropriate behavior, or both. As with socially reinforced behavior, the goal of treating stereotypy is to provide a functionally similar consequence (i.e., similar stimulation) for engaging in appropriate behavior. In short, treating stereotypy involves unique challenges that can be addressed with specific assessment and treatment procedures.

9.1.4 When Should Stereotypy Be Treated?

An individual's engagement in stereotypy can be problematic because it can interfere with socially appropriate interactions, academic work, or both (e.g., Cunningham & Schreibman, 2008; Enloe & Rapp, 2014; Lanovaz, Robertson, Soerono, & Watkins, 2013). Specifically, individuals who engage in stereotypy are often too interested in, and distracted by, their own stereotypy resulting in (a) delays to engaging in the appropriate behavior, such as responding to a peer or a teacher, (b) failure to focus and acquire academic skills, and (c) failure to learn, or to choose to engage in, age-appropriate activities (Koegel & Covert, 1972; Koegel, Firestone, Kramme, & Dunlap, 1974; Lovaas, Litrownik, & Mann, 1971).

Practitioners should be aware that interventions for stereotypy might produce other, unintended, behavioral changes for that child. In a review on the indirect effects of treating stereotypy, Lanovaz and Robertson et al. (2013) found that reducing stereotypy was typically associated with non-programmed increases in other behaviors, many of which were less desirable than stereotypy. In some instances, suppression of one form of stereotypy (e.g., hand flapping) was associated with increases in other forms of stereotypy (e.g., body rocking) or increases in other undesirable behavior (e.g., aggression). On the other hand, it is possible that intervention for one specific, targeted form of stereotypy (e.g., pacing) could decrease another form of stereotypy (e.g., hand flapping) that was not specifically targeted for intervention. To summarize, some undesirable behavior might be a side effect or by-product of specific treatments. To minimize the production of undesirable behavior, Lanovaz et al. recommended that practitioners specifically target a socially appropriate behavior to increase when decreasing stereotypy.

In addition to interfering with academic and social skill acquisition, stereotypy may also interfere with learning and enrichment opportunities (e.g., Cunningham & Schreibman, 2008). That is, parents of children who display stereotypy may inadvertently avoid community environments like parks and restaurants. For example, Cunningham and Schreibman (2008) suggested that parents might be apprehensive to bring their child to public locations due to perceived risk of their child encountering unpleasant social interactions (e.g., ridicule from peers) for engaging in stereotypy. Nevertheless, the literature is not clear about what level of stereotypy is perceived negatively by peers, parents, or educators. To this end, a child's engagement in low-level stereotypy might not require intervention. On a broader level, engagement in high levels of restrictive and repetitive behavior, which includes stereotypy, have been associated with increased caregiver-reported stress (Harrop, McBee & Boyd, 2016). Overall, both the potential for barriers to engaging in appropriate behavior of the client and undesirable interactions between the caregiver and the child suggest that treatment of stereotypy is warranted in many cases. Caregiver stress notwithstanding, if a child's stereotypy is non-harmful in a given context (i.e., it does not interfere with either academic tasks or social interactions), treating the behavior may not be necessary (Cook & Rapp, in press).

9.1.5 Process for Treating Stereotypy

For the remainder of this chapter, we refer to three levels of personnel within the process of assessing and treating stereotypy: practitioners, instructors, and caregivers. A practitioner will be a graduate-level trained professional who has specific training in stereotypy. This individual will likely hold the credential of board-certified behavior analyst (BCBA), doctoral level BCBA (BCBA-D), or licensed psychologist with behavior-analytic training. Practitioners are responsible for the following steps:

1. Developing clear response definitions for stereotypy
2. Identifying an appropriate system of measurement
3. Conducting an assessment to confirm that the behavior in question is stereotypy

4. Identifying an appropriate intervention for stereotypy
5. Training instructors and caregivers to deliver the chosen intervention
6. Monitoring the ongoing effects of the intervention

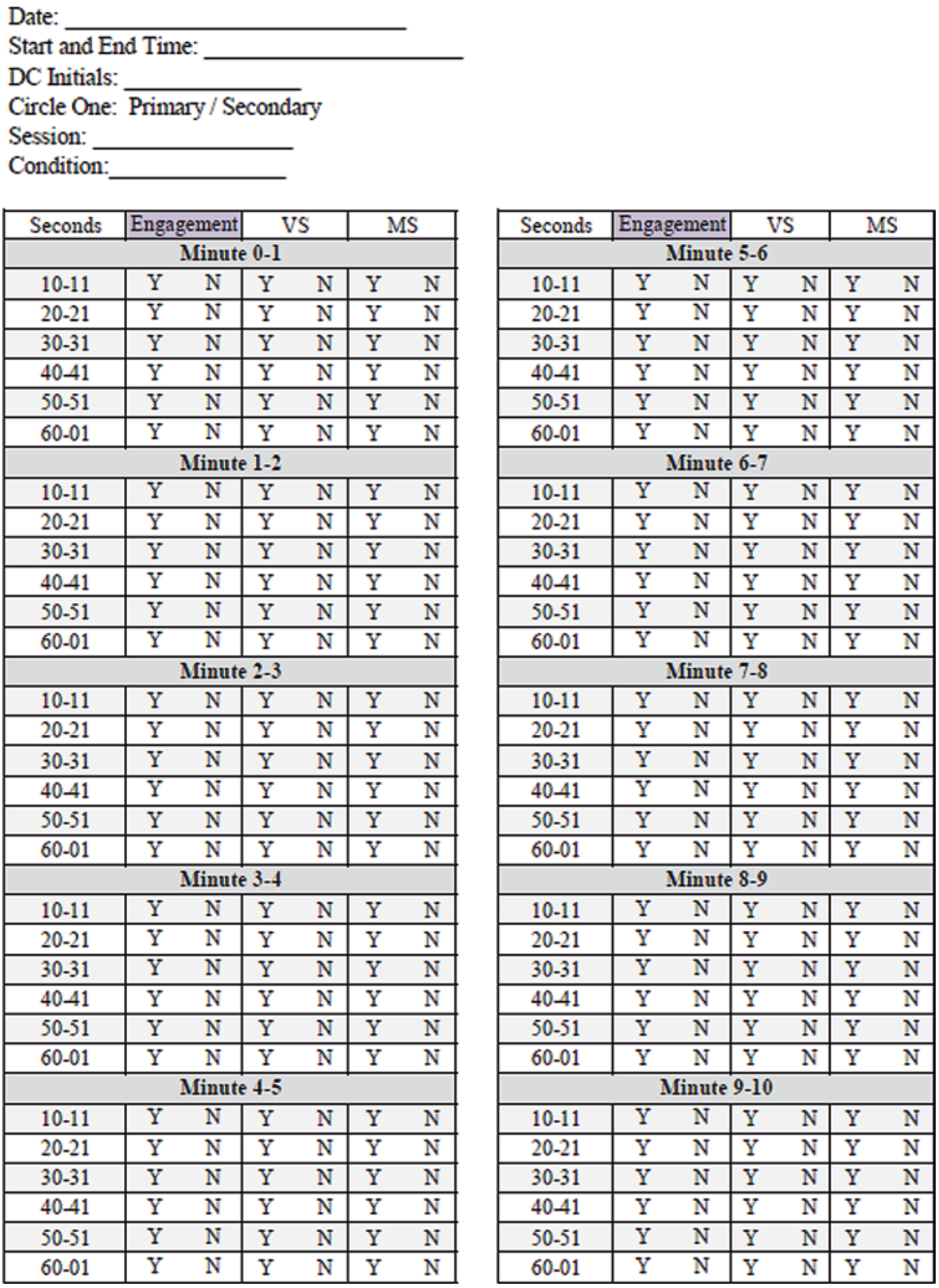
An instructor is an individual who is trained by a practitioner to conduct assessment procedures (e.g., data collection), implement a behavioral intervention, or both. Instructors often include associate-level board-certified behavior analysts (BCaBAs), registered behavior technicians (RBTs), and special educators; but they may also include other individuals specifically trained in and supervised by the practitioner. Caregivers typically include family members (e.g., parents and siblings) that have a personal relationship with the client, or someone else legally responsible for the clients' daily living and well-being. In the following sections, we describe how to assess and treat stereotypy displayed by children with ASD and related neurodevelopmental disorders.

9.1.6 Defining and Measuring Stereotypy

Developing a clear definition of stereotypy is a fundamental component of both assessment and treatment. Some individuals display multiple, distinct forms of stereotypy. Practitioners should develop specific definitions for each response form that are specific to that individual. Table 9.1 provides several examples of response forms and the corresponding response definitions. After the practitioner develops clear response definitions, the next step is to select an appropriate measurement system for the assessment and treatment of stereotypy. Because stereotypy is often deemed problematic due to the amount of time the respective individual devotes to the behavior, stereotypy is typically measured as a duration-based event. As such, we recommend using momentary time sampling (MTS; Cooper, Heron, & Heward, 2007) because it (a) provides a sensitive and reliable measure of duration events (e.g., Becraft, Borrero, Davis, & Mendres-Smith, 2016; Meany-Daboul, Roscoe, Bourret, & Ahearn, 2007), (b) can be used to concurrently measure multiple response forms (e.g., Rapp, Cook, McHugh, & Mann, 2017), and (c) is viewed favorably by practitioners and instructors (Hanley, Cammileri, Tiger, & Ingvarsson, 2007; Kolt & Rapp, 2014). As it pertains to (b) and (c), some studies suggest that instructors can engage in other data collection or related activities while collecting data with MTS (Becraft et al., 2016; Hanley et al., 2007; Rapp, Colby-Dirksen, Michalski, Carroll, & Lindenberg, 2008).

To collect data with MTS, divide the total observation or session time (e.g., 10 min) into smaller intervals (e.g., 10 s) and observe the individual for engagement in stereotypy at the very last second of the interval (see Fig. 9.1 for a sample data sheet for collecting data with 10-s MTS during a 10-min observation period). If the individual is engaging in the target stereotypy at that second, circle "Y" (yes) for that interval. If the individual is not engaging in the target stereotypy at that second, circle "N" (no) for that interval. To illustrate this process, we will provide an example for a 10-min session. Using the data sheet in Fig. 9.1, begin by starting a session timer. When the timer reaches the 10-s mark, record "Y" or "N" in the manner described above. When the session timer reaches the 20-s mark, record data in the same way. Continue recording data until the session timer reaches 10 min. At this point, stop the timer and count how many intervals you recorded "Y" to identify the total number of intervals in which the individual engaged in stereotypy throughout the session (see *Determining if a Behavior is Stereotypy* for graphing these totals). This value should be divided by the total number of intervals (60) and then multiplied by 100% to arrive at the percentage of 10-s intervals with stereotypy. For example, if 38 intervals were scored with a "Y" for body rocking, then this individual can be said to engage in body rocking for 63.3% of intervals during that 10-min session. The practitioner should plot this percentage as one data point on a linear graph (described in the next section).

Researchers have found that MTS can detect moderate and large behavior changes in duration



Date: ______________________
Start and End Time: ________________
DC Initials: ___________
Circle One: Primary / Secondary
Session: _____________
Condition:____________

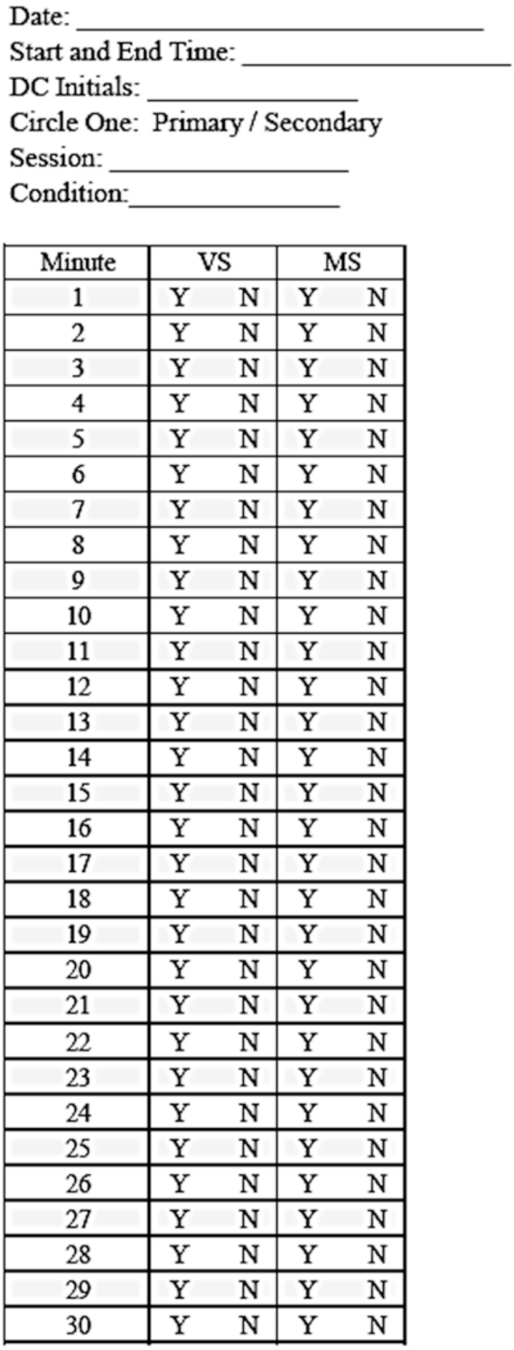
Seconds	Engagement		VS		MS	
Minute 0-1						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 1-2						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 2-3						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 3-4						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 4-5						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N

Seconds	Engagement		VS		MS	
Minute 5-6						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 6-7						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 7-8						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 8-9						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N
Minute 9-10						
10-11	Y	N	Y	N	Y	N
20-21	Y	N	Y	N	Y	N
30-31	Y	N	Y	N	Y	N
40-41	Y	N	Y	N	Y	N
50-51	Y	N	Y	N	Y	N
60-01	Y	N	Y	N	Y	N

Fig. 9.1 Data sheet for collecting data on stereotypy and object engagement using 10-s momentary time sampling during 10-min observation sessions

events for sessions as long as 30 min and interval sizes up to 30 s (e.g., Devine, Rapp, Testa, Henrickson, & Schnerch, 2011). Additionally, MTS with 1-min intervals can detect large behavior changes when sessions are 30–60 min in duration. Nevertheless, if the observation sessions (i.e., each session resulting in one data point) are only 5–10-min durations, practitioners should use MTS with 10-s intervals. The larger intervals are typically less labor intensive because the practitioner needs to observe the target behavior only at the last second of the interval. If a practitioner is conducting a 30-min session, we recommend he or she use 1-min intervals to record stereotypy with MTS (see Fig. 9.2). To provide an example of scoring with 1-min MTS for a 30-min session, we will refer to the data sheet in Fig. 9.2. Start a session timer, and when the timer reaches the 1-min mark record "Y" if the individual is engaging in the target stereotypy only at that second. If the individual is not engaging in the target behavior at that particular second, circle "N." When the session timer reaches the 2-min mark, record data in the same way. Continue recording data in this manner until the session timer reaches 30 min. At this point, stop the timer and count how many intervals you recorded "Y" to identify the total number of intervals in which the individual engaged in stereotypy throughout the session. As previously noted, the practitioner should graphically depict this data point in a linear graph for visual inspection.

Another option for practitioners is to collect continuous duration data or second-by-second data with a laptop computer program or tablet. As one example, Bullock, Fisher, and Hagopian (2017) described a free data collection system called "BDataPro."[1] In addition to enabling the observer to capture rate (frequency over time) and percentage of time engaged in the target behavior, it also provides a platform for data storage and analysis.



Date: ______________________________
Start and End Time: ____________________
DC Initials: _______________
Circle One: Primary / Secondary
Session: _________________
Condition: ________________

Minute	VS		MS	
1	Y	N	Y	N
2	Y	N	Y	N
3	Y	N	Y	N
4	Y	N	Y	N
5	Y	N	Y	N
6	Y	N	Y	N
7	Y	N	Y	N
8	Y	N	Y	N
9	Y	N	Y	N
10	Y	N	Y	N
11	Y	N	Y	N
12	Y	N	Y	N
13	Y	N	Y	N
14	Y	N	Y	N
15	Y	N	Y	N
16	Y	N	Y	N
17	Y	N	Y	N
18	Y	N	Y	N
19	Y	N	Y	N
20	Y	N	Y	N
21	Y	N	Y	N
22	Y	N	Y	N
23	Y	N	Y	N
24	Y	N	Y	N
25	Y	N	Y	N
26	Y	N	Y	N
27	Y	N	Y	N
28	Y	N	Y	N
29	Y	N	Y	N
30	Y	N	Y	N

Fig. 9.2 Data sheet for collecting data on vocal stereotypy (VS) and motor stereotypy (MS) using 1-min momentary time sampling during 30-min observation sessions

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[1] This data collection program can be downloaded at https://www.kennedykrieger.org/patient-care/patient-care-programs/inpatient-programs/neurobehavioral-unit-nbu/bdatapro-software-for-real-time-behavior-data-collection

9.1.7 Determining if a Behavior Is Stereotypy

Prior to treating stereotypy, a practitioner should formally assess whether the target behavior persists in the absence of social consequences. Behavior that does not persist in the absence of social consequences would (a) not meet the functional criterion for stereotypy and (b) require a different intervention aimed at manipulating social variables (see Chaps. 10 and 11). Intervening on stereotypy without a formal assessment carries the risk of ineffective treatment. Therefore, it is essential for practitioners to conduct a formal screening to determine whether stereotypy persists in the absence of social consequences. This can be accomplished with an adapted functional analysis consisting only of alone sessions (Querim et al., 2013). Because the instructor is typically in the room to collect data during this analysis, researchers have referred to the "alone" conditions more precisely as No Interaction (NI) conditions. Specifically, there are no consequences (or no social interaction) in response to the individual engaging in stereotypy. Additionally, there should be no other stimulation (e.g., toys, computers, materials) present during the assessment. In short, the individual is observed in a bare room, where they are most likely to "keep busy" by engaging in stereotypy. The practitioner should conduct 5- or 10-min NI sessions and collect data using 10-s MTS on the occurrence of stereotypy during these sessions.

As illustrated in Fig. 9.3, at least three NI sessions should be conducted and the assessment should continue until a stable or predictable trend is achieved. The pattern in Fig. 9.3 suggests that the targeted behavior is automatically reinforced (i.e., not maintained by social consequences) and would thus meet the definition of stereotypy. To conduct this assessment, use a data sheet similar to the one depicted in Fig. 9.1. If the target behavior decreases to zero or near-zero levels across the consecutive NI sessions (as illustrated in Fig. 9.4), then the behavior is likely not automatically reinforced and should not be deemed "stereotypy." In this case, the practitioner should seek other assessments to identify the function of the behavior (e.g., pacing maintained by attention) to then identify an appropriate functional intervention.

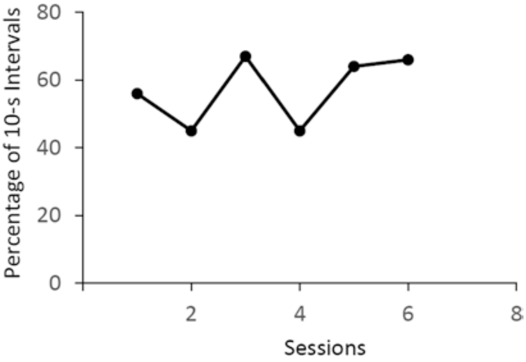

Fig. 9.3 Hypothetical data showing repetitive behavior that persists across sessions without social consequences. This behavior is maintained by a nonsocial source of reinforcement and would meet the definition of stereotypy

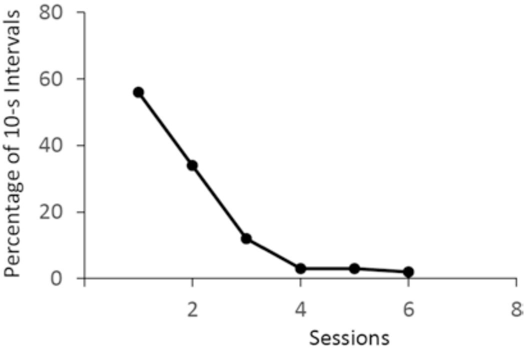

Fig. 9.4 Hypothetical data showing repetitive behavior that decreases without social consequences across sessions. This behavior is *not* maintained by a nonsocial source of reinforcement and would *not* meet the definition of stereotypy

As previously noted, data for the occurrence of stereotypy should always be graphically depicted in single-case designs (SCDs) for visual analysis by the practitioner. Although replication of treatment effects is the cornerstone of SCDs (e.g., Kazdin, 2011), several recent studies have shown that a basic baseline and treatment designs (AB designs) are often sufficient. These designs for evaluating and monitoring effectiveness of a program simply demonstrate some initial baseline sessions (baseline or “A” phase), followed by the sessions with the intervention in place (“B” phase). Typically, replication involves graphs with reversals (e.g., ABAB), which demonstrate the effectiveness of a given treatment; however, the simple AB design can also be useful for demonstrating clear behavior changes in clinical settings. This is particularly apparent for AB designs when (a) the interventions have considerable empirical support, (b) the baseline contains at least five data points or observation sessions, and (c) the baseline data path is relatively stable across sessions (Bartlett, Rapp, & Henrickson, 2011; Krueger, Rapp, Ott, Lood, & Novotny, 2013; Lanovaz, Huxley, & Dufour, 2017; Lanovaz, Turgeon, Cardinal, & Wheatley, 2018; Novotny et al., 2014). Visual analysis of data depicted in AB design graphs can also be supplemented with visual aids and statistical analysis (e.g., see Fisher, Kelley, & Lomas, 2003).

Practitioners should graph their data as the percentage of intervals with stereotypy across sessions (see Fig. 9.5). For each session, practitioners should count the total number of intervals in which stereotypy occurred and divide that number by the total number of intervals in the session. For example, if using 1-min intervals to collect data during a 30-min session, there would be a total of 30 intervals. If stereotypy occurred for 17 of those intervals, a practitioner should divide 17 by 30 and multiply the result by 100%. Then, a data point should be placed at 56.67% for that session. Graphically depicting the percentage of intervals with stereotypy allows the practitioner to visually analyze the effects of the chosen intervention and to make data-based decisions. The baseline phase should contain a data path with at least three to five data points; the data path should be relatively stable or increasing across sessions. If a data path containing five or more data points (i.e., sessions) in the treatment phase shows that stereotypy is not decreasing, the practitioner should discontinue the treatment and select another option. Treatment options are discussed in the next section.

9.1.8 Empirically Supported Treatments

The stereotypy literature presents various treatment options. Each individual treatment that we recommend in this section met the three general criteria outlined by Kratochwill et al. (2010, p. 21) for combining SCD studies. First, the treatment in question was demonstrated effective by at least five SCD studies that either met evidence standards or met evidence standards with reservations. Second, the treatment in question was evaluated by at least three different research

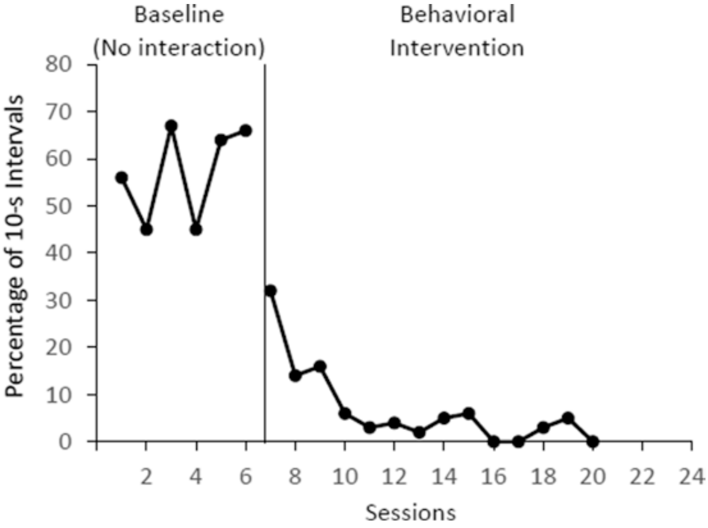

Fig. 9.5 Hypothetical data plotted in an AB design graph showing stable levels of stereotypy in the baseline phase and a clear reduction in stereotypy following the introduction of the behavioral intervention phase

teams. Third, the effects of the treatment were demonstrated at least 20 times across papers.

9.1.9 Treatment Stimulus Identification

A preference assessment is necessary to empirically identify items that can be provided either contingently on appropriate behavior (i.e., contingent reinforcement) or noncontingently to compete with stereotypy (i.e., noncontingent reinforcement). Numerous studies have shown that preference assessments identify items that are likely to function as reinforcers (i.e., they strengthen behavior over time) when provided contingently on (appropriate) behavior. As such, practitioners should conduct regular preference assessments when working with clients who display stereotypy.

The free operant stimulus preference assessment involves 10-min sessions in which the practitioner presents six or more items concurrently to the client (Roane, Vollmer, Ringdahl, & Marcus, 1998). The room used for the assessment will have these items spread throughout the space, but should otherwise be free of any other items (e.g., educational materials). Depending on the ability of the individual, the practitioner may need to give brief access to each item, as well as verbal and physical prompts to engage with each item, before beginning the assessment. Upon starting assessment, the practitioner will say to the client "you can play with whatever you want" and then allow the client free access to the items for 10 min. The practitioner does not interact with the client during this time, even if the individual is not engaging with any items. The data sheet depicted in Fig. 9.6 can be used to collect data on item engagement for this assessment. Note that the observer should score "no item" if the client is not engaged with an item at the end of an interval.

Typically, we define item engagement as physical contact with the item. If a visual stimulus is used (i.e., iPad), then we define item engagement as touching or looking at the item. At the end of the 10-min session, the practitioner should count the total intervals in which item engagement occurred with each item. The practitioner should then divide the number of intervals with item engagement for *Item 1* by the total number of intervals in the session (60, 10-s intervals in this example) and multiply that number by 100%. For example, if a client engaged with *Item 1* for 15 intervals, then the equation would look like 15/60 × 100%. When calculated, we find that the individual engaged with *Item 1* for 25% of the intervals. The practitioner should repeat these calculations for all items presented. The results should be graphically displayed in a bar graph to identify high-, medium-, and low-preference items. Figure 9.7 illustrates how the results for three 10-min sessions should be graphically depicted. As an additional resource for practitioners, a study by Weldy, Rapp, and Capocasa (2014) includes a step-by-step video demonstrating how to conduct and collect data during this type of preference assessment.[2]

A free operant preference assessment will identify items that can be used in the treatments that are described in subsequent sections. Although there are other methods for assessing a client's preference for potential reinforcers, this assessment is efficient and has been used repeatedly in the treatment literature (e.g., Rapp & Lanovaz, 2016). That is, stimuli identified with a free operant assessment have a high likelihood of functioning as a reinforcer (i.e., increasing future behavior) when provided contingently upon the occurrence of other appropriate behaviors (e.g., academic or social skills the practitioner aims to increase). In addition, research suggests that individuals display less problem behavior (e.g., aggression) during free operant preference assessments than during other preference assessment methods (Kang et al., 2010, 2011; Tung, Donaldson, & Kahng, 2017). Nevertheless, practitioners should be aware that some stimuli identified as highly preferred for the client may not compete with the reinforcing effects of stereotypy or, alternatively, could increase stereotypy

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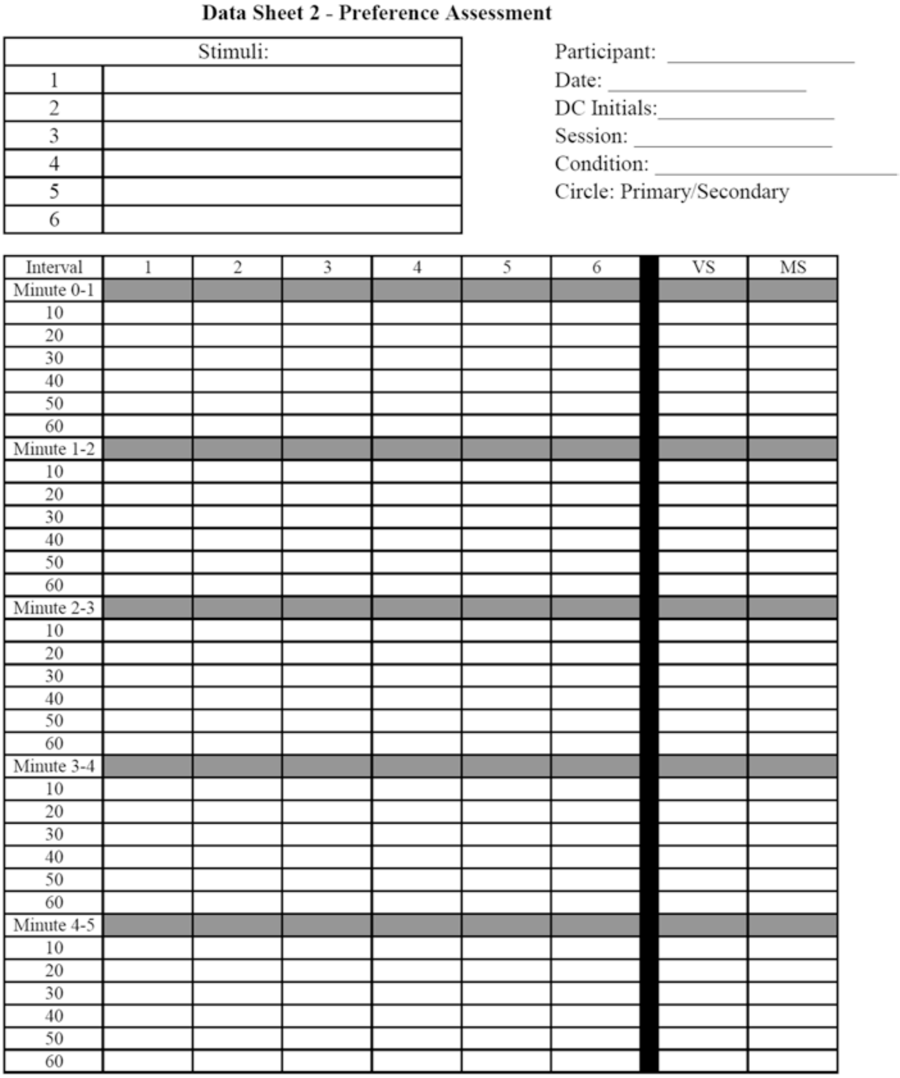
[2] This presentation can be downloaded from http://repository.stcloudstate.edu/cpcf_gradresearch/1



Data Sheet 2 - Preference Assessment

Stimuli:	
1	
2	
3	
4	
5	
6	

Participant: ________________
Date: ________________
DC Initials:________________
Session: ________________
Condition: ________________
Circle: Primary/Secondary

Interval	1	2	3	4	5	6	VS	MS
Minute 0-1	▨	▨	▨	▨	▨	▨	▨	▨
10								
20								
30								
40								
50								
60								
Minute 1-2	▨	▨	▨	▨	▨	▨	▨	▨
10								
20								
30								
40								
50								
60								
Minute 2-3	▨	▨	▨	▨	▨	▨	▨	▨
10								
20								
30								
40								
50								
60								
Minute 3-4	▨	▨	▨	▨	▨	▨	▨	▨
10								
20								
30								
40								
50								
60								
Minute 4-5	▨	▨	▨	▨	▨	▨	▨	▨
10								
20								
30								
40								
50								
60								

Fig. 9.6 Data sheet for 10-s momentary time sampling depicting the first 5 min of a session. This data sheet can be used for free operant stimulus preference assessments and free operant competing stimulus assessments. *VS* vocal stereotypy, *MS* motor stereotypy

(e.g., object stereotypy) while the client engages with the item (e.g., Rapp et al., 2013).

If a practitioner implements an intervention based on the results from a preference assessment and stereotypy does not decrease, he or she should consider identifying an item that is both preferred and competes with stereotypy. In addition, it may be advantageous to use edible items (also identified with a preference assessment; see below) as consequences for appropriate behavior that compete with stereotypy. Although edible items are unlikely to be functionally matched to most forms of motor stereotypy (i.e., they are unlikely to produce the same sensory stimulation as stereotypy), there is some empirical support for using such items as one component of an intervention to decrease stereotypy (e.g., Brogan, Rapp, Sennott, Cook, & Swinkels, 2018; Lanovaz, Rapp, & Ferguson, 2013). For example, edible items can be used as reinforcers when teaching alternative skills that will ultimately compete with a client's stereotypy. Other prefer-

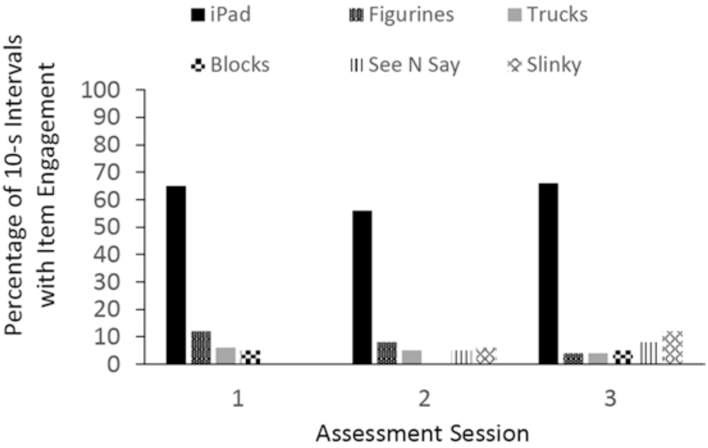


Fig. 9.7 Hypothetical results from three free operant stimulus preference assessments

ence assessments, such as the multiple stimulus without replacement assessment (DeLeon & Iwata, 1996), are useful for identifying preferred edible items with clients. A demonstration of how to conduct and collect data for this assessment is also provided by Weldy et al. (2014).[3] This assessment can be used when assessing either tangible items or edibles.

As previously noted, sometimes preference assessments identify highly preferred items that inadvertently increase stereotypy (Brogan et al., 2018; Frewing, Rapp, & Pastrana, 2015; Rapp et al., 2013). To reduce the probability of such an outcome, practitioners can conduct a free operant competing stimulus assessment (Frewing et al., 2015). A free operant competing stimulus assessment is procedurally identical to a free operant preference assessment, but it involves some additional data collection (see again Fig. 9.6 for corresponding data sheet). When initially selecting items for a free operant competing stimulus assessment, a practitioner should use their best judgement for choosing items that are potentially matched to the target stereotypy. For instance, for an individual who engages in vocal stereotypy, it is quite possible the reinforcing sensory product is auditory stimulation. Thus, the preference assessment should include several items that produce sound (e.g., videos, auditory toys, musical instruments). It is also beneficial to include other items that are not potentially matched.

To obtain reliable results with a free operant competing stimulus assessment, at least three 10-min sessions should be conducted (Frewing et al., 2015). In addition, observers should collect data on both item engagement *and* stereotypy using 10-s MTS (see far-right columns of Fig. 9.6). That is, at the observation period (e.g., at the 10-s mark), the observer will score "Y" under the corresponding item column *and* he or she will also score a "Y" under a stereotypy column (e.g., vocal stereotypy) if the person is also engaged in vocal stereotypy at the same second. After the sessions are completed, calculations are made separately for the percentage of intervals with item engagement and the conditional percentage of stereotypy associated with each item. To calculate the conditional percentage of stereotypy for *Item 1*, first count the number of intervals in which both stereotypy and item engagement occurred with *Item 1* were scored. Next, divide that number by the total number of scored intervals for *Item 1*. Finally, multiply that quotient by 100% to obtain the conditional percentage of stereotypy associated with *Item 1*. Repeat this process for each item.

The *conditional percentage* of stereotypy for each item should then be compared to the *background percentage* of stereotypy (total stereotypy with or without items) throughout the preference assessment. The *conditional percentage* of stereotypy occurs when stereotypy is conditional on engaging with an item. That is, both stereotypy

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[3] The MSWO assessment demonstration with data sheet can be downloaded from http://repository.stcloudstate.edu/cpcf_gradresearch/2/

and item engagement (with a given item) occur simultaneously during an observation interval (i.e., "Y" is scored for both within one interval). To illustrate, assume that an individual manipulates a book for 20 intervals of a session that contains 60 intervals total. Assume further that the individual hand flaps while manipulating a book for 17 intervals. The *conditional percentage* of hand flapping while manipulating the book would be calculated as 17 divided by 20 (the total number of intervals looking at a book with and without hand flapping), and then multiplied by 100% for a *conditional percentage* of 85%. That is, the individual hand flapped for 85% of the intervals for which he or she manipulated the book.

Background percentage is the stereotypy that occurs throughout the session, regardless of engagement (with any item or no item), in other words, all stereotypy that is scored within a given session. To calculate the *background percentage* of stereotypy during the preference assessment, count the total number of intervals in which stereotypy was scored, then divide that number by the total number of intervals in the assessment, and multiply the quotient by 100%. In keeping with the prior example, assume that the individual flapped his or her hands for 37 intervals (sometimes while playing with a ball, sometimes while looking at a book, and sometimes when there was no item engagement), then divide 37 by 60 (the total number of intervals in the session), and multiply that quotient by 100% for a *background percentage* of 61.7%. If the *conditional percentage* of stereotypy for an item is lower than the *background percentage* of stereotypy, then the assessment has identified an item associated with lower percentages of stereotypy; research suggests that this item may be used to decrease stereotypy (Brogan et al., 2018; Frewing et al., 2015). In this example, because the conditional percentage of hand flapping while engaged with the book (85% of intervals) was higher than the background percentage (61.7% on intervals), it is unlikely that the book will decrease stereotypy when provided noncontingently as the treatment for stereotypy.

Figure 9.8 shows hypothetical results from a free operant competing stimulus assessment.

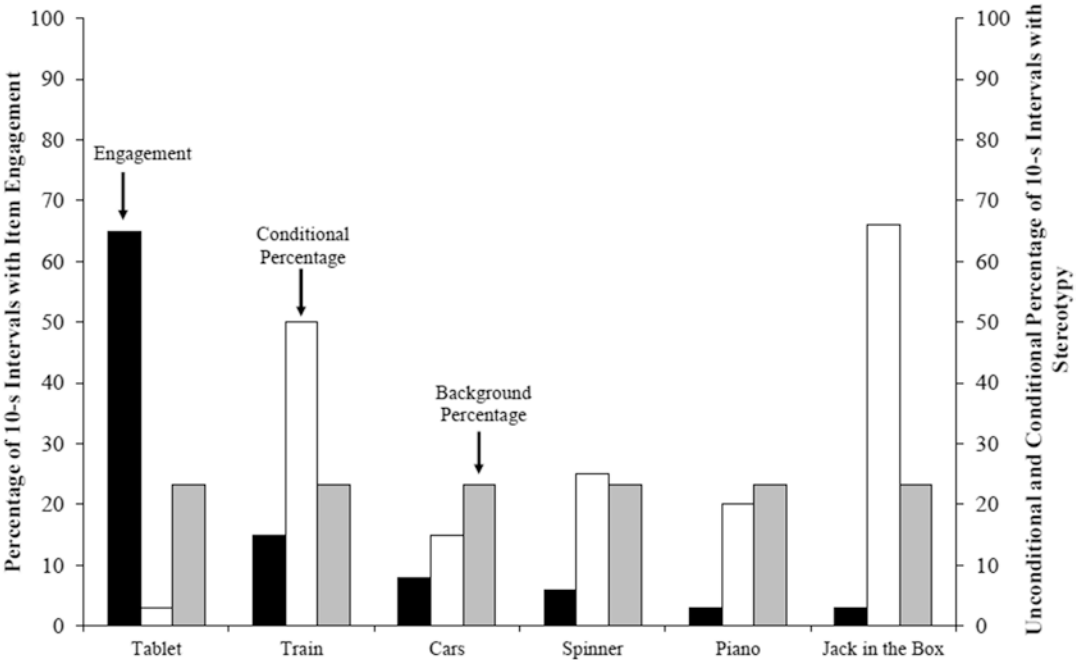

Fig. 9.8 Hypothetical results from three free operant competing stimulus assessments. Black bars represent item engagement, white bars represent the conditional percentage of stereotypy when engaged with the stimulus, and grey bars represent the background percentage of stereotypy in the sessions

Specifically, the results show that the individual engaged with the tablet for the highest percentage of intervals (about 65%), suggesting that the tablet was a highly preferred item. In addition, the results show that the *conditional percentage* of stereotypy while manipulating the tablet (3% of intervals) was lower than the *background percentage* of stereotypy (23% of intervals). Taken together, the assessment indicates that the tablet was both preferred and correlated with low levels of stereotypy. As such, using it as a reinforcer (contingently on appropriate behavior or noncontingently for prevention) is likely to decrease stereotypy when used systematically in an intervention. If the *conditional percentage* of stereotypy for an item is higher than the *background percentage* of stereotypy (as with the book in the example above), then the practitioner should either (a) use a different item that is associated with decreased stereotypy or (b) repeat the assessment with new items.

9.1.10 Treatment Selection

Practitioners have several options when treating stereotypy. The context in which the practitioner will be delivering treatment is one factor that may influence treatment choice. There are two broad contexts during which most behavioral interventions are provided: leisure and academic. Leisure contexts include routine free time or play periods during which (a) the client is not engaged in academic or vocational instruction and (b) a caregiver is able to complete other tasks (e.g., prepare a meal or instruct another child) that are not compatible with constant monitoring of the client's behavior. Leisure contexts may include other time periods that a child is required to manage their own behavior in a restricted setting such as riding in a car, waiting to be seen at the doctor's office, or visiting a family member's home. We generally attempt to target leisure periods that are 10 to 30 min in duration.

Academic contexts may include homework time, one-to-one skill practice, or group instruction; these contexts typically involve an instructor or a caregiver that must be available to perform multiple duties within the treatment plan. Some duties that the instructor or caregiver can expect to perform during academic treatment include providing praise or other reinforcers for correct academic behavior and blocking motor stereotypy. Interventions for academic contexts typically involve more specific actions from the instructor or caregiver as opposed to interventions during leisure time, which typically require initial actions followed by progressively fewer actions from the instructor or caregiver. Prefontaine, Lanovaz, McDuff, McHugh, and Cook (2017) developed a four-module app called the iSTIM (individual stereotypy treatment-integrated modules) to guide wait-listed caregivers through the process of measuring stereotypy, identifying preferred items, and selecting an appropriate intervention involving either contingent or noncontingent reinforcement (NCR) procedures. The iSTIM app (not yet available at the time of this publication) could serve as a supplement to guide practitioners through the assessment and treatment process.

9.1.10.1 Treatment during Leisure Periods

Practitioners should consider noncontingent reinforcement, or NCR, as the first option when treating stereotypy during leisure periods. Briefly, NCR as a treatment for stereotypy involves providing matched items (see procedures for the free operant competing stimulus assessment above) continuously throughout the session to provide reinforcement (the matched sensory product) as a preventative procedure. In other words, the individual will not need to engage in stereotypy to obtain a reinforcer (e.g., vocal stereotypy for auditory stimulation) because they will already be experiencing that reinforcing stimulation (auditory stimulation from preferred music). Practitioners should use NCR as a first-line treatment because it is easy to implement and is the least restrictive treatment option when compared to other treatments suggested in this chapter.

To implement NCR,[4] an instructor or a caregiver should provide continuous access to the item (identified in either the free operant pref-

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[4] The reader should not confuse NCR using music, a strongly supported procedure, with music therapy (see Chap. 6).

erence assessment or the free operant competing stimulus assessment) and collect data on stereotypy and item engagement using the system described above (i.e., 1-min MTS across 30-min sessions or 10-s MTS across 10-min sessions). If the client does not engage with the preferred item(s) for continuous periods of time, practitioners should use verbal and physical prompts to increase appropriate item engagement, which should decrease the likelihood that the client engages in other undesirable behavior (Lanovaz, Rapp, & Ferguson, 2013; Lanovaz, Rapp, Maciw, Dorion, & Pregent-Pelletier, 2016). If the graphically depicted data for the NCR intervention show clear reductions in stereotypy across several sessions, the practitioner should continue to implement NCR and may switch to less frequent monitoring of the client's behavior. We recommend conducting intermittent "probe" sessions to ensure that lowered stereotypy maintains over time. Probes should be conducted more frequently (e.g., twice a day for 5–10 min) at first, and then less frequently (e.g., one 10-min probe every 2 or 3 days) if the client continues to engage with the items.

If graphically depicted data show that stereotypy is not decreasing with NCR, practitioners should consider using NCR with a response cost (RC) component. Response cost is a type of treatment in which a practitioner removes a preferred item contingent on the client's engagement in stereotypy (Athens, Vollmer, Sloman, & St. Peter-Pipkin, 2008; Falcomata, Roane, Hovanetz, Kettering, & Keeney, 2004; Watkins & Rapp, 2014). To implement *NCR with RC*, provide the client free access to preferred item. Allow the individual to retain access to the item unless he or she engages in stereotypy. Contingent on stereotypy, the instructor or caregiver should immediately remove the preferred item (without commenting, and otherwise minimizing attention) for 10 to 15 s. After this period elapses, the instructor or caregiver returns the item to the individual and repeats the process as needed. The RC component of this intervention constitutes a negative punishment procedure. Briefly, negative punishment consists of removing of a preferred item or activity contingent on behavior that results in a decrease in that behavior over time. Typically, such procedures exert behavior-decreasing effects within three to five sessions. To this end, practitioners should collect data on the number of times RC is implemented during each session. If both the number of times RC is implemented and engagement in stereotypy in each session do not decrease during the three-to-five session period, practitioners should consider another treatment option.

Before implementing *NCR with RC*, practitioners should determine whether removing the preferred item will evoke other problem behaviors (e.g., crying, aggression) from the client. If a client engages in high-intensity problem behavior following the removal of a preferred item, do not implement NCR with RC. Likewise, if the client commonly engages in excess problem behavior when preferred items are removed, a separate treatment for this type of behavior should be sought (see Chaps. 10 and 11).

9.1.10.2 Considerations for Treatment during Leisure Periods

Although both NCR and *NCR with RC* are empirically supported treatments for stereotypy during leisure periods, each has some limitations. The first limitation is that most research on NCR uses 10-min sessions; thus, there is limited empirical evidence for predicting how the effects of NCR will maintain over longer session durations. The second limitation, as previously noted, is that NCR may decrease one form of stereotypy but increase other forms of stereotypy (Rapp, 2005; Rapp et al., 2013; Van Camp et al., 2000). Practitioners should monitor other forms of stereotypy (i.e., collect data on other forms as "nontargeted" responses) to ensure that such increases do not occur. If increases in other forms of stereotypy are detected, additional treatment components may be required. Third, as discussed above, *NCR with RC* could induce other problem behaviors (e.g., aggression to others or aggression to property) when items are removed contingently on stereotypy.

9.1.10.3 Treatment during Academic or Work Periods

Most clients who display stereotypy are required to participate in academic programs, vocational tasks, or both. We refer to both contexts as "work periods." Treatment of stereotypy during work periods may require different procedures than during leisure periods because noncontingent access to preferred items might interfere with working behavior. As such, we will discuss three treatment options to consider during work periods: (a) differential reinforcement of other behavior (DRO), (b) stimulus control procedures, and (c) response interruption and redirection (RIRD). Each of these procedures is fundamentally more complex than those described for leisure contexts (i.e., NCR, and *NCR with RC*). As such, we recommend the use of these procedures only by practitioners who have previously implemented complex behavioral procedures with appropriate supervision (e.g., someone who is familiar with, and has previously used, DRO to treat other problem behavior).

To set up a DRO procedure, a practitioner should identify a preferred item; this item will be provided contingently on the omission of stereotypy for a predetermined duration (e.g., Vollmer & Iwata, 1992). Specifically, we will describe the use of a trial-based DRO (Brogan et al., 2018; Rapp et al., 2017), which is a variation of a resetting DRO procedure for which there is considerable empirical support. Using a trial-based DRO (Rapp et al., 2017), each trial is scored as either successful (i.e., the client abstained from stereotypy for the duration of the trial) or failed (i.e., the client emitted stereotypy and the trial was then terminated). Following a pre-specified number of consecutive successful trials, the practitioner systematically increases the duration of the trials.

The conceptual framework behind DRO is that a functionally similar reinforcer is delivered for omitting stereotypy. In this way, stimulation that is similar to that which is generated by engagement in stereotypy is provided in the absence of stereotypy. During the time interval for which stereotypy is to be omitted, instructions or alternative work tasks can be provided. These work tasks may have separate programmed contingencies such as praise or tokens for correct responses and error correction for incorrect responses (see Chap. 11). Technically, if a practitioner includes programmed contingencies for work tasks, then the intervention contains two broad components: a DRO procedure for stereotypy and a differential reinforcement of alternative behavior (DRA) procedure for appropriate behavior. Regardless of whether a DRA will be included in the broader DRO session, a reasonable time period for which the client will be required to refrain from stereotypy needs to be determined. The initial time period should be calculated from baseline data.

To determine an initial interval duration for the DRO procedure, the practitioner should conduct at least one 10-min baseline session from which he or she will measure the length of time between the client's bouts of stereotypy (the interresponse time [IRT]). After completing the sessions, the practitioner should calculate the mean IRT from the baseline session and set the starting DRO criterion at or slightly below the mean. For example, if a client emitted stereotypy with IRTs of 30 s, 12 s, 7 s, 37 s, 28 s, 22 s, and 18 s, the mean IRT is 22 s. For a mean IRT of 22 s, the first criterion could be set at 22 s or 17 s (5 s less than the mean). When considering terminal criterion for a DRO, practitioners should note that most research shows that exceeding 5-min omission periods is difficult, particularly with vocal stereotypy (Rapp & Lanovaz, 2016).

The instructor should begin the DRO intervention session by informing the client (using language appropriate to the client's language ability) that he or she can have the preferred item if he or she does not engage in "[target stereotypy]." The instructor should ensure that the client can see the timer. If the client refrains from engaging in stereotypy for the entire trial duration, the instructor should score a successful trial and deliver access to a preferred item for about 30 s (the access periods should be increased as the omission criterion increases). If an instructor is delivering a reinforcer for correct responding on academic tasks, he or she should deliver the higher preference item contingent on meeting the DRO requirement. For example, during a 30-s DRO criterion, the caregiver or instructor can provide edibles contingent on prompted or independent correct responding during the work segment and then provide access to the preferred item (e.g., iPad™) for omitting stereotypy during the 30-s interval or trial. If a client engages in stereotypy before the criterion duration elapses, the instructor interrupts the stereotypy, scores a failed trial, verbally reminds the client of the DRO rule, and resets the timer for a new trial. The preferred item should only be delivered if the client refrains from engaging in stereotypy for the entire duration of the trial. As noted above, edibles (not the DRO reinforcer) can be provided for correct responding on work tasks during the interval or trial, as a separate contingency.

It is important to collect and plot data on client's performance during each trial of the DRO procedure (see Fig. 9.9 for an example using trial-based DRO). As noted above, the instructor should record successes and failures for each attempted omission period. Contingent on five or more consecutive successes, the duration of the next interval size can be systematically increased. Contingent on five consecutive failures, practitioners should decrease the criterion by half. Some individuals may experience more success in a DRO preparation than others. Research suggests that the upper range of the DRO interval will be about 5 min. When setting the terminal goal, consider how using the intervention can be applied in a generalized context. If a practitioner is unsuccessful in decreasing stereotypy using DRO, a stimulus control procedure could be an alternative intervention option.

Stimulus control procedures involve establishing visual stimuli (e.g., cards, a bracelet) to signal when stereotypy is and is not allowed (Anderson, Doughty, Doughty, Williams, & Saunders, 2010; Cook, Rapp, Gomes, Frazer, & Lindblad, 2014; Lydon, Moran, Healy, Mulhern, & Young, 2016; O'Connor, Prieto, Hoffman, DeQuinzio, & Taylor, 2011; Rapp, Patel, Ghezzi, O'Flaherty, & Titterington, 2009; Schumacher & Rapp, 2011). Based on the status of the current literature (i.e., strength of evidence), stimulus control procedures should be considered when (a) one or more

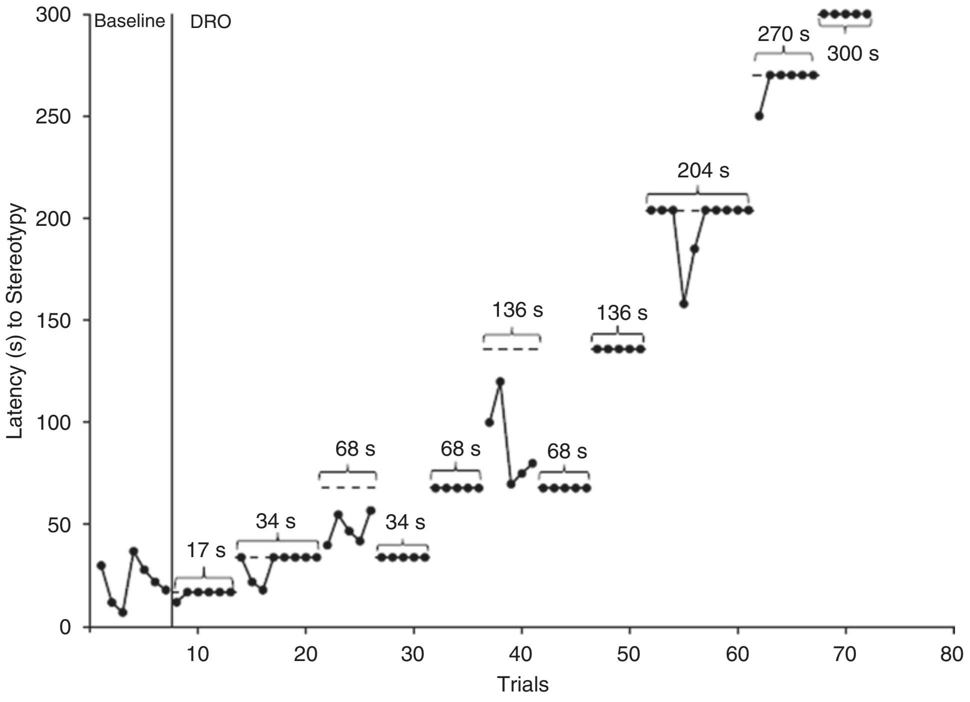

Fig. 9.9 Hypothetical results from a trial-based differential reinforcement of other behavior (DRO) treatment

preferred items cannot be identified for the client, (b) engagement with preferred items does not reduce stereotypy, (c) response cost with preferred items is ineffective, or (d) DRO does not consistently reduce stereotypy. Moreover, there must be at least one context in which engagement in stereotypy is not viewed as an inappropriate behavior. An additional feature to a stimulus control procedure may involve teaching individuals to request access to stereotypy contingent on academic engagement or other appropriate behaviors (e.g., Anderson et al., 2010; Slaton & Hanley, 2016). To arrange this contingency, clear contexts need to be established as to when stereotypy is and is not freely available; these signaled contexts are taught using stimulus control procedures.

To set up a stimulus control procedure, the practitioner should help the instructor select visual stimuli to signal the conditions. Researchers have used different colored cards: for example, a green card to signal that stereotypy is available and a red card to signal that stereotypy is not available (i.e., the instructor will provide a consequence for engaging in stereotypy). Practitioners should choose a signal that is salient to the individual receiving treatment (i.e., it should be large, at eye level, and placed where the individual will be oriented). In what follows, we illustrate the stimulus control process using green and red cards to signal when stereotypy is and is not permitted, respectively.

To implement a stimulus control session, an instructor should show the individual the green card and say, “It’s green time!”, and then allow the client to freely engage in stereotypy without programmed consequences. At the end of the green card condition (hereafter denoted “green condition”), the instructor should immediately remove the green card and replace it with the red card. The instructor should point to the red card and say, “It’s red time, keep your hands in your lap” (or other appropriate references to refrain from stereotypy). If the client engages in stereotypy during the red card condition (hereafter denoted “red condition”), the instructor should provide the predetermined consequence. Consequences should be selected based on previously observed effects on stereotypy. For example, results from previous treatment or observations could indicate that providing a verbal reprimand (e.g., the instructor firmly stating, “Hands down” or “No flapping”) stops the behavior in the moment. However, if previous experience providing verbal reprimands does not decrease the behavior, a different consequence should be considered. Other possible consequences include blocking (e.g., gently placing the individual’s hands on his or her lap for 2 s), response cost (if combined with NCR or a token procedure), or RIRD (discussed in the next section). The instructor or caregiver should provide the consequence immediately each time the individual starts to engage in stereotypy during the designated red condition.

When the stimulus control procedure is fully developed, instructors or caregivers should provide various types of instruction during the red condition. Presumably, the client will comply with academic or vocational instruction (and receive contingent praise, edibles, or both) and abstain from stereotypy during the red condition. Completion of the red condition should be immediately followed by a brief period of free access (without tasks) to stereotypy during the green condition. At the end of the green period, the instructor or caregiver re-presents the red condition with the corresponding tasks, and the process is repeated as needed across the instructional period. Data should be collected on the client’s stereotypy using methods described above (e.g., 10-s MTS) and graphically depicted to allow for visual monitoring of the results of the stimulus control intervention.

Although initial training with the stimulus control procedure should be conducted with equivalent durations with each condition, the terminal goal should be to both extend the red condition duration and decrease the green condition duration. For example, Cook et al. (2014) initially alternated 5-min sessions with red and green conditions. Thereafter, we gradually increased the red condition to 10 min and decreased a no-card condition, which was comparable to the green condition, to 1 min. In this way, the client displays little, if any, stereotypy during 10-min work segment to gain free access to stereotypy during a 1-min free period. If graphically depicted data show that stimulus control procedures involving response cost, response blocking, or mild reprimands do not reduce stereotypy, practitioners should consider the use of RIRD.

Procedures that involve RIRD consist of interrupting stereotypic behavior as soon as it occurs and prompting the individual to engage in three compliant responses following demands from an instructor. For instance, an instructor implementing RIRD for hand flapping would require the client to display a gross-motor imitation response such as “clap hands,” “pat legs,” or “pat head,” each of which is topographically incompatible with hand flapping. When implementing RIRD, instructors should also provide praise for socially appropriate behavior such as completing academic tasks without stereotypy. Although research demonstrates that RIRD can decrease motor stereotypy, vocal stereotypy, or both (Ahearn, Clark, MacDonald, & Chung, 2007; Ahrens, Lerman, Kodak, Worsdell, & Keegan, 2011; Miguel, Clark, Tereshko, Ahearn, & Zarcone, 2009; Schumacher & Rapp, 2011), RIRD is more intrusive than the other treatments described in this chapter. As such, practitioners should implement RIRD only after the other treatments have not decreased stereotypy to clinically acceptable levels.

When considering RIRD, it is important to note that if RIRD is to be implemented by caregivers, the practitioner should provide adequate training and continuous monitoring of treatment fidelity. Research has shown that it may be common for caregivers to implement and discontinue RIRD at incorrect times, which could have broad deleterious effects on treatment outcome (Giles, Swain, Quinn, & Weifenbach, 2017). Further, as previously noted, RIRD could be more effective when combined with a procedure that involves positive reinforcement (Lerman & Vorndran, 2002; but see Lydon, Healy, Moran, & Foody, 2015). As such, we recommend embedding RIRD in another intervention for stereotypy with a positive reinforcement component like a stimulus control procedure (e.g., providing contingent access to stereotypy). As with NCR plus response cost, the effects of RIRD should be visually evident within three to five treatment sessions.

9.1.10.4 Considerations of Treatment during Academic Periods

When considering the treatment options presented here (DRO, stimulus control, and RIRD), the first option should be DRO because it is a reinforcement-based procedure and less intrusive than punishment-based procedures like RIRD. However, DRO is not without limitations.

9.1.10.5 Considerations of DRO

One potential disadvantage of a DRO procedure is the limited terminal-interval durations that have been demonstrated in the literature. Although some studies have increased the DRO interval to 10 min or more, many studies conclude with a terminal duration of less than 1 min, which is of limited practical utility. As such, the terminal DRO interval must fit the context of either academic or vocational training. The second consideration is that DRO may be more difficult to implement for vocal stereotypy than for motor stereotypy. Vocal stereotypy is not easily blocked, whereas blocking can be practically applied to motor stereotypy. As such, the effects of DRO on vocal stereotypy may be limited. If DRO is not effective, stimulus control procedures are a viable option, but have their own considerations.

9.1.10.6 Considerations of Stimulus Control Procedures

One disadvantage of stimulus control procedures is that they have not been evaluated for periods of low supervision. For example, if a practitioner wants to implement the red condition during periods of independent work, the extent to which the red card will inhibit stereotypy without the close presence of the instructor or caregiver is unknown. Moreover, the average duration of the inhibitory (red card) condition in the literature is 6 min (Lydon et al., 2016). In short, the presence of an instructor is required for this procedure. Second, stimulus control procedures typically require a mild aversive consequence for engaging in stereotypy during the red condition. Third, this procedure requires a place and time wherein engagement in stereotypy is acceptable.

9.1.10.7 Considerations of RIRD

Procedures involving RIRD may be limited due to its aversive nature, and do not involve reinforcement unless combined with another procedure. As such, we caution practitioners about using this procedure in isolation and recommend that practitioners first attempt the other treatments discussed. Further, some studies suggest that the effects of RIRD on stereotypy could be overstated for some individuals due to methodological issues (Carroll & Kodak, 2014; Rapp & Lanovaz, 2016; Wunderlich & Vollmer, 2015). Despite the limitations noted here, DRO, stimulus control, and RIRD may be viable treatment options for some individuals during contexts involving academic work and other tasks. Ultimately, a practitioner's treatment selection should be dictated by the treatment context, a client's programming goals, and available resources.

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Functional Analysis and Challenging Behavior

10

Kathryn M. Kestner and Claire C. St. Peter

Abstract

Many children diagnosed with ASD engage in challenging behavior, which can interfere with relationships, academic success, and daily functioning, or pose a safety risk to the individual or others (e.g., aggression, self-injury). Challenging behavior may develop and persist because of the consequences it produces, such as gaining access to attention or activities or ending undesired situations. When treating challenging behavior, therapists often perform assessments to identify why the behavior occurs (i.e., the function). A variety of functional behavior assessment (FBA) methods are discussed in this chapter, including indirect assessments (e.g., interviews), descriptive assessments (e.g., naturalistic observation of a client's behavior), and functional analysis (i.e., manipulation of the environment to determine reinforcers maintaining challenging behavior). Functional assessments help therapists identify interventions that are likely to be effective and avoid those that would be contraindicated or ineffective. We recommend that therapists incorporate the function of challenging behavior into intervention planning, particularly when behavior is maintained by idiosyncratic variables or is not quickly responsive to well-established manualized interventions.

10.1 Prevalence of Challenging Behavior for Children with ASD

Challenging behavior (sometimes called problem behavior or externalizing behavior) generally refers to repeated instances of behavior that interfere with learning or social interactions. Some examples of challenging behavior include physical aggression, self-injury, tantrums, verbal aggression, property destruction, and noncompliance (e.g., McClintock, Hall, & Oliver, 2003). These and other forms of challenging behavior can interfere with academic success (Neitzel, 2010), contribute to teacher and family stress (Baker, Blacher, Crnic, & Edelbrock, 2002; Hastings et al., 2005; Lecavalier, Leone, & Wiltz, 2005), and predict out-of-home placements (McIntyre, Blacher, & Baker, 2002). In addition to the potential negative effects on relationships and functioning, some forms of challenging behavior (e.g., self-injury or physical aggression) can result in physical harm to the client or others.

Although challenging behavior is not a formal component of the diagnostic criteria for autism

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spectrum disorder (ASD; American Psychiatric Association, 2013), children diagnosed with ASD are more likely to exhibit clinically significant challenging behavior than their typically developing peers (Brereton, Tonge, & Einfeld, 2006; McClintock et al., 2003). For example, Hartley, Sikora, and McCoy (2008) found that 27% of parents of children with ASD rated their child's externalizing challenging behavior in the clinically significant range. Addressing challenging behavior is critical in part because the severity of challenging behavior is significantly correlated with parental stress (Baker et al., 2002; Hastings et al., 2005; Lecavalier et al., 2005), which may lead to parents becoming less effective intervention agents, and eventually lead to increased levels of challenging behavior (e.g., Lecavalier et al., 2005).

10.2 Relation Between Problem Behavior and Environment

A fundamental assumption of the functional assessment approach is that the consequences of behavior affect the future likelihood of that behavior. Therapists who want to have the most dramatic and lasting improvements of challenging behavior can do so by disrupting the relation between challenging behavior and the consequences that maintain it. To do so, therapists must determine which environmental events are likely to maintain which forms of challenging behavior for a particular individual. One way of making this determination is through the use of functional behavior assessment, including functional analysis. The consequences maintaining behavior can occur in the external environment or as sensory consequences inside the behaving person. For example, an individual might scream to gain access to attention from others, to escape an aversive situation, or to feel the vibrations in their throat. The consequences that maintain the behavior are called the "function" of the behavior.

10.2.1 Etiology of Behavioral Function

Environments exert a strong influence on challenging behavior. For example, suppose that a child whines when parents are not attending to the child. If parents attend to the whining, that whining becomes likely to occur when the child is not receiving attention. In other words, the child learns to use whining as a way to request parental attention, and that parental attention *reinforces* the whining. Although most forms of challenging behavior are reinforced by attention, access to items, or escape from aversive situations (see Beavers, Iwata, & Lerman, 2013, for a review), any event that follows challenging behavior might be a reinforcer maintaining that behavior, including events like "getting my way" (Hanley, Jin, Vanselow, & Hanratty, 2014) or being able to engage in repetitive behavior (Falcomata, Roane, Feeney, & Stephenson, 2010).

In addition to the consequences that maintain behavior, the events that occur before behavior (*antecedents*) also influence challenging behavior. In the whining example above, parental inattentiveness serves as a trigger for problem behavior. That is, whining is more likely to occur when the parent is not attending to the child. Therapists call these motivational events *establishing operations* (Laraway, Snycerski, Michael, & Poling, 2003). Establishing operations have two influences on behavior: they increase the value of a consequence (i.e., make it more reinforcing), and evoke behavior that previously resulted in that consequence. In the example above, removal of attention for some period of time makes attention more reinforcing and leads to the child engaging in behavior that has resulted in attention in the past. Establishing operations can take a variety of forms, including removal of attention or items, over- or under-stimulation, or presentation of aversive situations.

Events that signal that a reinforcer is available also influence the likelihood of responding. If behavior is more likely to be reinforced in the presence of one event than another, the child will be more likely to engage in the behavior in the presence of that event. Events that have been associated with reinforcement and therefore evoke behavior are called *discriminative stimuli*. Continuing with the example of parental attention from the paragraphs above, if withdrawal of attention is an establishing operation for whining, but the child's father is much more likely to attend to whining than is the child's mother, then the child is likely to whine when the father does not attend, but not when the mother does not attend. In technical language, the father is a discriminative stimulus for whining because his presence signals the availability of attention for whining. Like establishing operations, discriminative stimuli can take a variety of forms. Any stimulus that is correlated with the availability of reinforcement can become a discriminative stimulus, including locations and people.

For individuals with ASD or developmental disabilities, the most common establishing operations that evoke challenging behavior are removal of attention, removal or denied access to items, or presentation of difficult demands (Beavers et al., 2013). Although these events are the most common establishing operations, individuals' varied reinforcement histories result in idiosyncratic differences across individuals that are difficult or impossible to predict based on the form of the behavior or the diagnosis of the individual. As examples, challenging behavior may be evoked by harshly presented demands but not the same demand presented in a different tone of voice (Borrero, Vollmer, & Borrero, 2004) and may be maintained by atypical reinforcers, like access to talking about preferred topics (e.g., Roscoe, Kindle, & Pence, 2010). More information about idiosyncratic functions of behavior appears in the section on functional analysis, below.

The events that evoke and maintain behavior need not occur in the external environment. Sensory events that occur "inside the skin" can also evoke and maintain challenging behavior. Some forms of behavior, particularly self-injurious behavior (e.g., head banging, hand mouthing) or stereotypic behavior (e.g., body rocking, repeated nonfunctional vocalizations), are often maintained by sensory consequences (Beavers et al., 2013). In the behavior-analytic literature, these internal reinforcers are called *automatic* because the behavior automatically produces the reinforcer without involvement of another person. Even when the reinforcer occurs externally, the establishing operation may be internal. For example, individuals might be more likely to engage in challenging behavior that has previously resulted in the delivery of food (an external event) when they have not eaten (that is, when they are hungry), or engage in behavior that terminates aversive events when they have not slept (Kennedy & Meyer, 1996).

10.2.2 Common Functions of Challenging Behavior

Regardless of whether the reinforcers occur inside or outside of the skin, they can be categorized as being pleasurable stimuli added to the environment or aversive stimuli being removed from the environment. In other words, individuals engage in behavior to produce desirable consequences or escape or avoid undesirable consequences. When stimuli are added after a behavior that result in increases in the likelihood of behavior, the behavior is said to be maintained by *positive reinforcement*. Common positive reinforcers include gaining parents' attention or gaining access to items or activities following a behavior. For example, a parent may intend for attention to reduce the behavior (such as when parents reprimand a child), but that attention can actually serve as a positive reinforcer if the child continues to engage in the behavior to gain the parent's reprimands. Similarly, a parent may intend to reduce the behavior by providing comfort or items meant to have a calming effect, but these consequences may also serve as positive reinforcers. Such discrepancies between the form or intention of the consequence and the function that the consequence actually serves are common for individuals with ASD; a robust literature on functional analysis (described in more detail in the sections that follow) has shown that reprimands can serve as potent positive reinforcers for challenging behavior (e.g., Iwata, Dorsey, Suifer, Bauman, & Richman, 1982/1994). Recent studies suggest that about 33% of assessments of behavioral function show that behavior is maintained by a socially mediated positive reinforcer (i.e., reinforcers delivered by another person; Beavers et al., 2013).

Behavior can also be maintained by removal of aversive stimuli after the behavior. When aversive stimuli are removed after a behavior and the behavior becomes more likely, the behavior is said to be maintained by *negative reinforcement*. Termination of demands (i.e., instructions or tasks) is the most common negative reinforcer assessed (Beavers et al., 2013), but behavior can also be maintained by the removal of other stimuli that the individual finds aversive, like loud noises (e.g., McCord, Iwata, Galensky, Ellingson, & Thomson, 2001) or even attention from others (e.g., Marsteller & St. Peter, 2012). For example, consider a situation in which a parent gives a child an instruction to put his or her clothes away, but then stops delivering the instruction when the child refuses. The parent discontinuing his or her instructions may inadvertently serve as a (negative) reinforcer for the challenging behavior. Even a very brief termination of aversive stimuli like demands to complete a task can function as a negative reinforcer. For example, termination of a demand for a period as brief as 30 s can effectively reinforce challenging behavior for some individuals (e.g., Iwata et al., 1982/1994).

Negative-reinforcement contingencies can sometimes be difficult to identify because individuals may begin to engage in the challenging behavior as soon as "warning stimuli" are present (i.e., events that signal an upcoming aversive event will occur, even before the actual event occurs). For example, a child may begin screaming as soon as a parent takes out materials associated with difficult work, even before the parent has actually asked the child to do the task. Recent studies suggest that about 32% of assessments of behavioral function show that behavior is maintained by a socially mediated negative reinforcer (Beavers et al., 2013).

Notably, it is difficult to predict the function of behavior from its form alone. For example, in the published literature on functional analysis of *aggression*, about 18% of cases showed maintenance by positive reinforcement, 20% of cases showed maintenance by negative reinforcement, and about 7% showed maintenance by sensory/automatic reinforcement (notably, a clear function could not be obtained for all cases; Beavers et al., 2013). Thus, even though the *form* of behavior was similar (aggression), the *function* of behavior differed across cases. Function cannot be inferred from the form of the response or the diagnosis of the individual but must be individually determined. Additionally, the function of behavior can shift over time. For example, Lerman, Iwata, Smith, Zarcone, and Vollmer (1994) demonstrated that the function of behavior changed for three of four participants across a span of time ranging from 2 months to 2 years. Thus, function is not a static property of a particular behavior.

Understanding the function of behavior is important because function-based interventions have at least five advantages over interventions not based on behavioral function. First, therapists using function-based interventions can teach individuals more appropriate ways to access the reinforcer that is already maintaining challenging behavior rather than simply overriding those existing contingencies with other potent reinforcers or punishers. Interventions that are based on teaching a new, communicative response and reducing or eliminating the reinforcer maintaining challenging behavior are known as functional communication training (see Kurtz, Boelter, Jarmolowicz, Chin, & Hagopian, 2011, and Mancil, 2006 for reviews). Functional communication training was first described by Carr and Durand (1985) and has since been established as a highly effective intervention strategy with considerable generality (Kurtz et al., 2011; more information on functional communication training appears in Chap. 11). Thus, function-based interventions can strengthen communication skills, an area of known weakness for children with ASD. Second, the combination of reinforcement for an alternative behavior with cessation of reinforcement (extinction) for challenging behavior results in more robust treatment outcomes than interventions that do not involve extinction (e.g., Fisher et al., 1993). Third, interventions that use reinforcers identified in a functional analysis may prevent the child from experiencing long periods of deprivation from those reinforcers by teaching the child a new, more appropriate method for accessing the reinforcer (e.g., Michael, 2000). Fourth, the use of function-based interventions may reduce the reliance on punishment-based procedures, like timeout or the loss of privileges (e.g., Kahng, Iwata, & Lewin, 2002; Pelios, Morren, Tesch, & Axelrod, 1999). Such reductions in the use of punishment may increase the extent to which consumers find the interventions acceptable (e.g., Miltenberger, Lennox, & Erfanian, 1989). Finally, function-based interventions may be more humanistic than standardized interventions because they are necessarily tailored to meet the needs of the individual client (see Hanley, 2010 for a description of how individualizing interventions is a humanistic approach). For more information on function-based interventions, see Chap. 11 in this text. The remainder of this chapter discusses how to identify behavioral function, which is the first step to developing a function-based intervention.

10.3 Functional Behavior Assessment

Functional behavior assessment (FBA) refers to all of the assessment methods that are used to identify a function of behavior. The three categories of FBA are indirect assessment (e.g., interviews), descriptive analysis (e.g., ABC observations), and functional analysis. A primary purpose of indirect and descriptive assessments is to develop hypotheses about the function of the behavior. Functional analysis is the only FBA method that can show a functional (rather than correlational) relation between a hypothesized function and challenging behavior. There are pros and cons to each method, and it is sometimes recommended that therapists use a combination of methods as part of the assessment process (O'Neill et al., 1997).

10.3.1 Indirect Assessments

Indirect methods of FBA are used to gather information related to challenging behavior from those who are familiar with the client (e.g., caregivers). Indirect assessments can include questions that are open or close ended and are conducted as interviews, rating scales, or questionnaires. Unlike the assessment methods described later in this chapter, indirect assessments do not involve the direct observation of the client's behavior.

Because the validity and reliability of close-ended assessment tools are questionable (Dufrene, Kazmerski, & Labrot, 2017), some researchers now recommend open-ended interviews as a method of indirect assessment (e.g., Hanley, 2014). Open-ended interviews consist of asking the caregiver about aspects of the behavior, including the form of the behavior, common triggers, and what the caregiver does to stop the behavior. One such open-ended scale is the functional assessment interview (FAI), a semi-structured interview that typically takes 45–90 min to complete (O'Neill et al., 1997). Questions in the FAI ask caregivers to describe the challenging behavior, provide information about potential setting events (i.e., establishing operations), describe the typical antecedents and consequences for challenging behavior, identify reinforcers, and discuss the effects of previous interventions. Based on these responses, the therapist can derive hypotheses regarding antecedents and maintaining reinforcers for each challenging behavior and gather other important information to be used in the intervention-planning process.

Indirect assessments may be advantageous because they do not require extensive time or resources to complete. Many indirect assessments could be easily incorporated into intake meetings with parents. For therapists using parent-child interaction therapy (PCIT), indirect assessments could be conducted before the start of the child-directed interaction phase, at the same time that the therapist might do other parent-report measures like the child behavior checklist. Through the use of indirect assessments, therapists can easily gain an array of information that might support various other aspects of the assessment and intervention process.

Therapists can use indirect assessments to identify and operationally define challenging behavior. Designing operational definitions helps therapists plan for a data collection system for direct observations (e.g., descriptive analysis) and for tracking treatment progress. Interviews can help therapists narrow down the situations (e.g., settings, activity, time of day) during which the challenging behavior is more and less likely to occur. This information helps to develop hypotheses about the function of behavior and the plan for direct observations. Other advantages include gathering information leading to potential medical rule-outs, such as identifying health conditions or medications contributing to challenging behavior. For example, chronic ear infections can contribute to self-injury directed toward the ear because the behavior can result in the temporary reduction in pain caused by the infection. Likewise, medication can influence behavior by affecting motivation (e.g., a medication that increases appetite may also increase challenging behavior that is maintained by access to food).

Indirect methods can be helpful for assessing behavior that is not conducive to direct observation. For example, indirect methods may be appropriate for low-frequency challenging behavior or challenging behavior that would pose a serious health risk should it occur even one time (e.g., forms of self-injury, such as eye gouging, that may cause irreversible tissue damage). Low-frequency challenging behavior is difficult to capture during direct observation or functional analyses (e.g., a child who engages in physical aggression once or twice per month; O'Neill et al., 1997).

Therapists can also use indirect methods to prepare for descriptive and functional analyses. The events identified by caregivers can then be used to design procedures that explicitly evaluate the role of those events in regard to the problem behavior (Hanley, 2014; see more about this in the section on functional analysis, below). For example, the open-ended functional assessment interview (Hanley, 2009) can be used to directly inform the development of functional analysis conditions (see discussion of the interview-informed synthesized contingency analysis, in the Variations on Functional Analysis section, below). Additionally, indirect assessments provide an opportunity for the therapist to build rapport with the caregivers (Hanley, 2014).

Indirect assessments also include some noteworthy limitations. First, indirect assessments are only useful for determining behavioral function if the informants provide accurate information. One approach is to select interviewees who have considerable knowledge of the client and presenting problem (Hanley, 2014). However, recent research suggests that when multiple caregivers are interviewed, they are unlikely to report similarly about behavior; experts are better able to identify possible functions of behavior following brief observations of the client than are caregivers (Dracobly, Dozier, Briggs, & Juanico, 2017). Second, indirect assessments can only suggest possible correlations between possible reinforcers and behavior. In the absence of direct observation, it is exceedingly difficult to develop effective interventions from these reports alone.

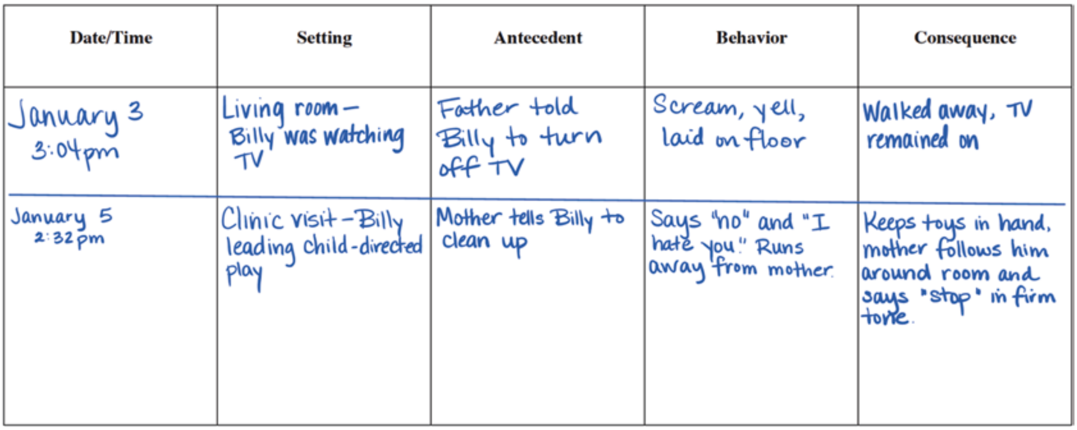
10.3.2 Descriptive Assessments

When conducting a descriptive assessment, therapists directly observe the client in the setting(s) in which the challenging behavior occurs. This is typically in natural settings, such as the child's home or classroom, but observations could also occur during clinic appointments. Therapists collect data on instances of challenging behavior and the events that surround the behavior (e.g., setting events, antecedents, consequences). Unlike a functional analysis, therapists typically do not change any aspects of the environment during a descriptive analysis (but, see our description of structured descriptive assessment at the end of this section). Rather, they observe the client's behavior under the conditions that would typically be present.

As mentioned in the previous section, therapists can use the information from an indirect assessment to identify appropriate observation periods. Ideally, descriptive analyses include observations during times and locations where the challenging behavior is likely to occur naturally. If this is not possible (for example, if the assessment is done during clinic appointments), therapists should structure the assessment to resemble the natural environment as much as possible. In many cases, it is also useful to observe (at least briefly) during situations that are unlikely to evoke the challenging behavior. Observing situations that both increase and reduce the likelihood of challenging behavior can allow the therapist to identify possible differences across those environments that might be impacting the behavior. For example, if an open-ended interview reveals that a child engages in challenging behavior at the table when he or she eats lunch with his or her mother, but not during dinner when his or her father is also present, observing during both of these situations may help the therapist identify the different variables potentially contributing to the target behavior.

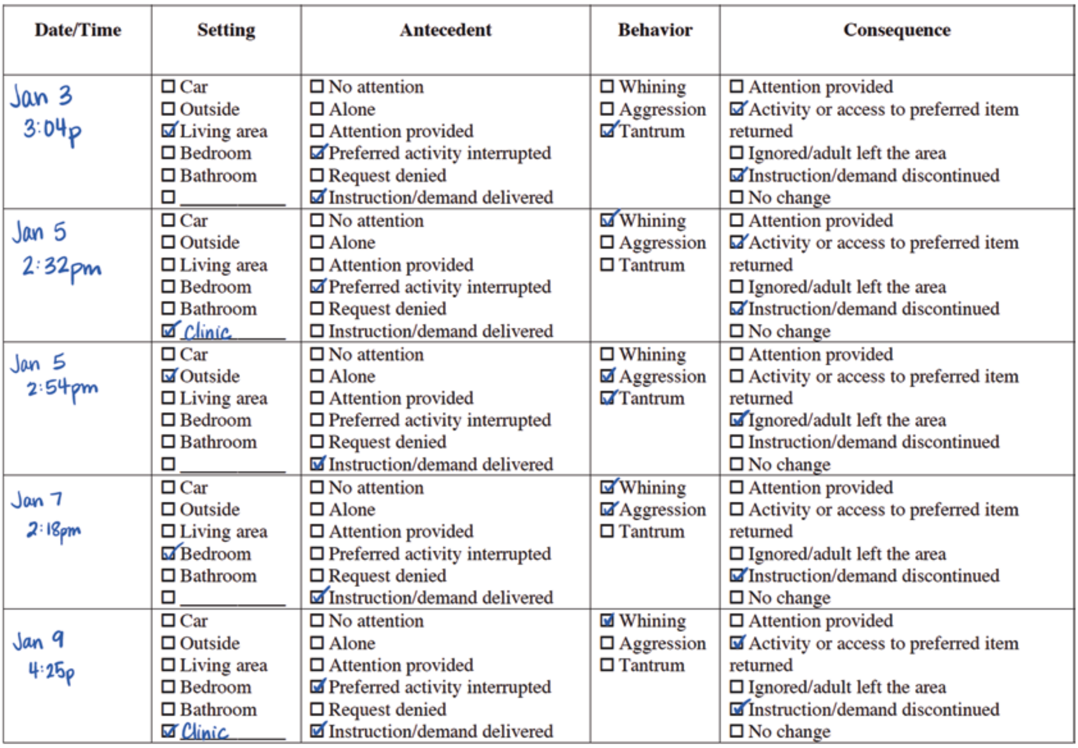
A common observation method for descriptive analysis is called antecedent–behavior–consequence (A–B–C) data collection (e.g., Bijou, Peterson, & Ault, 1968). ABC data collection often involves recording the date, time, and setting of target behavior and the events surrounding the occurrence of challenging behavior. Specifically, therapists record the antecedent and consequence events of the target behavior (i.e., events that occur directly before behavior and events that occur during or directly following behavior, respectively). For example, suppose a therapist observed an instance of target behavior that occurred directly after a parent told their child to turn off the television. After the parent's instruction, the child engaged in a tantrum and the parent walked away. The therapist would record the instruction to turn off the television as the antecedent, the tantrum as the target behavior, and the removal of the instruction as the consequence (see Fig. 10.1).

Different styles of ABC data recording can be used during a descriptive analysis. ABC recording can be narrative, in which the observer describes the ABCs in his or her own words (e.g., Lerman, Hovanetz, Strobel, & Tetreault, 2009; see Fig. 10.1 for an example). Alternatively, therapists can use a structured method with a data sheet with pre-arranged categories of responses. For example, a structured data sheet may include a line for the time and date of an occurrence of challenging behavior, along with checkboxes and prelisted options for the antecedents, behavior, and consequences (e.g., Functional Assessment Observation Form [FAOF]; O'Neill et al., 1997). Figure 10.2 gives



Date/Time	Setting	Antecedent	Behavior	Consequence
January 3 3:04pm	Living room – Billy was watching TV	Father told Billy to turn off TV	Scream, yell, laid on floor	Walked away, TV remained on
January 5 2:32pm	Clinic visit – Billy leading child-directed play	Mother tells Billy to clean up	Says "no" and "I hate you." Runs away from mother.	Keeps toys in hand, mother follows him around room and says "stop" in firm tone.

Fig. 10.1 A narrative ABC recording form



Date/Time	Setting	Antecedent	Behavior	Consequence
Jan 3 3:04p	☐ Car ☐ Outside ☑ Living area ☐ Bedroom ☐ Bathroom ☐ ___________	☐ No attention ☐ Alone ☐ Attention provided ☑ Preferred activity interrupted ☐ Request denied ☑ Instruction/demand delivered	☐ Whining ☐ Aggression ☑ Tantrum	☐ Attention provided ☑ Activity or access to preferred item returned ☐ Ignored/adult left the area ☑ Instruction/demand discontinued ☐ No change
Jan 5 2:32pm	☐ Car ☐ Outside ☐ Living area ☐ Bedroom ☐ Bathroom ☑ Clinic	☐ No attention ☐ Alone ☐ Attention provided ☑ Preferred activity interrupted ☐ Request denied ☐ Instruction/demand delivered	☑ Whining ☐ Aggression ☐ Tantrum	☐ Attention provided ☑ Activity or access to preferred item returned ☐ Ignored/adult left the area ☑ Instruction/demand discontinued ☐ No change
Jan 5 2:54pm	☐ Car ☑ Outside ☐ Living area ☐ Bedroom ☐ Bathroom ☐ ___________	☐ No attention ☐ Alone ☐ Attention provided ☐ Preferred activity interrupted ☐ Request denied ☑ Instruction/demand delivered	☐ Whining ☑ Aggression ☑ Tantrum	☐ Attention provided ☐ Activity or access to preferred item returned ☑ Ignored/adult left the area ☐ Instruction/demand discontinued ☐ No change
Jan 7 2:18pm	☐ Car ☐ Outside ☐ Living area ☑ Bedroom ☐ Bathroom ☐ ___________	☐ No attention ☐ Alone ☐ Attention provided ☐ Preferred activity interrupted ☐ Request denied ☑ Instruction/demand delivered	☑ Whining ☑ Aggression ☐ Tantrum	☐ Attention provided ☐ Activity or access to preferred item returned ☐ Ignored/adult left the area ☑ Instruction/demand discontinued ☐ No change
Jan 9 4:25p	☐ Car ☐ Outside ☐ Living area ☐ Bedroom ☐ Bathroom ☑ Clinic	☐ No attention ☐ Alone ☐ Attention provided ☑ Preferred activity interrupted ☐ Request denied ☑ Instruction/demand delivered	☑ Whining ☐ Aggression ☐ Tantrum	☐ Attention provided ☑ Activity or access to preferred item returned ☐ Ignored/adult left the area ☑ Instruction/demand discontinued ☐ No change

Fig. 10.2 A structured ABC recording form

an example of a structured data sheet that includes multiple observations. For each episode of behavior, the observer notes the date and time and categorizes events occurring before and after behavior, as well as any forms of behavior that occurred. Structured ABC data sheets may allow more rapid data collection and quantitative analysis than narrative ABC because events are grouped into categories during data collection. However, structured data sheets may also restrict information about idiosyncratic or unusual variables that occur surrounding behavior. In highly structured training situations, therapists generally collect more accurate data using structured data sheets than narrative data sheets, and also prefer the structured format (Lerman et al., 2009; Pence & St. Peter, 2018). Therapists interpret ABC data by looking for patterns in the information collected on the antecedents and consequences for each form of challenging behavior (see Pence, Roscoe, Bourret, & Ahearn, 2009 for additional examples of ABC data collection and analysis). When a target behavior reliably occurs with specific antecedents and consequences, the therapist can hypothesize the function of behavior. For example, if the data show that challenging behavior most often occurs directly after an instruction and is followed by the removal of the demand, it may be hypothesized that the target behavior is maintained by negative reinforcement in the form of escape from demands (see Fig. 10.2). Similarly, if challenging behavior most often occurs when a caregiver is not paying attention to the child and is then followed by attention (e.g., scolding), one may hypothesize that target behavior is reinforced by positive reinforcement in the form of attention. Some therapists also use more complex analyses, which involve calculating conditional probabilities (Lerman & Iwata, 1993; Mace & Lalli, 1991; Vollmer, Borrero, Wright, Van Camp, & Lalli, 2001). Such methods can be helpful but require more intense forms of data collection, such as taking time-stamped data several times per minute, even when the target behavior is not occurring (Mace, Lalli, & Lalli, 1991).

Descriptive analyses have several advantages. First, they eliminate the problems associated with retroactive self-report that are present for indirect assessments by having the therapist capture data on these events as they occur. Second, descriptive assessments do not require modifications to the environment, so they may be useful when therapists are particularly interested in naturally occurring caregiver-child interactions, or when modifications to the environment are not possible (for example, due to safety reasons). Third, descriptive analyses can identify possible idiosyncratic variables influencing behavior (Mace & Lalli, 1991; Tiger, Hanley, & Bessette, 2006), which can lead to a more successful functional analysis when those idiosyncratic events are incorporated (Hanley, Iwata, & McCord, 2003; Tiger et al., 2006). Perhaps for these reasons, descriptive assessment is the most commonly used FBA method by behavior-analytic therapists (Oliver, Pratt, & Normand, 2015).

Descriptive assessments may be particularly useful for therapists who wish to gain additional hypotheses about behavioral function while attempting other forms of treatment, such as PCIT. When treatment involves observation of parent-child interactions, particularly when those interactions are coded by the therapist, it may be possible to extract descriptive data from the existing codes. For example, presume that treatment coding suggests that a child often refuses when a parent makes a direct command. Rather than restating the demand, the parent sends the child to timeout after each refusal. The likelihood of the child refusing increases rather than decreases across treatment sessions. Sequences of events like these could be analyzed from observational coding and might suggest a potential function of behavior. In the example above, the therapist might speculate that the behavior was maintained by escape from demands, and that the timeout was sufficient escape to maintain the behavior. The therapist might work with the parent to remove the timeout after the problem behavior and ensure that the parent follows through on the original command. Alternatively, the therapist might use this information to inform a brief functional analysis (described below) to confirm the hypothesis before making treatment modifications.

Like the indirect assessment methods, there are several drawbacks to the use of descriptive analyses. Perhaps the most concerning limitation is the lack of validity for correctly identifying the function of challenging behavior (St. Peter et al., 2005; Thompson & Iwata, 2007). Descriptive analyses are less accurate in identifying the function of challenging behavior than functional analysis (described below; Lerman & Iwata, 1993; Thompson & Iwata, 2007). For example, because challenging behavior (particularly severe behavior) is often followed by some form of attention, descriptive analyses have a high rate of false positives for attention as a maintaining variable (St. Peter et al., 2005; Thompson & Iwata, 2007).

Additionally, although it seems easy to record the antecedents and consequences for behavior, research suggests that individuals are surprisingly inaccurate at the task (e.g., Pence & St. Peter, 2018). Individuals are particularly inaccurate when recording events like escape (Pence & St. Peter), perhaps because these events do not have a clear onset. For example, parents rarely explicitly remove a demand, but rather often fail to restate the demand following noncompliance. Thus, therapists are actually scoring the absence of a parent behavior rather than an explicit parental response. Additionally, analysis of descriptive data can be complicated because more than one antecedent or consequence often occurs in close proximity to the behavior. For example, in Fig. 10.1, the parent removes the demand (instruction to turn off the television) while simultaneously allowing continued access to a preferred activity (the television). This makes it difficult to determine whether the child is motivated by escaping instructions or accessing preferred items.

Another problem with descriptive analysis is that some caregivers learn to avoid situations that evoke undesired behavior (Carr, Taylor, & Robinson, 1991; Gunter et al., 1994); this can lead to long periods of observation during which the challenging behavior is never observed. For example, if asking a child to do chores led to challenging behavior in the past, caregivers may have learned to avoid asking the child to complete any chores. When caregivers avoid certain tasks during a descriptive analysis, it can lead to a false negative for an escape function (Hanley, 2012).

To some extent, these disadvantages can be reduced by structuring antecedents in the descriptive analysis. For example, a therapist might ask a parent to show what happens when the parent is busy (to evoke attention-maintained behavior) or when the child needs to complete work (to evoke escape-maintained behavior). *Structured descriptive assessments* (SDA) involve controlling antecedent events like those described above while allowing consequences to vary (e.g., Anderson & Long, 2002). Structured descriptive assessments may allow therapists to isolate variables that evoke challenging behavior and observe a wide range of possible antecedents, including those that parents might otherwise avoid. Although structured descriptive assessments still only identify correlated variables (unlike the functional analysis procedures described below), they have successfully identified reinforcers leading to effective treatments for diverse individuals across several studies (e.g., Anderson, English, & Hedrick, 2006; Anderson & Long, 2002; Dolezal & Kurtz, 2010).

10.3.3 Functional Analysis

Functional analysis (FA) is the most accurate assessment method for identifying maintaining variables of a challenging behavior displayed by children with ASD and is considered the current gold standard for determining behavior function. Functional analysis involves both the direct observation of the client's behavior and control of environmental variables (Hanley, 2012). During an FA, the therapist arranges test scenarios that each present the antecedents that potentially evoke challenging behavior (e.g., not attending to the client) and consequences potentially maintaining it (e.g., delivering attention following the behavior). Each possible maintaining variable is presented systematically so the therapist can determine the effects each has on challenging behavior. Functional analyses are tailored to the individual client, but the general procedures developed by Iwata et al. (1982/1994) are still the most commonly used (Beavers et al., 2013).

Beavers et al. (2013) identified 435 published research studies on FA. Of those studies, 26.7% were conducted with individuals diagnosed with autism. In the FA literature, some of the most researched forms of challenging behavior include aggression (43.2% of studies), vocalizations (22.5%), self-injury (54.7%), property destruction (20%), and disruptive behavior (21.8%; Beavers et al., 2013; note that some studies include multiple forms of challenging behavior, which is why the sum of the percentages exceeds 100%). Other forms of behavior for which FA procedures have studied include elopement, noncompliance, stereotypy, tantrums, and pica (Beavers et al., 2013).

Functional analyses are typically broken into distinct sessions, with highly controlled antecedents and consequences for behavior varying across sessions. The assessment sessions of an FA are each designed to test a possible function of behavior, and conditions are arranged to isolate variables in a similar manner to an experiment (which is why functional analyses are sometimes referred to as *experimental functional analyses*). The therapist arranges the establishing operation for the particular consequence being tested in that session. For example, when testing for attention-maintained behavior, the therapist arranges the antecedent by diverting attention away from the client. This increases the reinforcing value of attention if it indeed functions as a reinforcer. Any time the target behavior occurs, the therapist delivers the consequence associated with the test condition. In the case of the attention condition, the therapist would deliver attention each time the target behavior occurs.

Functional analyses often include multiple test conditions and, generally, each condition is tested several times across repeated sessions. The test sessions are typically 5–15 min in duration and conducted in rapid succession (Beavers et al., 2013). During each session, the therapist or assistant records data on occurrences of the target behavior. The therapist compares the rates or durations of target behavior during each condition to a comparison condition (i.e., *control* condition) in which the potential reinforcers are provided freely (i.e., there is no motivation to engage in challenging behavior). During a successful functional analysis, the challenging behavior is “turned on and off” by the antecedents and consequences arranged across conditions. Target behavior occurs more often in the condition including the antecedent(s) and maintaining reinforcer(s) than in the control condition.

10.3.3.1 Common Functional Analysis Conditions

Although conditions in a functional analysis should be selected based on hypothesized reinforcers for that particular client’s behavior, several conditions are commonly reported in the literature. These conditions are briefly described below.

Attention Condition

The attention condition is arranged to test for positive reinforcement in the form of attention as a potential maintaining reinforcer. To arrange the antecedent and motivating conditions, the therapist begins the session by announcing to the client that he or she has some work to do (e.g., paperwork), and then directs his or her attention to a task so he or she appears to be occupied. All responses except for the targeted form of challenging behavior are ignored. Each time the client engages in the target challenging behavior (e.g., hitting), the therapist provides brief attention (e.g., 20 s), mimicking the form of attention that is typically provided in the natural environment (e.g., reprimands, comforting statements). The therapist then withdraws his or her attention and continues to attend to his or her task until another instance of target behavior occurs.

Tangible Condition

The tangible condition tests for positive reinforcement in the form of gaining access to an item or activity. A tangible condition is only included when there is evidence from the indirect or descriptive analysis indicating that the client sometimes gains access to items during or after target behavior (e.g., food, iPad, toys); without this evidence, inclusion of a tangible condition may result in a false positive (Galiatsatos & Graff, 2003; Rooker, Iwata, Harper, Fahmie, & Camp, 2011; Shirley, Iwata, & Kahng, 1999). At the beginning of the session, the therapist removes the child’s access to the preferred item but keeps the item in sight. All behavior is ignored by the therapist unless the child emits the target behavior. Following each instance of the target behavior (e.g., a tantrum), the therapist provides access to the items for a set period of time (e.g., 20 s), and then restricts access again until the next occurrence of target behavior.

Escape Condition

The escape condition assesses for negative reinforcement as the maintaining variable, and it is usually arranged as escape from “chores” or academic activities. The activity should mimic demand situations that are present in the natural environment. At the beginning of the session, the therapist provides an instruction to complete the task (e.g., a math worksheet). He or she continues providing instructions and prompts throughout the session until the client emits the target behavior (e.g., whining) in which case he or she removes the task and stops providing instructions for a specified period of time (e.g., 20 s). The therapist then resumes presenting demands until another instance of target behavior occurs.

Alone/ignore Condition

The alone condition tests for automatic (sensory) reinforcement of the target behavior. The client is either left alone in a room or the therapist may be in the room with the client (the latter variation is often called an “ignore” condition, given that the client is not technically alone). Regardless, there are no social interactions or consequences delivered during the session. This situation is designed to mimic a period of time with low sensory input, which might evoke self-stimulation.

Play/control Condition

The play condition serves as a "control condition" for the assessment. During these sessions, the motivating operations for engaging in target behavior should be absent and there are no planned consequences for challenging behavior. Typically, this condition is arranged as including frequent, high-quality attention, no instructions or demands, and free access to preferred items and activities. If the target behavior does occur, the therapist continues the session without providing any special consequences. Because the motivation for attention-, escape-, and tangible-maintained behavior should be low, it is expected that very little target behavior will occur during this condition. Data on target behavior from each of the conditions (e.g., rate of responding) are compared to this condition.

10.3.3.2 Utility of Functional Analysis

By revealing the function of problem behavior, the results of a functional analysis narrow down the types of treatment procedures that are likely to be effective for decreasing an individual's challenging behavior (Hanley et al., 2003). Conducting a functional analysis can help therapists avoid prescribing an intervention that would be contraindicated. For example, timeout is often effective in cases of attention-maintained challenging behavior (Barkin, Scheindlin, Ip, Richardson, & Finch, 2007). If the challenging behavior is escape maintained, however, timeout would be a contraindicated intervention (Iwata, Pace, Cowdery, & Miltenberger, 1994). Because timeout procedures remove the child from the current activity or environment, using it under the wrong conditions can accidentally reinforce the challenging behavior. For example, parents who allow a child to run away when the child is asked to do an activity may be accidentally reinforcing the behavior. A similar situation may apply when a child vocally refuses to comply with parental directives, and the parent puts the child in timeout (thereby removing the demand for a period of time).

10.3.3.3 Considerations When Attempting a Functional Analysis

Functional analyses should not be undertaken lightly, as they may require considerable time, training, and resources. Additionally, FA technologies are not currently well developed for all forms of presenting challenging behavior (for example, behavior that is intense but very infrequent or that does not occur when others are nearby), and may pose a risk to the client due to the deliberate reinforcement of challenging behavior during the analysis. Several considerations for the implementation of FA procedures are briefly described below.

Material and Intellectual Resources Required

Therapists should consider whether they have the necessary resources in place prior to beginning a functional analysis. There are several resources required, the first of which is having a sufficient amount of available time with the client. Having some flexibility with the timeframe can also be helpful because it is difficult to predict the exact amount time that will be needed to complete an FA. The time requirement varies based on the case, number of test conditions, duration of test sessions, and number of times each condition is presented, the latter of which often depends on how clear the differences in responding are across conditions.

Sufficient and safe physical spaces are also needed to conduct an FA. The first requirement for a space is that the client and therapist are safe during the analysis. For example, sharp and hard objects should be removed from the area when assessing challenging behavior that involves using objects for self-injury or aggression. The space should also be relatively free of distractions to ensure that the antecedent and consequence conditions can be carefully controlled.

Finally, the analysis should be conducted by, or directly supervised by, a professional with direct training and expertise in functional analyses.

The individual overseeing the functional analysis should have previous experience with developing and implementing functional analyses, interpreting FA results, and function-based intervention planning. The therapist should also have expertise related to case-specific characteristics including the client's diagnostic category and form of challenging behavior.

Safety Concerns

In addition to arranging a safe space for the analysis (described above), therapists must incorporate additional safety procedures, especially when conducting a FA on potentially harmful forms of behavior (e.g., aggression or self-injury). Examples of safety procedures can be found in the literature (starting with Iwata et al., 1982/1994), but there are no standardized guidelines for safety procedures for FA (see Weeden, Mahoney, & Poling, 2010). The planning and execution of the FA should be done by, or with close consultation with, an individual who has specific training and experience with safety procedures. As part of the planning process, therapists should predetermine criteria for when an FA session would be terminated due to risk or injury. These criteria vary depending on the circumstance, and the decisions can sometimes be made with the assistance of a healthcare professional (e.g., Iwata et al., 1982/1994). Additional safety protocols may be needed, such as safety intervention techniques for blocking or avoiding instances of risky behavior. For example, a therapist may wear protective gear when the target behavior is aggression, or the surfaces in the room may be covered by a soft padding for self-injurious behavior that involves hitting surfaces. When dealing with potentially risky behavior, it is sometimes appropriate to speak with other health professionals, such as a physician, to determine the risk of harm (Hanley, 2012; Iwata et al., 1982/1994).

Design of Test and Control Conditions

Early steps in the development of client-specific FA procedures include selection of a target response and measurement system (Hanley, 2012). The target response should be of significance to the client and other stakeholders. When possible, therapists may try to target the lowest intensity challenging behavior that they believe serves the same function as other, more intense, forms of challenging behavior (Fritz, Iwata, Hammond, & Bloom, 2013). Selecting a lower intensity challenging behavior may reduce some of the safety concerns mentioned above. For example, if a child tends to stomp his or her feet and clench his or her fists before he or she engages in physical aggression, these precursor forms of behavior may share a function with aggression. When this is the case, a therapist can deliver consequences for the less severe forms of behavior (foot stomping and fist clenching) and avoid the occurrence the more severe behavior (aggression). Whatever challenging behavior is selected should be observable and measurable so that the frequency of the behavior can be compared across conditions (Hagopian, Dozier, Rooker, & Jones, 2013). Thus, the behavior should include a specific operational definition (for instance, "striking another person with an open hand") rather than a vague descriptor (like "aggression" or "becomes angry"). The operational definition of the behavior will help to inform the measurement system; does the response have a short duration and can be easily counted, or are other measurement strategies necessary?

After selection and definition of the target behavior, the therapist must determine what events might function as reinforcers for the behavior. As described above, therapists can develop initial hypotheses about possible reinforcers through indirect or descriptive assessments. Constraints on time or other resources might also impact the number of possible reinforcers that are tested in the FA; when therapists do not have much time, the number of test conditions must be limited. The form of the events in the FA should be analogous to those actually experienced by the client if possible. If this is not done, the reinforcers identified may differ from those maintaining the behavior in the natural environment (e.g., Lang et al., 2008). However, the possible reinforcers must be arranged such that the therapist can restrict access to those reinforcers (as an establishing operation) and present them only when prescribed by the FA protocol. For example, therapists often choose to use demands during an escape condition for which the child can be guided to comply (in an attempt to prevent unauthorized escape). Additionally, at least one control condition, in which the client has access to the possible reinforcers without having to engage in challenging behavior, should be included.

Other important considerations in the design of a client-specific FA procedure include the use of stimuli to signal the condition in place (Conners et al., 2000), the duration of sessions (Wallace & Iwata, 1999), the order of sessions (Hammond, Iwata, Rooker, Fritz, & Bloom, 2013), and the analysis of data (Hagopian et al., 1997). Each of these variables has been shown to systematically impact the outcomes of FA procedures. Thus, development of an appropriate functional analysis requires extensive training and expertise, and should not be undertaken by individuals without such training.

10.3.4 Variations of FA

Recall that variations of the procedures described by Iwata et al. (1982/1994) are still among the most commonly used (e.g., Beavers et al., 2013). These procedures use rapidly alternating conditions in which behavior is turned on and off across sessions, typically as shown by changes in response rate, to demonstrate what events functioned as reinforcers. Although there is a relatively strong demonstration of functional relations, this arrangement can require extensive time to complete (Iwata, Pace, Dorsey et al., 1994; Wallace & Iwata, 1999) and response rates can sometimes be unacceptably high (Thomason-Sassi, Iwata, Neidert, & Roscoe, 2011; Weeden et al., 2010). Thus, in some circumstances, other methodological variations of the FA are better suited to the environment or form of challenging behavior.

One such variation is the *brief functional analysis*. An early version of the brief functional analysis was described by Northup et al. (1991), who needed to complete a functional analysis in the span of a 90-min clinic visit. In one method for conducting a brief FA, the therapist conducts one session for each reinforcer hypothesized to maintain behavior. These initial sessions are used to identify the reinforcer that resulted in the highest rate of responding. The therapist alternates between sessions using this reinforcer and a control condition in which the reinforcer is provided for appropriate behavior rather than challenging behavior (a "contingency reversal"). For example, if a child's target behavior (refusals) occurred most often during the initial attention condition, the therapist would alternate between the attention condition (i.e., attention delivered after each refusal) and the contingency reversal condition (i.e., attention delivered after compliance). When successful, this brief assessment shows that behavior can be evoked and eliminated, and also demonstrates the possible treatment utility of reinforcing an alternative response. The entire analysis can be completed within the 90-min clinic appointment (Northup et al., 1991). Notably, however, outcomes of brief assessments may not match those obtained through longer FA procedures (Derby et al., 1992; Kahng & Iwata, 1999).

Another variation of typical FA procedures is the *trial based FA* (Sigafoos & Saggers, 1995). Trial-based FA procedures arrange antecedents and consequences in short, discrete units of time (typically, about 1–2 min). Trials end after a single target behavior occurs. Trials are conducted in two-trial blocks consisting of a brief exposure to a presumed establishing operation (a "test trial") and a brief exposure to a presumed reinforcer (a "control trial"). For example, in a trial-based FA of hitting, a therapist might test for an attention function by ignoring the child for 2 min (or until the first instance of hitting occurs), and then attending to the child for 2 min (or until an instance of hitting occurred; cf., Sigafoos & Saggers, 1995). This arrangement would be repeated for any other possible reinforcers; ten or more blocks of test and control trials are conducted for each possible reinforcer. The therapist measures the percentage of each kind of trial (e.g., attention test trials, attention control trials) during which the target behavior (e.g., hitting) occurred, and graphs the outcomes as grouped bars that directly compare test and control trials for each of the possible reinforcers. Functions of behavior are identified when target behavior occurs in a greater percentage of test trials than control trials for a particular reinforcer.

A more recent advance in FA methodology is the *Interview-Informed Synthesized Contingency Analysis*, or *IISCA* (Hanley et al., 2014). The IISCA uses on open-ended interview and brief observation to design individualized test and control conditions. The assumption of IISCA technologies is that single reinforcers (such as attention or escape in isolation) are unlikely to be sole forces in the maintenance of challenging behavior. Therefore, IISCA procedures often combine potential reinforcers into a single test condition; the combination of reinforcers is provided after each instance of challenging behavior. For example, if the interview suggests the parent attempts to soothe the child after a tantrum by talking and giving the child items, the test condition would arrange contingent delivery of both attention and tangibles following the challenging behavior. The control condition in this case would be arranged to provide constant access to attention and tangibles regardless of the child's behavior. Recent evaluations suggest that IISCA outcomes are unlikely to match those of more traditional FA methodologies (Fisher, Greer, Romani, Zangrillo, & Owen, 2016). Despite these mismatches, individualized treatments developed following IISCA procedures tend to be effective (Slaton, Hanley, & Raftery, 2017).

Although an array of FA procedures exist (see Iwata & Dozier, 2008 for an overview of common procedures used in practice), there is no standardized or manualized set of procedures that would be useful for all clients or presenting problems. In most cases, the procedures need to be modified to best capture the function of behavior within the constraints on available therapist resources. These modifications could include the duration of the session (Wallace & Iwata, 1999), the arrangement of sessions across time (see Iwata & Dozier, 2008, for some examples), and the particular forms of potential establishing operations and reinforcers that are arranged. An array of variables that are idiosyncratic to specific cases have been shown to influence FA outcomes (see Schlichenmeyer, Roscoe, Rooker, Wheeler, & Dube, 2013 for a review), and not all maintaining reinforcers are among those commonly tested. For example, challenging behavior can be maintained by access to rituals (Hausman, Kahng, Farrell, & Mongeon, 2009), parent compliance to the client requests (Bowman, Fisher, Thompson, & Piazza, 1997), and access to music (Carey & Halle, 2002). Thus, therapists must have a full understanding not only of how frequently described conditions might be conducted (see the previous section on the descriptions of common conditions) but also how to modify conditions to address the needs of a particular client.

Therapists also must have a thorough understanding of potential behavior-environment relations because there are no clearly established FA procedures for some forms of behavior. The currently established FA technologies may not be useful for behavior that occurs infrequently or that does not occur while others are watching. For example, it is difficult to conduct an FA on challenging behavior such as meltdowns that only occur once or twice per week, or aggression toward peers that happens only when adults are absent. For low-rate behavior, researchers have suggested extending the duration of the FA session to the entire day (Kahng, Abt, & Schonbachler, 2001) or conducting sessions only following an instance of challenging behavior (e.g., Tarbox, Wallace, Tarbox, Landaburu, & Williams, 2004). Although effective (e.g., Davis, Kahng, Schmidt, Bowman, & Boelter, 2012), such modifications are not always practical when staffing resources are limited.

There are at least three strategies that may be appropriate for covert behavior. One, therapists could determine what reinforcers maintain an arbitrarily selected response (like touching a card), in the hopes that a similar reinforcer maintains the covert behavior (Hanley, 2014). Two, it may be possible to measure responding during sessions using the products of the behavior rather than direct observation (similar to strategies used by Maglieri, DeLeon, Rodriguez-Catter, and Sevin, 2000), but such strategies have not yet been directly tested in the context of controlled research studies. Three, a therapist may rely on the hypothesized function derived from an indirect or a descriptive assessment and analyze the effects of a treatment based on the hypothesized function.

10.4 Conclusion

Incorporation of function into treatment planning may be particularly important when behavior is maintained by idiosyncratic variables or is not quickly responsive to well-established manualized interventions. Identifying the function of challenging behavior allows therapists to build interventions that are more effective and better meet the needs of the individual than interventions based on the form of the behavior. Although many methods exist for identifying function, FA technologies currently provide the best identification of behavioral function. However, developing and implementing appropriate FA procedures, and analyzing the results, requires extensive previous training and considerable knowledge of the client. In our opinion, the benefits that can be gained from understanding the function of behavior for individuals typically outweigh the costs. Thus, we recommend that therapists who regularly deal with challenging behavior exhibited by individuals with ASD or related disabilities seek explicit, high-quality training in functional analysis or collaborate with individuals who have such training, particularly when challenging behavior is resistant to manualized forms of intervention.

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11

Function-Based Interventions for Problem Behavior: Treatment Decisions and Feasibility Considerations

Sarah A. Weddle and Abbey B. Carreau

Abstract

Clinicians assisting children with deficits in social interaction and communication are likely to be tasked with assessing and treating their problem behavior as well. While problem behavior can range in severity, clinicians are at an advantage when they know the function of the problem behavior, and the child's relative or normative deficits in communication, tolerance for instruction, and preference for play. Thus, clinicians are positioned to implement or train parents on interventions that are functionally-based and/or empirically-supported which also have a greater likelihood of being effective. While intervention selection is a good place to start toward more positive outcomes for a child and family, there are other variables to consider that can further contribute to the success of an intervention plan. Once a clinician selects an intervention, the usability and fidelity can be improved by assessing and incorporating social validity factors into the decision-making process. Prior to implementation, clinicians should develop a detailed, yet succinct, intervention plan to establish consistency, train parents, and monitor integrity. This strategic approach to function-based intervention is rooted within an evidence-based framework.

11.1 Problem Behavior

An advanced understanding of the principles governing behavior has provided clinicians with a powerful technology of behavior change. This further provides an ethical responsibility to carefully consider why the behavior targeted for change is problematic, and to whom an intervention is likely to be of benefit. Clients have a right to effective treatment. On the other hand, they have a right to go without imposed behavior change that does not improve the quality of their life in any meaningful way. Accordingly, the first step in developing a treatment is to carefully determine which specific behaviors should be addressed or if at all (for further guidance in response selection, see Bosch & Fuqua, 2001; Cooper, Heron, & Heward, 2007; Hawkins, 1986).

Behavior selected for intervention may occur in many forms. Some responses may be relatively benign, such as brief episodes of noncompliance (i.e., failure to follow directions) or occasional talking out in class. Other responses pose much greater risk to self and others, such as self-injury, property destruction, pica (eating inedible items), or aggression. The challenge presented by the problem behavior often depends upon its frequency and intensity, which may range from mild (infrequent and low intensity) to severe (frequent and/or high intensity). Mild problem behavior may result in short-term challenges, but rarely

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results in substantial longer term social and educational detriments for the child or the larger community. By contrast, severe problem behavior greatly diminishes the quality of life of those affected, minimizing the extent to which individuals can access and engage in the community, successfully participate in a learning environment, or independently complete basic daily living skills. Severe problem behavior puts the individual and their extended community at serious risk of physical and emotional harm. It further places great social and financial burden on families and caregivers, as well as educational, medical, and community services.

So where should clinicians begin when an assessment is complete? Clinicians may have a relatively clear understanding of the function, and yet be overwhelmed with the volume of intervention options available via an initial literature review, common practice of their clinic and/or school, priorities of the family, and the overall precision required to execute intervention components with fidelity. An initial first step in the process is to parse through the evidence and examine the options available, and then assess the feasibility and practicality (discussed later in this chapter) of implementation with caregivers.

There are a variety of interventions available that aim to address problem behavior. On one side, there exists a preponderance of nonevidence-based options, often associated with claims and/or antidotes that greatly outweigh their true benefit. These common misrepresentations cloud important distinctions in efficacy between evidence-based intervention and “other” options (see Chap. 6 to learn more about the perils of nonevidence-based “fad” treatment options). Fortunately, this is balanced on the opposing end by a canon of empirically supported interventions. Many of these options do not rely on the function of the problem behavior. Token economies, level systems, behavioral contracts, and group contingencies are all examples of non-function-based behavioral interventions that may be implemented toward the improvement of problem behavior. Parent-child interaction therapy (PCIT) is a strategic approach to effective intervention that is not function based, but instead involves structured parent training in the implementation of various behavioral techniques during child-led play sessions and adult-led instructional sessions (Eyberg, 1988; Shillingsburg, 2005). PCIT has been shown to improve positive social behavior and decrease social avoidance and problem behavior for children and may be especially useful for young children who exhibit disruptive behavior. More recent research suggests that it may be effectively used to decrease problem behavior and increase positive social responses within the ASD population (Hansen & Shillingsburg, 2016).

Although some evidence suggests that PCIT may be effective in reducing some forms of problem behavior related to ASD (Lesack, Bearss, Calano, & Sharp, 2014), the effects of PCIT on severe or dangerous forms of problem behavior such as aggression, self-injury, elopement, or pica have less empirical support. In such cases, function-based intervention may be warranted.

11.2 Function-Based Intervention

Function-based interventions are empirically supported interventions for reducing problem behavior. They involve the systematic application of established behavioral principles (such as reinforcement, punishment, and extinction) to reduce challenging behavior and to increase alternative, appropriate behavior. An essential first step in function-based treatment is to have a good understanding of why the behavior is happening: it begins with functional assessment. As discussed in depth in Chaps. 2 and 10, problem behavior does not happen “out of the blue,” but instead is evoked by environmental antecedents (events that occur before problem behavior) and maintained by consequences (events that occur following problem behavior).

Chris was a 4-year-old with ASD who is minimally vocal. Chris’ parents express that they are concerned with his behavior, and through some discussion they identified aggression to be most concerning. Specifically, Chris will slap or kick his parents, and pull hair. Sometimes this occurs when they attempt sitting him in a chair for dinner, or when they change his clothing. Other times they notice yelling and some aggression when they are preoccupied with his older sister. The parents report that they know his language skills are below average and find it difficult to interact with their child. Due to their frustration with his aggression they commonly reprimand Chris and tell him "stop" following aggression. They also stop what they are doing (i.e., changing, sitting for dinner) with Chris to put him in time-out. They reported they have a hard time being consistent with time-out. The parents sought help because despite their efforts the aggression is becoming more intense and embarrassing around their extended family. Although this intervention (i.e., interruption via reprimand and time-out) is generally socially acceptable for typically developing children, and may be effective for many children, this would likely not be an effective intervention for Chris given his deficits in communication and advocating for himself. Making matters more complicated, it might appear to be a successful intervention, at least temporarily. To illustrate, when the parent reprimands Chris following aggression, it is likely to have an immediate effect on Chris' aggression. He is likely to stop aggressing because he has accessed the assumed functional reinforcer (adult attention), and a temporary pause with the expectation the parent is presenting (escape demand).

Unfortunately, the reality is that in the future Chris is more likely to be aggressive, because his behavior resulted in a better outcome for him, a parent interaction and cessation of something he does not care to do. Time-out is likely an ineffective option since it allows Chris to escape sitting for dinner or changing. He also lacks the current communication skills to obtain these outcomes (i.e., talking with mommy and daddy, tolerating routines) more appropriately. In other words, Chris' aggression has been *reinforced* by the provision of adult attention, and termination of a demand. This also has the added detriment of reinforcing the behavior of the parent. In this example, when Chris aggresses, the parent provides attention, and the aggressive behavior stops. As a result, the therapist is likely to continue to provide attention (here it is a reprimand) following future aggressive episodes. The provision of attention was *reinforced* by the termination of Chris' aggression. This is a dangerous cycle that the parents will need training and support on how to avoid as well as teach alternative communication skills to prevent the aggression all together.

In this case, a better treatment option would involve the withholding of attention contingent upon aggression, providing attention for compliance, and blocking access to escape while providing lots of fun interaction when he is sitting or being changed (where he can get some good social interaction practice). This would serve to separate the contingency between the challenging behavior (aggression) and its maintaining consequences (attention and/or escape). This is called *extinction*, and it is an important piece in creating an effective intervention: problem behavior that is maintained by a known reinforcer (e.g., attention, access to escape from demands, access to high-preferred items) will decrease when it no longer results in access to that reinforcer. Extinction is discussed in more detail later in the chapter. But first, it is useful to understand the importance of function that will be reviewed in the next section.

11.3 Function-Based Intervention: Evidence of Efficacy and Standards of Practice

In many cases of severe problem behavior, function-based intervention is not just *a* treatment option; it is *the* treatment option—the gold standard. The empirical evidence supporting their efficacy is extensive and well established. To briefly illustrate, Asmus et al. (2004) reviewed 138 inpatient cases using function-based treatment and found 90% reduction in problem behavior in more than 83% of cases. Similarly, Kurtz, Fodstad, Huete, and Hagopian (2013) reviewed 42 outpatient clients and found 80% reduction in problem behavior in 95% of cases. The effective use of function-based treatment has spanned decades, with clinical efficacy demonstrated across behaviors (e.g., elopement = Piazza et al., 1997; chronic hair pulling = Vorndran et al., 2008; aggression = Thompson, Fisher, Piazza, & Kuhn, 1998; self-injury, McCord, Thomson, & Iwata, 2001), diagnoses (autism = Horner, Carr, Strain, Todd, & Reed, 2002; ADHD = Ervin, DuPaul, Kern, & Friman, 1998; Alzheimer's = Baker, Hanley, & Mathews, 2006; Tourettes = Roane, Piazza, Cercone, & Grados, 2002), and settings (educational = Bessette & Wills, 2007; clinical = Hammond & Hall, 2011; home = Galensky, Miltenberger, Stricker, & Garlinghouse, 2001; community = Cihak, Alberto, & Fredrick, 2007). It has provided, and continues to provide, immeasurable benefit to affected individuals and their caregivers, clinicians, and the extended community. Clinicians who support parents as interventionists are then placed in situations in which they have a breadth and depth of literature on function-based intervention at their disposal but may have difficultly formulating a plan for a variety of reasons. A clinician may have difficultly identifying similarities of the case with published literature, adapting the intervention into a product that parents can realistically use on a consistent basis, as well as accounting for social validity variables. The development of functional interventions to treat problem behavior under theses complex circumstances is addressed later in this chapter.

11.4 Intervention Options

As an initial step in the process, clinicians should identify all potential intervention options under functional categories once they have identified the function(s) of the problem behavior. However, selection alone is not enough, and the clinician should also consider the feasibility of the selected intervention in "real-world" settings (e.g., classrooms, homes, community) where ongoing activities, events, and other distractions can severely impact reliable intervention implementation. Parent interventionists operate in a different world than folks in clinics. Parents are tired and stressed, and have other priorities. They deserve a gold medal for what they are tasked with daily, and without graduate-level training! With these factors in mind, function-based intervention is only going to be effective to the extent that it can be implemented with integrity. Accordingly, clinicians need to address the ease with which the intervention can be maintained in the environment it is intended. Clinicians are at an advantage when they develop interventions that are both functional and relatively easy to implement in the real world.

The purpose of the following sections is to provide clinicians with an overview of strategies to reduce problem behavior and increase more socially appropriate skills. Typically, these general categories are taken into consideration when developing an intervention plan. Although interventions are based on the specific variables evoking and maintaining a behavior, they can be grouped into more general categories including (1) antecedent interventions, (2) strategies to increase behavior, and (3) contingency manipulations. It is useful to first broadly define the strategies and foundation, so clinicians can understand how variations of these strategies can be made to accommodate function. More specific recommendations for plan components are discussed later in the chapter (see Sect. 11.11. *Intervention Decisions*) as well as specific procedures by functional category.

11.5 Antecedent Strategies

11.5.1 Antecedent Manipulations

Antecedents are environmental events that occur prior to a behavior. One option is to simply train or signal to the child that reinforcement is or is not available by arranging the environment to make a target behavior more or less likely. Signals can range from symbols depicting expectations for the environment (i.e., *safe hands* and *quiet voice* earn praise and recognition) to temporarily moving the child away from items or people that could be triggers for the problem behavior. For example, 8-year-old Alba has a history of throwing objects toward her peers. Her teacher removes hard objects from her environment that could be easily thrown and position an adult in between

Alba and the classmate. This serves to signal that potential reinforcement (adult and peer attention) is not available. In behavior analysis this type of modification is referred to as *discriminative stimulus manipulation,* and has only a behavior-altering effect, but does not address the motivating aspects of environmental events. Interventionists can also manipulate antecedent variables to reduce the value of reinforcers for problem behavior, effectively decreasing or increasing the value of engaging in behavior to access reinforcement, referred to as a *motivating operation* (Cooper et al., 2007). For a more detailed description of antecedent events see Chaps. 2 and 10.

A motivating operation has both *behavior*-altering and *value*-altering effects. There are several antecedent strategies to address problem behavior that function to escape or avoid various stimulus events, contexts, or activities. Some antecedent strategies to decrease the value of escape may include providing choices of tasks, and altering the difficulty or order of tasks presented. To illustrate, 6-year-old Isabel whines and throws herself on the floor after about 2 min after being instructed to write the alphabet. This is difficult for her teacher to manage so the teacher often just leaves Isabel alone. In this case, whining and tantrums are evoked by requests to write and maintained by escape from the task. A good starting point in this case would be to examine task difficulty and be sure that Isabel is able to do the required task. Alternatively, the task could be shortened such that Isabel could take a break every few minutes.

The choice of strategy depends on whether the evocative event is overly difficult for the child, whether it can be altered in some way, and whether it can be removed altogether. Antecedent manipulations can be as simple as giving the child a choice of scheduled activities, introducing reinforcers that are more valuable and interspersed within difficult tasks, and establishing some parameters and clear rules for when rewards are and are not available (Cooper et al., 1992). In other circumstances these manipulations could involve clinicians working with a teacher or parent to modify the pace of instruction (i.e., too fast or is the child bored?) or increase the child's active responses (i.e., speaking, hand raises) during instructional or play sessions.

The literature provides a wealth of antecedent strategies that have been used to effectively reduce problem behavior that is maintained by escape or avoidance (refer to Geiger, Carr, and LeBlanc, 2010, for a useful intervention selection model for escape-maintained problem behavior). The following provides a description of some common strategies including instructional fading, choice, and pairing that could be relatively feasible for parents and teachers.

11.5.1.1 Antecedent Strategy: Pairing

"Pairing" is a necessary initial procedure when establishing a relationship with a family and child in a clinic or introducing a student to a new classroom. In *PCIT* terms it is often referred to as rapport building, and essentially is a necessary component to teach young children those basic learning skills like sitting and attending to stimuli (Shillingsburg, Hansen, & Wright, 2018). It also establishes the therapist as the "granter of all good things" and establishes learning materials as objects that the child will be less likely to avoid in the future. Young learners usually find instructional time very enjoyable when pairing is used in conjunction with an instructional fading procedure. "Pairing" is used to establish the instructor and demand context as desirable prior to instruction. Often this involves associating the instructor and instructional context with high-preferred activities, items, and interactions (Kelly, Axe, Allen, & Maguire, 2015; Shillingsburg, Bowen, & Shapiro, 2014; Sundberg & Partington, 1998).

Shillingsburg et al. (2014) used a pairing procedure to promote social approach behavior during demand sessions for two individuals. For each participant, one therapist was "paired" and another was not. During pairing sessions, the therapist presented no demands, but engaged with the child, providing them with high-preferred items and activities. The therapist and child essentially had fun before the therapist presented a demand. During subsequent demand sessions, higher levels of social approach and lower levels of social avoidance were observed with therapists who were "paired" relative to those who were not, providing evidence that the procedures functioned to establish the paired instructor and context as desirable.

11.5.1.2 Antecedent Strategy: Instructional Fading

Instructional fading is an antecedent strategy that involves the withdrawal of demands or tasks, followed by their gradual reintroduction. Cecily, a 12-year-old with a diagnosis of emotional and behavioral disorder (EBD), engaged in disruptive episodes (yelling and slamming fists) any time her teacher presented her with math facts. Even though the content was adapted for her instructional level she had a history of engaging in this behavior to escape. Baseline data (three sessions at 5 min each) suggested that Cecily was able to complete approximately one problem before she yelled, and the teacher removed the task. She also yelled and/or slammed her fist about 1.5 times per minute. In the instructional fading intervention phase, the teacher started the first session with no demands and some preferred items and observed no problem behavior for the entire 5 min. She then ran two more sessions at this criterion. Prior to the next session the teacher presented one math problem with assistance followed by the exchange of a token. Any instance of yelling was followed by the teacher representing the problem with increased assistance so that there was no opportunity for an error. Compliance was praised if it did not occur with the yelling or fist slamming. This procedure continued for 5 min. This criterion was repeated until an 80% reduction in problem behavior was achieved. Over subsequent sessions the teacher slowly increased the number of math problems and faded out the number of tokens she provided until no problem behavior was observed during 5-min sessions. For another example of instructional fading for a behavior such as self-injury please refer Pace, Iwata, Cowdery, Andree, and McIntyre (1993) or Piazza, Moes, and Fisher (1996).

11.5.1.3 Antecedent Strategy: Choice

Clinicians may incorporate choice into the instructional environment or demand situation (Dyer, Dunlap, & Winterling, 1990; Foster-Johnson, Ferro, & Dunlap, 1994), allowing participants to avoid specific tasks without removing the aversive tasks altogether. In an application of this method, Dyer et al. (1990) incorporated a choice intervention for three children (ages 5, 11, and 11) in which problem behavior was observed in two conditions: choice and no choice. In the choice condition children were given a choice for both preferred items and for the tasks they completed. In no choice the teacher dictated the items and activities. Tasks included activities such as puzzle, blocks, and sorting. Problem behavior in the choice conditions was lower than in the no-choice conditions for all three children. This is a relatively simple strategy that can look a variety of ways. For younger children with choice-making in their repertoire, a parent can ask 3-year-old Isabelle to pick "pants or skirt" (while holding up the items) when dressing in the morning which is historically a a 25-min struggle. In the case of completing tasks at home, Joan presents her 6-year-old Jake with three options (clean toys, puzzle, story time = not fun for Jake) with two of those options being typically nonpreferred for her son. Subsequently, those two other options remain, but a better reward is waiting for him after Jake finished.

11.5.1.4 Antecedent Strategy: Task Interspersal

Task interspersal is a teaching procedure in which an instructor presents several discrete tasks that are already in a child's repertoire before introducing a task that is not mastered (Horner, Day, Sprague, O'Brien, & Heathfield, 1991). The teaching arrangement is advantageous for preventing escape-maintained problem behavior (Rapp & Gunby, 2016). For example, Nick's parents report that sight words typically set Nick off (snapping pencils, throwing snacks, bolting out of the room) during homework time. The behavior is identified to be maintained by escape. So Nick's parents begin homework time by having Nick respond to three different mastered math facts before presenting two new target sight words. The clinician recommends the parents vary the sequence of trials (i.e., when each flashcard is presented, and Nick is asked to respond), but generally to begin with the skills they know he has mastered. After this sequence they give Nick a celebration along with a few small chocolates before going back to work. If at any point the parents observe his face becoming strained, then they should present a known task and then immediately tell him to take a break. This strategy serves to maintain motivation and minimize the frustration children experience when learning new skills.

These antecedent manipulations can be used in conjunction with one another to prevent problem behavior in situations that once triggered such behavior. A clinician identifies that Jillian's screaming occurs when her parents block access to toys and take her to the table for skill acquisition during home therapy sessions. Therefore, 4-year-old Jillian's therapist uses pairing to establish herself as someone Jillian will approach and lead to some of her favorite toys, and later uses these toys to motivate Jillian to come sit at the table. From here instructional fading can be used in which Jillian's compliant behavior is reinforced with access to those favorite toys and some high-quality praise. The therapist then introduces some imitation (mastered) interspersed with a few matching tasks (acquisition). After 2 weeks Jillian is sitting and completing tasks that once triggered her problem behavior.

11.6 Strategies to Increase an Alternative or Other Response

Problem behavior is communicative in nature, and not surprisingly children with deficits in language and social interaction defer to problem behavior to achieve what typically developing children often do through spoken words. Typically developing children may also engage in problem behavior, but as their verbal communication skills become more complex they are able to adequately self-advocate. The added benefit of targeting alternative responses is that they are more socially appropriate and tend to be naturally reinforced within the social community whereas the problem behavior does not and can be socially stigmatizing. The section below includes strategies for increasing alternative, replacement skills.

11.6.1 Contingent Reinforcement

Reinforcement procedures involve the *presentation* of a stimulus (e.g., attention or a high-preferred toy) following a response that leads to an increase in that response (Skinner, 1953). They are *positive* reinforcement procedures. Positive reinforcement is often programmed through various methods of *differential reinforcement*. As its name suggests, *differential reinforcement* involves the provision of reinforcement differentially, for one type of response but not another. To use differential reinforcement to decrease problem behavior, clinicians may withhold reinforcement for problem behavior (i.e., place it on extinction) and differentially provide reinforcement for a separate, replacement response (Cooper et al., 2007). All parents may find it reasonable during a play session to jump in with hugs and smiles when they observe any resemblance of the behavior they want to happen more often.

11.6.1.1 Differential Reinforcement of Alternative Behavior (DRA)

Differential reinforcement of alternative behavior (DRA) involves ignoring the problem behavior while providing reinforcement for an "alternative" response, often a previously taught communicative response. For example, recall 4-year-old Chris. Chris' aggression was maintained in part by the attention he received from his parents. His parents reported Chris would sometimes grab them around the leg to make such bids but did not always get the response they assumed he desired. During intervention his parents ignored the problem behavior as best as they could, but also provided attention when Chris made more appropriate bids for interaction (this was defined as a tap or touch on the body or a vocal approximation of the word play). For other children this could involve handing a teacher a card that says "help" or "5-min break," but not following instances of problem behavior.

11.6.1.2 Communication Training

In the example above, differential response was used to train an alternative communication response. Communication training is necessary to teach correspondence between their behavior and accessing reinforcement (toy, parent, cessation of demand) for children with limited vocabularies and spoken language. This serves to "replace" problem behavior with an appropriate response while maintaining access to valued reinforcers. Please see Chap. 7 for a detailed description regarding teaching communication responses for children with limited repertoires. Thorough reviews of inpatient and outpatient cases have provided support on the effectiveness of communication training as a component of function-based intervention, with results generally indicating at least 80% reduction in problem behavior across at least 85% of cases (e.g., Hagopian, Fisher, Sullivan, Acquisto, & LeBlanc, 1998; Rooker, Jessel, Kurtz, & Hagopian, 2013). For a practical guide on functional communication training refer Tiger, Hanley, and Bruzek, 2008).

11.6.2 Noncontingent Reinforcement

Another method of decreasing problem behavior may involve the provision of reinforcers noncontingently (i.e., without any type of behavioral criteria). Under a noncontingent reinforcement (NCR) schedule, reinforcers may be delivered on a time-based schedule, independent of responding (Richman, Barnard-Brak, Grubb, Bosch, & Abby, 2015). Access to functional reinforcers is likely to decrease the motivation to engage in problem behavior (if the individual already gains access to the functional reinforcer, there is no "need" to engage in challenging behavior to access it). NCR is commonly combined with other intervention components such as extinction for problem behavior and/or differential reinforcement. During noncontingent reinforcement, reinforcement is delivered on a fixed or variable time-based schedule, regardless of problem behavior (i.e., whether it occurs or not). For a child similar to Chris his parents would benefit from providing more quality interactions on a consistent schedule during those challenging routines, and especially just prior to assisting his sibling, a situation they report is likely to trigger some aggression.

11.6.3 Relative Value of Reinforcement

One important component to an individualized approach to intervention involves the identification of effective reinforcers. Oftentimes, toys, stickers, candy, and praise are assumed to be of high value. In the larger society, these are often labeled "rewards." Rewards differ from "reinforcers" to the extent that rewards are socially defined and assumed to be of value. However reinforcers are defined only by their effect on behavior (i.e., the stimulus event follows a response and increases the future probability of that response). Importantly, there is vast variability in the extent to which stimuli function as reinforcers across individuals, necessitating individualized assessments to determine relative, individualized preferences.

High-preferred items are more likely to be reinforcers and are thus likely to be more effective in intervention relative to less preferred items. There are a variety of methods to systematically determine the relative preference value of stimuli or activities to ensure that high-preferred items are included in intervention. Three common methods for *tangibles* include paired-choice stimulus preference assessment (Fisher, 1992), multiple stimulus without replacement (DeLeon & Iwata, 1996), and free operant preference assessment (Pace, 1985). Each of these methods has benefits and should be selected by evaluating the skills of the individual and the limitations of the environment (e.g., time constraints, staff/parent competence, number of items available). Pence, St Peter, and Tetreault (2012) offer a thorough discussion of training and feasibility considerations regarding various tangible preference assessments. Not all forms of *attention* are equal (Fisher, Ninness, Piazza,

& Owen-DeSchryver, 1996; Kodak, Northup, & Kelley, 2007) either so assessing preference for social interaction can improve the quality of intervention. For attention preference assessment methods see Kelly, Roscoe, Hanley, and Schlichenmeyer (2014); Clay, Samaha, Bloom, Bogoev, and Boyle (2013); and Gardner, Wacker, and Boelter (2009).

Reinforcers may be altered along a variety of dimensions such as quality (e.g., value relative to the individual), immediacy/delay, amount, and response effort (Neef, Shade, & Miller, 1994). In plain terms reinforcers should be provided immediately following demonstration of new skills, be at a volume or an amount that appears valuable, and the effort required to receive reinforcement should be relatively easy at first. The new skills taught should be easy and efficient to the extent they are just as efficient and result in the same reinforcement that the problem behavior achieved in the past.

11.7 Contingency Manipulations

Even when antecedent or other interventions are used, it often will be necessary to adjust how others respond to the problem behavior when it occurs. And, at first it *will* still occur. Antecedent interventions and reinforcement procedures for alternative responses will not be sufficient if there is a lengthy history of problem behavior. As they say, "old habits die hard." Clinicians must assist parents for how to respond so that problem behavior does not serve the purpose it once had. This can involve extinction, minimizing reinforcement, and punishment.

11.7.1 Extinction

When reinforcement of a previously reinforced behavior is discontinued, the future probability of that behavior decreases. This procedure, and its effect on behavior, is called *extinction*. Cooper et al. (2007) provide a nice distinction between procedural forms of extinction which often involves ignoring or withholding preferred items/edibles/activities following problem behavior, and functional extinction, which involves specifically withholding reinforcers that maintain behavior. Basically, if clinicians have data showing that environmental events are strengthening the occurrence of undesirable behavior then well-informed intervention should block the individual from accessing those consequences (i.e., cracker, juice, "a stern talking to") following problem behavior.

When applying extinction within an intervention plan, clinicians should be mindful that it may be accompanied by an "extinction burst," or a temporary increase in responding following extinction (Lerman, Iwata, & Wallace, 1999). Rather than indicating ineffective intervention, extinction bursts may instead indicate that the reinforcer being withheld is valuable, signifying that the intervention will likely be effective (Cooper et al., 2007). Extinction should always be used in conjunction with other reinforcement-based procedures, and/or other antecedent strategies. Even the most experienced clinicians have difficulty applying extinction procedures, because they must be done consistently.

Therefore, asking parents to implement those same procedures is unfair, and not likely to happen. For an applied example, suppose a clinician coached a parent to ignore Chris, and the parent was only able to accomplish this task *most* of the time when Chris pinched his arm. The clinician observes that two out of ten times the parent provided a powerful pain reaction. The clinician observes that some pinches were impossible for the parent to ignore because they hurt. Across all those instances the parent sometimes responded and sometimes ignored the pinches. Following a pain reaction, Chris looked at the parent and occasionally laughed. So, the father essentially taught Chris: *sometimes I will ignore you, and sometimes when you use more force I look at you and say "stop!"* Then Chris then learns that pinching is still effective for gaining social interaction (putative reinforcer) and will continue to likely pinch more frequently than even before when every pinch satisfied his motivation for interaction/entertainment from the parent. For many children with limited verbal communication skills these social interactions can be extremely rewarding, because they are unable to engage in behaviors like talking about their favorite characters, toys, imaginative play. These age appropriate behaviors would otherwise occupy their time, and be incompatible with the problem behavior. Clinicians, instead, benefit from recommending a variation of extinction by minimizing the reinforcer.

11.7.1.1 Alternative to Extinction: Minimizing the Reinforcer

As many parents report and what clinicians know from experience is that simply ignoring the behavior and blocking access to previous reinforcement are very difficult to achieve. Therefore, it may be more feasible to minimize the reinforcers for problem behavior while simultaneously teaching pro-social skills (e.g., communication for the reinforcer—adult assistance or favorite toy; tolerance for instruction) which are often part of the concerns presented at intake as well. When a parent minimizes reinforcement, they modify aspects of the reinforcers so that they are of less value to a child. Generally, for attention functions it is best to minimize the social interaction by diverting direct eye, using calm and neutral tone, and avoiding rapid body movement. If a toddler punches his sister to hear his father say loudly and sternly "bad Danny!", then a modification to this response would be "hands down" in a *neutral* tone for Danny who is reinforced by the reprimand. For the child who hits his legs for the sensory stimulation, his teachers neutrally block his legs with padding so that the child is safe. The point of minimizing reinforcers is to take as much fun as possible out of the equation.

11.7.2 Punishment

Punishment is a consequence that upon presentation or removal of stimuli the future likelihood of behavior decreases (Skinner, 1953). The presentation of a stimulus following behavior that serves to decrease the behavior is positive punishment. Timothy's mother sees her son moving toward an electrical outlet with his finger. Instead of moving in and providing hugs and holding her son (likely will be positive reinforcement if this is something Timothy likes) she loudly screams and frightens the daylights out of him and he cries. Two days later, she notices him looking toward the outlet and then back at her, but he does not move to touch the outlet. This is an example of positive punishment.

Negative punishment involves the removal of a stimulus to decrease the future occurrence of behavior. One such procedure, "time-out," is a classic negative punishment. For another example, Luke, a 9-year-old with a history of outbursts at homework time, usually plays video games when his assignments are done. His father sits down with Luke to begin, and when his father corrects an error on the assignment Luke throws his bag across the room and cries. His father informs Luke that his video games are not available following his outburst.

When parents and teachers impose penalties and "costs" associated with engaging in a behavior it can have some unwanted effects; it is extremely hard to fade out especially if alternative or incentives to engage in an alternative behavior are not built into the current environment. Think of Luke who has just lost access to play with his games, meaningful interactions (when Dad speaks, it is to tell Luke he is wrong), and is presented with even more tasks that are difficult. What does Luke have left to look forward to? Not much. From Luke's perspective it would be more beneficial for him to continue with the outburst than to sit down and work for nothing; he lost his games.

Penalties (i.e., punishment) are extremely hard to fade and parents must be extremely consistent with implementation. Meaning, there should be clear rules that are understood by the child (especially for time-out procedures!). This level of understanding may not be achieved by some individuals with communication and/or social interaction deficits. Other negative effects from using punishment procedures include emotional reactions/aggression or future avoidance of a caregiver who delivered the punishment and damaged rapport (Cooper et al., 2007) which you will recall is an important component prior to introducing skill acquisition programming. When a clinician considers punishment procedures it should never be done without assessing the risks and benefits of such procedure, and always include reinforcement procedures as well. Practitioners and clinicians should always consult their credentialing board's ethical codes for guidelines and considerations of using punishment procedures.

11.8 Intervention Strategies for Escape/Avoidance Functions

Escape has been consistently identified as a common function of problem behavior in review papers on functional analysis (Beavers, Iwata, & Lerman, 2013; Hanley, Iwata, & McCord, 2003). Escape functions indicate the individual engages in challenging behavior to escape or avoid tasks, people, events, or locations. Notably, this also indicates that these contexts and events are aversive, with various variables potentially contributing to the aversiveness of the event. Discriminative stimuli such as noise volume and lighting in the setting or the size of the group are common features aversive to children. Motivating variables derived from the child's previous experiences (unpleasant tasks were presented, or the child was frightened by a particular event) can influence the degree of aversiveness and likelihood of escape as well. Accordingly, a crucial first step in designing an intervention to address problem behavior sensitive to escape is to closely examine (and modify) the aversive context, and then follow up with differentially reinforcing alternative, communication responses.

For example, 6-year-old Hannah screams and throws her workbook into the garbage after her teacher asks her to begin her math work. This is difficult for her teacher to manage in a busy classroom, so the teacher often just gives Hannah some time on her own to calm down. In this case, Hannah's screaming and throwing are evoked by requests to complete math worksheets and are maintained by escape from the task. The strategies below are a demonstration to address Hannah's escape-maintained screaming and refusal to work on math.

11.8.1 Antecedent Strategies

Hannah's teacher should begin by assessing if the math task is at the student's instructional level and are there any deficits in academics or communication that could be contributing to the aversion. It is possible that Hannah needs additional practice before seeing the content for the first time in front of her friends. In a busy classroom, the teacher should determine the extent to which Hannah is attending to the material, and if there are social distractions either positive or negative. Once data is collected on these variables, antecedent strategies can decrease the value and likelihood in engaging in these behaviors. For a younger child or beginning learner it would be beneficial to gather information on the level of rapport built (sufficient pairing prior to skill acquisition), the amount of easy versus difficult tasks, tolerance for presenting instruction or following directions at all. The learning environment is arranged so it is conducive for listening and learning: organized and relatively calm with available reinforcers.

11.8.2 Differential Reinforcement to Teach Communication

Functional communication training (FCT) is often incorporated into interventions for escape-maintained problem behavior. In such cases, problem behavior is generally placed on extinction and breaks from demands may be provided contingent upon a communicative response (e.g., vocal request, picture exchange, sign) to remove the task. In their seminal demonstration of the efficacy of FCT in combination with escape extinction, Carr and Durand (1985) taught participants with escape-maintained problem behavior to emit the vocal response, "I don't understand," to access assistance from the therapist while instructions continued in the face of problem behavior. The intervention package resulted in near-zero levels of problem behavior across participants. Here, access to teacher assistance may have served to decrease the difficulty and response effort necessary to complete the task, and, correspondingly, the motivation to escape its presentation.

During the initial stages of intervention, functional communication is generally reinforced continuously (after each response) to well establish the behavior. However, this schedule of reinforcement is often impractical over the long term. In a busy classroom, no way! Further, a high rate of requests for breaks inevitably diminishes opportunities for learning during periods of instruction. Accordingly, interventions that include functional communication should also include strategies to thin the schedule of reinforcement toward one that is viable within the confines of the natural environment and allows sufficient time for instruction.

In the example of Hannah, her teacher trained Hannah to signal when she needs assistance or to get a drink of water in the back of the room while she waits. The teacher in this scenario must honor every initial request for assistance and/or breaks for water. When she assists Hannah, it must also be arranged so that Hannah is receiving the quality of instruction she requires to decrease the aversion to the task. Over time the teacher could increase tolerance for waiting by adding signals or check-ins. Signals can give Hannah some information on when to expect help such as "Hannah, I will be over in two minutes when I am done with Paulo. It's ok for you to color while you wait."

11.8.3 Differential Reinforcement Plus Escape Extinction

As reviewed earlier in the contingency manipulation section, extinction is commonly employed as a component of interventions developed to address problem behavior maintained by access to escape. Here, instead of providing escape (the reinforcer) following problem behavior, the instructor, caregiver, or clinician would continue to present demands. Escape extinction is often used in conjunction with other reinforcement-based procedures, and/or other antecedent strategies. The efficacy of escape extinction has been repeatedly demonstrated and is accordingly a common component in intervention to address escape-maintained problem behavior (Iwata, Pace, Kalsher, Cowdery, & Cataldo, 1990). Zarcone et al. (1993) demonstrated that demand-fading procedures used in conjunction with escape extinction may reduce the likelihood of extinction bursts. Furthermore, what is often cited as *best practice* is that when withholding reinforcement for one behavior, it is highly recommended to "build in" reinforcement for another (Cooper et al., 2007; Gardner et al., 2009; Hawkins, 1986) which can decrease the intensity behaviors associated with purely extinction-only procedures.

Escape extinction alone would not be a good option for Hannah under these circumstances (i.e., busy classroom and teacher) as repeated attempts to redirect her toward her work would likely lead to more intense problem behavior. Escape extinction could be a viable intervention if built into an instructional fading protocol within a setting in which one adult or a parent could follow the procedures very precisely. The therapist or parent would ignore Hannah's problem behavior and provide differential reinforcement (acknowledgment for sitting and waiting, quality assistance and tangibles for attempting the task, etc.).

11.8.4 Noncontingent Reinforcement

During noncontingent reinforcement, reinforcement is delivered on a fixed or variable time-based schedule, regardless of problem behavior (i.e., whether it occurs or not). Accordingly, in the intervention of escape-maintained problem behavior, NCR involves the delivery of escape (breaks) from demands, regardless of problem behavior (Vollmer, Marcus, & Ringdahl, 1995).

The schedule (fixed = predictable and consistent; varied = less predictable, inconsistent) of NCR for breaks is important. It allows for success of the procedure at the beginning and a mechanism to fade over time. Clinicians should first collect data on the latency between the presentation of the demand, and the first occurrence of problem behavior to collect baseline. Based on this information, breaks occur on a fixed time schedule until a student has achieved an 80% reduction in problem behavior. Then the fixed time interval can be increased based on the child's current tolerance (completing the task without problem behavior). Once problem behavior is maintained at an 80% reduction the time in between breaks should vary to fade out the reinforcement procedure.

For Hannah this procedure really does not make sense since it was reported to only occur only during the context of math. If Hannah were in substantially-separate, special education setting, and she had a low tolerance for completing tasks then noncontingent reinforcement and scheduled breaks would be a more feasible option.

11.9 Intervention Strategies for Attention/Tangible Functions

When functional analysis results indicate an attention or a tangible function, the individual's problem behavior is maintained by access to a form of social attention (e.g., praise, reprimands, physical attention) or a tangible item or activity (e.g., food items, toys, games). Within these categories, it is important to identify valuable tangibles and forms of attention to assess in the functional analysis, and to later incorporate within a functional intervention. Once the relevant reinforcers have been identified, intervention may incorporate one or more of the following strategies.

Four-year-old Santiago lives with his single mother and two infant siblings. When his mother leaves Santiago to change, feed, or otherwise care for her infants, Santiago will empty out drawers and cabinets, throwing the contents onto the floor. His mother, interrupted from her task at hand, often reprimands him at length and physically guides him to the room to clean up. Here, Santiago's disruptive behavior is evoked by the absence of his mother and is maintained by her attention.

11.9.1 Differential Reinforcement

Differential reinforcement in this functional context involves withholding tangibles or attention following instances of problem behavior (extinction) and providing the same reinforcers contingent upon an alternative, incompatible, or "other" behavior. Differential reinforcement procedures may promote an alternative response to access the reinforcer maintaining problem behavior. In our example, Santiago's mother should avoid talking to Santiago after he destroys his room, and provide quality attention when he yells "mama, come!" Alternative behaviors such as communication responses are taught using functional communication procedures.

11.9.2 Communication Training

Functional communication may provide an alternative means for an individual to access attention or tangibles. Here, individuals may be taught to request specific items (toys, preferred foods), locations (playground, restaurant, break area), or activities (swinging, dancing, jumping), or to request attention using various phrases (e.g., "I want to play," "Come here," or "Let's talk"). The mode of communication taught is highly individualized, depending upon the individual's strengths and preferences. Options include vocal communication, picture exchange, signs, or communication devices (switches, tablets), among others. Carr and Durand (1985) first demonstrated the utility of functional communication training (FCT) in reducing problem behavior understood to be maintained by attention. The researchers placed problem behavior on extinction and instead taught two children to solicit attention by asking "Am I doing good work?" This resulted in substantial reductions in problem behavior. The efficacy intervention involving FCT within an intervention for attention and tangibly maintained problem behavior has since been extensively replicated (e.g., Mace & Lalli, 1991; Marcus & Vollmer, 1996; Smith, Lerman & Iwata, 1996).

Say that over time Santiago began to throw himself on the floor and cry, and reliably his mother gave him a tablet to make the crying stop. In this instance, the function of the tantrum is tangible access (tablet). Parent training would consist of an intervention for a new communication response for tablet. The intervention consists of using differential reinforcement when a good boy, withhold tablet following the problem behavior, train Santiago how to request his tablet, and then presentation of the tablet to Santiago immediately and always following request (if there is no problem behavior).

11.9.3 Noncontingent Reinforcement

Noncontingent reinforcement (NCR) involves the delivery of attention or tangibles on a time-based schedule, regardless of problem behavior. Hanley, Piazza, and Fisher (1997) and others have demonstrated the efficacy of NCR to decrease the motivation to engage in problem behavior, as the reinforcer for problem behavior is already available "for free." Hagopian, Fisher, and Legacy (1994a, 1994b) used NCR to effectively reduce the problem behavior exhibited by 5-year-old quadruplets. In this case, the intervention had to be generalized to a single parent, necessitating an intervention that was not highly labor intensive. The researchers initially demonstrated that dense schedules of noncontingent reinforcement reduced problem behavior for all four children. Next, they systematically faded the schedule of reinforcement based upon the observed rates of problem behavior. They were able to successfully fade the schedule of noncontingent reinforcement from dense (attention delivered every 10 s) to lean (attention delivered every 5 min) for all four children while maintaining low levels of problem behavior. As a last step, generalization sessions were conducted across therapists and with the mother, with intervention gains maintaining across individuals, settings, and over time.

For Santiago, an NCR procedure could be less strategic than outlined above, but could be implemented during those times of day when mom knows are historically challenging for him—when her attention will be on his siblings. Therefore, his mother begins the NCR schedule when the infants go down for a nap. She knows that Santiago loves story time and she gets his most preferred cookies and they spend at least 30 min sitting and playing together while his brothers are asleep. When the infants wake, and mother is busy with them she asks Santiago to sit next to her and help her with whatever she is doing. She talks to him the entire time using language like "Santiago your brother is messy. Hand me a wipe. You are such a sweet boy."

Here is another example of this procedure for behavior maintained by tangible access. Marco, a vocal 9-year-old with ASD, with social interaction deficits, loves playing a game in his classroom. When another child is in his class chooses Marco's favorite game during free time, Marco screams loudly and aggresses toward the peer. In addition to communication and social skill training, his teacher has this game available on a predictable schedule during the day (NCR).

11.10 Intervention Strategies for Automatic Functions

When results of a functional analysis indicate that problem behavior maintains in the absence of any social consequences, it is said to be "automatically" maintained (Vaughan & Michael, 1982). Two separate patterns of responding within an FA may indicate automatic reinforcement: rates of responding are highest during the alone/no-interaction condition and lowest during the play condition, or rates of responding are high across conditions (Hagopian et al., 1997).

It is important to note that the form (or topography) of the problem behavior does not indicate its function. However, there are some responses that are commonly associated with automatic reinforcement. For example, pica (the ingestion of inedible items) is a particularly dangerous problem behavior that often persists in the absence of social consequences. Research also indicates that stereotypy (repetitive motor and/or vocal behavior) is often automatically-maintained, and often presumed to be reinforced by the sensory stimulation it produces (Lovaas, Newsom, & Hickman, 1987). Although automatic reinforcement is common to both behaviors, social functions have also been identified (Kennedy, Meyer, Knowles, & Shukla, 2000; Mace & Knight, 1986), highlighting the importance of assessing the function of behavior prior to intervention, regardless of the degree to which one might assume an automatic function.

It is often presumed that with automatically-maintained problem behavior, the response in and of itself produces unidentifiable (private) consequences that are reinforcing. This causes some challenges to functional treatment that are not present for other functions; if we cannot directly observe or identify the reinforcing properties of the maintaining variables, parents are challenged to withhold them (extinction) or provide them as functional reinforcers (NCR/DR) (Kennedy & Souza, 1995; Vollmer, 1994). Nevertheless, there are common treatments that seek to address the putative function of problem behavior, with the understanding that the true nature of the reinforcer has not been fully identified.

While clinicians may not be able to identify the specific reinforcing properties of these private events, researchers have demonstrated that arbitrary reinforcers may be incorporated into treatment packages to reduce automatically maintained problem behavior.

Eight-year-old Aliya hums, smacks her lips, and emits other noncommunicative sounds, especially when she seems to be excited. Her parents have found that she produces these sounds across a variety of environments and circumstances but have noticed decreases in the behavior whenever she is listening to music.

11.10.1 Reinforcement Procedures

As noted, the specific private events that reinforce problem behavior in this functional category are often unknown (although hypotheses can be made), and thus more difficult for parents and clinicians to manipulate. On the other hand, it is sometimes possible to distract children from engaging in behavior due to sensory stimulation. Accordingly, for automatically-maintained problem behavior, reinforcement procedures can include high-preferred “arbitrary” reinforcers that are identified via preference assessment, and then incorporated into intervention noncontingently as a competing source of reinforcement (e.g., enriched environment/competing items). Parents and clinician also have the option to differentially reinforce alternative, adaptive behavior such as toy engagement (e.g., Lindberg, Iwata, Kahng, & DeLeon, 1999; Vollmer, Marcus, & LeBlanc, 1994).

11.10.1.1 Competing Items

Competing items are those that “compete” with the reinforcement derived through problem behavior. They are often included in treatment packages for automatically maintained problem behavior (Ahearn, Clark, Gardenier, Chung, & Dube, 2003; Piazza, Adelinis, Hanley, Goh, & Delia, 2000; Piazza, Moes, & Fisher, 1996; Roscoe, Iwata, & Goh, 1998). The efficacy of a competing item is generally assessed by examining the extent to which problem behavior is diminished when the individual has access to the item, relative to when they do not. Shore, Iwata, DeLeon, Kahng, and Smith (1997) describe a method for assessing competing items where items are presented individually while problem behavior and engagement are recorded. Levels of problem behavior associated with individual items are then compared to a control condition in which no items are present. These comparisons allow a determination of items that best “compete” with the problem behavior.

The extent to which competing stimuli reduce problem behavior may be affected by the extent to which the sensory consequences of competing stimuli “match” the sensory consequence of the target behavior (Higbee, Chang, & Endicott, 2005; Piazza et al., 2000; Rapp, 2007). For example, Piazza et al. (2000) evaluated the effects of “matched” and “unmatched” competing stimuli for three automatically-maintained behaviors. The researchers conducted two preference assessments for each behavior: one using an array of items that produced sensory consequences similar to those produced by the problem behavior ("matched"), and one using an array of items that produced sensory consequences dissimilar to those produced by problem behavior ("unmatched"). Results indicated more substantial reductions for all three problem behaviors given continuous access to "matched" stimuli, indicating that the type of sensory stimulation produced through item engagement (and its similarity to the stimulation produced through problem behavior) may contribute to its efficacy as a treatment item.

In the case of Aliya, music is reported by her parents to compete with her lip smacking and noncommunicative sounds. This is a very insightful observation on their part and suggests that this intervention could be a viable one moving forward. From here additional competing preferred items both "unmatched" and 'matched" to the sensory experience could be introduced as intervention. For example, an unmatched activity could be expanding the array of preferred songs and introducing other competing activities during her break and leisure time. A matched activity would consist of singing or dancing, and differentially reinforcing rules and parameters for when song and dance are appropriate. In times of excitement, her parents could differentially reinforce less disruptive and more socially appropriate vocalizations (*I did it! I'm happy*!) using a specific token system to earn her favorite things. Tokens are rewarded when she chooses communicative language over noncommunicative language during times of excitement.

11.10.1.2 Enriched Environment

Interventions based on the inclusion of high-preferred stimuli in an "enriched environment" have successfully reduced problem behavior maintained by automatic reinforcement. For example, Vollmer et al. (1994) observed high rates of self-injury during periods of no interaction for three participants. Vollmer et al. (1994) compared rates of self-injury when there were no toys and no therapist present, when there was a therapist and preferred stimuli available (enriched environment preferred), and when there was a therapist present and non-preferred toys available (enriched environment non-preferred items). Self-injury was the lowest when intervention included an enriched environment with preferred stimuli. Stated differently, if the environment is arranged with enjoyable items and people, and children are motivated to play, then we can distract them from engaging in the problem behavior that also serves that same purpose.

11.10.2 Extinction

For other functions of problem behavior, extinction generally involves withholding of the functional reinforcer contingent upon responding. This is impracticable in the case of automatically reinforced behavior to the extent that the behavior and reinforcer are inextricably linked. Instead, in the case of automatically-maintained responding, suppression of behavior through extinction effects may occur through separating the reinforcer from the target behavior through blocking the completion of the response, or by diminishing the reinforcing sensory consequences of the behavior using protective equipment. It is not possible nor ethical to block Aliya's lip smacking and noncommunicative sounds via these intervention procedures. For a student engaging in automatically reinforced head-to-surface self-injury, response interruption and protective equipment are necessary to keep the child and everyone else safe.

11.10.2.1 Response Interruption and Protective Equipment

Response blocking, or response interruption, involves physically blocking the completion of the response (Hanley, Iwata, Thompson, & Lindberg, 2000; Kliebert, Tiger, & Toussaint, 2011; Lerman & Iwata, 1996; Tiger, Hanley, & Bessette, 2006). Although this method has been shown to decrease automatically-maintained problem behavior, it has real challenges and risks associated with its implementation. To obtain and maintain intervention effects, response blocking must be implemented with near-perfect integrity to avoid intermittent reinforcement of the behavior (e.g., Kliebert, Tiger, & Toussaint, 2011).

This is labor intensive, necessitating the clinician or caregiver to remain within arms' reach of the individual and to remain highly vigilant in anticipation of problem behavior. Likewise, the associated cost of this intensity of intervention is high, to the extent that the level of care would likely require one-to-one ongoing support, or more, depending upon the severity of the response.

Other extinction procedures work by diminishing the stimulation produced by the behavior through the application of protective equipment or through environmental modifications. This might include padding tables or devices, or the use of helmets, boxing gloves, mitts, or goggles (e.g., Mazaleski, Iwata, Rodgers, Vollmer, & Zarcone, 1994; Moore, Fisher, & Pennington, 2004; Rincover & Devany, 1982). For a child whose behavior necessitates use of protective equipment it is recommended that you refer the child to a trained and experienced professional who can implement best practice to keep the child safe.

11.11 Intervention Decisions

Clinical decisions should be made in consideration with context and function of the behavior, including but not limited to the selection of target and alternative responses; preferred reinforcers; reinforcement schedules and strategies for thinning (Hanley, Iwata, & Thompson, 2001); and generalization. An individualized approach should be endorsed at every step along the way. The following section outlines a framework for making intervention decisions.

11.11.1 Intervention Selection: A Framework for Guiding the Intervention Process

Using the evidence-based practice (EBP) model as a decision-making framework has advantages when selecting from a myriad of treatment options. Essentially, EBP is composed of three components including selecting interventions with empirical support, identifying and using client values and the environmental context (i.e., social validity), and using clinical judgement to monitor the entire treatment process (Spencer, Detrich, & Slocum, 2012; Slocum et al., 2014). Previously, in this chapter intervention options were reviewed along with empirical support. Below the value of social validity and data-based clinical judgement is discussed to improve feasibility.

11.11.2 Feasibility Considerations: Social Validity and Clinical Judgement

One component of evidence-based practice is the consideration of the client or family's values when selecting an effective treatment. Social validity can be defined as an element of external validity, but specifically the extent to which parents are satisfied and value the outcomes achieved during treatment (Callahan et al., 2017). Practitioners should aim to achieve a higher level of satisfaction by seeking family and client values, and feedback prior to and during the intervention process. Strain, Barton, and Dunalp (2012) point out that the selection of effective treatments alone does not guarantee that the treatment will work for an individual, and it is necessary to assess acceptability and perceived value (i.e., feedback parents, student, children teachers) before the intervention process begins. Social validity assessment can be achieved through questionnaires or interview (see Carter, 2010, for more detailed information regarding social validity assessment). Clinicians often benefit from reviewing a written plan, and discussing the intervention with families, and explicitly asking if the family sees value in the proposed goals and procedures.

Regarding intervention selection decisions, at a broader level the procedures chosen should be based on what is in the best interest of the child, and what is most likely to be used by teachers and parents (Wolf, 1978). In some circumstances the most effective, functionally-based intervention may not be appealing to caregivers, or even a priority (Carter, 2010). While the intervention may not be appealing, your job as an interventionist is to identify the empirically-supported interven-

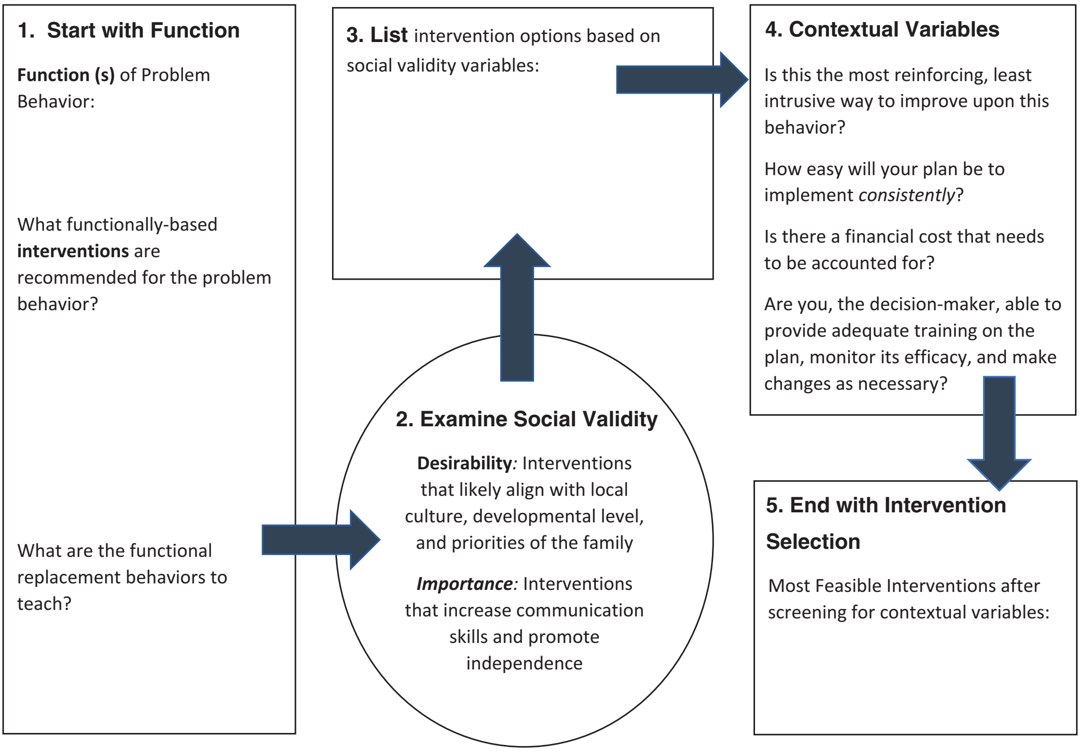

Fig. 11.1 Intervention selection flowchart

tions that you recommend, but that your client can both support (i.e., see importance) and invest time and energy (i.e., can reasonably implement on a consistent basis) in as well (Strain et al., 2012). Please see Fig. 11.1, *Intervention Selection Flowchart*, for a visual support for guiding the process of intervention selection. The *Intervention Selection Flowchart* can serve as a tool for identifying critical and relevant social validity and contextual information into the decision-making process.

11.11.3 Intervention Implementation

11.11.3.1 Develop a Written Plan

While this step within intervention selection may be painfully obvious, it is worth explicitly outlining as a critical component to intervention planning and implementation. The document serves as a protocol for consistency across all the important people working with a child. The plan should be thorough enough so that caregivers and therapists understand the strategies you prescribe, and can reasonably follow through with integrity, but not so cumbersome and technical that the plan is aversive to read. If the written document is too complicated, it is likely to be avoided like the plague. The intervention plan document should contain the following (this excludes the basics like child name, location, other demographic information):

- *Measurable definitions for the problem behavior(s) including the function*
- *Measurable definitions for the replacement behavior(s)*
- *Idiosyncratic variables:*
  - *List child's common preferred tangibles (from preference assessment)*
  - *List preferred form attention* (i.e., *how to best interact with the child)*

  - *Information regarding tasks: both triggers and enjoyable*
- *Antecedent strategies for how to prevent the behavior*
  - *Specifically, how to teach the child a more socially acceptable and safer replacement behavior (*i.e., *functional communication, engage with competing items)*
- *Consequence strategies for how to react when problem behavior occurs*
- *Instructions for how and when to record data prior to (baseline) and during intervention*

The replacement behaviors chosen in intervention planning must allow the individual to access or escape the same consequences (tangibles, attention, demands, sensory stimulation) he or she did by engaging in the problem behavior. The alternative response or replacement behavior must be provided with more reinforcement, and less response effort to influence appropriate responses. There are also circumstances in which extinction or ignoring the problem behavior is not safe nor feasible. For example, it might be impossible not to attend to aggression if it is aimed at a small child, or to ignore dangerous behavior such as running out into the street or accessing dangerous materials. In such cases, it is important to tip the balance toward the appropriate response by providing a denser/higher quality of reinforcement for the appropriate response, relative to the challenging behavior to prevent such unsafe behavior all together.

Once you develop a plan with this recommended frame, the next step is to appraise the plan within a larger context once it is on paper. For example, your functionally-based behavior support plan should both be developmentally appropriate to the extent possible and align with the culture/ethics of the clinic, classroom, and family (styles of parenting, teacher's personal philosophy, etc.). Be cautious as you reflect on these contextual variables, as you should never select an intervention based solely on the desires/styles of those you serve, especially at the expense of opting with a nonfunctionally based intervention.

It is best practice to include a short-term and long-term plan for generalization or next steps once you have achieved your goal to reduce the problem behavior and teach functional alternatives (i.e., communication) so that you are continually promoting independence for the child. Of course, you should carefully note and consider strategies that could potentially have any unwanted side effects and seek consultation from a behavior specialist if this is the case. Prior to implementation of the written plan, it is beneficial to determine whom, when, and how you will train teachers, parents, and therapists. A behavioral skill training (BST) approach is ideal for building competency of procedures and is comprised of reviewing step-by-step instructions, modeling those instructions, role-plays, and feedback on trainees' performance of steps (see Crane, 1995, for more detailed description of training procedures).

At this point in the process of intervention you should have confidence that your functionally-based intervention will be effective. You have conducted (1) functional analysis, (2) identified the function(s), (3) selected a functionally-based intervention with empirical support, (4) incorporated the social validity and contextual variables into selection, (5) developed a written plan and trained the key players, and (6) planned for treatment generalization. Next, it is time to collect data to determine efficacy, or the extent to which your intervention has an effect on decreasing problem behavior and increasing more desirable skills.

11.11.3.2 Assess Progress

The good news is that the merits of your intervention work are not typically based on your confidence level. For a novice interventionist, confidence could be very low, and for a veteran obnoxiously inflated. Regardless of where on this spectrum someone falls, intervention efficacy is determined using single-subject design data.

Single-subject Design

Horner and Odom (2014) summarized the basic logic of single-subject design very well. In single-subject design the individual serves as his or her own control as documented through observable events prior to and throughout the course of intervention. Observable events (i.e., frequency, duration) are the dependent variable, and are plotted graphically on *x*-axes (time) and *y*-axes (behavior observed). Interventionists use visual analysis to analyze the efficacy of intervention during baseline (no intervention in place) and during intervention. Changes from baseline to intervention are separated by phase change lines. Changes in intervention or additions to intervention components are also noted by a break in the data series and phase change line.

Recall Chris, the 5-year-old who engaged in aggression for adult attention and to escape changing and sitting. In the graph Chris was trained to tap his parents as an alternative to hitting, while they also blocked escape and provided high-quality interactions for any approximation of compliance during changing and sitting. See Fig. 11.2 for an example graph depicting the efficacy of intervention in Chris. There should be at least three to five data points within phases (e.g., observed problem behavior). Second, the data points should be stable. Third, level is assessed in comparison to the vertical positioning of the data on the graph in relation to the *x*-axis. Lastly, trend is inspected to determine increases, decreases, or no change from baseline. Collectively, when examining a graph there should be an appearance that events occurred in a predictable fashion (Richards, Taylor, & Ramasamy, 2014). If this does not appear to be the case, you may ask yourself if you correctly identified the function, whether the data are reliable, or if there is a high level of integrity with the procedures (see following section).

The overall goal of intervention is to produce changes in behavior that are meaningful. In practice, an 80% reduction of problem behavior is generally considered the standard for effective treatment. However this greatly depends upon the individual, the target behavior, and the larger context of the problem. A goal is set by calculating the frequency or duration required to achieve an 80% reduction and positioning this value as a goal line positioned over your graph (from

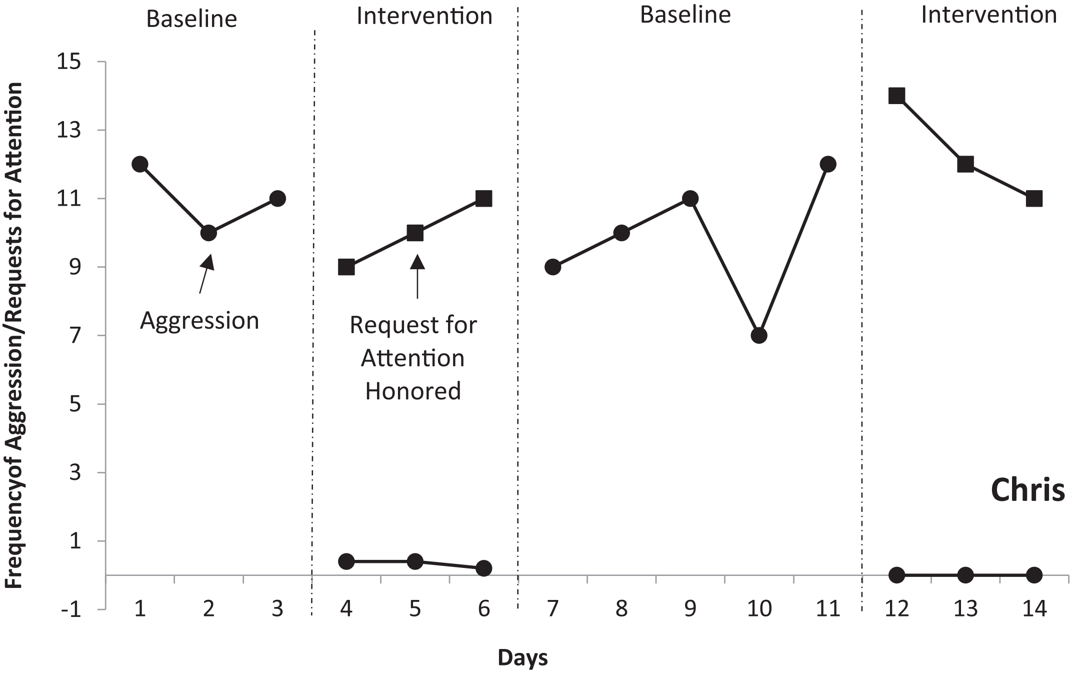

Fig. 11.2 Example single-subject design graph

baseline value to goal value) to determine progress throughout intervention.

11.11.3.3 Measure Integrity

In addition to incorporating social validation into intervention planning to increase the likelihood of follow-through (i.e., consistent implementation), measuring intervention integrity allows an interventionist to document that prescribed procedures are followed as intended. In fact, functionally-based behavioral treatments may not be efficacious unless they are implemented with a high level of fidelity.

Intervention integrity can be assessed by developing a procedural checklist directly from the written intervention plan. This checklist can be used to both self-monitor, and as an observation tool to monitor integrity across all interventionists. Based on observations of the intervention procedures in-vivo, integrity level can be determined (i.e., total correct procedures implemented/total opportunities to implement × 100 = % integrity), and follow-up training can be provided (for those missed opportunities observed). In some cases, an interventionist may determine through this process that certain barriers exist to implementing an intervention component. Vollmer, Sloman, and St. Peter Pipkin (2008) offer a more thorough discussion, and practical usage guidelines for measuring treatment integrity in real-world settings.

11.12 Case Example 1: Javier

Javier was a 4-year-old with a diagnosis of global developmental delay (GDD) when he was referred for an assessment, intervention, and consultation. Javier attended an integrated preschool that served both typically developing children and those with developmental disabilities. Since arriving to the preschool Javier's teachers reported extreme difficulty trying to manage him. Specifically, they reported that he would engage in high-pitched screaming. The screaming was so loud that other children in the classroom would begin crying, and the classroom routine would be disrupted for up to an hour. Screaming reportedly occurred frequently during unstructured periods, and often resulted in Javier being consoled by the paraprofessional who would generally rub his back and provide him with a tablet to watch his favorite videos.

In an initial interview we asked his teachers how and how often Javier communicated. They reported that Javier made about three vocal approximations of words including cracker (cacka), no, and juice (ju). He also pushed items away and grabbed/pushed caregivers toward objects he desired. Given the interview information, we conducted a functional analysis at the school with the help of the paraprofessional and an intern. The conditions in the functional analysis consisted of a tangible (tablet with videos provided immediately following screaming), attention (provided by a paraprofessional immediately following screaming), and control (in which both the tablet and attention were both available on a continuous or consistent schedule, respectively). The results of the functional analysis (see Fig. 11.3) suggested that screaming functioned to access preferred tangible items. Javier did scream occasionally during the attention conditions, but much less frequently.

Based on the results of the functional analysis, the information we noted on his limited communication skills during the structured interview, and our own observations, we determined that intervention should consist of functional communication training (i.e., FCT) to teach Javier to appropriately request access to his tablet. We also determined that we would train and coach the paraprofessional and teacher to ignore all instances of screaming (i.e., extinction), and withhold access to his tablet if screaming occurred.

We used a behavioral skill training (BST) approach (BST; i.e., instructions, modeling, role-play, feedback; Crane, 1995) to train the paraprofessional on the functional communication training protocol. Training sessions were held each day before school. The functional communication training protocol consisted of two components: (1) withhold access to the tablet/preferred item following all occurrences of screaming (extinction) and (2) provide the items immediately following occurrences of communication

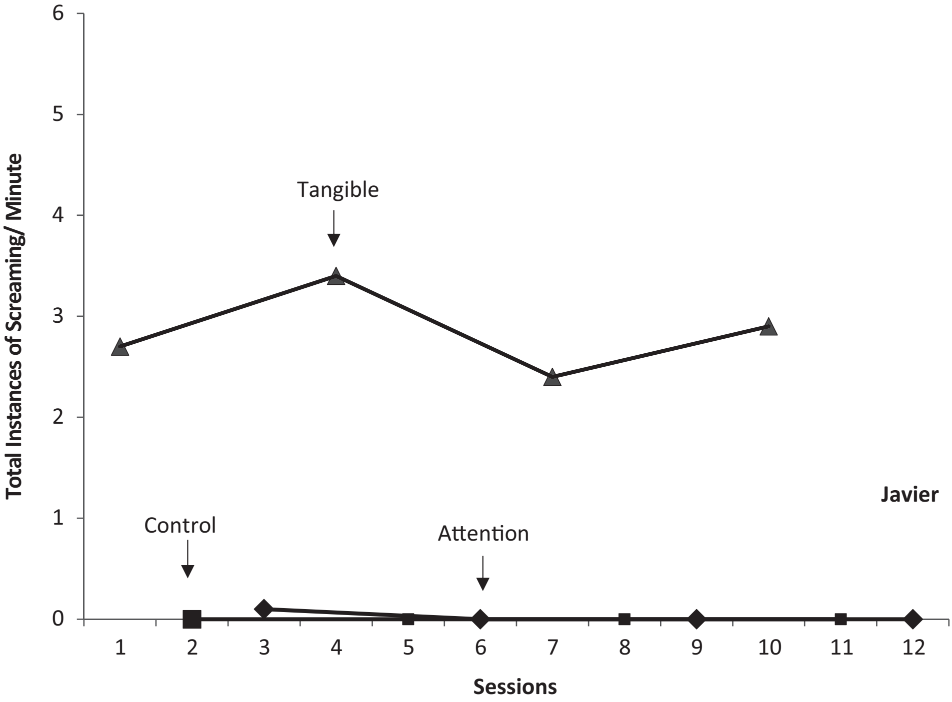

Fig. 11.3 Results of functional analysis for Javier (Case Example 1)

(i.e., functional communication training which is a type of differential reinforcement procedure). Once the paraprofessional was able to follow all the procedures with 100% accuracy she started training Javier to request his tablet by rewarding approximations of the word "tablet." We provided her with a hand-held counter to record every instance of screaming. If screaming occurred with the request for tablet we withheld the tablet as a reinforcer and waited 15 s for the absence of screaming and prompted a request for the tablet. Javier was able to learn how to independently request tablet (approximation = "ta") after approximately 20 min.

Figure 11.4 displays screaming pre- and post-intervention. We collected baseline for five sessions to achieve a stable baseline. On session six we introduced intervention and immediately observed decreases in screaming as well as notable increases in the new functional communication responses for his tablet. We were able to achieve three consecutive sessions of no screaming on sessions 13–15.

After we introduced the intervention for Javier we developed a treatment integrity checklist that directly corresponded to the training protocol; essentially the checklist was a list of steps in how to respond when Javier screamed and when Javier requested the tablet. We scored the paraprofessional's adherence to the plan and determined that she could consistently (over the first 6 school days) implement around 90% of the procedure as prescribed. We used our training protocol and integrity checklist to train additional staff to work with Javier, and eventual make more requests in his classroom.

11.13 Case Example 2: Naomi

Naomi was a moderately vocal 8-year-old diagnosed with autism spectrum disorder (ASD). Naomi's mother sought help at home with her daughter's aggression. Although Naomi was an older child she had not received services in her home prior to our introduction. Our initial

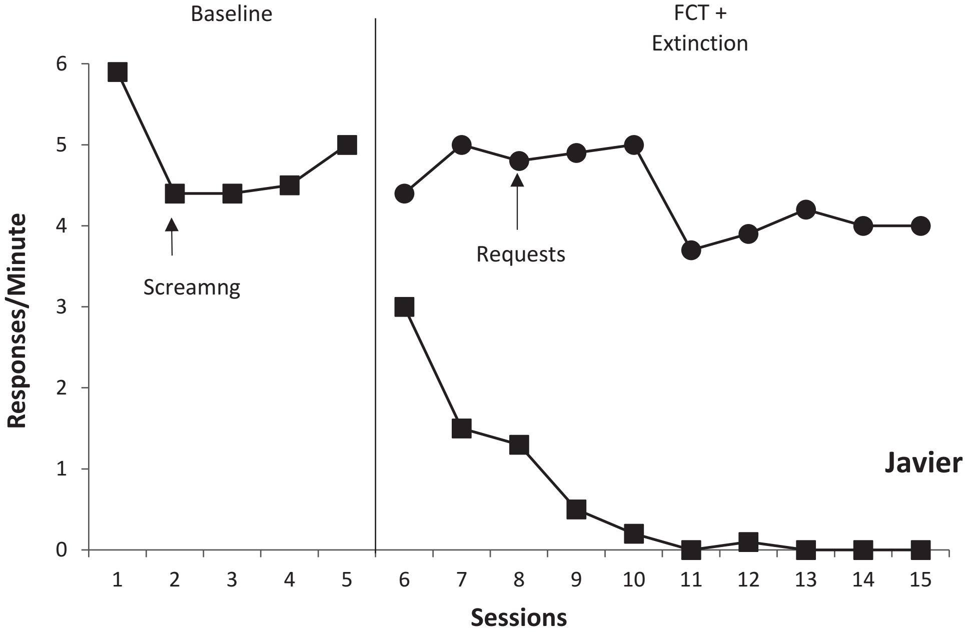

Fig. 11.4 Efficacy of functionally based intervention for Javier (Case Example 1)

interactions with those familiar with Naomi were during her individual education plan (IEP) team meeting, in which they reported that Naomi engaged in daily, high-rate aggression toward her mother at home. She had been admitted to a psychiatric hospital, preventing her from attending her educational program. The school district and parent requested our assistance with intervention to prevent a more restrictive and costly residential placement out of the district. Naomi had recently returned home from 4 days in such a facility.

Prior to assessment, our consultants interviewed her teacher who reported that Naomi did not engage in aggression at school, and generally participated in teaching sessions when her day was predictable. During the day, adults provided choices for tasks mixed with fun activities, and frequently provided high-quality attention. Her teacher estimated that staff provided smiles, tickles, or “Naomi celebrations” (playful handclapping/cheering routines) approximately every 5 min.

We also interviewed her mother. Naomi’s mother was a single parent who worked long hours. She admitted that while she tried to touch base with Naomi and follow through with what the school suggested, she did not see how any of the school strategies could work for her at home. She could barely get through her long days caring for Naomi and it would be a challenge to use a picture schedule, provide Naomi with animated celebrations, and “think three steps ahead.” Naomi’s mother also said that while she loved her daughter very much she struggled to provide her with the quality of care and interactions she may need since she divorced Naomi’s father 3 years earlier. She reported that Naomi’s aggression and yelling “no” were much lower prior to the divorce because she could get her what she needed: toys, food, and attention. Lately Naomi seemed to aggress during her self-care routines. Naomi’s mother would direct her to the shower and Naomi would push and pull her mother toward the bathroom in a forceful manner. This resulted in Naomi receiving her mother’s assistance through the

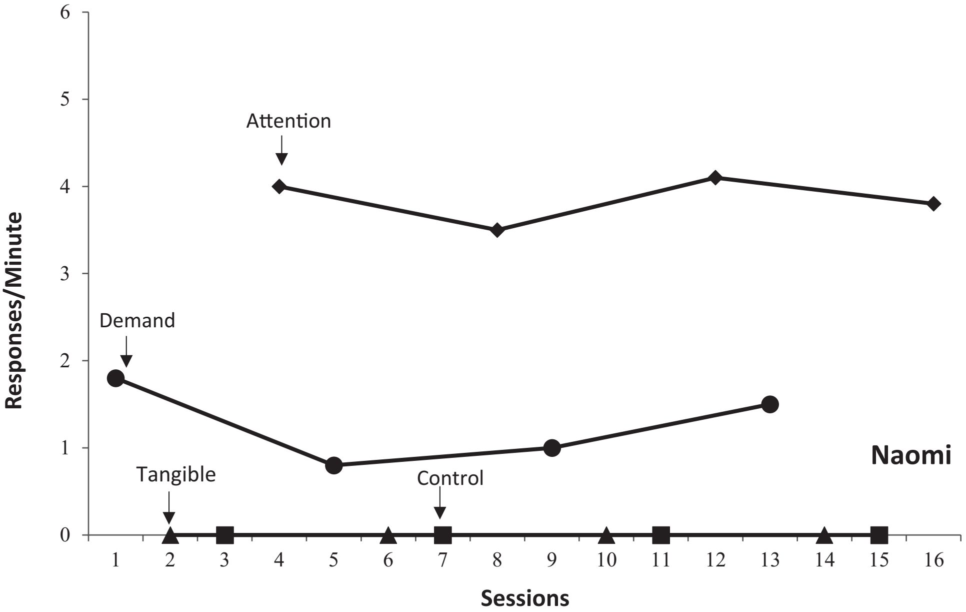

Fig. 11.5 Results of functional analysis for Naomi (Case Example 2)

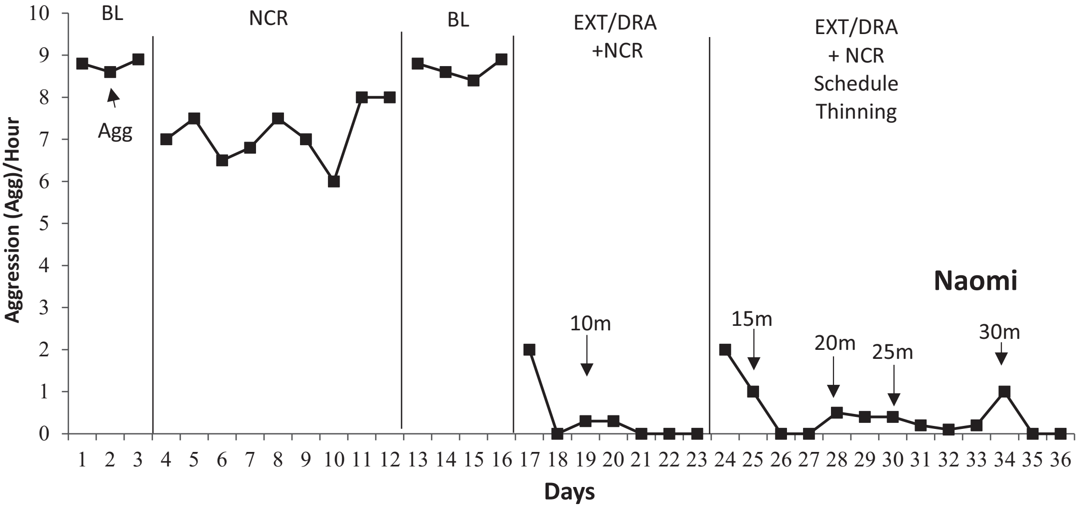

Fig. 11.6 Efficacy of functionally-based intervention for Naomi (Case Example 2)

whole pre-bedtime routine. If Naomi did not want to do something her mother asked (e.g., brush her hair, pick up items) she generally pushed her away.

Based on the intervention information, we conducted a home-based functional analysis with Naomi's mother. We concluded that Naomi primarily engaged in aggression to access her mother's attention and to escape demands in the home setting (see Fig. 11.5). Given these findings, we designed an intervention plan to include noncontingent attention (the form of this attention included animated conversation and hugs) from her mother on a consistent schedule (i.e., every 10 min during the evening hours). We started with this intervention first based on feasibility (easiest for mom), and given attention was identified as the primary function. We decided to add other components on an as-needed basis (see Fig. 11.6).

Although our intervention produced a decrease in aggression, it was still occurring at a notable level. After nine sessions of this noncontingent reinforcement (NCR) intervention we returned to baseline to reassess experimental control. We met with Naomi's mother and agreed to add some additional components to the intervention during non-preferred demands. In order to reduce the target behavior further her mother was trained to refrain from providing escape from the task while withholding additional attention upon occurrences of aggression (Ext), and providing praise for compliance (DRA) during the non-preferred demands/routines at home. Naomi's mother continued to provide her with NCR (attention) on the schedule (every 10 min) at all other times of the evening hours. This produced a significant decrease in aggression.

On day 23, Naomi's mother brought up a valid concern. Naomi's mother was fatigued, and she felt Naomi was asking for breaks too often; the breaks delayed the onset of their hygiene routine and they were finishing about 30 min later than usual. Subsequently we thinned the schedule of noncontingent reinforcement over the following weeks so that the time interval between NCR increased in 5-minute intervals. During this phase we carefully continued to monitor the aggression. Ultimately, we were able to make this intervention more feasible for her mother while maintaining low levels of aggression in the home.

11.14 Summary

Effective intervention begins with a clear understanding of the variables contributing to target behavior. The true "end" of intervention development is indefinite to the extent that interventions may evolve and require modifications to maintain treatment gains over time and across contexts. The effort is well worth it. Clinicians who are determined to understand the mechanisms responsible for behavior change, and who carefully take into consideration social validity and idiosyncratic variables into intervention selection, effectively utilize an evidence-based practice approach. This process of intervention selection and implementation for problem behavior can impart life-changing gains for the individuals, families, and communities you serve.

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Part III

Parent–Child Interaction Therapy (PCIT) and Autism Spectrum Disorder: Theory and Research

12

Mapping PCIT onto the Landscape of Parent Training Programs for Youth with Autism Spectrum Disorder

Karen Bearss

Abstract

Parent training (PT) is generally synonymous with "evidence-based treatment for children with disruptive behavior" and it is considered to be among the most well-established treatments in child mental health. The recognized struggles parents face in raising a child with autism spectrum disorder (ASD) have led to increased interest in the development of evidence-based parenting interventions for ASD. Due to the complex nature of ASD, PT program development in this population has taken a multifaceted path, targeting a wide range of behaviors including deficits in language, social reciprocity, self-help skills, and joint attention, as well as self-stimulatory and repetitive behaviors. This chapter presents the diverse and complex landscape of PT for individuals with ASD through an illustrative taxonomy of four main categories of programs: care coordination, psychoeducation, parent-mediated interventions for core symptoms, and parent-mediated interventions for maladaptive behaviors, noting that programs specifically targeting disruptive behaviors in this population represent just a small segment of available interventions. The chapter then highlights the unique contributions PCIT brings to the field of parenting interventions in ASD.

In child mental health services, the term "parent training" (PT) is synonymous with evidence-based treatment for children with disruptive behavior. There is a convincing body of evidence regarding the efficacy of parent training in treating disruptive behavior in children with oppositional defiant disorder and attention-deficit hyperactivity disorder from preschool to adolescence. PT is now considered to be among the most well-established evidence-based treatments in child mental health (Dretzke et al., 2009; Michelson, Davenport, Dretzke, Barlow, & Day, 2013). Clinicians can now choose from one of several well-established, structured programs, including Kazdin's Parent Training (Kazdin, 2005), Sanders' Triple P Program (triplep.net), Barkley's Defiant Children (Barkley, 2013), Webster Stratton's Incredible Years (www.incredibleyears.com), and Eyberg's Parent-Child Interaction Therapy (pcit.org; McNeil & Hembree-Kigin, 2010). This body of evidence has influenced international dissemination of parent training and prompted several clinical practice guidelines in the United States, the United Kingdom, and elsewhere in an effort to raise standards of mental health care for youth (American Academy of Child and

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Adolescent Psychiatry, 2007; National Institute for Health and Care Excellence, 2006).

12.1 Parent Training in ASD

Parent training (PT) as a mode of treatment in autism spectrum disorder (ASD) has taken a different and somewhat multifaceted path for obvious reasons—the complexity of the disorder, with deficits in social communication, imitation, and play, requires a more expansive approach. Due to the child's multiple needs, "best practices" for children with ASD have historically involved intensive, child-focused, school-based services (National Research Council, 2001) targeting core symptoms of ASD. Because parent participation is included as one of the six main tenets of the Individuals with Disability Education Act (IDEA; 34 C.F.R.§ 300.321, 2004), parent training may be provided as a supplement to these comprehensive school-based programs. In this context, PT is designed to play a supporting role in the promotion of continued skill acquisition and generalization from class to the home and community.

12.2 Role of Parent Training

Challenges associated with caring for a child with ASD do not end when the child leaves the classroom. Multiple studies confirm the burden and stress parents face (Hayes & Watson, 2013; Kogan et al., 2008; Tonge et al., 2006). Without resources available through the school system, parents have to look elsewhere for support and guidance on managing the challenges of raising a child with ASD. Unfortunately, access to quality community-based services is limited. This lack of availability of appropriate services is compounded by the lack of trained specialists (Brookman-Frazee, Drahota, Stadnick, & Palinkas, 2012). Although children with ASD represent 10–14% of psychiatrically referred populations (Joshi et al., 2010), only 5% of community mental health therapists consider themselves to have expertise in ASD (Brookman-Frazee, Drahota, & Stadnick, 2012). Moreover, training on the assessment and treatment of ASD is limited (Brookman-Frazee, Drahota, Stadnick, & Palinkas, 2012). Parents also report frustration about the slow pace of progress in treatment and lack of practical "tools" to manage children with ASD (Brookman-Frazee, Drahota, & Stadnick, 2012). As a result, the demand for parent support in caring for children with ASD, both within the school and community systems, far outpaces the availability of services by skilled providers in the community. This lack of access often results in long waiting lists for services and families resorting to treatments without empirical support (Wacker, Lee, Padilla Dalmau, Kopelman, & Lindgren, 2013). Many other children on the autism spectrum simply do not have access to needed services.

The recognized struggles parents face in raising a child with ASD have led to increased interest in the development of evidence-based, parent-focused interventions for ASD. PT is a fitting treatment model for several reasons: (1) it is traditionally a time-limited approach (typically 10–20 sessions) delivered during brief (1–1.5 h) weekly sessions; (2) it has demonstrated efficacy in treating disruptive behavior in typically developing children (Dretzke et al., 2009; Kaminski, Valle, Filene, & Boyle, 2008; Lundahl, Risser, & Lovejoy, 2006; Michelson et al., 2013); (3) it empowers parents by emphasizing their role as the change agent; (4) it is more effective compared to interventions delivered by a therapist alone (Buschbacher, Fox, & Clarke, 2004; Ingersoll & Dvortcsak, 2006); (5) it is deliverable in a wide range of service settings. Finally, there is increased recognition that intensive, school-based interventions are costly (Solomon, Necheles, Ferch, & Bruckman, 2007) and specialized, intensive services may not be available in all communities (Croen, Grether, Hoogstrate, & Selvin, 2002). Teaching parents to be the therapist for their child allows for delivery of treatment across settings and contexts (Burrell & Borrego, 2012).

12.3 What Is Parent Training in Autism Spectrum Disorder

As noted above, parent training in the general child mental health field refers to a systematic approach designed to reduce disruptive child behaviors. In the field of autism spectrum disorder (ASD), however, the term "parent training" is attached to a variety of treatments that may not share common features. The ambiguity of the term "parent training" in ASD may be due to differences in the targets of intervention. Whereas traditional PT typically has a clear focus on disruptive behaviors like aggression and defiance, "parent training" with ASD targets a wide range of behaviors, including deficits in language, social reciprocity, self-help skills, and joint attention, as well as self-stimulatory and repetitive behaviors. Thus, although the term "parent training" is a clear label for describing an empirically supported treatment for children with disruptive behavior uncomplicated by ASD, the application of this term within ASD is significantly more complex (Nevill, Lecavalier, & Stratis, 2018; Oono, Honey, & McConachie, 2013; Postorino et al., 2017). Given this broad application of the label "parent training" in ASD, it is not surprising that clinicians (even those well versed in ASD) offer differing definitions. Confusion about the label *parent training* in ASD may also extend to parents, clinic administrators, insurance companies, and policy makers. Thus, given the ambiguities of terminology used to describe parent training programs in ASD, clarification is vital (see Fig. 12.1).

12.4 Parent Training: Characterizing the Label

The first division of parent training programs within ASD is whether the program is focused on imparting information to the parent that promotes understanding of ASD versus promoting skill acquisition in the child or management of maladaptive behavior (Bearss, Burrell, et al., 2015). Figure 12.1 highlights the differences in these two broad categories. This initial classification schema can be broadened to include programs within four main categories: care coordination, psychoeducation, parent-mediated interventions for core symptoms, and parent-mediated interventions for maladaptive behaviors. Each of these modalities has a tradition and a history. Moreover, each has varying levels of research support from case reports, through rigorous single-subject design and, rarely, randomized controlled trials with structured interventions.

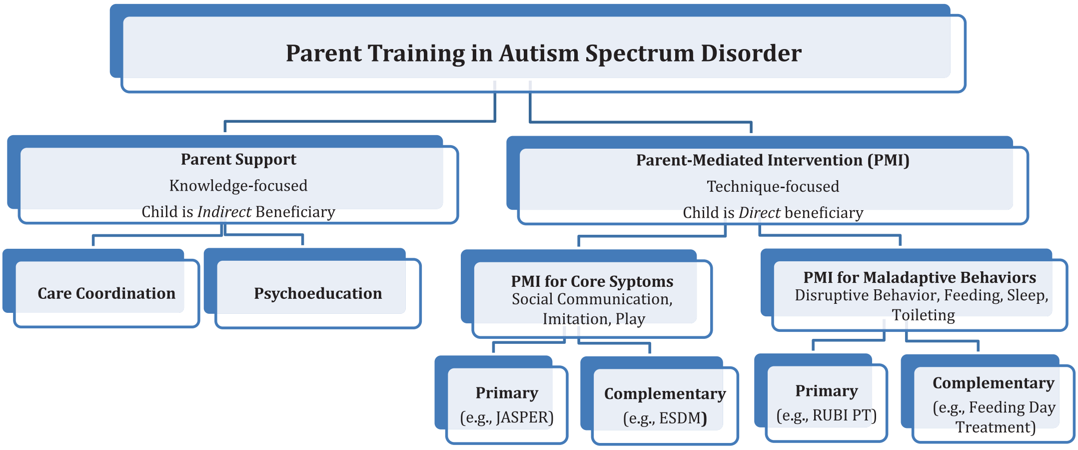

Fig. 12.1 Taxonomy of parent training in autism spectrum disorder (Bearss, Burrell, Stewart, & Scahill, 2015). RUBI-PT stands for Research Unit in Behavioral Intervention-Parent Training (Bearss, Johnson, et al., 2015). ESDM stands for Early Start Denver Model (Dawson et al., 2010). JASPER stands for Joint Attention, Symbolic Play, Engagement, and Regulation (Kasari et al., 2014)

Parent training can also be characterized by the program's format, intensity, location, duration, and target age group of the child (Beaudoin, Sébire, & Couture, 2014; Oono et al., 2013; Schultz, Schmidt, & Sticher, 2011; Steiner, Koegel, Koegel, & Ence, 2012). *Format* refers to how information is presented to the parent. Self-guided material may be available online or in self-help books. Alternatively, therapist-guided programs may be offered in groups or one to one. The most common and most complex format involves therapist-guided parent-child interactions (Schultz et al., 2011). Parent training programs may also range from low to high *intensity*. Low-intensity programs may include brief consultation with a care coordinator or bimonthly meetings with a therapist. Other more intensive programs may include 60–90-min weekly outpatient or in-home sessions (Bearss, Johnson, et al., 2015; Hardan et al., 2014; Kasari et al., 2014). High-intensity programs may involve multiple sessions a week or day treatment (Dawson et al., 2010; Sharp, Jaquess, Morton, & Miles, 2011; Wong & Kwan, 2010). In their review of parenting programs for children with ASD, Schultz et al. (2011) reported that intensity of treatments ranges from 1 to 25 h a week. *Location* is where the intervention takes place and may include clinic, school, home-based services or in recent years online presentation or delivery via telehealth (Bearss et al., 2018; Wacker et al., 2013). *Duration* reflects the length of time for the parent intervention. The range of parent training programs for young children with ASD varies widely from 1 week to 2 years (Oono et al., 2013). Finally, programs may focus on specific *target age* groups. For example, in younger or newly diagnosed children, services may focus on increasing parent understanding of their child's diagnosis and how to navigate educational planning and related systems of care. Treatments targeting parents of young children commonly focus on addressing core skill deficits, such as communication, socialization, and joint attention (Dawson et al., 2010; Kasari et al., 2014). Conversely, parents of older children and transition-age youth may instead benefit from programs targeting long-term planning (Smith, Greenberg, & Mailick, 2014).

12.5 Parent Support

Parent support encompasses programs intended to provide indirect benefit to the child by providing support to the parent and increasing parental knowledge about ASD. Parent support can be categorized as *care coordination* and *psychoeducation*.

12.5.1 Care Coordination

The Agency for Healthcare Research and Quality (AHRQ) defines care coordination as "the deliberate organization of patient care activities between two or more participants involved in a patient's care to facilitate the appropriate delivery of health care services" (AHRQ, , 2014, p. 41). Given the complex medical and educational requirements of children with ASD, care coordination is an essential element in the overall clinical management. Indeed, children with ASD use more healthcare resources than the general pediatric population (Gurney, McPheeters, & Davis, 2006; Liptak, Stuart, & Auinger, 2006). Parental effort required to coordinate multiple services is substantial, which results in parents reducing working hours or discontinuing work outside the home to meet service demands (Kogan et al., 2008). For example, in a sample of 2088 families from the 2005 to 2006 National Survey of Children with Special Health Care Needs, 25% of families reported spending 10 or more hours per week coordinating the child's care (Kogan et al., 2008). This burden of care could be reduced if access to appropriate services and better integration of available services were available (Parellada et al., 2013).

The goal of care coordination is to connect families to services and to bridge gaps along a care pathway. This often involves assisting parents to navigate the complicated array of medical, behavioral, alternative, educational, and medical treatments. Care coordination tends to be a brief and time-limited consultative service delivered by a social worker or case manager. State and local agencies may also provide care coordination services. For example, in Pennsylvania, families can register their child with the Office of Developmental Programs to obtain services from a support coordinator who will serve as an advocate and develop an Individual Support Plan (Lubetsky, Handen, Lubetsky, & McGonigle, 2014). Although there are accepted recommendations for educational and medical services for children with ASD (e.g., National Research Council, 2001; National Standards Report, 2009), empirical support for current models of "care coordination" in ASD is sparse. A major barrier to rigorous testing of care coordination models is the wide range of regional differences in available services. In addition, the services indicated for children with ASD across the range of severity and age pose a challenge for care coordination. As in many areas in ASD, one size does not fit all.

12.5.2 Psychoeducation

Among the most frequently expressed unmet need by parents of children with ASD at the point of the child's diagnosis is access to quality information about ASD (Hamilton, 2008; Whitaker, 2002). By providing parents with up-to-date information about ASD, effective psychoeducational programs can help parents adjust expectations for the child's future and advocate for appropriate services. For example, psychoeducation can help parents prepare for the challenges in the development of an Individualized Education Plan (IEP). Parents of newly diagnosed children need guidance about interventions with empirical support, interventions without solid evidence that are promising, as well as interventions that are unfounded and unsafe. Psychoeducation can also be beneficial as new challenges unfold throughout the child's lifetime, such as the onset of puberty or transition to independent living.

There are many self-guided psychoeducational resources available to parents, such as Volkmar and Wiesner's (2009) book "A Practical Guide to Autism: What Every Parent, Family Member, and Teacher Needs to Know," or Web-based resources such as the Autism Speaks 100 Day Kit (http://www.autismspeaks.org/family-services/tool-kits/100-day-kit). Informal psychoeducation also occurs as a part of regular clinical practice (e.g., within the primary care or mental health setting). A structured psychoeducational program is likely to be more intensive than care coordination in the number of visits and can be delivered by case managers, social workers, psychiatric nurse practitioners, or psychologists. Structured psychoeducational programs are generally short term in duration (i.e., 6–12 sessions) and can be conducted in group or individual formats. Group programs have the added value of promoting mutual support and opportunities to share personal experience with other parents (Daley, Singhal, Weisner, Barua, & Brezis, 2013; Farmer & Reupert, 2013).

Common outcomes for psychoeducational programs in ASD include increased parental knowledge, enhanced competence in advocating for the child, decreased parental stress, and a reduced sense of isolation (Daley et al., 2013; Farmer & Reupert, 2013; Smith et al., 2014; Tonge et al., 2006). Psychoeducation also may include a few sessions on behavioral management strategies or techniques to enhance communication. Given the brief coverage of these topics within a broader psychoeducation program (Farmer & Reupert, 2013; Smith et al., 2014), these few sessions may increase parental knowledge on behavioral techniques, but are unlikely to provide adequate guidance on management of moderate or greater behavioral problems. To date, research on psychoeducation in ASD is limited. A few pilot studies have examined psychoeducation as a stand-alone intervention for ASD (Daley et al., 2013; Farmer & Reupert, 2013; Smith et al., 2014) or as a "control" condition (Bearss, Johnson, et al., 2015; Hardan et al., 2014; Tonge et al., 2006; Tonge, Brereton, Kiomall, Mackinnon, & Rinehart, 2014).

12.6 Parent-Mediated Interventions

Parent-mediated interventions are *technique focused* where the parent is the agent of change and the child is the *direct* beneficiary of treatment (Bearss, Burrell, et al., 2015). As shown in Fig. 12.1, parent-mediated interventions may focus on the treatment of core features of ASD or maladaptive behaviors.

Programs that fall within parent-mediated interventions may be further divided into ***primary*** or ***complementary*** interventions. This distinction is based upon whether the parent is the primary change agent or a team member in a therapist-led intervention. ***Primary*** programs actively engage the parent from the outset in order to facilitate the child's acquisition of specific skills (e.g., joint attention; Kasari et al., 2014) or the reduction of the child's maladaptive behaviors (Bearss, Johnson, et al., 2015). In ***complementary*** programs, the treatment, at least initially, involves the child working with a therapist. The therapist then may work with the parent to promote generalization of techniques from therapist to parent (e.g., Early Start Denver Model; Dawson et al., 2010) or from clinic into the home and community (e.g., Marcus Autism Center Feeding Program; Sharp et al., 2011). Although this distinction is useful for classifying interventions, hybrid programs have emerged in which interventions initially designed as complementary have expanded to include primary programs (e.g., Early Start Denver Model, Rogers et al., 2012).

12.6.1 Parent-Mediated Intervention (PMI) for Core Symptoms

PMIs for core symptoms include treatments that focus on teaching parents how to promote social interaction, communication, imitation, and play skills. Although there are self-guided PMI resources for parents (e.g., *Teaching Social Communication to Children with Autism: A Manual for Parents* (Ingersoll & Dvortcsak, 2010); *More than Words: A Parent's Guide to Building Interaction and Language Skills for Children with Autism Spectrum Disorder or Social Communication Difficulties*, Sussman, 2012), most PMI programs for core symptoms involve therapist working with the parent-child dyad (Oono et al., 2013; Schultz et al., 2011). PMIs can be delivered in the home and community settings. These locations may be preferred because interactions and skill acquisition occur in a naturalistic setting (Carter et al., 2011; Dawson et al., 2010; Drew et al., 2002; Roberts et al., 2011; Siller, Hutman, & Sigman, 2013; Smith, Groen, & Wynn, 2000). Most programs run 2–3 h per session, but the frequency ranges widely from twice daily to monthly (Oono et al., 2013). Duration varies as well. Although many structured PMIs targeting core symptoms are over 1 year in length (Casenhiser, Shanker, & Stieben, 2013; Dawson et al., 2010; Drew et al., 2002; Green et al., 2010; Roberts et al., 2011), a few programs teach skills to parents within 1–2 weeks (Nefdt, Koegel, Singer, & Gerber, 2010; Wong & Kwan, 2010). PMIs may be delivered by a variety of professionals including special educators, speech pathologists, psychologists, psychiatric nurse practitioners, and Board Certified Behavior Analysts.

Currently, most parenting interventions for core features of ASD focus on socialization and communication or imitation skills (Oono et al., 2013). The review by Schultz et al. (2011) noted that nearly half of the 30 identified parent training studies focused on communication as the primary target for intervention. In Beaudoin et al.'s (2014) review on parenting interventions for toddlers with ASD, communication was a main goal in all 15 included studies. Finally, Nevill et al. (2018) recently completed a meta-analysis of 19 RCTs of parent-mediated interventions for core symptoms, with sample sizes ranging from 20 to 152. Outcomes focused on ASD symptom severity, socialization, communication-language, and cognition, with results indicating that change on most domains was associated with small effects (weighted Hedges' g varied from 0.18 (communication-language) to 0.27 (socialization) and averaged 0.23 across domains. While the strength of treatment effects varied depending on the informant (parent versus clinician), outcomes were not significantly different based on dose of treatment or type of comparator condition (e.g., treatment as usual, active comparator).

12.6.2 Parent-Mediated Intervention for Maladaptive Behavior

Recent findings suggest that the most stressful part of parenting a child with ASD is not managing core symptoms, per se, but the presence of co-occurring disruptive behaviors (Osborne & Reed, 2009). This is of significance as up to half of children with ASD exhibit high rates of disruptive behaviors, such as tantrums, aggression, property destruction, noncompliance with routine demands, self-injury, and hyperactivity (Kaat & Lecavalier, 2013; Kanne & Mazurek, 2011; Maskey, Warnell, Parr, Couteur, & McConachie, 2013; Mayes et al., 2012; Mazurek, Kanne, & Wodka, 2013) as well as more focal concerns such as food refusal (Sharp et al., 2013), sleep disturbance (Hoffman, Sweeney, Gilliam, & Lopez-Wagner, 2006; Johnson et al., 2014), toileting problems (Maskey et al., 2013; Simonoff et al., 2008), and elopement (Anderson et al., 2012). These maladaptive behaviors may interfere with a child's response to educational intervention, lead to further isolation from peers, and increase caregiver stress due to disruptions in daily activities (Brereton, Tonge, & Einfeld, 2006; Hayes & Watson, 2013; Herring et al., 2006; Simonoff et al., 2008; Tonge et al., 2006). These behaviors can also erode the family's quality of life (Hayes & Watson, 2013). Compared with parents of neurotypical children, parents of children with ASD report a greater sense of helplessness and are more likely to avoid conflict when facing challenges of parenting (Herring et al., 2006). Children with ASD with disruptive behavior who actively resist acquiring new skills or performing already acquired skills will likely fall behind in adaptive functioning (Scahill et al., 2016). Indeed, on measures of adaptive functioning, children with ASD are often a full standard deviation below their assessed cognitive ability (Kanne et al., 2011; Perry, Flanagan, Dunn Geier, & Freeman, 2009). This connection between disruptive behavior and impaired adaptive functioning provides a compelling rationale for PMIs designed to reduce the child's behavioral problems.

Until recently, most studies on training parents to reduce disruptive behavior in their children with ASD have used single-subject designs (Campbell, 2003). These studies offer proof of concept for specific parent-mediated techniques for children with ASD and maladaptive behavior; however, the individualized approach may hinder replication (Smith et al., 2007). In addition, study samples were often inadequately characterized making generalization difficult. To move the field forward, the consensus was that testing PT requires the use of structured manuals in randomized trials to promote replication, dissemination, and eventual implementation in real-world settings (Smith et al., 2007).

More recently, several open prospective case series (Bearss, Johnson, Handen, Smith, & Scahill, 2013; Brookman-Frazee, Drahota, & Stadnick, 2012; Dababnah & Parish, 2016; Okuno et al., 2011; Roberts & Pickering, 2010; RUPP, 2007; Wacker et al., 2013) and quasi-experimental trials (Lindgren et al., 2016; Tonge et al., 2014) using structured manuals have been published, supporting the efficacy of PT in reducing behavioral problems in children with ASD. Additionally, six randomized clinical trials (RCTs) of PT as a stand-alone treatment have been published to date, with sample sizes ranging from 26 to 180 (Bearss, Johnson, et al., 2015; Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Reitzel et al., 2013; Sofronoff, Leslie, & Brown, 2004; Tellegen & Sanders, 2014; Whittingham, Sofronoff, Sheffield, & Sanders, 2009). PT has also been shown to be an effective adjunct treatment to medication in youth with ASD: atomoxetine in the treatment of attention deficit hyperactivity and noncompliance (Handen et al., 2015) and risperidone in the treatment of serious behavioral problems (Aman et al., 2009). Most recently, a meta-analysis of eight randomized controlled trials has showed that PT is an effective intervention for reducing disruptive behavior in children with ASD (age 2–14 years). The quality and duration of PT varied and effect sizes ranged from small to large. The overall effect size was 0.58 (Postorino et al., 2017).

12.7 Clinical Implications of Characterizing Parent Training Programs

The simple division of parent support programs and parent-mediated interventions for children with ASD illustrated in Fig. 12.1 is a starting place for positioning a given intervention into the broader treatment landscape. The diverse nature of available programs involving parents requires the field to avoid using labels that do not elucidate the program content. In practical terms, this implies that saying a program is a "PMI" is insufficient. The label should, for example, promote distinction between a "PMI for communication" versus a "PMI for disruptive behavior." Although this expanded description may seem unnecessary or burdensome, it may be especially useful to insurance companies, policy makers, and clinic administrators. These stakeholders may not be familiar with the similarities and differences across various parent training programs—but they play an important role in determining program viability. Moreover, parents, who are the primary consumer of these services, are often inundated with information and may be overwhelmed by treatment choices. Clear descriptions will help parents decipher treatment options.

The delineation of parent support programs and parent-mediated interventions implies that the resulting categories are mutually exclusive. In clinical settings, however, the demarcation may not be so firm and there may be overlap across the four areas (i.e., care coordination, psychoeducation, PMI for core symptoms, PMI for maladaptive behaviors). In some settings, clinicians provide a combination of supportive and skill-based treatments by necessity. Alternatively, there may be programs that are designed primarily to address core symptoms or behavioral issues in children with ASD but may also include, as part of the program, sessions on enhancing language acquisition.

12.8 Evidence-Based PMIs for ASD and Disruptive Behavior

The taxonomy described by Bearss and Burrell et al. (2015) illustrates the complexity and diversity of parenting programs for individuals with ASD. It also highlights how programs specifically targeting disruptive behaviors in this population represent just a small segment of available interventions. The remainder of this chapter highlights two programs that qualify as "Primary Parent-Mediated Interventions for Disruptive Behavior" that contain the bulk of empirical support within this category: the RUBI parent training program and PCIT.

12.8.1 The Research Unit in Behavioral Intervention (RUBI) Program

To date, the RUBI parent training program (RUBI-PT) is the best studied PMI for reducing disruptive behavior children with ASD (Aman et al., 2009; Bearss et al., 2013, 2018; Bearss, Johnson, et al., 2015; Johnson et al., 2007; RUPP, 2007; Scahill et al., 2012, Scahill et al., 2016). The RUBI-PT program consists of 11 core and 7 supplemental (focal-problem) sessions (e.g., toileting, feeding, sleep issues) as well as booster sessions and home visits. The intervention is based on the principles of applied behavior analysis (ABA), which posits that disruptive, noncompliant, and aggressive behaviors serve a function for the child: to access a tangible item (certain food or preferred toy), gain attention, escape from a demand, or because it is self-stimulatory in nature. Within the ABA model, the key to changing a behavior is to identify its function as a means to inform modifications to the situations that precede and the consequences that follow the behavior. Within

RUBI-PT, therapists set out to teach parents how to modify the child's behavior, setting up the parent as the change agents. The RUBI-PT program targets routine activities that often pose a daily struggle for parents of children with ASD including getting dressed, getting ready for bed, or managing trips to the grocery store.

With funding from the National Institute of Mental Health (NIMH), the initial version of the RUBI-PT manual was tested in a multi-site feasibility trial with 17 children (RUPP Autism Network, 2007). This was followed by a 6-month, randomized trial comparing risperidone alone to risperidone plus RUBI-PT in 124 school-age children (4–13 years) with ASD and serious behavioral problems. In that study, both treatments resulted in substantial reduction of disruptive behavior. But risperidone plus RUBI-PT was superior to drug only (Aman et al., 2009). The RUBI-PT manual was then revised for younger children with ASD and disruptive behaviors under the simple assumption that a downward extension of the manual may prevent the emergence of more severe behaviors in school-age children and avert the need for medication. An open pilot trial of RUBI-PT as a stand-alone treatment in 16 children between the ages of 3 and 7 years supported the feasibility and initial efficacy of the modified manual (Bearss et al., 2013). The RUBI Autism Network then launched a NIMH-funded multi-site trial in 180 children (age 3–7 years) with ASD and disruptive behavior. Subjects were randomly assigned to RUBI-PT or a structured 13-session parent education program (PEP) for 6 months. PEP provided parents with an up-to-date overview of topics related to ASD (e.g., differential diagnosis, genetics, available treatments, and educational placement); however, PEP did not include any information on child behavior management. Both RUBI-PT and PEP were delivered individually to parents by trained therapists over 24 weeks.

In the RUBI trial, independent evaluators, who were blind to treatment assignment, classified 69% of children in RUBI-PT with a positive response compared to 40% in the PEP group at week 24 (Bearss, Johnson, et al., 2015). A key secondary outcome of interest was change in adaptive skills as measured on the *Vineland Adaptive Behavior Scales*. In line with the model that reducing disruptive behavior sets the stage for improvements in adaptive skills, there was a significant improvement in Vineland Daily Living Skills in RUBI-PT compared to no change in PEP (Scahill et al., 2016). Parents attended 92% of the core therapy sessions and attrition by week 24 was low at 11%. Therapist fidelity to the treatment was excellent, averaging 97%. Similar findings were noted with a subsequent open-label pilot trial of the RUBI-PT program when delivered via telehealth (Bearss et al., 2018). These results provide strong evidence that the RUBI-PT program significantly reduces disruptive behavior, parents are engaged in treatment, and therapists can reliably deliver the intervention. Table 12.1 summarizes outcomes of the RUBI-PT program across the five trials (RUPP, 2007; Aman et al., 2009; Bearss et al., 2013, 2018; Bearss, Johnson, et al., 2015).

12.8.2 Parent-Child Interaction Therapy (PCIT)

PCIT (www.pcit.org) is widely recognized as an evidence-based program designed to target disruptive behaviors in typically developing children aged 2–7 (Eyberg & Funderburk, 2011; Eyberg, Nelson, & Boggs, 2008; McNeil & Hembree-Kigin, 2010) and is emerging as an efficacious treatment for disruptive behaviors in youth with ASD. Its efficacy has been demonstrated by numerous randomized trials over the past 25 years (Herschell, Calzada, Eyberg, & McNeil, 2002; McNeil & Hembree-Kigin, 2010). More recently, PCIT has been successfully used in the treatment of preschoolers with depression, ADHD, and anxiety and is also considered a best practice for children and families served in the child welfare system (Lenze, Pautsch, & Luby, 2011; Matos, Bauermeister, & Bernal, 2009; McNeil, Herschell, & Gurwitch, 2005; Pincus, Santucci, Ehrenreich, & Eyberg, 2008; Timmer, Ware, Urquiza, & Zebell, 2010).

Table 12.1 Outcomes of the RUBI-PT program across four trials

Study	N	Design	Therapist fidelity to PT	Attrition	Effect size[a]	Outcome
RUPP, 2007	17	Open label, pilot	94%	18%	0.88	Supported feasibility and preliminary efficacy for multi-site study
Aman et al., 2009	124	Two group RCT[b]: risperidone vs. risperidone + RUBI-PT	95%	27%	2.61	Drug + PT > drug alone
Bearss et al., 2013	16	Open label, pilot	93%	13%	0.94	Supported feasibility and preliminary efficacy in young children
Bearss, Johnson, et al., 2015	180	Two group RCT[b]: RUBI-PT vs. parent education	97%	10%	1.77	PT > parent education
Bearss et al., 2018	14	Open label, pilot	98%	7%	1.25	Supported feasibility of delivering RUBI via telehealth

[a] Within-subject effect size for RUBI-PT on the primary outcome measure, the Aberrant Behavior Checklist. ES = (Mean at baseline − Mean at endpoint)/Baseline standard deviation

[b] *RCT* Randomized clinical trial

Based on Baumrind's (Baumrind, 1966, 1978) developmental theory of parenting, PCIT synthesizes attachment theory, which promotes warmth in the relationship between parent and child, with operant and social learning theory, which utilizes differential reinforcement to modify and decrease disruptive behavior (McNeil & Hembree-Kigin, 2010). PCIT accomplishes this balance through a two-stage intervention: child-directed interaction (CDI) and parent-directed interaction (PDI) . Treatment begins with CDI, which involves a therapist behind a one-way mirror coaching the parent to actively engage in play with the child. CDI encourages parental warmth and responsiveness in order to promote a secure parent-child relationship, which then contributes to the child's greater social-emotional regulation when frustration occurs. A secure parent-child attachment, in turn, enhances the child's desire to please and willingness to comply. CDI is designed to increase parent use of "*PRIDE*" skills (*P*raise appropriate behaviors, *R*eflect child speech, *I*mitate the child's play, *D*escribe the child's actions, engage with *E*njoyment) and to ignore inappropriate behavior during play. Once a parent masters these skills, PDI is initiated, which emphasizes how behavioral contingencies shape dysfunctional interactions between disruptive children and their parents. To interrupt a cycle of escalating disruptive behaviors between parent and child, parents learn to incorporate clear limit setting within the context of an authoritative relationship.

PCIT is designed to address the *proximal* target of parent use of appropriate strategies to improve the interactional pattern between parent and child. This is accomplished by teaching the parent to provide intensive positive social attention and language modeling while playing with the child via the PRIDE skills. Change in parenting skills is designed to promote *distal* changes in the child—increasing the saliency of the caregiver as a positive social partner and setting up the child to be more tolerant of demands that will begin during PDI. Using time series analyses, Pemberton, Borrego, and Sherman (2013) demonstrated improvement in parental differential attention over the course of PCIT in relation to changes in child behavior (reduction in disruptive behavior).

12.8.2.1 Expanding PCIT to ASD

There has been notable interest in expanding PCIT to children with ASD and disruptive behaviors, noted by statement papers (Masse, Wagner, McNeil, & Chorney, 2007), case studies (Agazzi, Tan, & Tan, 2013; Armstrong, DeLoatche, Preece, & Agazzi, 2015; Armstrong & Kimonis, 2013; Hansen & Shillingsburg, 2016;

Hatamzadeh, Pouretemad, & Hassanabadi, 2010; Lesack, Bearss, Celano, & Sharp, 2014; Masse, McNeil, Wagner, & Quetsch, 2016), one open-label trial ($N = 17$) (Zlomke, Jeter, & Murphy, 2017), and two small RCTs ($N = 19$; $N = 39$) (Ginn, Clionsky, Eyberg, Warner-Metzher, & Abner, 2017; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). This interest is driven by the noted similarities between PCIT and other well-established treatment models in ASD. For example, PCIT follows hallmarks of applied behavior analysis (ABA), with its emphasis on the use of behavioral observation data to determine the course of treatment and assess change both within and across sessions. PCIT also utilizes live parent-child coaching to promote skill acquisition in the parent. PCIT also is similar to Naturalistic Developmental Behavioral Interventions (NDBIs, Schreibman et al., 2015), which are emerging as a common framework for many parent-mediated interventions for core symptoms of ASD. Examples of specific, evidence-based NDBIs include the Early Start Denver Model (ESDM; Dawson et al., 2010), the JASPER model (Kasari et al., 2014), and Pivotal Response Training (PRT; Koegel & Koegel, 2006). Like PCIT, NDBIs utilize learning experiences that promote cross-domain skill development, so that a particular task may be designed to promote acquisition of social, language, and cognitive skills. Additional hallmarks of NDBIs that are found in PCIT include the delivery of services in naturalistic and interactive social contexts, such as play and daily routines, while using child-directed activities as the entry point for engagement. This approach appreciates the value of allowing the child to be an active instead of passive learner. Finally, like NDBIs, PCIT focuses on promoting functional skills used in everyday life and in the context of meaningful exchanges between the child and his or her caregiver.

12.8.2.2 Novel Contributions of PCIT to ASD Interventions

Both RUBI-PT and PCIT have disruptive behavior as the primary target for treatment; however, there are important differences between the two programs. In terms of programmatic structure, RUBI utilizes didactics as the primary means of knowledge transfer and skill acquisition by the parent. PCIT, comparatively, relies on in vivo behavioral coding and coaching techniques as the primary means of promoting skill acquisition by the parent and assessing progress through treatment. The goal is to help parents over-practice parenting skills to the point of mastery (i.e., habit). A high bar for parental skill mastery has resulted in PCIT demonstrating some of the largest effect sizes in the realm of children's mental health (e.g., $d = 1.65$) (Ward, Theule, & Cheung, 2016) and is considered a best practice for the treatment of trauma associated with child maltreatment, as well as anxiety, hyperactivity, defiance, tantrums, and aggression in preschoolers (McNeil & Hembree-Kigin, 2010). In terms of measuring outcomes, RUBI relies heavily on parent report (change in parent skills, reductions in child disruptive behavior) whereas PCIT utilizes direct observation to assess parent skill acquisition and to determine progress (i.e., change in child behavior) as key primary outcomes. Most importantly, the RUBI program focuses exclusively on disruptive behaviors and adaptive skills. In fact, most PT programs within ASD focus on core symptoms *or* maladaptive behaviors (Bearss, Burrell, et al., 2015). While PCIT was developed as an intervention for disruptive behavior, it is unique in that changes targeted in treatment include improving the saliency of the child's social partner (caregiver) while also promoting the value of language (Costa et al., 2018; Garcia, Bagner, Pruden, & Nichols-Lopez, 2015; Tempel, Wagner, & McNeil, 2008) and play as the tools to promote engagement between parent and child, all of which are priority targets for children with ASD. The added value of targeting improvements in language and core symptoms of ASD would suggest that PCIT is an integrated treatment model that can be utilized to target *both* core symptoms and maladaptive behaviors. Parents of youth with ASD have to juggle multiple, fragmented appointments for their children—survey data suggest that parents average between four to seven different treatments at any one time; the greater the severity of symptoms, the more treatments are likely to be in use (Goin-Kochel, Myers, & Mackintosh, 2007; Green et al., 2006). Having one program that can target multiple domains of child functioning, specifically across domains (disruptive behavior and core symptoms), may reduce the need for numerous, sequential treatments for children and their families, easing family burden and providing a tangible impact on family quality of life.

12.9 Future Directions

Acknowledging that ASD is a heterogeneous population, evaluation of the efficacy of PCIT in children with ASD, including exploration of specific baseline characteristics that may moderate treatment response, will provide guidance to clinicians and is consistent with the goal of personalized clinical care—knowing not just *if* PCIT works, but also for whom (Lei, Nahum-Shani, Lynch, Oslin, & Murphy, 2012). Additionally, as the empirical foundation for PCIT expands, there will be concomitant need for dissemination (spreading the word about the evidence-based intervention) and implementation (deliberate steps to incorporate evidence-based treatments into real-world settings). PCIT is an internationally disseminated intervention, with over 180 certified trainers and thousands of certified/rostered therapists that span all 50 states and 14 countries. PCIT also has a well-organized and centralized organization (PCIT International; www.pcit.org) supporting efforts around continuing education, international development, policy and advocacy, training, and research. The organization is committed to the provision of ongoing training of community providers and the dissemination of research through annual statewide, national, and international conferences. This well-structured organization allows for quick dissemination of new findings. As results from trials continue to support the efficacy of PCIT for children with ASD and more is learned about whom it best serves, the path to deployment (use by community practitioners) requires only dissemination of information; no new training is required. Additionally, new information and recommendation can be integrated into standardized trainings for new therapists and included in PCIT International's array of continuing education options. Put simply, PCIT has the ability to move quickly from efficacy to implementation.

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13

A Clinical Description of Parent-Child Interaction Therapy

Paul Shawler and Beverly Funderburk

Abstract

Parent-Child Interaction Therapy (PCIT) was originally developed by Dr. Sheila Eyberg to address early childhood behavior problems and promote pro-social and emotional development in young children. PCIT is a two-stage, behavioral parent training program which guides caregivers to develop authoritative parenting skills that balance a warm relationship with the child and effective limit setting. PCIT targets patterns of parent-child interaction rather than focusing on specific target behaviors by having a therapist actively coach a caregiver during real-time interactions with the child. PCIT was designed to provide a developmentally sensitive treatment format for young children, featuring play-based learning opportunities as the primary medium to facilitate behavior change. PCIT has an extensive evidence base for a range of early childhood problems, and PCIT repeatedly receives the highest rankings among reviews of evidence-based treatments. This chapter is designed to provide information on the theoretical and historical underpinnings of PCIT, review the core features, describe the format of treatment, and illustrate how PCIT has been utilized in different settings to meet the needs of children and families.

13.1 Impact of Early Childhood Behavior Problems

Early occurrence of childhood behavior problems is associated with a host of long-term significant impairments, including academic and social difficulties that impact adjustment into adulthood (Frick & Nigg, 2012). Thirteen percent or more of preschoolers are estimated to have a disruptive behavior disorder (Lavigne, Lebailly, Hopkins, Gouze, & Binns, 2009). Further, preschoolers are more likely than any other age group to be suspended and expelled from educational programs (Gilliam, 2005; Gilliam & Shahar, 2006). The interplay between childhood behavior problems and early academic adversity places children with disruptive behavior disorders at extreme risk for dropping out of high school as well as increased involvement with the justice system (American Psychological Association, 2008; Lamont et al., 2013; Petras, Masyn, Buckley, Ialongo, & Kellam, 2011). It is clear that childhood behavior problems are a public health concern and the most common reason that caregivers seek mental health services for their children (Loeber, Burke, Lahey, Winters, & Zera, 2000).

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Children with autism spectrum disorder (ASD) are three times more likely than their peers to experience childhood behavioral problems (Einfeld & Tonge, 1996; Hartley, Sikora, & McCoy, 2008; Mazurek, Kanne, & Wodka, 2013; Shawler & Sullivan, 2017). The most prevalent comorbid childhood behavior problems in children with ASD are noncompliance, oppositional behavior, and aggression (Baker & Feinfield, 2003). For children with ASD, ongoing behavior problems impact family well-being, educational interventions, placement decisions at home and school, social-emotional development, and use of antipsychotic medication (Brereton, Tonge, & Einfeld, 2006; Hartley et al., 2008; Lauderdale-Littin, Howell, & Blacher, 2013; Lecavalier, 2006; McGill & Poynter, 2012; Storch et al., 2012). Furthermore, these problems are exacerbated by child maltreatment, which can occur at high rates for children with ASD (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). Children with ASD and co-occurring behavior problems need intervention to limit the debilitating impact of difficult behaviors on health, safety, learning, and social relationships (Pearson et al., 2006); early intervention, involving the whole family, is key to circumventing downstream detrimental consequences on the most vulnerable children.

One treatment developed and widely used to address early childhood behavior problems and promote pro-social and emotional development in young children is Parent-Child Interaction Therapy (PCIT). Over the years, PCIT has garnered widespread support for several populations, including children involved in child welfare (Chaffin et al., 2004; Wilsie, Campbell, Chaffin, & Funderburk, 2017). This chapter is designed to provide information on the theoretical and historical underpinnings of PCIT, review the core features of treatment, and describe how PCIT has been utilized in different settings to meet the needs of children and families.

13.2 Introduction to PCIT

PCIT is an evidence-based treatment designed to assist families of children, from age two-and-a-half years up to 7 years, who present with a range of early childhood behavioral difficulties (see Chap. 14 of this handbook; Eyberg & Funderburk, 2011). Given the research documenting PCIT's effectiveness and utility for a range of early childhood problems, PCIT repeatedly receives the highest rankings among reviews of evidence-based treatments (e.g., California Evidence-Based Clearinghouse for Child Welfare, 2017; www.samhsa.gov/treatment/). PCIT is typically conducted in 1-h, weekly sessions at community outpatient mental health clinics. The average length of treatment is 15 sessions in controlled research trials. However, community clinicians have reported average treatment duration of 20 sessions.

Dr. Sheila Eyberg developed PCIT as a treatment to directly impact patterns of parent-child interaction rather than focusing on specific target behaviors. As such, a core feature of PCIT consists of a therapist actively coaching a caregiver during real-time interactions with his/her child. Further, PCIT was designed to provide a developmentally sensitive treatment format for young children, featuring play-based learning opportunities as the primary medium for facilitating behavior change.

PCIT consists of two distinct intervention phases. The first phase, Child-Directed Interaction (CDI) , lays the foundation for enhancing the parent-child relationship, fostering mutual warmth, and increasing positive attention for pro-social behaviors. The second phase, Parent-Directed Interaction (PDI), trains parents in skills to build structure for children through appropriate limit setting. Each phase begins with a session in which skills are taught to parents, and in subsequent sessions therapists directly coach parents in the skills. CDI precedes PDI, and the skills in each phase are complementary and additive. CDI skills include teaching caregivers how to deliver differential attention for positive child behaviors while minimizing attention provided for minor misbehaviors. Differential attention is a fundamental behavioral skill that is paired with targeted and selective use of additional caregiver skills that include praising, reflecting, imitating, and describing a child's behavior, with attention also given to nonverbal expressions of warmth and enjoyment (also known as the PRIDE skills).

These skills allow the caregiver to master traditional play therapy skills designed to enhance the caregiver-child relationship. Coaching assists the caregiver in enjoying time with his/her child and strengthening the attachment by enhancing emotional attunement between caregiver and child.

The second phase, PDI, involves teaching the caregiver skills to improve child compliance and reduce disruptive behavior. Skills include delivering effective commands (i.e., specific instructions), providing contingent reinforcement for compliance, and establishing a structured and developmentally sensitive discipline procedure to develop child compliance. Caregivers are coached to carry out procedures in a calm, clear, and consistent manner, allowing the caregiver to set limits that are predictable to the child. While PCIT is a short-term intervention, it traditionally is not time limited. In other words, progression through treatment is not based on a certain number of sessions attended or material presented. Instead, progression is based on parental mastery of skills and measured childhood behavior. Below, we describe the theoretical underpinnings of PCIT and follow with a detailed description of the intervention.

13.2.1 Theoretical Underpinnings

PCIT is one of several treatments developed in the 1970s at Oregon Health Sciences University, which was a fertile ground for innovative approaches to the treatment of childhood disruptive behaviors. The two-stage model developed and practiced there by Dr. Connie Hanf, a largely unpublished clinician and teacher, inspired a number of scientist-practitioners who trained during her tenure (Reitman & McMahon, 2013). Treatment developers inspired by Hanf's model included Drs. Eyberg, Cunningham, Barkley, Webster-Stratton, Forehand, and McMahon (Reitman & McMahon, 2013). The two-stage treatment model integrated the two prevalent child treatments of the time, individual play therapy and behavior therapy based on operant conditioning principles.

The first treatment approach incorporated into PCIT was traditional play therapy, in which the therapist follows the child's behavior and emotions during play to help the child express emotions safely through fantasy play (Axline, 1947). This downward extension of Rogerian therapy for young children relies on the therapist-child relationship to facilitate healing and change. The second phase of treatment in the Hanf model utilized the techniques of another child therapy technique, behavior therapy. In contrast to individual play therapy, which has its roots in psychodynamic and client-centered adult psychotherapy, behavior therapy was developed largely from techniques for the treatment of challenging behaviors related to developmental disabilities. Behavior therapy relied on operant conditioning paradigms, with techniques applied and carefully tracked by paraprofessionals under the guidance of the therapist. In Hanf's method, parents were taught to apply both the bonding techniques of play therapy and the social learning principles of behavior therapy. Progress was monitored and graphed, contingencies modified based on the observed data, and outcome success based on objective measures of improvement.

The transfer of the healing relationship from the therapist-child bond over to the caregiver-child bond was a major innovation of the Hanf model. It recognized that parent-child interactions are often strained when the child has disruptive behaviors, and in fact parent-child interaction patterns often are instrumental in developing and maintaining the disruptive behaviors. The beneficial effects of a weekly session with a play therapist could easily be overshadowed by the many hours of negative interactions in the home, and play therapy with a therapist did little to affect change in the parent-child relationship.

Teaching, modeling, and direct coaching of skills using a bug-in-ear microphone introduced the live coaching element implemented in PCIT. These components help caregivers to master the techniques that integrate the relationship-strengthening aspects of play therapy with behavior management skills to increase compliance and reduce disruptive behaviors. The calming effects of play therapy were transferred into the home setting by capitalizing on the most important relationship in the young child's life, the parent-child relationship. While the parent-child relationship has the capacity to promote healthy social-emotional development and self-regulation, it equally has the capacity to shape dysfunctional patterns of development. Another strong influence coming from the Oregon Social Learning program was the work of Patterson and colleagues (Forgatch, Bullock, & Patterson, 2004; Patterson, 1982). Patterson described a coercive cycle in which child noncompliance or negative behavior was sustained by the parent's withdrawing demands, and periodic negative parenting strategies such as yelling or hitting were reinforced by a temporary decrease in the child's disruption. The child's noncompliance and the parent's use of ineffective or harsh parenting techniques were mutually reinforced in an escalating cycle of increasingly negative interactions. Behavior problems were often inadvertently developed and maintained by patterns of interaction that progress as the child and parent exert bidirectional influence in innumerable moment-by-moment interchanges. Hanf's model recognized that the selective attention and positive regard that characterized the play therapy skills could be difficult to sustain in disciplinary situations based on practiced patterns of negative parent-child interactions; caregivers of young children also needed skills for appropriate limit setting.

Of the behavioral parenting approaches that follow Hanf's two-stage model, Eyberg placed relatively heavier emphasis on the play therapy phase and on live coaching techniques in the development of PCIT (Reitman & McMahon, 2013). The establishment of a warm and safe therapeutic relationship to foster and support change was weighted heavily, with the understanding that "play is the primary medium through which children develop problem-solving skills and work through developmental problems" (Eyberg, 1988, p. 38). Adding the behavior therapy techniques of differential attention and behavioral contingencies based on social learning principles gave caregivers the ability to interrupt and reshape negative patterns. In addition, the PDI phase of treatment involves a predictable, positive discipline program. The parent becomes a more predictable partner for the young child, offering clear limits and supporting the child's developing emotional and behavioral regulation. The use of the bug-in-ear microphone for in vivo coaching marks PCIT as an intensive format; this method relies on immediate feedback as the caregiver interacts with the child, which later research has shown to be associated with larger effect sizes (Kaminski, Valle, Filene, & Boyle, 2008). Hanf's two-stage model provided a format and techniques that were formative for PCIT and the other behavioral parent training approaches.

Diana Baumrind's work on parenting typology is foundational for parenting theory (Baumrind, 1967; Baumrind & Black, 1967). Based on Baumrind's work, parenting styles (i.e., authoritative, indulgent, authoritarian, neglectful) can be characterized on dimensions of demandingness and responsiveness. An authoritative parenting style tends to be high on both dimensions. The indulgent parenting style reflects low demandingness and high responsiveness, the authoritarian style of parenting reflects high demandingness with low responsiveness, and the neglectful parenting style is low on both dimensions. The two phases of PCIT neatly overlay the dimensions identified by Baumrind, with the CDI phase focusing on responsiveness and the PDI phase targeting the dimension of demandingness. The structure of the two-stage model is well suited to teaching the authoritative parenting style that Baumrind's research on child development found to be associated with positive outcomes in many facets of social and emotional adjustment (Baumrind, 1989). The ability to coach live interactions gives the therapist the ability to help parents move along the dimensions of responsiveness and demandingness to match the desirable authoritative style.

Eyberg crafted PCIT with the goal of obtaining the best outcomes identified by the child development literature for families of young children. PCIT uses the best available treatment techniques to offer the strongest lasting effects. The result was a robust treatment format that has been supported by decades of rigorous research.

13.2.2 Overview of the PCIT Protocol

13.2.2.1 Assessment Period

A standardized protocol (Eyberg & Funderburk, 2011) for delivering PCIT and meeting training competencies is available from PCIT International© (www.pcit.org). The protocol outlines treatment procedures, and also includes session-specific integrity checklists to promote treatment fidelity. As with other evidence-based treatments, PCIT starts with a pretreatment assessment composed of a clinical interview and standardized measures to assess presenting concerns. In addition to survey-based measurements, PCIT utilizes structured behavioral observations of parent-child interactions using an empirically validated behavioral coding system, the Dyadic Parent-Child Interaction Coding System, Fourth Edition (DPICS-IV; Eyberg, Chase, Fernandez, & Nelson, 2014).

The DPICS-IV is the framework for tracking parent and child behaviors over the course of PCIT. The structured observation adds important information that may not be obtained in an interview or through other measurement instruments to help guide treatment and monitor family skill progression. The assessment period provides a baseline of parent-child interactions in situations comprised of varying levels of demandingness, and starts a series of real-time functional assessments that allow therapists to modify factors maintaining problematic behaviors.

To assist in real-time functional assessment, the pretreatment DPICS-IV includes three 5-min observational tasks. All tasks are conducted in a child-friendly room with 3–5 toys. In the first task, the parent is instructed to follow the child's lead and play along with activities the child chooses (Child-Led Play). This situation is designed to observe the parent-child dyad in a low-demand scenario where the child has control. The second task is a moderate-demand situation in which the parent is instructed to choose an activity and have the child play according to the parent's rules (Parent-Led Play). Finally, the third task is a high-demand situation in which the parent is instructed to have the child clean up the toys in the room (Clean Up). All interactions are coded based on the DPICS-IV's operationally defined variables. The structured observations at the therapy intake assessment provide a baseline of parental skill, child compliance, and quality of the parent-child interaction.

13.2.2.2 Structure of Treatment Sessions

Following the initial assessment period, PCIT is structured into two distinct intervention phases to strengthen positive parent-child interactions and manage child behavior. Each phase begins with a "teach" session where the caregiver is introduced to the new skills. Apart from the two teach sessions, the remaining sessions largely focus on coaching. After the initial teach session, each "coaching" session begins with the caregiver completing a standardized assessment of his/her child's behavior (i.e., Eyberg Child Behavior Inventory [ECBI]; Eyberg & Pincus, 1999). In addition, most sessions include structured parent-child behavioral observations. The completion of the ECBI allows a systematic and standardized approach to monitor child behavior; the behavioral observation and coding from the DPICS-IV allow a systematic way to track caregiver skill acquisition over time. Coding also assists therapists in determining coaching goals in each session to guide the caregiver toward mastery of skills.

Historically (and most commonly), therapists provide coaching in session behind a one-way mirror. Therapists use a microphone to speak to caregivers through a hearing aid or Bluetooth receiver, called a bug-in-the-ear device. The caregiver and child dyad are instructed to play in a therapy room where a therapist can observe behind the one-way mirror to promote more naturalistic interactions. The therapist communicates in real time through *coaching statements* with the caregiver during these interactions. This in vivo coaching style of the caregiver is a hallmark of PCIT. Importantly, Kaminski et al. (2008) found in a meta-analysis of parenting interventions that skill practice with a parent and their own child is one of the most powerful predictors of reductions of child behavior problems. Therefore, therapist coaching is essential in assisting the caregiver to learn new skills for improving the parent-child relationship and reducing child problem behaviors. Meanwhile, the child perceives the caregiver as the central adult in the session and the therapist as a more peripheral figure.

Commonly, PCIT sessions are broken down as follows. The family will come into an outpatient treatment clinic to receive PCIT services. Before starting the session, the parent will be asked to fill out an ECBI. Next, the therapist meets with the parent for a brief check-in (e.g., 5 min) to review homework and any particular stressors the family has had since last session. The therapist then conducts the first task of the DPICS-IV assessment and spends the next 30–40 min directly coaching the parent skills. If more than one caregiver is present, time is divided, with each caregiver coached one on one with the child. Caregivers not actively being coached have the opportunity to observe the other parent being coached and can learn vicariously through observation. Therapists should reinforce that PCIT is a transparent intervention in which the therapist partners with each of the caregivers to achieve treatment goals. The session concludes with the therapist reentering the treatment room to review treatment progress and assign skill-based homework exercises. In this final 5–10 min of the session, the therapist reviews with the caregivers a graph of ECBI scores tracking child behavior and the DPICS-IV coding data measuring progress toward skill mastery.

13.3 PCIT Phases

13.3.1 Phase 1: Child-Directed Interaction

The first phase of treatment, CDI, targets strengthening the parent-child relationship and increasing child pro-social behavior. The foundation of CDI is to establish a positive environment where a parent can reinforce a child's appropriate behavior through traditional behavioral play therapy techniques. After the initial assessment is completed, CDI begins with a teach session for the parent to learn and practice the skills with a therapist. To establish a positive environment, parents are instructed to follow the child's lead in play without imposing demands. In this process, parents are explicitly taught how to provide differential attention to child behavior: ignoring inappropriate behavior, and providing praise and positive attention when the child engages in a positive opposite behavior. Specifically, this process involves parents actively ignoring negative behaviors that are not a safety concern such as temper tantrums, yelling, or rough play. As soon as a child engages in an appropriate behavior, the parent selectively attends to that behavior, providing social reinforcement in the form of the parent's warm attention. Using these skills, parents can strengthen pro-social child behavior such as sharing and playing gently with toys while also reducing negative attention-seeking behaviors. As such, CDI helps smooth the path for the limit setting that is introduced in the second phase of treatment.

CDI skills are broken into two broad categories consisting of behaviors parents should use and behaviors to be avoided. To strengthen caregivers' ability to provide effective differential attention, a specific set of skills are taught known as the "PRIDE" skills. These skills enhance the parent-child relationship, reinforce appropriate child behaviors, and increase the frequency of those behaviors. The skills include (1) *Labeled* **P***raise:* behavior-specific praise that recognizes and encourages the child's use of pro-social behaviors; (2) **R***eflection*: an active listening skill to provide attention to the child's appropriate verbal behavior and enhance verbal communication; (3) **I***mitation*: physically doing what the child is doing to promote positive behaviors and improve attunement; (4) *Behavioral* **D***escription*: pointing out what the child is doing to sustain interest in positive behaviors and increase attention and focus; and (5) **E***njoyment*: playing warmly, genuinely, and enthusiastically with the child.

Parents are taught to avoid using certain behaviors in CDI to allow for the child to maintain the lead in play. Certain parental behaviors can take the lead from the child or negatively impact the parent-child interaction. For instance, parents are taught to avoid using commands, questions, and critical statements. Commands take the lead from a child and often cause conflict or noncompliance. Questions often require a child to answer, shift attention away from play, and function as an indirect command (e.g., “Are you ready to clean up?’). Finally, critical statements provide attention to negative behavior and create a negative interaction between the parent and child.

Parents are recognized in PCIT as the critical agents of change. Skills learned and fine-tuned in therapy sessions are expected to be practiced in the home between coaching sessions. CDI skill practice consists of a 5-min therapeutic dose of behavioral play therapy between a parent and child known as “special time.” Skill practice is purposely limited to 5 min as it is hard to maintain high fidelity of skills past 5 min, and consistent short practice intervals are sufficient for skill advancement. Parents are asked to practice every day and typically need to complete the skill practice at least 4 days a week to make good progress toward mastery. Further, child behavior and parent-child relationship will only improve if the parent is consistently using the skills. While the skill practice is set for 5 min, it is expected that parents will naturally begin to generalize the skills beyond the 5-min play-based task as the parent recognizes the positive change in his/her child and the parent and child are mutually reinforced by their increasingly positive interactions.

As noted above, CDI coaching sessions begin with a brief check-in followed by the 5-min Child-Led Play task of the DPICS-IV. The therapist completes the behavior observation at each CDI coach session to measure skill development and set goals for that day’s coaching. As PCIT is assessment driven and mastery based, progression to the second phase of treatment requires that parents meet mastery of the CDI skills. Mastery criteria involve the parent demonstrating at least ten labeled praises, ten behavioral descriptions, ten reflections, and no more than a total of three questions, commands, and critical statements to the child during the 5-min observation period. The quantitative measurement of skills serves as a proxy measure of positive parent-child interaction and parental warmth that fosters secure attachment. Once a parent has demonstrated mastery of CDI skills, the parent and child transition to the next phase of treatment.

13.3.1.1 Coaching in CDI

To assist parents with mastery criteria, clinicians focus on select coaching statements. Coaching statements should be concise (ideally, just a few words), offered immediately after a behavior, positive, and supportive. Similar to skills the parents are instructed to use with children, clinicians focus on maintaining a positive relationship with parents through the use of differential attention, with an emphasis on specific praise for desired behavior. For instance, if a parent states to his/her child, “You put a red flag on the top of your tower,” a coach would immediately respond with something like “That was a great behavioral description. You are helping to keep him focused.” Coaching statements deliver immediate feedback and positive reinforcement to parental use of skills. Common coaching statements include labeled praises (e.g., “Perfect choice to ignore that”), observations of the child (e.g., “He just gave you a labeled praise”) or parent (e.g., “You are modeling gentle play”), cues to use the CDI skills (e.g., “Praise her for that” or “What could you praise her for now”), higher order statements that link skills being applied to the parent’s effect (e.g., “You praised him for good manners and now he’s being more polite”), and occasional gentle correctives (e.g., “Next time let’s try to ignore that behavior”). Early in treatment, clinicians may provide more direct coaching through the use of line-feeding phrases (e.g., “Say, ‘*You are putting the man on the house*’”) to help the caregiver establish the skills. Additionally, clinicians may selectively attend to certain skills and ignore use of certain phrases such as parental questions. The coach must establish a steady pace of feedback for the ignoring technique to be effective, and statements that follow the parents' skills have been shown to be more effective to encourage change than directive coaching statements (Barnett, Niec, & Acevedo-Polakovich, 2014). Coaching focuses on helping the parent gradually develop the skills from just feeling comfortable in the play situation at first to eventually meeting mastery criteria.

Common coaching practices involve select skill practice. For instance, if a parent is having a hard time meeting mastery criteria for reflections, a coach may focus on increasing reflections by telling a parent to reflect every statement the child makes and by offering whatever support is necessary to help the parent succeed in the allotted time. In summary, coaching in CDI should be highly engaging, provided in a timely fashion, positive, parent led, and attentive to principles of differential social attention.

13.3.2 Phase 2: Parent-Directed Interaction

The second phase of PCIT, PDI, is designed to teach parents to give specific kinds of instructions known to increase child compliance (i.e., effective commands), apply consistent and appropriate limits on child behavior, and provide a developmentally sensitive discipline procedure that parents can implement in a predictable manner. In turn, children are taught to comply with parental demands, develop impulse control, as well as improve their ability to manage feelings of frustration and anger in socially appropriate ways. PDI continues to emphasize the fundamental importance of the parent-child relationship strengthened within the CDI phase of PCIT. CDI skills are important to maintain throughout PCIT, and they continue to be addressed in every session throughout the second phase of treatment. For instance, if a parent does not meet mastery criteria for CDI skills in the initial observation of a PDI session, additional CDI coaching time is devoted prior to coaching PDI. A high level of CDI skills supports a warm parent-child relationship that increases the likelihood of willing child compliance and the maintenance of other pro-social child behaviors. Creating an environment in which the child is likely to comply with parental commands allows a child to be reinforced for appropriate behavior and limits the need for additional discipline. It is also important to note that parents are expected to continue to have daily special time with their child using the CDI skills throughout PDI and after treatment is completed.

As in CDI, PDI begins with a teach session prior to resuming coaching sessions with the child. As mentioned, parents are taught how to deliver a specific kind of instruction known as an effective command. An effective command is one that is direct, specific, developmentally appropriate, and positively stated. Commands are to be given one at a time to increase the likelihood for child compliance. Additionally, parents are taught a specialized time-out procedure that can be implemented in a calm, neutral, clear, and consistent manner for child noncompliance and severe misbehavior (e.g., aggression, destruction of property). The time-out procedure begins with the parent using an effective direct command with the child (e.g., "Please put the blue block in the box"). Parents provide social reinforcement for compliance through the use of a labeled praise (e.g., "Thank you for listening"). If a child does not comply, the parent is instructed to give the child a warning that if he/she does not comply, he/she will have to go to time-out. The warning is stated with the same words each time to cue the child that the parent will follow through. If the child does not comply, the parent continues with a structured time-out procedure in which the child is expected to sit on a chair for 3 min plus 5 s of silence. The time-out procedure concludes with a return to the original command that the child must obey to complete the time-out. Compliance with the original command is immediately followed with a second, follow-up command. The second command is delivered to ensure child learning and to over-practice compliance. The PDI procedure has planned responses for all the loopholes that some young children use to escape the boredom of time-out and the need to complete the original command. These "loopholes" include escape from the time-out chair, accessing toys or other objects of entertainment during time-out, or capturing the parent's attention. The coach helps the caregiver learn not to respond to attention-seeking behaviors as long as the child remains safely in the time-out chair. Once the child obeys the follow-up command, the parent delivers an emphatic labeled praise for minding and listening, the parent and child return to playing, and the parent utilizes CDI skills to deescalate the child and return to a positive equilibrium. Importance is placed on having a positive play period following a time-out to emphasize the parent's responsiveness while maintaining the demandingness that expects appropriate behavior from the child. This procedure also demonstrates to the child that the parent loves the child but will not bend to noncompliance or inappropriate behavior.

The initial steps of PDI (protocol sessions PDI Coach 1–3) involve the parent and child practicing compliance within play-based situations. As PDI progresses, an increased emphasis is placed on the generalization of compliance outside the clinic environment to the home setting. For instance, children will move from play-based compliance practice immediately following special time at home to practicing PDI at home in select situations. Once these steps have been mastered with the child demonstrating compliance and the parent appropriately implementing the discipline procedure, parents move to using commands as needed throughout the day at home. Later steps in PDI (protocol sessions PDI Coach 4–7) are introduced when the parent and child have made progress with the skills to the extent that the parent is following the PDI procedures with relative independence, the child is largely complying after the warning statement (rather than needing a time-out), and the child is able to sit in the time-out chair (without trying to escape) when a time-out is needed. The later steps of PDI promote further generalization of skills by introducing "house rules" that involve automatic time-out for selected aggressive or seriously disruptive behaviors (e.g., hitting, spitting on people) and extend the range of discipline skills to public locations (e.g., grocery store, restaurant).

As in CDI, the progression of PDI is also based on data and mastery criteria. For PDI mastery, parents must correctly demonstrate the delivery of at least 75% effective commands as well as 75% effective follow-through with the appropriate consequences (e.g., labeled praise for compliance, delivery of the warning for noncompliance) in the discipline procedure. Parents are expected to memorize and use specific phrases in the discipline procedure. Use of the verbatim phrases assists with predictability for the child. Further, it reduces stress for parents as they have prepared and overlearned responses ready for challenging situations.

13.3.2.1 Coaching in PDI

Coaching in PDI may seem very different for clinicians than CDI coaching. Specifically, a clinician must lead (rather than follow) the parent's behavior. Leading the parent to carry out the PDI procedures correctly on every trial provides the young child with an optimal environment to learn the new discipline procedure (and makes it predictable). Clinicians can better anticipate child behaviors, prepare parents for next steps (mentally, verbally, and physically), and prevent potentially confusing parental errors. Therefore, clinicians start PDI by line feeding parents a direct command and the correct discipline procedure phrase. This allows errorless learning for the parent, improving his/her ability to remember the procedure correctly and effectively carry out the procedure outside of session. Therapists guide the caregiver through the flow of the discipline procedure. For instance, a coach may need to clarify if a child understood the command and how to progress if it is unclear. A coach may offer suggestions for clarity (e.g., "Point to the object and motion to your hand"). As treatment progresses, coaches allow the parent to gradually take the lead, but are ready to quickly correct the parent if he/she strays from the structured protocol.

During PDI, clinicians should continue to provide their coaching statements and feedback by utilizing CDI coaching techniques (e.g., labeled praises, observations) when they can. Since most parents' CDI skills are now at mastery level, coaches can cue the parent to apply CDI skills between commands while focusing most of their effort on coaching discipline procedures. It is important that coaches remain calm and warm during PDI to (1) teach the time-out procedure with clarity, (2) help the parent regulate his/her own emotions, and (3) maintain a positive relationship with the parent during the potentially trying procedure. More specifically, the PDI coach should offer supportive statements to help the parent remain composed during the sometimes upsetting experience of an unhappy or protesting young child (e.g., "It is hard to ignore him on the timeout chair when he says that, but he is just trying everything to get your attention and avoid following through with your command. Take a deep breath. You are being a great mom by teaching him how to listen"). Remaining composed may look different across parents. For example, some parents may feel hesitant about carrying out a discipline procedure due to parental anxiety, and a coach should be attuned to caregivers' feelings and perspectives when coaching. Other parents might become impatient or angry when the child does not comply, and again the therapist must help the parent to remain composed and adherent to the procedures. The warmth and responsiveness of CDI remains a touchstone throughout PDI, both in the parent's interactions with the child and the coach's communication with the parent.

Coaching in PDI requires managing the environment. It is important to maintain a positive environment, alternating CDI skills with PDI skills. Prompting caregivers to use approximately one command a minute tends to allow enough practice opportunities in session while maintaining a positive environment. In particularly challenging cases, a clinician may need to step into the room and assist the caregiver to calm down or manage a situation in which the child becomes aggressive and the parent is struggling to manage the situation. As PDI advances, it is the clinician's responsibility to assist in the generalization of skills outside the therapy room by incorporating practice in places such as the lobby, the playground, or the hallways of the clinic. Every PCIT case should include some practice outside of the treatment room to promote generalization. Some therapists schedule outings with the family for practice in public, while other therapists remain in their setting but can practice within the agency and help parents plan for public outings on their own.

13.3.3 Graduation from PCIT

Before families can officially graduate from PCIT, they are required to meet a specific set of graduation criteria. First, parents must demonstrate mastery criteria of both CDI and PDI skills. Second, ratings of child behavior must be within normal limits (as measured by the ECBI). Specifically, scores on the ECBI must be within half a standard deviation away from the normative mean (i.e., 114 or below). Third, parents must express confidence in their abilities to appropriately manage child behavior without the need of ongoing support from a clinician. To assess for graduation readiness, the three situations of the DPICS-IV (i.e., Child-Led Play, Parent-Led Play, Clean Up) are then conducted (as was originally done at pretreatment). If the above criteria are met, the clinician and family review the family's progress toward treatment goals. Importantly, the clinician assists the parents in "next steps" on how to maintain consistent skill use over time. Additionally, the clinician should have a discussion with parents on how to manage future child behavior problems; this discussion is guided by a handout provided in the PCIT protocol. Lastly, the family is praised for their dedication to treatment, their continued efforts, and the positive changes they have accomplished over the course of PCIT. It is customary for clinicians to celebrate the family's graduation from treatment by providing a certificate of success for the caregivers and a blue ribbon or some small token of recognition for the child.

13.4 Delivery Setting of PCIT

13.4.1 Meeting Needs of Families

PCIT has historically been delivered in clinic-based settings, most commonly through the bug-in-the-ear device and a one-way mirror setup. However, some clinics lack standard PCIT rooms with one-way mirrors and communication equipment. When these barriers occur, coaching will take place in the room with the clinician positioned behind the parent (coaching "over the shoulder"); although this may seem awkward for some families at first, parents and children generally accommodate to this quite well.

Given the success of PCIT in clinic, PCIT is pioneering delivery in new frontiers. For instance, some providers have secured funds to purchase and deliver PCIT in mobile clinics through modified recreational vehicles (Girard, 2011). Others have suggested an intensive clinic model, bringing families into the clinic multiple times a week to enhance parental skill acquisition, quicken the pace of treatment, and rapidly change child behavior (Graziano et al., 2014). In addition, PCIT has been delivered successfully in group treatment modalities and demonstrated the potential to serve a greater number of families at one time (e.g., Niec, Barnett, Prewett, & Shanley Chatham, 2016).

Enhancing the availability of PCIT is an important endeavor as research suggests that only 3% of young children in need of mental health treatment receive it (Kataoka, Zang, & Wells, 2002; Lavigne et al., 2009). Additionally, attrition in clinic-based mental health care for children is alarming, ranging from 30% to 70% (Eyberg, Boggs, & Jaccard, 2014; Warnick, Bearss, Weersing, Scahill, & Woolston, 2014). The latest empirically supported expansions for PCIT that focus on disseminating treatment include home-based PCIT (Fowles et al., 2017) and Internet-delivered PCIT (I-PCIT; Comer et al., 2015). Home-based PCIT and I-PCIT have the potential to enhance participation, spread reach, and simultaneously reduce family-based attrition factors (e.g., transportation, childcare). For instance, home-based PCIT has seen increased attention and produced positive results (see Masse and McNeil, 2008, for full considerations of home-based PCIT). A recent statewide implementation study tested standard clinic-based delivery to an intensive home-based model of PCIT with wraparound services for high-risk families (Fowles et al., 2017). The quasi-experimental design demonstrated that families in home-based PCIT were twice as likely to complete services compared to participants in clinic-based PCIT (64.66% vs. 33.15%). In addition to being home based, I-PCIT (see Comer et al., 2015, for full considerations of I-PCIT) has particular promise to reach families via video teleconferencing (Cooper-Vince, Chou, Furr, Puliafico, & Comer, 2016). Whether in-home, group, clinic, or Internet based, PCIT has demonstrated improvements in parenting skills, improved parent-child relationships, and demonstrated large reductions in child disruptive behavior problems (Chaffin et al., 2004; Fleming, Kimonis, Datyner, & Comer, 2017; Foley, McNeil, Norman, & Wallace, 2016; Galanter et al., 2012; Gresl, Fox, & Fleischmann, 2014; Lanier et al., 2011; Ware, McNeil, Masse, & Stevens, 2008).

13.5 Conclusion

Parent-Child Interaction Therapy, developed by Sheila Eyberg, is a variant of Hanf's two-stage model of behavioral parent training. The goal of PCIT is to restructure ineffectual patterns of parent-child interactions to promote a more authoritative parenting style and optimize social and emotional adjustment in children. The first phase of treatment, CDI, incorporates techniques of play therapy as the parent learns to be highly responsive to the child and strengthen the parent-child bond. The assessment-driven treatment requires mastery of the CDI skills to proceed to the second phase of treatment, PDI; PDI focuses on training the parent in effective discipline procedures based on social learning principles. This discipline phase encourages the high levels of structure and expectations that match the high level of demandingness defined in Baumrind's authoritative style. Parents gradually build positive parenting skills as they play with their child and are coached by PCIT therapists. Coaching is typically done from behind a one-way mirror using a bug-in-ear microphone to give the parent immediate feedback on their use of PRIDE skills and effective discipline techniques. This live coaching format produces large and lasting effects that include improved parenting behaviors and reductions in children's disruptive behavior. This robust treatment has demonstrated success in a variety of treatment formats and settings, and continues to evolve based on constantly expanding empirical evidence and clinical applications.

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14

PCIT: Summary of 40 Years of Research

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Abstract

Parent-Child Interaction Therapy (PCIT) is a manualized behavioral parent training program developed by Dr. Sheila Eyberg in the 1970s. Since its development over 40 years ago, research on PCIT has followed Kazdin's model for treatment development, progressing from a conceptualization of the problem area and proposed mechanisms of change, to a formalization of the intervention, to outcome studies, and ending with testing the boundary limits of the intervention. PCIT is now recognized as an evidence-based treatment for young children with disruptive behavior disorders and/or a history of harsh physical discipline and child physical abuse, with increasing evidence to support its use for children of diverse cultural backgrounds and with varied presenting concerns. The current chapter reviews 40 years of research on PCIT, beginning with a summary of effectiveness and efficacy trials using standard PCIT, followed by descriptions of adaptation and applications of PCIT for children of diverse backgrounds and with a variety of presenting concerns.

Parent-Child Interaction Therapy (PCIT) is a manualized behavioral parent training program, originally developed by Dr. Sheila Eyberg in the 1970s as an intervention for young children with high-level externalizing behavior problems (Eyberg & Robinson, 1982). PCIT is a modification of the Hanf two-stage model of treatment (Hanf, 1969) which became popular in the 1970s and represented a shift away from individual therapy to a focus on family interactions in the treatment of childhood disorders (Eyberg & Robinson, 1982). PCIT differs from the original Hanf model in that it emphasizes strengthening the parent-child relationship (Eyberg & Robinson, 1982). Although it has been refined over the decades, PCIT has retained the two-phase structure. The Child-Directed Interaction (CDI) phase is focused on teaching the parent traditional play therapy skills to strengthen the relationship between the parent and child. The second phase, Parent-Directed Interaction (PDI), is focused on improving child compliance and other forms of misbehavior using operant techniques (McNeil & Hembree-Kigin, 2010; a full description of the treatment model is provided in Chap. 13 of this book).

Over four decades of research on PCIT has accumulated, resulting in its recognition as an evidence-based treatment for children aged 2.5–7 years with disruptive behavior disorders (Zisser & Eyberg, 2010) or with a history of child physical abuse or harsh physical discipline

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(Chadwick Center for Children and Families, 2004). The goal of this chapter is to review this substantive body of research on PCIT, guided by Kazdin's (1997) model for developing effective treatments as an organizing framework. Kazdin (1997) proposed that the development of effective treatments should begin with a thorough conceptualization of the problem area, as well as possible processes and mechanisms related to the problem area. Next, research should investigate the relation between these proposed processes and the problem area, followed by a conceptualization of the treatment based on mechanisms of change. Once the relations have been established and a treatment model has been conceptualized, the intervention should be manualized and implemented, followed by an evaluation of treatment outcomes. Finally, boundary limits of the treatment should be tested, focusing on diverse client groups and contextual factors (Kazdin, 1997).

The historical progression of research on PCIT has largely followed Kazdin's model, with earlier research investigating the specific treatment components and their relation to child misbehavior, followed by the manualization of the intervention and assessment of treatment outcomes using a variety of research designs. Efficacy and effectiveness trials assessing client outcomes for PCIT were later followed by studies examining novel applications of the treatment model with diverse groups and in innovative settings. Recent areas of focus have included using PCIT with children outside the 2.5–7 year age range, from diverse cultural backgrounds, and with a variety of presenting concerns.[1]

This research-focused chapter will begin with a review of treatment outcomes followed by a discussion of innovative uses for PCIT. A thorough review of the early phases of treatment development as outlined by Kazdin (1997), such as research demonstrating the effect of specific skills used in PCIT (e.g., different types of praise, time-out) on child behavior, is outside the scope of this chapter. Interested readers are invited to reference an early description of PCIT (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993), which provides an overview of the background research that supported the development of both the original Hanf model and PCIT. While efforts have been made to include as comprehensive a review as possible in each chapter section, it was impossible to include a description of all published literature on PCIT given how extensively PCIT has been studied. As such, tables have been provided in sections with larger bodies of research, to give readers a complete list of relevant articles.

14.1 Outcome Studies

In line with Kazdin's (1997) early stages of treatment development, foundational studies that led to the formation of the PCIT model included research investigating the effects of specific parental skills, such as different types of praise (Bernhardt & Forehand, 1975) and the parameters of time-out (Bean & Roberts, 1981), on child behavior. Once the efficacy of these distinct components was established, the full PCIT model was developed and the treatment was manualized. The first published description of the PCIT model (Eyberg & Robinson, 1982) details the treatment of seven families with a child between the ages of 2–7 years with disruptive behaviors. This sample is representative of the early focus of PCIT outcomes studies, and the research reviewed in this section will include studies that used standard PCIT for families of children between 2.5 and 7 years with disruptive behaviors. Readers will notice the later section within this chapter pertaining to diagnosis-specific adaptations, which summarizes the literature on PCIT outcomes for different presenting concerns.

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[1] The authors would like to note that a variety of caregivers (e.g., foster parents, kinship caregivers, extended family members; Mersky, Topitzes, Grant-Savela, Brondino, & McNeil, 2016; N'zi et al., 2016) are often included in standard PCIT. This point warrants special consideration in light of language choices made throughout the chapter. To maintain consistency, both with the name of the intervention and throughout the various sections of this chapter, the use of "parent" was chosen over "caregiver." However, we would like readers to note that the term "parent" should be considered a descriptor for any individual who is a caregiver for the child.

Numerous outcome studies have noted statistically and clinically significant improvements in both parenting skills and child behaviors across a variety of research designs. Earlier studies tended to be efficacy trials, which employed strict inclusion and exclusion criteria and with treatment delivered in a controlled university clinic setting (e.g., Eisenstadt et al., 1993; Eyberg & Robinson, 1982). These studies demonstrated improvements in parenting skills and child behavior from pretreatment to posttreatment (Eisenstadt et al., 1993; Eyberg & Matarazzo, 1980), as well as improvements compared to nontreatment control groups (Brestan, Eyberg, Boggs, & Algina, 1997; Eyberg & Matarazzo, 1980; McNeil, Capage, Bahl, & Blanc, 1999; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998) using multi-method and multi-informant approaches. Long-term follow-up from these studies has shown that improvements made during treatment were maintained between 1 and 6 years posttreatment (Boggs et al., 2005; Eyberg et al., 2001; Hood & Eyberg, 2003). In addition, generalization of improvements have been found in child behavior to the school setting (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991) and in parent skills used with untreated siblings (Brestan et al., 1997). Research has also shown that parents who complete treatment feel more confident in their abilities to manage their child's behaviors and are satisfied with the intervention process, content, and outcome (Schuhmann et al., 1998).

More recently, PCIT outcomes have been evaluated in effectiveness trials, with more flexibility in participant inclusion and with treatment delivered in community settings. As with the efficacy trials, the majority of the effectiveness studies have noted improvements in child behavior and in parenting skills, both from pretreatment to posttreatment and when compared to nontreatment control groups. These studies have been summarized in Table 14.1 and only include effectiveness studies that have been conducted using standard PCIT within the United States. Those studies that have used an adaptation of PCIT or have been conducted internationally are reviewed in later sections of this chapter.

PCIT has been the focus of several reviews (e.g., Eyber, Nelson, & Boggs, 2008; Lieneman, Brabson, Highlander, Wallace, & McNeil, 2017) and meta-analyses (Thomas, Abell, Webb, Avdagic, & Zimmer-Gembeck, 2017; Thomas & Zimmer-Gembeck, 2007; Ward, Theule, & Cheung, 2016). Although PCIT has still not been directly compared with an alternative treatment or placebo control within the United States, one study used meta-analyses to compare PCIT with Triple P—Positive Parenting Program (Thomas & Zimmer-Gembeck, 2007) in Australia. Results of this meta-analysis indicated improved child behaviors and parenting for both programs, with larger effect sizes noted for PCIT compared to most forms of Triple P (Thomas & Zimmer-Gembeck, 2011). Two recent meta-analyses examined PCIT outcomes (Thomas et al., 2017; Ward et al., 2016), with the most recent including 23 studies (Thomas et al., 2017). Both meta-analyses found large effect sizes for changes in child behavior and parenting skills (Thomas et al., 2017; Ward et al., 2016).

14.2 Treatment Components

As a manualized version of PCIT had been found to be both efficacious and effective, the next step outlined by Kazdin (1997) is to test the treatment process by examining the extent to which specific methods, techniques, and components of the intervention affect processes critical to the conceptual model of the target problem. Accordingly, PCIT researchers have studied specific PCIT treatment components.

14.2.1 Treatment Phases

Studies have been conducted to understand the sequencing and omission of treatment phases. Two studies have found that the CDI phase alone produces important treatment gains, such as decreases in parenting stress, increases in positive parenting practices, and decreases in child disruptive behavior (Danko, Garbacz, & Budd, 2016; Harwood & Eyberg, 2006). Other

Table 14.1 Summary of PCIT effectiveness studies

Authors	*n*	Setting	Study design	Findings
Budd, Hella, Bae, Meyerson, and Watkin (2011)	4 families 5 children	Urban community behavioral health clinic	Pre-post case studies	Significant improvement in child behavior, from the clinical range (pre) to below clinical (post)
Danko, Garbacz, and Budd (2016)	52 families	Urban community behavioral health clinic	Pre-post	Significant improvement in child behavior ($d = 2.30$)
Galanter et al. (2012)	83 families	In-home services	Pre-post	Significant improvement in child behavior ($d = 1.22$)
Hakman, Chaffin, Funderburk, and Silovsky (2009)	22 families	Child welfare agency	Pre-post	Increases in positive parental responses and decreases in negative parental responses
Keeshin, Oxman, Schindler, and Campbell (2015)	8 mother-child dyads	Domestic violence shelter	Pre-post	Significant increases in positive verbalizations and decreases in negative verbalizations
Lyon and Budd (2010)	14 families	Urban community behavioral health center	Pre-post	Significant improvement in child misbehavior, with less improvement noted for treatment non-completers
Naik-Polan and Budd (2008)	4 mother-child dyads	Child welfare outpatient clinic	Pre-post	Increases in positive parental responses and decreases in negative parental responses
N'zi, Stevens, and Eyberg (2016)	14 families	Participants in a kinship care program	Group comparison	Significant decreases in child externalizing problems ($d = 1.04$) for the PCIT group but not the waitlist control group
Self-Brown et al. (2012)	83 families	Child welfare agency	Pre-post benchmarking	Community PCIT produced better outcomes than a control benchmark, but inferior outcomes to a gold-standard PCIT efficacy trial benchmark
Timmer, Urquiza, and Zebell (2006)	75 foster families 98 non-abusive biological parent-child dyads	University-based outpatient clinic	Group comparison	Significant improvement in child behavior from pretreatment to posttreatment for both foster parents and biological parents, with no difference between these groups
Timmer, Ware, Urquiza, and Zebell (2010)	62 families with IPV; 67 families without IPV	University-based outpatient clinic	Group comparison	Significant improvement in child behavior from pretreatment to posttreatment for families with and without IPV, with no difference between these groups

Note*:* *PCIT* Parent-Child Interaction Therapy, *IPV* interparental violence

researchers have reversed the standard order of treatment, by beginning with the PDI phase. Families receiving PDI first reported greater improvements in child behavior problems than families receiving CDI first; however, there were no significant differences between groups on other outcome measures (e.g., parenting stress, child self-esteem; Eisenstadt et al., 1993). Although CDI does improve the parent-child relationship and set the foundation for PDI, it may be useful to deliver PDI first for some families with children who exhibit serious and potentially dangerous behavior problems (Eisenstadt et al., 1993).

14.2.2 Assessment

Standard PCIT includes assessment measures to guide and individualize treatment for each family. Such assessment methods include the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) and the Sutter-Eyberg Student Behavior Inventory (SESBI; Eyberg & Pincus, 1999) to track parent reports of child behavior at home and teacher reports of child behavior at school, respectively. In addition, the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013) is an observational coding system used to assess the quality of parent-child interactions in therapy sessions. The DPICS is used in two ways in standard PCIT. First, the therapist codes parent-child interactions during three different five-minute scenarios prior to beginning treatment, as a baseline measure of parent skill and child compliance. Coding within these three scenarios can also be completed posttreatment to assess overall change in parent skill and child compliance. Second, throughout the course of treatment, parent-child interactions are coded during the first five minutes of every session. This allows the therapist to identify specific skills that should be the focus of that day's session, in addition to continually tracking progress throughout treatment.

Before coding starts, parents are encouraged to begin using their skills during a five-minute warm up segment to allow the parent-child dyad to adjust to the task and the environment. To evaluate the necessity of these warm up segments, differences in parent skill use during the warm up segments and coded segments have been examined. Though Thornberry and Brestan-Knight (2011) found no significant differences in skill use between the two segments, Shanley and Niec (2011) did find significant differences during the warm up and coded segments, but only during the first of the three standard situations used in the DPICS. Given these mixed findings, additional research is needed to more fully understand the need for warm up segments when using the DPICS (Shanley & Niec, 2011; Thornberry & Brestan-Knight, 2011). Bahl et al. (1999) provide a helpful case example illustrating the use of assessment throughout treatment.

14.2.3 Homework

Daily homework is required of parents in PCIT given its impact on facilitating skill acquisition and generalization. Danko, Brown, Van Schoick, and Budd (2016) directly examined the hypothesis that daily homework improves treatment engagement and found that parents who completed more homework were also more likely to report higher levels of treatment satisfaction and were somewhat more likely to complete treatment (Danko, Brown, et al., 2016). Similarly, a study by Stokes et al. (2016) found that families who completed more homework achieved skill mastery and graduated from PCIT in fewer sessions than families who reported lower rates of homework completion (Stokes et al., 2016). These findings suggest that daily homework is helpful in improving family outcomes in PCIT.

14.2.4 Therapist-Client Communication

One of the most crucial and unique features of PCIT is the in vivo feedback, generally referred to as coaching, that is provided by the therapist to the parents while they interact with their child. This coaching and in vivo feedback has been shown to be essential to improving parenting skills (Shanley & Niec, 2010). Shanley and Niec (2010) randomized parent-child dyads to either a coaching or non-coaching condition. Each family completed a baseline DPICS observation session, followed by a second session 1 week later. During the second session, families in the coaching condition received in vivo feedback designed to increase their use of positive parenting skills, while the families in the non-coaching condition were simply observed again. Families in the non-coaching condition demonstrated a decrease in positive parenting skills, whereas families in the coaching condition demonstrated a significant increase in their use of parenting skills (Shanley & Niec, 2010).

Following evidence that basic coaching is essential to positive parenting changes, researchers examined the quality of coaching interactions. One such study found that parents who were taught components of PCIT through a mix of positive (e.g., "good job ignoring that") and constructive comments (e.g., "you're asking a lot of questions") used PCIT skills at a higher rate than parents who were taught using either a positive only or neutral style (Herschell, Capage, Bahl, & McNeil, 2008). Additional research found that responsive coaching (e.g., praising parents, process comments) was a significant mediator of parenting behavior change, whereas directive coaching (e.g., modeling or prompting a specific skill) was not related to parenting behavior change (Barnett, Niec, & Acevedo-Polakovich, 2014). While it is clear from this research that coaching is essential to parent behavior change, findings regarding the type and style of coaching are incomplete. Additional research would help to elucidate the impact of positive or responsive coaching compared with more directive or constructive coaching.

14.2.5 Maintenance of Skills

Maintenance strategies are supplementary components to PCIT and include (a) increasing the length of time between sessions (e.g., once a month) at the end of treatment; (b) teaching parents self-management, problem-solving, and communication skills; (c) providing booster sessions; (d) and delivering other forms of continued therapist contact after treatment ends (Eyberg, Edwards, Boggs, & Foote, 1998). Eyberg, Boggs, and Jaccard (2014) examined the effects of monthly phone calls on the maintenance of treatment outcomes posttreatment by comparing families who received monthly relapse prevention planning phone calls from their PCIT therapist with families who did not receive phone calls. These families were compared at 1- and 2-year follow-up assessments. Both groups of families showed few changes from their posttreatment assessment to their 2-year follow-up assessment, and no differences were noted in the rates of change for each group. While it is possible that maintenance strategies are not necessary for families who successfully complete PCIT, it is also possible that routine assessments alone may inadvertently reinforce maintenance of outcomes (Eyberg et al., 2014).

14.3 Implementation

As PCIT has been established as an effective treatment, and a more nuanced understanding of the essential components of PCIT has been obtained, efforts have been made to increase the availability of PCIT for families who could benefit from such services. To facilitate the implementation and accessibility of PCIT, a number of organizational innovations occurred. In 2009, PCIT International, Inc. was formed to provide training and certification and to promote the fidelity of the model in both research and practice (Funderburk & Eyberg, 2011). At the same time, training guidelines and certification requirements were established (Eyber, Nelson, & Boggs, 2008). These innovations coincided with a few large-scale implementation initiatives, generally within county- or state-level systems. Reports on these implementation efforts have provided important insights regarding common challenges, such as difficulties with initial recruitment and retention of families, as well as high clinician turnover rates (Beveridge et al., 2015; Self-Brown, Whitaker, Berliner, & Kolko, 2012; Timmer et al., 2015; Topitzes, Mersky, & McNeil, 2015). In addition, recommendations for upfront planning were provided, including careful matching of the intervention with the needs of the community, identifying a PCIT champion/advocate, ongoing support for the agencies and providers, and pre-implementation consideration of and planning for long-term sustainability (Beveridge et al., 2015; Scudder et al., 2017; Self-Brown, Valente, et al., 2012; Timmer et al., 2015; Topitzes et al., 2015).

Training has been identified as one of the most crucial factors for the implementation of a new intervention (Proctor et al., 2009; Stirman et al., 2012). As such, there has been significant attention on the type of training provided to therapists interested in PCIT certification. One study noted a discrepancy in the type of training received by different types of therapists; namely that community therapists are trained primarily through phone consultations after the initial face-to-face workshop training, while graduate student therapists in a university training model receive live in-person consultation while they coach families (Funderburk, Ware, Altshuler, & Chaffin, 2008). Although community therapists were more comfortable with the traditional phone consultation model, they found a pilot trial of remote real-time training (i.e., in vivo Skype feedback by an expert consultant) to be more helpful to their competency in PCIT (Funderburk et al., 2008). A later follow-up study noted meaningful improvements in client outcomes with remote real-time training compared with standard phone consultation (Funderburk et al., 2015). Results of these studies indicate that community therapists may benefit from the use of real-time training even more than standard phone consultation.

Training is considered crucial to implementation, as evidence has shown that clinicians who simply review a treatment manual are unlikely to improve their knowledge and skill to the point of mastery (Herschell et al., 2009), which limits their ability to successfully implement a new intervention. PCIT experts have provided their perspectives regarding critical aspects of training and have indicated that selecting appropriate trainees and engaging in pretraining preparation are important (Scudder & Herschell, 2015). In addition, the majority of experts indicated that an ideal training format would consist of a multiday in-person workshop, with role-plays and video review identified as important training activities to include (Scudder & Herschell, 2015). Despite consensus among experts on some of these critical training areas, there is still much to be learned about the impact of training methods on clinician knowledge, skill, and mastery of PCIT. Results of an ongoing randomized controlled trial (RCT) to compare three different training models within a statewide implementation initiative will help to provide information on best practices for PCIT training (Herschell et al., 2015). Such findings will allow for more evidence-based training practices, which in turn will facilitate the implementation and long-term sustainability of the intervention in community treatment settings.

14.4 Cost Analyses

One often-cited barrier to the implementation of evidence-based practices is the higher cost compared to services as usual (Lang & Connell, 2017). These higher costs are generally associated with start-up investments, such as the purchase of manuals and equipment, and initial therapist trainings (Lang & Connell, 2017). However, these costs are not often weighed in relation to the financial benefits that can come from the effective treatment of behavioral health concerns for both the family and society at large. In addition to being an estimated ten times more expensive for families than children without behavior problems (Scott, Knapp, Henderson, & Maughan, 2001), children with externalizing behavior problems may cost society up to $2 million over their lifetimes if untreated (Cohen, 1998). Given these figures, it is important to consider the costs of interventions for disruptive behaviors relative to their potential benefits to society.

Several studies to date have conducted cost analyses of PCIT. Aos, Lieb, Mayfield, Miller, and Pennucci (2004) evaluated PCIT within a child welfare setting and found a cost-benefit ratio of $1296–$4247 per child. That is, PCIT costs $1296 to implement per child but resulted in an estimated savings of $4247 within the domains of crime, substance abuse, education, teen pregnancy, teen suicide attempts, child abuse/neglect, and domestic violence (Aos et al., 2004). At a net gain of nearly $3500, Aos et al. (2004) concluded that PCIT within child welfare was a cost-beneficial program. A later study compared the costs of PCIT with treatment as usual, based on a review of service utilization records within a system of care (Krivelyova, Sukumar, Stephens, & Freeman, 2007). Although PCIT was initially more expensive than treatment as usual, the average cost for course of treatment for one child averaged out to be $600 less than treatment as usual after 18 months (Krivelyova et al., 2007). These findings suggest that the initial start-up costs are worth the investment and will pay for themselves over the long run (Krivelyova et al., 2007).

Goldfine, Wagner, Branstetter, and McNeil (2008) completed a cost-effectiveness analysis of PCIT using available published data on the associated costs and clinical benefits of PCIT treatment (Goldfine et al., 2008). Findings included an estimated $14,063.79 in initial costs, including equipment, toys, and therapy room renovations. They also found that PCIT costs approximately $1025.71 per child, and that it would cost from $22.07 to $100.56 to result in a one-point improvement on common assessment measures used in PCIT. Although there are no standards or guidelines to determine what is a reasonable cost for services, Goldfine et al. (2008) argued that these figures are reasonable compared with the substantial costs (both measureable and unmeasurable) to society that result from untreated disruptive behavior disorders.

Since 2012, the Washington State Institute for Public Policy has kept track of and routinely updated cost-benefit analyses of various evidence-based programs within their state, including PCIT. Within their child welfare system, the most recent data (updated in 2017) showed a $15.00 benefit to cost ratio, indicating that every dollar spent for PCIT services resulted in a $15 savings across participants, taxpayers, and other stakeholders (Washington State Institute for Public Policy, 2017). Thus, although initial start-up costs are often cited as a barrier to implementing PCIT, results across these various studies support the cost-effectiveness of PCIT.

14.5 Adaptations of PCIT

As outlined by Kazdin (1997), once the effectiveness of a treatment has been empirically supported, the next step in treatment development is to test its boundary limits. In line with Kazdin's (1997) model, more recent research has focused on applying PCIT to diverse groups. It is crucial to keep in mind the core features of PCIT and to ensure that any adaptations not stray from these core features. In this vein, Dr. Eyberg outlined guidelines for adapting PCIT to new populations (Eyberg, 2005).

The first defining feature of PCIT is the inclusion of both the parent(s) and child in sessions designed to teach them new ways of positively interacting (Eyberg, 2005). During these sessions, therapists observe and coach the parent within two treatment phases, the first focused on relationship enhancement and the second focused on consistent discipline procedures. This two-phased approach based on the Hanf model (Hanf, 1969) distinguishes PCIT from other interventions and is a crucial feature to retain. The second feature of importance is the empirical nature of PCIT. Not only was PCIT developed scientifically through rigorous testing of various treatment components (Eyberg & Robinson, 1982), but PCIT therapists also use measures to track family progress throughout treatment and to adjust the course of treatment for individual family needs. Dr. Eyberg stressed the importance of maintaining this empirical focus by making adaptations not only based on the clinical need of new populations but also based on scientific evidence (Eyberg, 2005). The following sections will describe changes made to the PCIT model for children of different ages and cultural backgrounds, and with different presenting concerns, as well changes in the treatment setting. Each of studies described in the subsequent section has retained the core features of PCIT while adhering to Dr. Eyberg's call for clinically and scientifically informed changes to the original model.

One final detail to note pertains to the language used to describe changes made to a treatment. In general, *tailoring* refers to changes in style or delivery made by the therapist based on the specific needs of an individual case (Eyberg, 2005). Skilled clinicians should tailor PCIT regularly for each of their families, based on the data collected at each session. *Adaptations* are larger changes made to the structure or content of an intervention when the core features are not feasible for use with a specific population (Eyberg, 2005). Finally, *modifications* refer to universal changes made by the treatment developer to the original intervention (Eyberg, 2005). The subsequent sections will describe a combination of adaptations and case studies in which tailoring has occurred.

14.5.1 Child Age Adaptations

Specific components of PCIT are appropriate for children between the ages of 2.5 and 7 years due to developmental considerations. As such, changes must be made to some of these components to make them more developmentally appropriate for children who fall outside of this age range. One example has been the adaptation of PCIT for premature infants, who are at a higher risk for developing externalizing behavior problems than infants born full-term (Linsell et al., 2016). Examples of specific changes include having parents use short sentences with developmentally appropriate concepts, and providing gestural cues (e.g., touching a block) when giving a command such as "Give me this blue block," during the PDI phase of treatment (Bagner, Sheinkopf, Hinckley, & Lester, 2009). Research on the effectiveness of PCIT with premature infants has demonstrated positive outcomes in parental stress and depressive symptoms, along with improvements in infant externalizing behaviors, internalizing behaviors, and physiological regulation (Bagner et al., 2009; Graziano, Bagner, Sheinkopf, Vohr, & Lester, 2012).

Early identification and treatment of behavior problems has received increased attention, given the possibility of providing briefer and less intensive interventions to attenuate such problems before childhood. Indeed, evidence suggests that early parent-child interactions, particularly those that may be characteristic of Patterson's coercion model (Patterson, 1976), predict later antisocial behavior and other psychopathology (e.g., Shaw, Gilliom, Ingoldsby, & Nagin, 2003; Shaw, Lacourse, & Nagin, 2005). Therefore, PCIT has also been adapted for infants not born premature, as an intervention to target early behavior problems (Bagner et al., 2016). The Infant Behavior Program is an adaptation of PCIT for infants that preserves the primary aspects of the CDI phase, while eliminating the PDI phase which is not developmentally appropriate for young children (Bagner, Rodríguez, Blake, & Rosa-Olivares, 2013). Families who participated in the Infant Behavior Program displayed significant increases in positive parenting behaviors (e.g., increased praise), more secure attachment behavior (e.g., sensitivity), reductions in infant externalizing and internalizing behaviors, and gains in infant language production (Bagner et al., 2013; Bagner, Coxe, et al., 2016; Bagner, Garcia, & Hill, 2016; Blizzard, Barroso, Ramos, Graziano, & Bagner, 2017).

PCIT adaptations have also been developed for toddlers younger than 2.5 years. Early toddlerhood may be a particularly challenging time for parents, as it is common for children during this stage to have difficulties with tantrums, aggression, and emotion regulation (Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013). Structurally, sessions are often kept to 30–45 min at the beginning of treatment and are gradually lengthened (Kohlhoff & Morgan, 2009). Similar to other adaptations of PCIT with younger children, the CDI phase is emphasized and parents are encouraged to use simple language when practicing the "Do" skills (Dombrowski, Timmer, Blacker, & Urquiza, 2005). The PDI phase of treatment is excluded; however, parents are taught developmentally appropriate PDI concepts (e.g., consequences) throughout treatment to manage behavior problems (Dombrowski et al., 2005; Kohlhoff & Morgan, 2009). Although research for this age range is limited, a published case study and pilot study found that PCIT was effective in increasing positive parenting skills and reducing child disruptive behaviors (Dombrowski et al., 2005; Kohlhoff & Morgan, 2009).

Age adaptations for PCIT have primarily focused on younger children; however, PCIT may also be tailored for older children with behavioral problems (McNeil & Hembree-Kigin, 2010; Stokes, Scudder, Costello, & McNeil, 2017). Older children may present unique challenges in PCIT, as they may be less motivated by parental attention and may not respond as positively as younger children to some of the CDI skills. In addition, there may be distinct variation in their preferred toys during playtime, their frequency of talking, and their size and weight. Within the CDI phase, commonly used toys may not be of interest to older children, but families and the therapist can tailor treatment to find appropriate toys that the older child still enjoys. Forming a strong therapist-child alliance may be particularly useful with older children, and it has been recommended that the therapist lengthen treatment sessions to allow for 5–10 min of therapist-child CDI time (McNeil & Hembree-Kigin, 2010).

As older children may be taller and heavier than younger children, it may be difficult for parents to carry the child to time-out. Adaptations to the PDI phase have been suggested, such as using a longer period of ignoring, incentive charts, and restrictions of privileges (Stokes et al., 2017). A published case study presenting some of these treatment adaptations with an 8-year-old child found that at posttreatment, the child no longer met criteria for oppositional defiant disorder nor had clinically significant internalizing or externalizing behavior problems (Stokes et al., 2017).

14.5.2 Diagnosis-Specific Adaptations

While PCIT was primarily developed to address externalizing behavior problems, it is common for children presenting with externalizing behavior problems to have at least one comorbid behavioral health disorder. In fact, one study noted 46% of children diagnosed with oppositional defiant disorder or conduct disorder also met criteria for at least one other disorder (Maughan, Rowe, Messer, Goodman, & Meltzer, 2004). As such, PCIT has been adjusted to better meet the needs of children presenting with a variety of behavioral health concerns.

14.5.2.1 Trauma

Children who experience a traumatic event commonly display a variety of symptoms, including disruptive behaviors, which may be targeted by behavioral parent training programs (Ford et al., 2000). Given its emphasis on both strengthening the parent-child relationship and improving discipline practices, standard PCIT has been recognized by the Kauffmans' Best Practices Project as one of the best treatments for families with a history of abuse; the efficacy of PCIT has been documented for children with diverse trauma histories, including physical abuse, sexual abuse, and witnessing interpersonal violence (IPV).

For families in a coercive cycle of harsh discipline and/or physical abuse, no adaptations have been required, and standard PCIT has been found to teach parents appropriate discipline strategies, strengthen the parent-child relationship, and increase maternal sensitivity (Thomas & Herschell, 2013). Parents with a history of physical abuse who participate in PCIT rapidly increase their use of positive parenting skills, while simultaneously decreasing their use of maladaptive parenting skills in response to appropriate child behavior (Hakman et al., 2009; Thomas & Zimmer-Gembeck, 2012). Similarly, children who witness IPV commonly experience significant behavior problems, and the stressful event may negatively impact the parent-child relationship (Lourenco et al., 2013). Thus, PCIT has been used as a treatment for children who have witnessed IPV (Borrego, Gutow, Reicher, & Barker, 2008; Pearl, 2008; Timmer, Ware, et al., 2010) and within a domestic violence shelter setting (Herschell, Scudder, Schaffner, & Slagel, 2016). PCIT has demonstrated success in strengthening the maternal-child relationship for children exposed to violence, in addition to demonstrating improvements in internalizing and externalizing behaviors in these children (Herschell et al., 2016; Pearl, 2008; Timmer, Ware, et al., 2010). For children with a trauma history who display problematic sexual behaviors, PCIT has been found to be effective in reducing these sexual concerns (Allen, Timmer, & Urquiza, 2016). The efficacy of PCIT for children with trauma histories has been demonstrated across numerous case studies, pilot studies, and randomized controlled trials.

14.5.2.2 Internalizing Disorders

There is growing evidence that PCIT is an effective treatment for children with specific internalizing disorders: separation anxiety, selective mutism, and depressive symptoms. Previous research suggests that targeting negative parent-child interactions, improving parental attention of child courageous behavior, and teaching ignoring of fearful behavior is an effective strategy at reducing separation anxiety disorder (SAD) symptoms in children (Pincus, Eyberg, & Choate, 2005). PCIT for SAD incorporates a Bravery-Directed Interaction (BDI) component, in which the therapist coaches the family through a hierarchy of exposures during each session (Pincus et al., 2005). The BDI component of treatment is integrated following the CDI phase, when parents often report feeling more confident and ready to assist their child in mastering the exposures (Pincus, Santucci, Ehrenreich, & Eyberg, 2008). An adaptation overview by Pincus et al. (2008) provides additional information on treatment considerations when implementing PCIT with this population. In a pilot study examining the efficacy of this adaptation, children participating in PCIT showed significant decreases in separation anxiety behaviors as well as disruptive behaviors that were maintained at a 3-month follow-up (Choate, Pincus, Eyberg, & Barlow, 2005).

Various components of PCIT have also been adapted to treat children with selective mutism. For example, changes to the DPICS behavioral observation system prompted the creation of the Selective Mutism Behavioral Observation Task (SM-BOTS; Carpenter, Puliafico, Kurtz, Pincus, & Comer, 2014; Kurtz, 2008). The SM-BOTS is similar to the DPICS in that there are three standardized five-minute situations, but differs in that it allows for unobtrusive observations of children with selective mutism who will not talk in front of others. In addition, the DPICS coding scheme was adjusted to account for parent behaviors that are unique to the maintenance of selective mutism (e.g., “mind reading”). This new version of the DPICS coding system is referred to as the Selective Mutism Interactive Coding System (SMICS-R; Carpenter et al., 2014; Kurtz, 2007). Additionally, a Verbal Directed Interaction (VDI) phase was added to the PCIT treatment model, in which parents are coached to promote and support their child’s verbal behavior (Carpenter et al., 2014). Pilot data of the adapted version of PCIT for selective mutism delivered both individually and in a group format suggest that the intervention promotes increased verbalizations among children with selective mutism (Carpenter et al., 2014).

An adaptation of PCIT for preschool children with Major Depressive Disorder (MDD) has also been developed based upon the need for more efficacious treatments with this population, and growing research suggesting the importance of parental involvement in treatment for preschool children with MDD (Eyberg, 2005). PCIT-Emotional Development (PCIT-ED) includes an Emotional Development module, in which the therapist coaches the parent in helping their child to identify, label, understand, and regulate their emotions (Lenze, Pautsch, & Luby, 2011). In a pilot study, children who participated in PCIT-ED showed marked improvements in depression severity, internalizing and externalizing symptoms, and functional impairment (Lenze et al., 2011).

14.5.2.3 Intellectual and Developmental Disabilities

Disruptive behaviors are common among individuals with intellectual and developmental disabilities and are often sources of stress and strain on the parent-child relationship (Hastings, 2002). PCIT shares many commonalities with other treatments for this population, including the use of praise for positive behaviors, the use of commands and compliance training, and time-out from positive reinforcement (McDiarmid & Bagner, 2005). Specific tailoring may be made to standard PCIT for children with intellectual and developmental disabilities, such as using short and repetitive verbalizations, emphasizing physical praise, and allotting extra time to defining the behavior if house rules are used (McDiarmid & Bagner, 2005). A randomized controlled trial found that PCIT was successful in reducing disruptive behaviors and parenting stress in young children with an intellectual disability and comorbid oppositional defiant disorder (Bagner & Eyberg, 2007).

14.5.2.4 Chronic Illness

Emerging research suggests that PCIT may also be an appropriate intervention for children with chronic illness and disruptive behaviors. Disruptive behavior in chronically ill children presents a challenge for medical providers and may negatively impact the child's health due to noncompliance with medical regimens (Pinquart & Shen, 2011). A case study examined the use of PCIT for a child with cancer presenting with disruptive behaviors (e.g., tantrums) that adversely influenced his medical evaluations (Bagner, Fernandez, & Eyberg, 2004). Several changes were made to tailor standard PCIT, including using a toy "doctor kit" during CDI, praising positive reactions to "medical behaviors" (e.g., blood drawings), and using a hospital chair as a time-out chair in PDI (Bagner et al., 2004). According to both parent and medical provider report, PCIT led to decreases in the child's disruptive behaviors and greater compliance during medical treatments (Bagner et al., 2004).

14.5.2.5 Autism Spectrum Disorder

In addition to characteristic features such as deficits in social communication, repetitive behavior, and restricted interests (American Psychiatric Association, 2013), children with autism spectrum disorder (ASD) often demonstrate externalizing symptoms and behavioral problems (Lecavalier, 2006). As such, parent training interventions like PCIT have been examined and supported as an effective method of treating disruptive behaviors in children with ASD (Postorino et al., 2017). Given the focus of this book, Chap. 16 is devoted entirely to outlining relevant research on PCIT for children with ASD. However, it is worth mentioning here that both case studies involving tailored PCIT (e.g., Lesack, Bearss, Celano, & Sharp, 2014; Masse, McNeil, Wagner, & Chorney, 2007) and larger group-comparison studies (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Solomon, Ono, Timmer, & Goodlin-Jones, 2008) have indicated that PCIT can be effective in reducing child disruptive behavior and in improving child compliance for children with ASD.

14.5.3 Culture-Specific Adaptations

Examining the effectiveness of evidence-based treatments in culturally and ethnically diverse groups is an important area of the clinical research. Behavioral health disparities for ethnic minority groups are well documented; however, the development of most psychosocial treatments for children, including PCIT, has been largely based on White families (Butler & Eyberg, 2006). The literature suggests various differences in characteristics, beliefs, and behaviors (e.g., parent help-seeking behaviors, service utilization settings) between ethnic minority groups and White participants in behavioral parent training programs, all of which may impact the effectiveness of treatment and treatment attrition (Butler & Eyberg, 2006). As PCIT use has expanded over the past 40 years, standard PCIT has been adapted to various cultures and minority populations to better fit families' needs.

The use of standard PCIT with Black children and families has resulted in findings largely consistent with those reported for White families (Capage, Bennett, & McNeil, 2008; Fernandez, Butler, & Eyberg, 2011; McNeil, Capage, & Bennett, 2002; Pearl, 2008; Querido, Warner, & Eyberg, 2002). McNeil et al. (2002) discussed differences in parenting values and behaviors, and treatment topics in PCIT with Black children and White children. As found in the majority White culture, an authoritative parenting style has been associated with fewer child behavior problems in this sample of Black families (McNeil et al., 2002). Standard PCIT treatment demonstrated effectiveness for Black families in reducing disruptive behaviors (Capage et al., 2008; Fernandez et al., 2011). This study also yielded no significant differences in diagnosis, treatment participation, treatment length, number of sessions completed, or attrition rates between a White and Black treatment group, when controlling for socioeconomic status (Capage et al., 2008).

Standard PCIT has also shown positive outcomes in an Australian community-based early childhood clinic. In an early study of PCIT conducted outside a university research setting, Phillips, Morgan, Cawthorne, and Barnett (2008) provided PCIT to 43 families with 1.5- to 4-year-olds seeking treatment for disruptive behaviors. Parents were highly satisfied with treatment, and findings suggest decreases in parent-reported child behavior problem intensity and frequency; externalizing and internalizing symptoms; and parenting stress, depression, and anxiety (Phillips et al., 2008). Two additional studies of PCIT in Australia have been published and will be discussed later in the chapter because they both examined an abbreviated format of PCIT (Nixon, Sweeney, Erickson, & Touyz, 2003, 2004).

Child outcomes in a study of PCIT in the Netherlands were also similar to those found in U.S. studies with regard to child disruptive behaviors (Abrahamse et al., 2012). In a study comparing PCIT to a Dutch-developed treatment called Family Creative Therapy, there were significantly greater improvements in parenting skills and child behavior for the families completing PCIT (Abrahamse, Niec, Junger, Boer, & Lindauer, 2016). Additionally, attrition rates were lower for families completing PCIT in this population compared to U.S. studies (Abrahamse et al., 2016). It is worth noting that results suggested greater improvement in both parenting skills and child behavior for PCIT than Family Creative Therapy, and that improvements were better maintained in families who completed PCIT than those who completed Family Creative Therapy or who dropped out of treatment.

The use of standard PCIT has also been examined in Chinese families. Compared to a waitlist control group, families who completed PCIT reported decreases in intensity and frequency of child behavior problems, parenting stress, and inappropriate parenting strategies; increases in positive parenting skills; and changes in the use of corporal punishment at posttreatment (Leung, Tsang, Heung, & Yiu, 2009; Leung, Tsang, Sin, & Choi, 2015). Though these findings are similar to outcomes in American studies and in ethnic minority groups, the authors noted cultural considerations related to the use of PCIT with this sample. The authors indicated that the Chinese parents in the sample appeared hesitant to use praise with their children, struggled with letting the child lead the play, and had difficulty ignoring negative child behavior. In addition, these parents expressed concern that other family members may not agree with or support the use of the child management techniques used in PCIT (Leung et al., 2009).

Chen and Forston (2015) recently examined the use of PCIT in Taiwan. The researchers made very minor cultural changes, which included the addition of culturally appropriate examples in teach sessions. Results suggest that the sample of 44 children (ages 3- to 11-years-old) and their parent(s) who participated in standard PCIT services experienced significantly less child behavior problems at posttreatment (although the effects diminished at the 3-month follow-up). Current research points to PCIT being effective across different Asian samples; however, important differences among Asian cultures and subgroups must continue to be taken into account.

PCIT has been studied with a variety of Hispanic populations. In one study of PCIT with Latino/a families, McCabe, Yeh, Garland, Lau, and Chavez (2005) developed Guidano a Niños Activos (GANA), a version of PCIT culturally adapted for Mexican American families, which emphasizes the importance of carefully assessing culturally influenced concepts (e.g., parent perception of their child's problem and its causes, parenting styles). McCabe and Yeh (2009) then evaluated the effectiveness of GANA compared to standard PCIT and treatment as usual (TAU). They randomly assigned 58 Mexican American children between the ages of 3 and 7 years with behavior problems and their families to the three different treatment modalities. Child behavior problems significantly improved across all three modalities; however, parents who participated in

GANA and PCIT both reported improved parenting skills, as well as decreased parenting stress and negative parenting behaviors compared to TAU. There were no significant differences between GANA and PCIT. These findings may be partly due to insufficient power to detect a difference between GANA and PCIT. However, it is also possible that PCIT is robust to cultural modifications and small adjustments can be made without affecting outcomes (McCabe & Yeh, 2009).

PCIT has also been adapted for Puerto Rican children with hyperactivity and other behavior problems (Matos, Torres, Santiago, Jurado, & Rodriguez, 2006). The researchers made adaptations to the standard PCIT protocol, including increased length of treatment sessions, additional check-in time, and the use of culturally appropriate metaphors. The adapted PCIT protocol was tested in an efficacy study in which 32 families were randomly assigned to either PCIT or a wait-list control group. Families in the PCIT group demonstrated significant decreases in attention-deficit/hyperactivity disorder symptoms, child behavior problems, and parenting stress as well as significant improvements in parent and family functioning, parent satisfaction with treatment, and positive parenting practices (Matos, Bauermeister, & Bernal, 2009). These treatment gains were maintained at the 3.5-month follow-up.

PCIT has also been adapted for American Indians and Alaska Natives (AI/AN; BigFoot & Funderburk, 2011). The components of PCIT were set within the Circle Theory and Old Wisdom philosophies that regard children as the center of the circle and that they need warmth and encouragement from family members and elders (BigFoot & Funderburk, 2011). AI/AN populations tend to intuitively understand foundational aspects of PCIT, including the reinforcement of desirable behaviors and the importance of CDI. In addition, their tradition of oral storytelling helps them to reduce questions and describe their child's behavior. In PCIT with AI/AN populations, it is helpful to view and explain discipline as teaching the child self-control and learning about rules, rather than describing it as punishment. It may also be helpful for rapport building with AI/AN individuals to carefully assess their parenting beliefs, to avoid using excess jargon or focusing on the technical aspects of PCIT, to include additional child caregivers, and to not be too intrusive or controlling in live coaching (BigFoot & Funderburk, 2011).

14.5.4 Parental Behavioral Health Considerations

Recent research has examined the impact that parental behavioral health may have on the ability to engage in standard PCIT (Pemberton, Kramer, Borrego, & Owen, 2013). Although no specific adaptations have been recommended for parents with attention-deficit/hyperactivity disorder, research has found that these symptoms are associated with lower parental engagement and reduced use of positive parenting, as well as greater levels of inconsistent discipline (Chronis-Tuscano et al., 2008). Additional research has found that effective doses of medication improved parental ability to decrease overall use of commands (Babinski et al., 2014), suggesting that the treatment of caregiver attention-deficit/hyperactivity disorder symptoms may help with their ability to engage effectively in PCIT.

Mothers experiencing depressive symptoms have been shown to report more severe child behavior problems at pretreatment, but also reported greater reductions in behavior problems following treatment than mothers not experiencing depressive symptoms (Timmer et al., 2011). Although no adaptations have been recommended for mothers experiencing depressive symptoms, this research underscores the importance of considering how caregiver characteristics may impact their reporting of child behavior and their ability to engage in therapy.

One final population of recent interest has been parents with intellectual disabilities, given concerns that they may have more difficulty understanding and learning PCIT skills. Recommendations for tailoring treatment with this population include simplifying coaching instructions and focusing on a single skill per coaching session (Chengappa, McNeil, Norman, Quetsch, & Travers, 2017). Additionally, an increase in the frequency of treatment may help reinforce skills, allowing parents with intellectual disabilities to maintain their skill use (Chengappa et al., 2017).

14.5.5 PCIT as a Preventative Intervention

As PCIT has been shown to be effective for a variety of presenting concerns, recent efforts have focused on the use of PCIT as a preventative intervention to alleviate subclinical concerns and/or for at-risk individuals. To date, this area of research has focused on the prevention of externalizing behavior problems and child maltreatment—the two domains in which PCIT has the largest evidence base—in addition to the prevention of developmental/language delays.

Changes to the PCIT model for the prevention of externalizing behavior problems have focused primarily on adjusting the treatment format. For example, one study examined the effect of two brief versions of PCIT administered in a primary care setting (Berkovits, O'Brien, Carter, & Eyberg, 2010). The first version was a self-directed learning condition in which parents were mailed materials on PCIT skills and provided with information on how to implement them. The second version was a four-session group education condition in which parents obtained information on CDI and PDI during two sessions each. Both versions yielded improved parental reports of child behavior and high rates of parent satisfaction (Berkovits et al., 2010). Adapting PCIT for a more universal approach to prevention of child externalizing behaviors has also yielded promising results. For instance, non-parent participants aged 19–23 years demonstrated improved parenting knowledge following completion of a PCIT-based pre-parenting course (Lee, Wilsie, & Brestan-Knight, 2011). In addition, increases in positive skills (e.g., labeled praise) and decreases in negative skills (e.g., criticism) were noted for preschool and kindergarten teachers who completed a PCIT-based training (Gershenson, Lyon, & Budd, 2010). Although additional research directly assessing child behavior is needed, current evidence suggests that PCIT can successfully be adapted as a preventative intervention for externalizing behaviors.

PCIT has also shown promise as a preventative intervention for child maltreatment. Findings from several studies of families with a history of child maltreatment have noted the typical PCIT outcomes (e.g., improved parent-child relationships, increased use of positive parenting skills) in addition to diminished likelihood of maltreatment recidivism (Chaffin, Funderburk, Bard, Valle, & Gurwitch, 2011; Thomas & Zimmer-Gembeck, 2011). It is important to note that these studies demonstrated the prevention of future maltreatment (i.e., recidivism) rather than prevention of initial instances of maltreatment. As such, it can be difficult to distinguish between when PCIT is functioning as a standard intervention for maltreatment and when it is functioning as a preventative intervention. Two studies have bolstered support for the preventative aspect of PCIT for child maltreatment by demonstrating improvements in child behavior and parenting skills, as well as decreases in parenting stress for samples of families at risk for maltreatment but without histories of maltreatment (Allen, Timmer, & Urquiza, 2014; Lanier, Kohl, Benz, Swinger, & Drake, 2014).

Given the association between language delays and externalizing behavior problems (Tempel, Wagner, & McNeil, 2009), research has investigated the impact of PCIT on language deficits. Results of several studies have shown increases in both the frequency and type of verbalizations. These improvements were noted for both infants and for children at risk for language deficits (Allen & Marshall, 2011; Garcia, Bagner, Pruden, & Nichols-Lopez, 2015). These findings are hypothesized to be the direct result of the skills that parents are taught to use in PCIT. Namely, parents are asked to use positive communications skills with their children throughout the day, which results in a language-rich environment and more frequent modeling of appropriate verbalizations (Tempel et al., 2009).

Evidence has shown that parental use of positive communication skills mediates the relation between PCIT treatment and the noted improvements in child language production (Bagner, Coxe, et al., 2016).

14.5.6 Format Adaptations

As with most psychosocial interventions, particularly with youth, a high rate of families receiving PCIT services leave treatment before they graduate (Fernandez & Eyberg, 2005, 2009; Lanier et al., 2011). One strategy to address potential barriers to treatment and to combat high rates of attrition has been the development of novel delivery methods for PCIT. Some of these format adaptations have yielded promising outcomes as preventative interventions (e.g., Berkovits et al., 2010; Lee et al., 2011; Scudder, McNeil, Chengappa, & Costello, 2014) and are described in the previous section of this chapter. A variety of format adaptations designed to treat families with a history of child maltreatment and/or with clinical levels of child behavior problems are reviewed below.

14.5.6.1 Abbreviated PCIT

Although PCIT delivered in efficacy trials generally lasts 12–14 sessions, it has been found to take longer than anticipated for parents to reach mastery criteria when delivered in community settings (Franco, Soler, & McBride, 2005). As such, researchers have explored the use of an abbreviated version of PCIT to expedite treatment and reduce travel burdens for families. Abbreviated PCIT included the use of didactic videotapes in place of CDI and PDI teach sessions, in addition to five alternating telephone consultations and face-to-face sessions (Nixon et al., 2003, 2004). Families of children ages 3–5 years with disruptive behaviors were randomized to standard PCIT, abbreviated PCIT, or a waitlist control.

Results indicated improvements in child behavior and parenting skills for families in both the standard PCIT and abbreviated PCIT groups, with greater improvements for both groups relative to the waitlist control (Nixon et al., 2003). The noted effects were slightly greater for the standard PCIT group than the abbreviated PCIT group immediately following treatment, but were not different at the 6-month follow-up period (Nixon et al., 2003). A later follow-up study demonstrated that these treatment gains were maintained at 1 year and 2 years posttreatment for families in both the standard and abbreviated PCIT groups (Nixon et al., 2004).

14.5.6.2 Intensive PCIT

Similar to abbreviated PCIT, researchers have also tested the feasibility of an intensive version of PCIT. This adaptation consisted of daily 90-min sessions across 2 weeks, for a total of 10 sessions (Graziano et al., 2015). Eleven families with children ages 3–8 years with clinical levels of externalizing behavior problems participated in the feasibility trial. Results indicated significant increases in parental use of positive skills, as well as significant decreases in parental use of negative skills and parenting stress. Significant improvements were also noted in parental use of effective discipline strategies and in child behavior. In addition, effect sizes for all outcome domains (i.e., child behavior and parenting skills) were greater for intensive PCIT than those reported in standard PCIT outcome studies. Also of note, an impressively high rate of session attendance was reported, with only one session missed out of 110 total sessions across all families (Graziano et al., 2015).

14.5.6.3 Group PCIT

As costs are often cited as a barrier to community implementation of PCIT (Christian, Niec, Acevedo-Polakovich, & Kassab, 2014), several researchers have examined group-based PCIT as a method of increasing cost-effectiveness. Given the time required to coach individual parent-child dyads, groups of 3–6 dyads have been found to be most manageable for group PCIT (Niec, Hemme, Yopp, & Brestan, 2005). Additionally, it has been recommended that each session last between 90 min and 2 h, with the first session focused on establishing rapport and group guidelines before moving onto the CDI teach session

(Niec et al., 2005). Other recommendations include coaching each parent for 15–20 min each while other parents practice coding, and transitioning the entire group to PDI after five CDI coaching sessions. A full description of a protocol for group PCIT can be found in Niec et al. (2005).

Group PCIT has been examined as a pilot feasibility study (Nieter, Thornberry, & Brestan-Knight, 2013) and has also been compared with a treatment as usual group (e.g., psychoeducational content on stress management, communication, discipline; Foley, McNeil, Norman, & Wallace, 2016) and with standard PCIT (Niec, Barnett, Prewett, & Shanley, 2016). In all three studies, families who participated in group PCIT demonstrated significant reductions in child behavior and parenting stress, as well as improvements in parenting skills (Foley et al., 2016; Niec et al., 2016; Nieter et al., 2013). Improvements in child behavior and the use of positive parenting skills were found to be greater for group PCIT than for treatment as usual, although no group differences were noted in parental use of negative skills (Foley et al., 2016). The positive child and parent outcomes noted for group PCIT were no different than the outcomes noted for standard PCIT (Niec et al., 2016). These results suggest that PCIT can be effectively delivered in a group format to increase the number of families who benefit from treatment at one time.

14.5.6.4 In-home PCIT

Another strategy to reduce attrition from PCIT has been to deliver PCIT in the home. Not only can this adaptation help to eliminate transportation barriers and reach more families, but it can also help with the generalization of skills to the home setting. Although results of one study found that 1 h per week of in-home coaching in addition to standard PCIT did not result in additional improvements above and beyond standard PCIT alone (Timmer, Zebell, Culver, & Urquiza, 2010), other studies have yielded more promising results. Several studies have found significant improvements in child behavior, increases in parent use of positive skills and effective discipline practices pretreatment to posttreatment, and high rates of parent satisfaction (Galanter et al., 2012; Gresl, Fox, & Fleischmann, 2014; Ware, McNeil, Masse, & Stevens, 2008). Additionally, reduced rates of child abuse potential in a sample of families at risk for child maltreatment were noted following completion of in-home PCIT (Galanter et al., 2012). Given the potential of in-home PCIT to reduce barriers to treatment, two teams of in-home PCIT providers were included in a statewide implementation of PCIT across Delaware (Beveridge et al., 2015).

14.5.6.5 Teacher-Child Interaction Training (TCIT)

Given its effectiveness in improving child behavior in the home, an early adaptation of PCIT for the classroom resulted in the development of TCIT. In TCIT, teachers first go through a group training that covers the foundational principles and skills of PCIT before moving onto the practice of skills within small groups (Lyon et al., 2009). Following the initial training, teachers implement the skills in the classroom during the CDI phase. Rather than eliminating their use of negative skills such as commands and questions, teachers are instructed to use these skills more sparingly and in a meaningful way that enhances the learning environment. This is a key difference from standard PCIT, in which parents are instructed to eliminate their use of negative skills (Lyon et al., 2009). The PDI phase of treatment has also been adapted and termed Teacher-Directed Interaction. During this phase, teachers are instructed to use effective commands, in addition to a time-out like procedure called Sit and Watch, for oppositional or disruptive behaviors (Lyon et al., 2009). Given the constraints of a classroom setting, TCIT coaches remain in the classroom and provide a combination of verbal and written feedback to assist teachers in the use of their skills (Lyon et al., 2009), rather than using the standard PCIT bug-in-the-ear coaching device.

Studies examining outcomes for classrooms using TCIT have yielded promising findings. Consistently, results indicate increased teacher use of positive attention and decreased use of negative attention (Fernandez et al., 2015;

Garbacz, Zychinski, Feuer, Carter, & Budd, 2014; Lyon et al., 2009; Tiano & McNeil, 2006). Improvements in child behavior, less teacher distress associated with child misbehavior (Tiano & McNeil, 2006), and high levels of teacher satisfaction (Fernandez et al., 2015; Lyon et al., 2009) have also been noted.

14.6 Conclusion

PCIT is a well-researched intervention, with substantial support demonstrating positive outcomes for diverse populations and in a variety of settings. The main principles and skills emphasized in PCIT are versatile, allowing for relative ease in adapting the treatment for new groups. Despite advances in various domains of research, PCIT remains under-implemented and under-utilized.

In addition to continuing research that extends PCIT to new populations, future efforts should focus on improving the availbility of and access to PCIT. Such efforts should include continued research on implementation of PCIT in new locations as well as research on best practices for the sustainability of PCIT where it has already been implemented. Given the noted effectiveness of PCIT for both behavioral health and child welfare-related concerns, researchers should consider identifying methods to promote integration within state or local service systems. One final area of critical importance is the dissemination of information on the cost-effectiveness of PCIT to policy makers and system-level stakeholders as a means of advocating for the financing of additional PCIT programs. All of these efforts will increase the availability of PCIT services to the wide range of diverse families who may benefit from such services.

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Theoretical Basis for Parent-Child Interaction Therapy with Autism Spectrum Disorder

15

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Abstract

Parent-Child Interaction Therapy (PCIT) is an evidence-based treatment for children with disruptive behavior disorders and their parents. Given the versatility of PCIT and the high prevalence of disruptive behaviors among children with autism spectrum disorder (ASD), recent evidence suggests potential benefits of using PCIT in children on the autism spectrum and their families. While applied behavior analysis (ABA) is often described as the gold standard treatment for children on the spectrum, PCIT shares many theoretical and conceptual similarities with ABA and other evidence-based treatments for ASD. This chapter highlights these overlapping elements and describes specific components of PCIT that may add to existing services for children with ASD. Although PCIT in its present form may not meet all the needs of children with ASD, it has some considerable strengths when compared to current treatments for autism. This chapter argues for the usefulness of PCIT as a gateway treatment prior to beginning a more intensive intervention and as an alternative intervention for those who may not have access to more intensive, ABA-based therapies. Limitations, caveats, and future directions are also addressed in this chapter.

Autism spectrum disorder (ASD) is a lifelong psychiatric condition characterized by deficits in social communication and social interaction skills, patterns of restricted interests and activities, and repetitive, idiosyncratic behaviors (American Psychiatric Association, 2013). According to the Centers for Disease Control and Prevention (CDC), approximately 1 in 59 children are affected by ASD (CDC, 2018a). Given the prevalence and functional impairments associated with ASD, empirically based early intervention is warranted. While applied behavior analysis (ABA) is often described as the preferred model of treatment for children on the spectrum, there has been some recent evidence to suggest that Parent-Child Interaction Therapy (PCIT) is an effective treatment for young children with ASD. The purpose of this chapter is to provide a theoretical rationale for why PCIT is a valid treatment approach for this unique population of children. This chapter includes a discussion of how PCIT implements core components of ABA and other evidence-based treatments for ASD as well as what PCIT adds to existing services for these children. PCIT will also be

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described as a potential gateway treatment for these children, meaning that it has the potential to set children with ASD up for success prior to receiving other evidence-based therapeutic services by focusing on developing core skills (e.g., compliance, emotion regulation). A focus on these skills in PCIT prior to beginning more intensive services will likely enhance the effectiveness of later treatment, such as ABA.

15.1 Theoretical Overlap Between PCIT and ABA

15.1.1 ABA

ABA is an empirically validated and principle-based therapeutic paradigm designed to modify and improve socially appropriate behavioral deficits for children with ASD (e.g., increase appropriate communication skills, decrease stereotypic behavior; Klintwall & Eikeseth, 2014). ABA is considered the gold standard for treatment of US children with autism (e.g., McPhilemy & Dillenburger, 2013; Sturmey & Hersen, 2012). ABA services are highly intensive, typically involving up to 40 h of treatment per week, occurring over 5–7 days, and being delivered on a one-to-one (paraprofessional-to-child) basis. However, variations of ABA may be delivered in a small-group format with slightly less structure (Roane, Fisher, & Carr, 2016).

The principles underlying ABA date back to B.F. Skinner's behaviorism, namely, shaping and reinforcement (Roane et al., 2016). In an applied shaping procedure, for example, children are instructed to provide responses to vocal instructions and teaching stimuli. Children are then rewarded when responses meet or exceed a predetermined criterion or goal. Over time, this criterion is shifted to advance speech and skills (Newman, Reinecke, & Ramos, 2009). Praise and other forms of positive reinforcement are used to validate appropriate responses. In contrast, inappropriate responses or other negative behaviors are not reinforced, and incompatible tasks are utilized to reduce the likelihood that these behaviors will occur (Roane et al., 2016). With the goal of socially and functionally modifying behavior, ABA utilizes thorough functional assessment and emphasizes child skill building. As such, ABA focuses on teaching specific, well-defined behaviors through the systematic delivery of brief, repeated trials, a process referred to as discrete-trial teaching (see Chap. 2 in this book for more details; Roane et al., 2016).

15.1.2 PCIT

PCIT is an evidence-based treatment targeting families of children (ages 2–7 years) with severe disruptive behavior (McNeil & Hembree-Kigin, 2010). Based on Hanf's (1969) two-stage treatment model, social learning theory, and attachment theory, PCIT is grounded in improving child behaviors through the enhancement of the parent-child relationship and a structured discipline procedure. To achieve these goals, PCIT has two distinct phases: a relationship enhancement phase (Child-Directed Interaction, CDI) and a compliance training phase (Parent-Directed Interaction, PDI). Conducted over weekly 1-h sessions, PCIT is a structured, data-driven program involving the use of live coaching and mastery criteria to determine progress. PCIT has been shown to be effective for many different childhood concerns such as anxiety, depression, trauma, attention-deficit/hyperactivity disorder (ADHD), and more recently autism (e.g., Carpenter, Puliafico, Kurtz, Pincus, & Comer, 2014; Gurwitch, Messer, & Funderburk, 2017; Masse, McNeil, Wagner, & Quetsch, 2016; McNeil & Hembree-Kigin, 2010).

On a superficial level, PCIT and ABA appear to differ in many respects; however, PCIT and ABA do share some theoretical and more concrete similarities, including the following: (a) the use of functional assessment; (b) the use of a structured, data-driven system; and (c) a goal of behavior change, including reducing negative disruptive behaviors, increasing positive socially acceptable behaviors, and use of an intensive compliance training component. First, PCIT and ABA both recognize the value of functional assessment in identifying the "function" or impact of the child's behavior via exploring antecedents (precursors) and consequences (the results) of the child's behavior (Greco, Sorrell, & McNeil, 2001; Matson & Williams, 2014; Stasolla, Caffò, Perilli, Boccasini, & Damiani, 2017). While PCIT does not involve the intensive level of detail typically found in traditional functional assessment (as is the case with ABA), PCIT does utilize similar assessment of a behavior's function and methods of direct observation to determine reinforcing agents for the child and to individualize aspects of the treatment (e.g., edible rewards in ABA and specific toys/activities utilized in the CDI phase of treatment). A common type of functional assessment in PCIT is coaching the parent to ignore disruptive behavior and return attention when the child displays a few seconds of appropriate behavior. This coaching process allows the therapist to determine if the function of the inappropriate behavior was to obtain parental attention.

Second, both ABA and PCIT utilize structured, data-driven systems. In ABA, discrete trials are utilized as a system for skill building and reinforcing behavior change, and as a method of monitoring progress over time. Similarly, PCIT involves the use of a structured system of behavior observation, referred to as the Dyadic Parent-Child Interaction Coding System (DPICS), for the purposes of tracking parent behavior and child compliance over time (Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013). The DPICS is also used to determine mastery of skills for the purpose of determining phase change from CDI to PDI to treatment completion. The Eyberg Child Behavior Inventory (ECBI) is administered in each session and graphed to determine the child's progress over time (Eyberg & Pincus, 1999). Treatment completion requires the ECBI to fall within normal limits, in addition to parents displaying mastery of both the CDI and PDI skills as measured by the DPICS (McNeil & Hembree-Kigin, 2010).

Next, ABA and PCIT share similar goals of behavior change. Specifically, both treatments implement reinforcement and punishment techniques to increase appropriate, desirable behaviors and decrease inappropriate or destructive behaviors. This also relates to the compliance training portions of both PCIT and ABA. Whereas ABA trains compliance through discrete trials, as previously described, PCIT involves the use of a series of techniques, including selective attention, effective commands, and correct, consistent follow-through of time-out procedures for noncompliance. These techniques, again, enhance appropriate, positive, and compliant behaviors; increase the desirability of social interactions; and reduce disruptive and noncompliant behaviors. For example, praise, behavioral descriptions, and reflections are specific applications of parental attention that may be used to encourage communication, expand on child imaginative play, increase time on-task, and increase prosocial behaviors, thereby increasing the likelihood that these behaviors generalize across settings (McNeil & Hembree-Kigin, 2010). Additionally, the use of effective commands sets children up for success by teaching parents to provide developmentally appropriate expectations and giving the child ample time to comply to a feasible task. Finally, the use of consistency in the compliance training approach (consistent follow-through) allows children to learn what to expect from their caregivers when they do not comply (e.g., time away from pleasurable activities) as well as positive aspects of social interactions (e.g., child takes the lead in play, more time with desirable toys/activities; McNeil & Hembree-Kigin, 2010).

15.2 Comparisons Between PCIT and Common Treatments for Children with ASD

In the following sections, PCIT is compared to each popular treatment model for children with ASD. DIR/Floortime, the University of California-Los Angeles (UCLA) Young Autism Project, pivotal response treatment, positive behavior support, the Early Start Denver Model, and TEACCH are briefly described. Similarities between each model and PCIT for children with ASD are discussed. See Table 15.1 for the primary theoretical and skill components of PCIT that will be compared to established ASD programs in the sections that follow.

Table 15.1 Theoretical and conceptual treatment components of PCIT

Theoretical treatment components and conceptual goals of PCIT
Primary caregivers as change agents
Increasing positive interactions
Relationship enhancement
Emotional communication
Improving social engagement
Behavior modification and establishing a teaching relationship
Positive reinforcement
Individual differences (respect for neurodiversity and developmental differences)
Implementation in multiple environments/generalizability
Structuring environment to influence behavior change
Likely generalization to other children in the home (i.e., siblings)
Functional assessment
Compliance training
Ignoring negative behaviors/use of incompatible commands
Parent coaching/instruction and feedback
Child-led play (including play therapy techniques) and a focus on parent-child interactions

15.2.1 Theoretical Overlap Between PCIT and the DIR/Floortime Model

The Developmental, Individual Difference, Relationship-based Model, also known as the DIR/Floortime Model, is a comprehensive assessment and intervention program for children with ASD (Greenspan & Wieder, 2006). Designed to promote social-emotional, language, and intellectual/cognitive development, Floortime is an application of the foundational principles of the DIR model. The DIR/Floortime model has parents engage in intentional play and interaction skills to accomplish these goals (Greenspan, DeGangi, & Wieder, 2001; Greenspan & Wieder, 2006).

The DIR/Floortime model is broken into three specific factors: development, individual differences, and relationships. The developmental factor focuses on assessing and expanding the child's socio-emotional and cognitive development, particularly by supporting movement up a ladder of nine developmental tasks ranging from regulation and attention to complex thinking. Other developmental tasks on this ladder relate to social engagement and interaction skills, complex communication, symbolic play, and emotional and logical thinking (Davis, Harwell, Isaacson, & Wieder, 2014). The individual difference factor focuses on assessing, incorporating, and recognizing neurodiversity, or the biological differences of each individual child. Lastly, the relationship-based factor focuses on important relationships in the child's life to support the integration of social-emotional and cognitive growth (Davis et al., 2014; Greenspan et al., 2001; Greenspan & Wieder, 2006). The DIR/Floortime approach utilizes a series of strategies to promote social-emotional and intellectual/cognitive development. These include (a) providing sensitive interactions by following the child's verbal and nonverbal cues, (b) being responsive to all communication by the child, (c) building upward or meeting the child at his/her developmental level, (d) using play as the method of instruction and engagement, (e) using natural interests of the child, (f) using problems to help the child generate solutions and initiate problem-solving, (g) using pretend play, (h) embracing and identifying a range of feelings, (i) enriching ideas or stories in play and conversation, and (j) self-reflecting in interactions (Davis et al., 2014).

The DIR/Floortime model is similar to the CDI phase of PCIT in two major ways: (1) the use of play therapy techniques for providing sensitive interactions, improving the parent-child relationship, and as a method of learning and engagement and (2) an acknowledgement of the essential role of caregivers in play therapy and, relatedly, use of parents/caregivers as the agent of positive behavior change for themselves and their children. First, both CDI and DIR/Floortime utilize play therapy techniques in which the child leads the interaction and the caregiver is instructed to meet the child at his/her developmental level. Caregivers are encouraged to incorporate natural interests (e.g., toys, activities) into play and are educated on how play is a developmentally appropriate way to build relationships with their child and encourage learning (Davis et al., 2014; McNeil & Hembree-Kigin, 2010). Caregivers in both approaches are also instructed on how to positively attend to their child and how to tailor their interactions (e.g., communication) to meet the needs of their child, such as allowing the child to take the lead in play and finding enjoyment in what their child is saying and doing (Davis et al., 2014; McNeil & Hembree-Kigin, 2010). Further, while DIR/Floortime may have a differing set of techniques (as previously described) to meet the same goals, the positive parenting skills in PCIT are used for relationship building; learning to respond to child cues; increasing positive, supportive interactions by showing caregivers the value of child-led play and finding enjoyment in what their child is saying and doing; and encouraging developmentally appropriate learning and engagement (Davis et al., 2014; McNeil & Hembree-Kigin, 2010). For example, both DIR/Floortime and PCIT share a technique in which the caregiver either reflects or expands on what the child is doing or saying (e.g., while telling a story, engaging in imaginative play). This skill has the advantage of encouraging the child's communicative and prosocial behaviors and increasing the level of positive interaction between the child and his/her caregiver (McNeil & Hembree-Kigin, 2010).

Additionally, both CDI and DIR/Floortime acknowledge the essential role of caregivers in play therapy, particularly as agents of change for their own and their child's behavior. During CDI and DIR/Floortime, parents/caregivers are taught specific skills to increase the use of positive interaction and communication with their child. PCIT's first phase of treatment, CDI, utilizes specific techniques to encourage change in both the parent and child's behavior (e.g., labeled praises, positive attention, feedback). These skills are used to reinforce appropriate and positive behaviors (e.g., eye contact, imaginative play) and to ignore inappropriate behaviors (e.g., throwing toys; Eyberg & Funderburk, 2011; McNeil & Hembree-Kigin, 2010). During CDI, parents are also instructed on the strategic use of ignoring and redirecting so that negative attention (i.e., telling them to stop or "no") is not provided for disruptive behaviors; this then changes a pattern that is often present in parental/caregiver behavior (Eyberg & Funderburk, 2011; McNeil & Hembree-Kigin, 2010). The DIR/Floortime technique similarly encourages behavior change on the part of parents by teaching them to follow their child's lead without redirecting the child (e.g., toward other activities) and to put aside the parents' own distractions and thoughts about how play should occur (Davis et al., 2014). Overall, while the DIR/Floortime model may focus more on specific deficits related to ASD, the approach shares a major function with CDI via the use of child-led interactions and play therapy techniques: influencing positive behavioral changes in parents and children and improved relations and interactions between them (Davis et al., 2014; Eyberg & Funderburk, 2011; McNeil & Hembree-Kigin, 2010).

15.2.2 Theoretical Overlap Between PCIT and UCLA Young Autism Project (Lovaas Model)

In 1987, Lovaas designed the first early and intensive behavioral intervention for ASD via the UCLA Young Autism Project. The goal of this treatment was to provide children with ASD some additional training following ABA to generalize skills across other environments and situations (i.e., home, school; Lovaas & Smith, 2003). Lovaas adapted the original ABA model to be increasingly comprehensive, employing several therapists per child to provide 40 h of intensive one-on-one treatment per week at home, at school, and in the community (Klintwall & Eikeseth, 2014; Lovaas, 1987). Parents were included as members of the treatment team and received feedback on how to implement treatment with their child in these different settings (Klintwall & Eikeseth, 2014; Lovaas, 1987).

PCIT and the UCLA Young Autism Project are theoretically similar with regard to the following components: (a) a goal of generalizability and (b) a focus on compliance training. First, Lovaas adapted his model to allow for the inclusion of the caregiver in the treatment team (Klintwall & Eikeseth, 2014; Lovaas, 1987). By allowing the parent to take a role in the child's instruction, generalizability was more likely to occur in the home setting. PCIT recognizes that the parent is the agent of change for child behavior problems (McNeil & Hembree-Kigin, 2010). Like the Lovaas model, the use of live coaching in PCIT allows the therapist to provide caregivers with feedback about their therapeutic skills, therefore instilling confidence in the parents' own ability to promote change in their children (McNeil & Hembree-Kigin, 2010). Additionally, PCIT is often generalized into the community through community practice sessions (in PDI), similar to the Lovaas model (McNeil & Hembree-Kigin, 2010). During these PDI practice sessions, the parent is instructed to use a public, community location (e.g., grocery store) with their child to practice treatment skills in a naturalistic setting while adapting the procedures to match the environment (e.g., a time-out towel instead of a time-out chair; McNeil & Hembree-Kigin, 2010). The therapist may also use other aspects of their clinic environment (e.g., waiting room, hallway) to have the parent practice these skills outside of the typical PCIT room (McNeil & Hembree-Kigin, 2010). Further, PCIT may also be delivered by a teacher in the school setting through a separate protocol referred to as Teacher-Child Interaction Training (TCIT). For more information, please see McNeil and Hembree-Kigin (2010).

Next, PCIT and ABA share a focus on compliance training. In the Lovaas model, the first stage uses discrete trial teaching designed to improve the likelihood that the child will comply with simple, one-step instructions (e.g., "look here," "come here"). Similarly, in PCIT, a discipline sequence is utilized to accomplish the same goal of improving compliance (McNeil & Hembree-Kigin, 2010). Caregivers in PCIT are coached to give a simple, one-step instruction (e.g., "sit down") to meet the developmental level of the child. Compliance training begins with play commands involving the toys and progresses to more real-life commands involving cleanup, transitions, self-help skills, and safety behaviors. When a child complies with these specific, direct commands, they are met with positive attention and can return to a desirable task. With continued noncompliance from the child, the parent progresses through a time-out-based discipline procedure until the child follows through with the original command. The parent continues with the use of CDI skills (i.e., praise, reflection, imitation, description, enjoyment, PRIDE skills) to reinforce the child's decision to comply and maintain engagement in the play (McNeil & Hembree-Kigin, 2010). The consistency of this discipline procedure allows the child to establish a teaching relationship with the caregiver in which positive, compliant behaviors are associated with desirable outcomes (i.e., with praise and increased time with pleasurable activities) and noncompliance is associated with undesirable outcomes (i.e., a strategic time-out in a chair procedure and decreased time with pleasurable activities; for more details, please see McNeil & Hembree-Kigin, 2010).

15.2.3 Theoretical Overlap Between PCIT and Pivotal Response Treatment (PRT)

PRT was designed to overcome some of the challenges of traditional ABA treatments for autism (Koegel, Ashbaugh, & Koegel, 2016). The major goal of PRT is for children with ASD to increase motivation to engage in learning and social environments, combating a learned helplessness theorized to limit these children's baseline levels of functioning (Koegel et al., 2016). PRT includes both structured and unstructured components (e.g., child-chosen activities) and works toward specific treatment goals (e.g., improved communication, social interaction, and academic performance) in a more naturalistic, child-directed manner (Koegel & Koegel, 2006).

PRT and PCIT are similar in three main respects: they both employ the caregiver as an agent of change, intervene in less structured ways than traditional ABA, and involve natural elements. First, many interventions for children with ASD recognize the value of caregiver involvement (Greenspan & Wieder, 2006; Horner, Carr, Strain, Todd, & Reed, 2002; Lovaas, Koegel, Simmons, & Long, 1973; Mahoney & Perales, 2003). Similarly to PCIT, PRT takes this involvement one step further by employing the caregiver as an agent of change in the intervention. Interventions for ASD emphasizing caregiver collaboration have been shown to be more effective than those relying on professional involvement alone (Ingersoll & Dvortcsak, 2006; Lovaas et al., 1973; Lovaas & Smith, 2003). This is not surprising given that caregivers likely interact with their children for several hours or more daily, creating opportunities for extensive "treatment" delivery. This rationale was a driving factor in the original development of PCIT—if skills were transferred from therapist to caregiver, the benefits delivered in a typical therapy session for 1 h per week could be provided by caregivers for many hours per week (Eyberg, 1988). Given the extraordinary time commitment required of traditional ABA treatment for ASD, both PCIT and PRT have clear advantages in this respect.

Additionally, both PRT and PCIT target treatment goals in less structured, more general ways than does traditional ABA treatment. Both tailor general behavioral principles (e.g., verbal reinforcement) to individual treatment goals as a result of observations and treatment planning with caregivers. Third, PRT and PCIT emphasize the inclusion of natural elements in therapy (e.g., child-preferred toys, home environment, child-directed interactions, and natural reinforcement) to promote generalization. These strategies are designed to simplify treatment delivery for caregivers in everyday life, decrease frustration for children, contribute to more positive caregiver-child relationships, and increase the reinforcement value of social interactions for children with ASD.

15.2.4 Theoretical Overlap Between PCIT and Positive Behavior Support (PBS) Model

PBS is an ABA approach aimed at modifying a child's environment (rather than the child) to make the child's utilization of problem behaviors "irrelevant, inefficient, and ineffective" (Horner, 2000, p. 97). In other words, educational and system (e.g., home, school) change methods are utilized to improve a child's likelihood of success and to minimize inappropriate behaviors (Carr et al., 2002). Examples of environmental accommodations (educational and system change methods) used in PBS include providing visual supports, utilizing consistent routines, informing of transitions or changes, offering breaks, removing distractions or other disturbing stimuli, using simple instructions, and integrating preferred activities throughout the child's daily routine (i.e., home, school, in treatment sessions). Other forms of environmental restructuring teach caregivers and children new skills to expand their behavioral repertoires and attend to behavioral consequences (Horner, 2000).

In conjunction with functional analyses of children's problem behaviors, children are taught more appropriate ways to communicate their needs. Caregivers also practice new strategies for preventing negative consequences of children's behaviors (e.g., blocking attempts to bite, not allowing escape from a nonpreferred activity). PBS emphasizes collaboration with families, educators, and other community members to increase inclusion in social and educational environments for children with ASD (Blair, Lee, Cho, & Dunlap, 2011). Further, PBS takes both a prevention and intervention stance, gradually increasing the nature and intensity of supports as symptoms of ASD and other disruptive behaviors become more problematic (Neitzel, 2010).

PBS and PCIT prioritize the reduction and prevention of behavior problems. To accomplish this, they both emphasize functional assessment through detailed behavior plans. In both models, therapists integrate information from multiple sources (e.g., caregivers, educators) with their own behavioral observations to develop hypotheses about antecedents and consequences of target behaviors. These hypotheses are tested and adjusted throughout therapy sessions, in classroom protocols, and at-home practice. As in PBS, caregivers and children participating in PCIT learn new skills to expand their behavior repertoires to meet the specific needs of individual families.

15.2.5 Theoretical Overlap Between PCIT and the Early Start Denver Model (ESDM)

ESDM is a comprehensive early and intensive behavioral intervention which combines components of ABA, relationship enhancement, and developmental skill building (Dawson et al., 2010). ESDM is intended for children with ASD between the ages of 24 and 48 months and is typically delivered for 15–20 h per week for about 2 years (Rogers et al., 2012). One of the main components of ESDM requires a therapist or other caregiver to lead a joint activity with the identified child while incorporating communication and other targeted skill practice, taking advantage of behavioral principles in the process (e.g., shaping, chaining; Rogers & Dawson, 2010a). ESDM therapists continuously monitor children's progress in a variety of developmentally informed, goal-oriented domains (e.g., representational play; Rogers & Dawson, 2010a). ESDM goals shift, and treatment progresses over time based on a child's ability to master different skills. As in PCIT, caregivers play important roles in the treatment model, completing training in therapeutic techniques, participating in ongoing coaching sessions, and receiving feedback after "parent play" sessions (Dawson et al., 2010).

PCIT and ESDM share the idea that caregivers are the most influential people in young children's lives. In both therapies, caregiver input is incorporated into all treatment planning and decision-making. Caregiver training in therapeutic techniques is the first component of treatment in both models, underscoring the importance of caregiver-child interactions as opportunities for treatment delivery. In fact, following initial assessments, training, and treatment planning, caregivers can deliver ESDM largely without the direct involvement of therapists (Rogers & Dawson, 2010b). The same is true for PCIT, where after caregivers demonstrate mastery of CDI and PDI skills, they are capable of managing child behavior problems on their own.

15.2.6 Theoretical Overlap Between PCIT and Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)

TEACCH is a program of structured education that relies on collaboration between caregivers and educators (Schopler & Olley, 1980). TEACCH methods recognize the typical strengths and challenges experienced by children with ASD in the domains of sensory processing and information processing; attention; communication; language; and concepts of time, transitions, routines, preferences, and impulsivity (Mesibov & Shea, 2010). These principles are incorporated into clinical services (e.g., assessment, individual therapy, parent training, and groups), residential and employment programs for adults with ASD, and other services for those with ASD (e.g., social work, speech therapy, education; TEACCH Autism Program, 2012). TEACCH takes a strength-based approach, focusing on building up what the child and family do well in order to target each child's specific needs. Moreover, TEACCH encourages child-initiated communication, incorporates a child's interests to motivate learning, and emphasizes visual concepts (Mesibov & Shea, 2010). By decreasing problem behaviors and teaching new skills, TEACCH methods aim to increase independence and functioning for individuals with ASD (Van Bourgondien, Reichle, & Schopler, 2003).

TEACCH is similar to PCIT in that it values child-centered interactions and a family-centered approach, effective communication, and use of natural elements to accomplish its treatment goals. Both models also take into account the strengths, interests, and abilities of the client in order to inform and improve the intervention. As such, TEACCH and PCIT both allow a certain degree of flexibility in their techniques to suit the needs of the child and their caregiver. For example, while TEACCH often emphasizes visual strategies to meet the visual learning strength of a child with ASD, PCIT is highly structured and can be advantageous for meeting the routine-based learning style of a child with ASD (Virués-Ortega, Arnold-Saritepe, Hird, & Phillips, 2017). Finally, both PCIT and TEACCH have been shown to improve caregiver communication strategies, child compliance, caregiver stress, and caregiver-child relationship (Bagner & Eyberg, 2003; Marcus, Kunce, & Schopler, 2005; Marcus, Lansing, Andrews, & Schopler, 1978; Masse et al., 2016; Timmer et al., 2011; Virués-Ortega et al., 2017).

Please see Table 15.1 for theoretical and conceptual treatment components of PCIT.

15.3 Strengths of PCIT as a Treatment for ASD

As previously described in detail in this chapter, PCIT has many components and theoretical underpinnings that are similar to other evidence-based treatments for ASD. In addition to these similarities, PCIT has strengths above and beyond other treatments mentioned for children on the autism spectrum. The following section is dedicated to detailing some of the advantages of using PCIT for children with ASD.

While ABA was historically designed for early intervention (prior to the age of 5 years), PCIT has the potential to serve a larger age range of children on the spectrum as research has demonstrated PCIT's effectiveness for children aged 2–7 years. Additionally, more recent evidence has shown that PCIT, even in a brief form, can lead to improvements in both infant/toddler (12–24 months) and parent behaviors, as well as reductions in parenting stress (Bagner et al., 2016; Kohlhoff & Morgan, 2014). Moreover, PCIT delivered to parents and infants in the form of a home-based intervention has been associated with increases in child verbal behavior (i.e., total utterances, number of distinct types of utterances) at a 6-month follow-up (Bagner, Garcia, & Hill, 2016). These changes were indirectly affected by the intervention through decreases in infant externalizing behaviors, suggesting that it may be best to address behavior problems in early intervention prior to beginning specific language skill building (Bagner, Garcia, & Hill, 2016). This research implies that PCIT may serve as a first-line gateway intervention for young children prior to receiving other services, such as ABA.

Other research and conceptual papers have also described the potential of PCIT as a gateway intervention, particularly given that externalizing behaviors such as irritability, aggression, and noncompliance are common in children with ASD. In fact, it is estimated that approximately 25% of children with ASD have clinically significant disruptive behaviors and potentially comorbid disruptive behavior disorders (Kaat & Lecavalier, 2013). In this way, PCIT has the potential to systematically address aggressive and noncompliant behavior in approximately 12–20 weekly sessions (1 h in duration), prior to beginning an intensive, 40-h-per-week protocol (Masse, McNeil, Wagner, & Chorney, 2007; McNeil & Hembree-Kigin, 2010). As such, PCIT is a brief intervention, yet leads to clinically significant changes in aggression, defiance, and tantrums, often resulting in disruptive behaviors improving to within normal limits (McNeil & Hembree-Kigin, 2010). Research has also shown PCIT to improve parental stress and parent-child relationship, and may enhance the child and family's readiness for more intensive, comprehensive services (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Masse et al., 2007). It is also possible that the youth may improve more quickly or find increased benefit from a more targeted, skill-based intervention post-PCIT, given that noncompliance, aggression, and similar difficult behaviors are likely to be dramatically reduced prior to the start of treatment (Masse et al., 2007).

Case studies (e.g., Armstrong, DeLoatche, Preece, & Agazzi, 2015; Budd, Hella, Bae, Meyerson, & Watkin, 2011) and other recent research have shown that PCIT may be successful for children with ASD who are high functioning (Masse et al., 2007, 2016). For example, in a randomized controlled study conducted by Ginn et al. (2017), the CDI phase of PCIT alone resulted in statistically significant and clinically meaningful improvements in disruptive behavior across children aged 3–7 years with a diagnosis of ASD. Improvements were also maintained at a 6-week follow-up (Ginn et al., 2017). Other research has shown that PCIT is an acceptable and feasible intervention for children with both intellectual disability and ASD (e.g., Armstrong et al., 2015). In a recent pilot trial by Zlomke, Jeter, and Murphy (2017), results suggested that PCIT led to statistically and clinically significant reductions in the intensity and frequency of disruptive behaviors of children with ASD with large effect sizes. Correspondingly, in a theoretical discussion of the potential effectiveness of PCIT in children with developmental disabilities, McDiarmid and Bagner (2005) suggest that children with these disorders (who have receptive language skills at or above the age equivalent of 2 years) may respond to PCIT with comparable improvements to that of typically developing children. These authors suggest that PCIT shares several features with other efficacious treatments for developmental disabilities, has consistently demonstrated reductions in disruptive behaviors for typically developing children, and requires little modification for children with these developmental concerns (McDiarmid & Bagner, 2005).

In addition to recent evidence suggesting feasibility, efficacy, and effectiveness of PCIT in reducing disruptive behavior in young children with ASD, research has also demonstrated the efficacy of PCIT for improving compliance with children with ASD. In PCIT, children and families are trained in a compliance procedure to the point that it becomes habit through frequent rehearsal in the PDI phase (Masse, 2010). Children practice complying at high rates in both the clinic and home setting during "listening exercises" resulting in learned associations between compliance, social attention (e.g., labeled praise), and increased time engaging in pleasurable activities (e.g., toys, games). Inversely, noncompliance becomes associated with time-out from these reinforcers (Masse, 2010). Despite social deficits common among young children with ASD, the PDI protocol has demonstrated efficacy for children on the spectrum. For example, Masse et al. (2016) utilized a single-subject, nonconcurrent multiple baseline design across three children with ASD and found improvements in the children's behavior similar to children without ASD who received PCIT services. Results suggested that the majority (two of the three youth included in the study) showed increased compliance rates at post-intervention and even greater compliance at 12-week follow-up (Masse et al., 2016). This is noteworthy given that research with typically developing children, including several meta-analyses, has consistently suggested large effect sizes in the reduction of disruptive, noncompliant behaviors. In a recent 2016 meta-analysis of 12 different PCIT studies, results indicated an extremely high Cohen's *d* effect size of 1.65 for child compliance (Ward, Theule, & Cheung, 2016). By comparison, some of the interventions described in this chapter (i.e., TEACCH) have more modest effect sizes, depending on the behavior being measured. ABA, on the other hand, often finds much larger effect sizes, similar to that of PCIT (e.g., Virués-Ortega, 2010; Virues-Ortega, Julio, & Pastor-Barriuso, 2013).

Recent research is positive regarding the efficacy of PCIT with young children with ASD. PCIT has proven to be an incredibly versatile program for typically developing children as well as children with differing diagnoses or comorbidities, with results from studies consistently suggesting large effect sizes. For example, while originally designed for disruptive behaviors related to oppositional defiant disorder, PCIT is a promising intervention for children with ADHD with improvements in inattention, impulsivity, and hyperactivity (Chronis-Tuscano et al., 2016; Matos, Bauermeister, & Bernal, 2009; McNeil & Hembree-Kigin, 2010; Wagner & McNeil, 2008). Research on PCIT has also been especially robust in the areas of anxiety and trauma (e.g., Carpenter et al., 2014; Gurwitch et al., 2017; Pincus, Santucci, Ehrenreich, & Eyberg, 2008). In fact, PCIT is widely recognized as an evidence-based treatment for young children with trauma histories and those with physically abusive parents (McNeil & Hembree-Kigin, 2010). As such, an additional strength of PCIT is its focus on helping parents to achieve authoritative parenting styles, which utilize a combination of sensitivity/responsiveness and structure/limits. While not a major emphasis in most ABA programs, PCIT helps caregivers to recognize their child's strengths and appealing qualities despite behavioral deficits and/or excesses. The focus on improving the caregiver-child relationship and strengthening attachment reduces the likelihood of caregivers responding to behavior problems with anger, criticism, or rejection (e.g., Allen, Timmer, & Urquiza, 2014).

PCIT has several methodological, logistical, and financial advantages as compared to ABA. With regard to methodological strengths, PCIT targets mastery of skills through detailed criteria, emphasizes continued assessment at each session, and utilizes specific protocol for treatment administration which allows for standardized delivery of the intervention across individuals, therapists, and training agencies. Further, PCIT has a clearly delineated technology for transferring skills to parents through coaching, coding, and tracking of skill acquisition over time.

In addition to these methodological strengths, there are many logistical benefits of PCIT. Given the intensive nature of ABA, it is nearly impossible for all children on the spectrum to receive ABA. As such, many ABA therapists have long waiting lists. Additionally, while there are thousands of certified ABA therapists, these therapists are not available in many areas of the country, resulting in service deserts. In rural areas of the country, families may need to travel hours to commute to services. This is not a realistic option for many families as the cost of transportation on top of the cost of ABA services may be too burdensome. PCIT may serve as an option for families who are on waitlists or are unable to receive ABA services. While PCIT certification is relatively new compared to ABA, many new therapists become certified each year, given the train-the-trainer model and the relatively short duration of training (40 h; see www.pcit.org/pcit-certification.html).

PCIT is also widely disseminated both nationally and internationally, with recent efforts focusing on community and statewide implementation and dissemination of PCIT (e.g., Beveridge et al., 2015; Herschell et al., 2015; Pearl et al., 2012). Further, given its specific dissemination plan, manualized approach, and attention to fidelity concerns, PCIT is more easily disseminated and implemented than ABA, which has no standardized manual across variations. PCIT also has a relatively brief timeline (approximately 12–20 sessions) as compared to years of enrollment in ABA and has the potential of being administered in multiple settings, such as in the home, school, and other childcare programs (e.g., after-school programs, group homes). Delivery across multiple contexts increases the likelihood of consistent and generalizable outcomes across settings and situations (e.g., use during community outings, homework, family life). In fact, initial research has shown promise with regard to efficacy and effectiveness of PCIT delivered in the home setting, including for at-risk families (Galanter et al., 2012; Masse & McNeil, 2008; Wallace, Quetsch, Robinson, McCoy, & McNeil, 2018). Home-based PCIT is a current area of growth in both research and implementation domains. Research has also suggested benefit and generalizability to siblings in the home, particularly given that parents are encouraged to practice and utilize the skills with other children (Brestan, Eyberg, Boggs, & Algina, 1997; Eyberg & Robinson, 1982). This is also noteworthy given that recent research has suggested that ASD recurs in families at a relatively high rate, particularly among siblings (CDC, 2018b; Sandin, Lichtenstein, Kuja-Halkola, Hultman, Larsson, & Reichenberg, 2017). Components of PCIT (i.e., Cooperation Game) can also be used to address other factors in the home, such as sibling conflict (McNeil & Hembree-Kigin, 2010). Further, PCIT demonstrates evidence of treatment effects generalizing to other settings, including the school (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991).

Lastly, there are also financial benefits for using PCIT. As mentioned above, if ABA services are not available in an area, utilizing PCIT may help reduce the burden of families attempting to travel to receive services. Cost analyses have been conducted for PCIT, demonstrating its cost to be modest compared to treatment gains (i.e., behavior changes) and the estimated cost incurred in the population without treatment. PCIT has also been found to be of comparable financial cost to other evidence-based treatments for disruptive behaviors, though treatment gains in PCIT often significantly exceed those of other interventions (Goldfine, Wagner, Branstetter, & McNeil, 2008).

15.4 Limitations of PCIT and Caveats Based on Preliminary Research

Despite the many reasons why PCIT is well suited for treating young children with ASD, there are several areas in which standard PCIT may fall short in addressing the treatment needs of these children. As compared with other treatments for ASD described in this chapter, standard PCIT does not explicitly target language development, social skill training, reduction in stereotypic and restrictive repetitive behaviors, or progress on other developmental tasks. Standard PCIT is not designed for children with less than a 24-month age equivalent for receptive and expressive language abilities nor does it provide respite for caregivers. These limitations are described in detail below, along with their caveats and areas for potential future research.

15.4.1 Language Development

PCIT does not explicitly train children with ASD to improve expressive and receptive language skills. Many comprehensive treatments for ASD like traditional ABA and the UCLA Young Autism Project use structured techniques such as discrete trial teaching to progressively improve language skills. In these programs, each component of complex verbal communication is broken down into small, measurable steps and then selectively reinforced in combination with a variety of detailed prompting and fading strategies until mastery. With this intense, detailed approach to speech and communication strategies, children with ASD have made significant gains in their language abilities (e.g., eliciting speech from nonverbal children; Howard, Sparkman, Cohen, Green, & Stanislaw, 2005). Because of the communication deficits experienced by many children with ASD, it is important that treatments target speech.

Although PCIT does not break language training into discrete trials, some PCIT treatment components encourage improved speech production and communication. Theoretically, caregivers' use of PRIDE skills both model and provide practice in appropriate conversations. Caregivers' use of selective attention to ignore children's inappropriate methods of requesting (e.g., screaming) and praise appropriate verbalizations (e.g., naming the desired object) also encourages the child's motivation to practice expressive language skills (Masse et al., 2007). With this in mind, Tempel, Wagner, and McNeil (2009) have described PCIT as sharing many theoretical and conceptual similarities with speech-language interventions: using praise, repeating verbalizations by the child and adding semantic content to child's utterances, imitation in play, parallel talk, and self-talk. Related to these reasons, PCIT has been described as potentially having clinical utility for children with and/or at risk for language delays. For these reasons, studies show that PCIT leads to improvements in language even when it is not the specific target of treatment (see Chap. 23 in this handbook). Garcia, Bagner, Pruden, and Nichols-Lopez (2015) found that mothers' use of positive PRIDE skills during PCIT mediated increases in number of unique words produced by their identified children from pre- to posttreatment. These findings remained after statistically accounting for age, IQ, and total words. Children in this study either experienced or were at risk for experiencing developmental delays, although children with ASD were excluded. Mele and Kurtz (2013) also provided initial evidence for the efficacy of an adapted PCIT paradigm and protocol for selective mutism utilizing a single-case design. Treatment was found to be successful in increasing verbalizations for a 5-year-old female (Carpenter et al., 2014; Mele & Kurtz, 2013). Further, Bagner et al. (2016) also studied the effects of a modified version of PCIT on infants' language production. The Infant Behavior Program is an in-home adaptation of PCIT intended for children aged 12–15 months with early signs of externalizing behavior problems. Compared with a control group of infants receiving primary pediatric care alone, infants who participated in the Infant Behavior Program produced more total words and more different words at 6-month follow-up. In addition, reductions in behavior problems as a result of the Infant Behavior Program also contributed to increases in language production at 3- and 6-month follow-ups (Bagner et al., 2016). These findings may be most relevant for children on the spectrum who have limited language abilities despite being of an older developmental age.

Initial study of language skills, PCIT, and children with ASD are promising. Hansen and Shillingsburg (2016) found that children vocalized more after participation in a modified version of PCIT for autism. Abner et al. (2008) demonstrated increases in word count, and Zlomke et al. (2017) showed increases in functional communication for children with ASD treated with PCIT. Due to small sample sizes, however, more research is needed in this area. In addition, future studies should investigate the utility of additional modules or adaptations focused on language training as did Hansen and Shillingsburg (2016). Finally, careful clinical consideration, functional assessment, and consultation with experts in ASD are important in distinguishing verbal delays from defiance in this population when delivering PCIT.

15.4.2 Social Skills

Deficits in social functioning are a defining feature of ASD and are integral to other areas of child development (American Psychiatric Association, 2013; Flynn & Healy, 2012). PCIT does not break down social skills into small steps. Many comprehensive treatments for ASD work methodically on each part of social interactions with the greater goal of appropriate social development for these children. In light of this limitation, researchers and clinicians have proposed two methods for promoting social skills for children with ASD using PCIT: (a) use fundamental strategies of PCIT to promote necessary social development, and (b) create an additional phase of treatment to more specifically address the needs of children with ASD.

The first approach argues that components of the existing intervention can be used to address social skill deficits. Based on their skill training and coaching, caregivers model positive social skills (e.g., imitation, reflection, behavioral description, enjoyment, praise, playing interactively, taking turns) while avoiding socially inappropriate behaviors like negative talk. PCIT therapists should tailor treatment for children with ASD to target goals of increased social skill acquisition (Masse et al., 2007). Using standard PCIT including coaching to social goals like eye contact and sharing, Masse et al. (2016) noted improvements in the Social Relating subscale of the Autism Behavior Checklist at posttreatment in a study of PCIT with children on the autism spectrum (Krug, Arick, & Almond, 1988). The Social Relating subscale includes items addressing friendship development, avoiding eye contact, and attending to social cues. In another example, Solomon, Ono, Timmer, and Goodlin-Jones (2008) coached caregivers to selectively attend to initiation of social interactions as compared with independent play.

Secondly, researchers have proposed development of an adjunct, social skill component for PCIT geared toward children with ASD. Masse et al. (2007) advocated for additional coaching of social skill training following successful completion of the CDI and PDI portions of PCIT because child compliance and willingness to participate in social interactions are higher as a result of treatment. Incorporating social skill training adaptations into the existing CDI and PDI phases of treatment is another viable future adaptation of PCIT for children with ASD, as Hansen and Shillingsburg (2016) found success with inclusion of specific language training in a similar fashion across two case studies.

15.4.3 Stereotypic and Restrictive Repetitive Behaviors

The PCIT Protocol Manual (Eyberg & Funderburk, 2011) does not instruct therapists on how to handle perseverative behaviors or stereotypies (e.g., echolalia, nonfunctional play, hand-flapping) in children with ASD during PCIT. Theoretically speaking, it is difficult to adhere to the goals of CDI (i.e., letting the child lead the play to promote caregiver-child bonding) without concurrently reinforcing some of these restrictive repetitive behaviors.

Researchers and PCIT experts have suggested a variety of ways in which therapists may tailor PCIT to address restrictive repetitive behaviors. Based on clinical experiences, Masse et al. (2007) and McNeil and Hembree-Kigin (2010) suggest coaching caregivers to use PRIDE skills to attend to safe, nondestructive, restrictive, repetitive behaviors during CDI because of the potential benefits to the caregiver-child relationship. Through these authors' clinical experiences, it was found that coaching a caregiver to ignore restrictive repetitive behaviors resulted largely in ignoring the child and therefore undermining the goals of CDI. Theoretically, the benefits received by children with ASD and their caregivers from acceptance, enjoyment, and child-led structure of CDI outweigh the potential reinforcement of restrictive repetitive behaviors which may later be addressed with differential reinforcement or incompatible commands in PDI (Masse et al., 2007; McNeil & Hembree-Kigin, 2010).

In contrast, Solomon et al. (2008) took a different approach in their pilot study, coaching caregivers to avoid bringing up topics related to children's restricted interests, redirecting children to engage in play when the child was isolating themselves or being overly controlling during CDI, and giving special attention to instances of child-initiated interactions. Similarly, Budd et al. (2011) coached the mother in their case study to avoid describing and reflecting her child's restrictive repetitive behaviors during CDI. In another case study, Agazzi, Tan, and Tan (2013) had success with the use of differential attention in this area by coaching a mother to ignore a repetitive self-stimulatory behavior (back arching), create a highly stimulating play environment, and consistently praise the child for joining in with play. Further, a 2014 case study by Lesack, Bearss, Celano, and Sharp tailored a unique set of guidelines for addressing these issues based on initial observations and a coaching session. Toys with a low likelihood for perseverative play (e.g., Legos) were substituted in place of more stimulating toys (e.g., those with lots of lights and sounds) to encourage interpersonal engagement. During CDI, therapists coached the caregiver only to reflect vocalizations with clear communicative purposes or associations with specific objects. Caregivers were also coached to ignore other, noncommunicative vocalizations and provide additional attention for all attempts at functional communication. Finally, Lesack, Bearss, Celano, and Sharp (2014) addressed potentially dangerous perseverative behaviors (e.g., unscrewing lightbulbs) through compliance training in PDI.

In summary, there are a variety of options available in PCIT for working with restrictive repetitive behaviors successfully, and unique child and family characteristics should be considered. Initial caregiver-child observations including functional assessment of behaviors are key in developing individualized treatment plans. Therapists working with children with ASD should be familiar with the guidelines presented in this book regarding tailored treatment strategies. Consultation with experts in ASD is also encouraged when making treatment decisions regarding restrictive repetitive behaviors.

15.4.4 Other Developmental Tasks

Early and intensive behavioral interventions such as ESDM intervene on an impressive number of child developmental domains. In addition to working toward specific goals in communication and social skills, ESDM targets and measures progress in the areas of imitation, joint attention, cognition, play, fine and gross motor skills, behavior, as well as personal independence in eating, dressing, grooming, hygiene, and chores (Rogers & Dawson, 2010a). PCIT does not provide one-on-one therapy devoted to progressing through focused, operationalized steps in these domains. As such, PCIT in its standard form is not as comprehensive as other treatments for ASD.

Despite concerns of comprehensiveness, PCIT may address these developmental goals through caregiver coaching and capitalizing on the caregiver-child relationship. As with social skills or restrictive repetitive behaviors, children with ASD in PCIT may have unique goals related to developmental skills which therapists and caregivers target during coaching and at-home practice. For example, the father of a child who has difficulty in eating independently could be coached to praise the child for taking bites, describe the child's eating behaviors, and model appropriate table manners while ignoring any distracting or disruptive behaviors during session. Later, the father could practice these selective attention skills at home during mealtimes. Because PCIT therapists complete formal behavioral observations of parent-child interactions at each session, target behaviors (along with their antecedents, and consequences) are regularly assessed (McNeil, Filcheck, Greco, Ware, & Bernard, 2001). Using this data, treatment is tailored to meet the goals of each individual child and family.

Furthermore, everyday life continually presents caregivers with opportunities to monitor their children's progress on developmental tasks like dressing, feeding, and grooming. With increased child compliance and expertise in providing effective commands through PCIT participation, families may be better equipped to promote child growth in these areas on their own. There is little concern about generalization of new learning to everyday situations as caregivers model, teach, and reinforce these new skills in natural environments. Caregivers also have flexibility in adapting new goals to match the rate of an individual child's progress.

Even still, caregivers may not be aware of appropriate developmental expectations for their children with ASD, may not devote as much time or energy to these goals, or may not be as skilled at teaching these skills in a stepwise fashion as trained behavior analysts. Therefore, as a part of standard PCIT, therapists must provide emphasis on coaching in these domains. To more fully meet the needs of children with ASD, these developmental areas may need to be included in an ASD-specific adaptation of the model.

15.4.5 Nonverbal/Lower Functioning Children

Within the literature involving PCIT and ASD, researchers often exclude children who score beyond designated cutoffs on measures of ASD symptom severity, language abilities, IQ, and mental age. These decisions are based in part on the idea that children participating in PCIT must be able to understand the commands given during the PDI portion of treatment. However, there is some evidence of successful treatment of children younger than 2 years of age with adaptations of PCIT. As previously cited, Bagner et al. (2016) showed increases in language production for infants (ages 12–15 months) who participated in the Infant Behavior Program, an adapted version of PCIT without the PDI phase, as compared with a control group. A pilot study of another adaptation, Parent-Child Interaction Therapy for Toddlers (PCIT-T), designed to treat children aged 12–24 months, demonstrated effect sizes similar to those of standard PCIT through reductions in ECBI intensity scores (Kohlhoff & Morgan, 2014). Finally, a case study of a 5-year-old child with a serve developmental delay demonstrating receptive language skills at a 15-month age equivalent and expressive language skills at a 10-month age equivalent yielded important thinking points about utilizing PCIT for children without high language levels (Lesack et al., 2014). In this case, backup procedures to time-out were required five times during a total of 13 PDI coach sessions, but only one of these backup procedures was needed within the final five PDI coaching sessions. This outcome provides evidence that a child with less than 24-month receptive and expressive language equivalents could understand PCIT disciplinary procedures. Although legitimate ethical concerns remain regarding the use of PCIT with nonverbal, lower functioning children, these studies provide examples of possible utility in this subset of the ASD population.

15.4.6 Respite for Caregivers

Finally, PCIT requires a substantial investment in time and energy from caregivers. During PCIT, caregivers are expected to attend weekly 1-h sessions for 12–20 weeks, and actively participate through caregiver-child interactions, skill acquisition, and practice. Caregivers participating in PCIT commit to practicing skills at home with their child for 5 min each day. In contrast, many ABA or early intensive behavioral intervention programs involve a therapist or other professional working one on one in a clinic with the identified child for 15–40 h per week for several years. Incidentally, these treatment hours can provide a much-needed break for overburdened caregivers who are challenged with consistently meeting the needs of a child with ASD and/or other behavioral challenges. Although PCIT does not provide this secondary reprieve for families, decreases in a child's aggressive and disruptive behavior problems as a result of PCIT treatment may open doors for the child to participate in childcare, classroom activities, and community events/activities (which were previously inaccessible to the child) giving caregivers other opportunities for respite. In addition, the resulting improvements in parenting stress (Bagner & Eyberg, 2003), self-efficacy (Hood & Eyberg, 2003), and caregiver-child relationship (Timmer et al., 2011) found in the PCIT literature may decrease this need for respite as well.

15.5 Conclusion

This chapter provides a detailed account of the theoretical and conceptual overlap between PCIT and other evidence-based interventions for children on the autism spectrum, including ABA and its modified versions. Although PCIT was originally designed for children with disruptive behaviors, PCIT has been shown to be a versatile intervention, adaptable for a range of populations. PCIT may not specifically target language development, social skill training, stereotypic behaviors, or progress on specific developmental skills or tasks, but research suggests that PCIT has promise to address these domains, even with minor adaptations. Additionally, while PCIT may require some adaptations to be utilized as a standalone intervention for ASD, recent research has shown that PCIT has several advantages when compared to other ASD treatments. These studies suggest that the unique components and characteristics of PCIT have the potential to add considerably to the value of existing services for children with ASD and their families.

While initially appearing dissimilar to other ASD interventions on a surface level (e.g., in content, scope, delivery format), PCIT implements many core components of ABA and other evidence-based treatments. These components include the utilization of functional assessment, semi-structured procedures, child-directed interaction, compliance training, and caregiver involvement as well as a goal of modifying behavior and implementing change across systems and environments to ensure generalizability. PCIT shares some theoretical and conceptual underpinnings related to these components. Above and beyond these comparisons, however, PCIT has several notable advantages: PCIT focuses on a larger age range of children, consistently demonstrates superior effect sizes across research studies and populations of children, focuses on the naturalistic environment, has the ability to be delivered in the home setting, has diminished cost, has increased dissemination and implementation ability, reduces oppositional tendencies and improves compliance, is acceptable to families, has increased fidelity across training institutions and trainers, and has the potential of generalizability to siblings. Although PCIT in its present form does not appear to be comprehensive enough to direct all the components needed for effective treatment of ASD, these strengths are notable and suggest that PCIT has the potential to be (a) an effective gateway treatment for children prior to receiving more intensive services or (b) an important component in a milieu of services. PCIT also shows promise as a treatment for higher functioning children on the spectrum and as a helpful and supportive intervention for families on ABA waiting lists or who do not have access to these more intensive and expensive interventions. Still, further research in these areas is warranted.

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16 Parent-Child Interaction Therapy with Children on the Autism Spectrum: A Narrative Review

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Abstract

This chapter reviews, in detail, all Parent-Child Interaction Therapy (PCIT) studies for children diagnosed with autism spectrum disorder (ASD) and provides information to improve clinical expertise and inform effective practice. Even though PCIT was originally developed to treat children with externalizing behaviors, there has been increased interest in using this evidence-based treatment (EBT) with children on the spectrum. Two theoretical articles, seven nonexperimental studies, and four quasi-experimental and experimental studies comprise the entire literature of PCIT for children with ASD (PCIT-ASD). These studies lay the groundwork necessary to inform future researchers and clinicians interested in PCIT-ASD.

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16.1 Prevalence Rates

In the past 10 years, ASD has emerged as a recognizable and dire public health concern (Baio, 2012). The overall prevalence of ASD is approximately 60 individuals per 10,000 (Newschaffer et al., 2007). However, current prevalence estimates for child populations indicate that between 1 in 88 and 1 in 110 children have ASD (Baio, 2012; Lord & Bishop, 2010). This statistic is particularly jarring as preliminary estimates of healthcare costs for children on the spectrum are nine times higher than other Medicaid-eligible children, with a lifetime societal cost estimate of

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$3.2 million for each person diagnosed with ASD (Ganz, 2007; Newschaffer et al., 2007).

The current rates of ASD are expected to rise as disparities in diagnosis decrease (Baio, 2012; Lord & Bishop, 2010) yet, even with this increased need, the heterogeneous symptomatology of ASD will continue to present treatment issues for clinicians (e.g., variability in functioning across the spectrum, comorbidities). For example, a single ASD resource classroom serving an entire school is likely to fall short of meeting their students' diverse needs (Lord & Bishop, 2010). That is, a school district with 10,000 children would expect to serve around 100 children on the spectrum; one elementary school would have about 5 children with ASD who range in age (5–12), language skill (nonverbal to verbal), IQ (severely impaired to superior), and disruptive behavior (none to highly disruptive). Researchers and service providers must understand both the prevalence and heterogeneity of ASD to inform successful intervention implementation efforts and effective clinical practice.

16.1.1 Disruptive Behaviors

Disruptive behaviors in children on the spectrum are particularly important when conceptualizing ASD-PCIT as many children experience comorbid oppositional behaviors (Kaat & Lecavalier, 2013). Disruptive behaviors encompass a range of externalizing problems ranging from whining and hyperactivity to aggression and defiance. In a large national sample, Mandell, Walrath, Manteuffel, Sgro, and Pinto-Martin (2005) noted that a sizeable number of children were referred for psychological treatment due to disruptive behaviors, of which as many as 40% had a diagnosis of ASD. Specifically, children diagnosed with autism and Asperger's syndrome most often exhibited physical aggression (19.0% and 20.0% of the sample, respectively). Consistent with disruptive behavior referral rates, Kanne and Mazurek (2011) found that 56% of children and adolescents with ASD in a large sample (*N* = 1380) were exhibiting mild-to-severe levels of aggressive behaviors. However other researchers have found that 27% of children with autism demonstrated clinically significant externalizing problems (Hartley, Sikora, & McCoy, 2008). As shown above, several studies highlight a subsample of children with ASD present with comorbid disruptive behaviors; with that in mind, we must understand what system provides effective and timely treatment to these children.

16.1.1.1 Treatment of Disruptive Behaviors in ASD Children

Community-based mental health (CMH) clinics provide a range of comprehensive mental health services to support and treat people within their communities (e.g., outpatient, wraparound, and support groups; Mandell et al., 2005). Many children on the spectrum may receive support for social and academic issues through the education system; however, they turn to the mental health system for issues related to behavioral problems and comorbid psychiatric conditions (Brookman-Frazee et al., 2009). For instance, the CMH system serves the same percentage of children with ASD as the special education system in the United States (Mandell et al., 2005). Many parents report participating in CMH services with their children prior to the child receiving an ASD diagnosis. In one of the first studies characterizing CMH for children with ASD, Brookman-Frazee, Taylor, and Garland (2010) found that children on the spectrum represent almost 10% of children referred for services due to disruptive behaviors. Additional studies exploring CMH services also reported disruptive behaviors as the most common presenting problem for children with ASD, based on both therapist (84.6%) and parent report (100%; Brookman-Frazee, Baker-Ericzén, Stadnick, & Taylor, 2012; Brookman-Frazee, Drahota, Stadnick, & Palinkas, 2012). CMH clinics are therefore particularly important in identifying children on the spectrum to provide them with effective and timely early interventions (Brookman-Frazee, Baker-Ericzén, et al., 2012).

16.2 Motivation for Application

The application of PCIT with children with ASD is both practical and theoretically driven. With disruptive behaviors causing significant additional impairments beyond ASD, Kaat and Lecavalier's (2013) literature review pointed to a dearth of EBTs for ASD that focus on comorbid disruptive behaviors. These children, who sometimes appear at CMH clinics prior to receiving an ASD diagnosis, need quality, time-limited EBTs targeting disruptive behaviors (Brookman-Frazee, Baker-Ericzén, et al., 2012; Kaat & Lecavalier, 2013). In recent years, more and more clinicians have expressed interest in ways to apply PCIT to children on the spectrum. Since 2009, researchers have also shown interest in this topic as PCIT with children on the autism spectrum has been explored at nearly all regional, national, and international PCIT conferences (see references for an extensive list). Adding PCIT-ASD to the set of services available to children on the spectrum would provide parents a unique treatment option directly targeting disruptive behavior problems.

Social contingencies—verbal reinforcement, ignoring, and time-out—constitute a major component of PCIT. Prior assumptions on the salience of social contingencies resulted in the historical exclusion of children on the autism spectrum from participating in PCIT. Awareness that social reinforcement does work with children on the spectrum has allowed for research to investigate the efficacy and effectiveness of PCIT-ASD. Over 40 years of PCIT research supports the effectiveness of PCIT in decreasing disruptive behavior and increasing compliance among typically developing children (see Chap. 14 in this handbook for a review; Brestan & Eyberg, 1998). The current PCIT-ASD literature provides a case for conducting PCIT-ASD with children who display co-occurring disruptive behaviors.

16.3 PCIT-ASD Research Overview

The goals of this literature review are to survey the current state of knowledge, provide a historical account of the development of PCIT-ASD, and identify limitations in the existing literature. Research will be discussed chronologically within three categories of study design—theoretical, nonexperimental, and quasi-experimental and experimental. The following study overviews integrate the research clearly within a historical context to inform effective clinical practice and guide future research.

16.3.1 Theoretical

Theoretical research provides a conceptual framework for understanding, analyzing, and designing ways to investigate relationships. It also establishes a foundation on which to build future studies. In the case of PCIT-ASD, theoretical research informs planned changes, otherwise known as adaptations, to effectively apply this intervention with this unique population (Eyberg, 2005). The first two articles discuss the theoretical reasoning and conceptualization to effectively apply PCIT for use with children on the autism spectrum.

16.3.1.1 Developmental Disabilities

Similar to children on the spectrum, children with developmental disabilities (DD) are at greater risk for exhibiting disruptive behaviors, which greatly impact their social relationships and adaptive functioning. McDiarmid and Bagner (2005) set the stage for the expansion of PCIT to ASD populations through their theoretical discussion of PCIT for children with DD. Specifically, they drew parallels between the primary components of current treatments for children with DD and those used in PCIT (i.e., behavioral approaches, incidental teaching, errorless compliance training, and parent training). For example, the Child-Directed Interaction (CDI) phase of PCIT includes ample incidental teaching and reinforcement of children's positive behaviors. The Parent-Directed Interaction (PDI) phase of PCIT utilizes an increasingly challenging continuum of commands. PCIT also teaches caregivers contingency management, an important aspect of parent-training programs implemented for children with DD.

McDiarmid and Bagner (2005) noted that standard PCIT requires minimal modifications to elicit behavioral change in children with DD. This approach is successful because PCIT was developed for implementation with children who display varied levels of cognitive and language development. Children do not need to be verbal to participate in PCIT, but they need to understand simple commands. Therefore, the authors recommended that potential developmentally delayed candidates for PCIT have receptive language skills at or above 24 months.

However, children with cognitive delays may receive additional benefit from PCIT when parent-child interactions are used to increase children's vocabulary and emphasis is placed on ensuring that children comprehend parent verbalizations (McDiarmid & Bagner, 2005). The authors identified three specific caregiver skills developed in the traditional PCIT model that could be adapted to increase beneficial treatment outcomes for individuals with DD—praise, behavioral descriptions, and providing effective commands. Specifically, it was suggested that praise be modified to match the child's language and/or cognitive abilities to guarantee that the child comprehends the praise. For example, if the child had limited language abilities and could not understand verbal praise, a hug or pat on the back might be a more effective method than verbal praise. Secondly, it was recommended that behavioral descriptions were concise and focused on correct word usage when being used with a child who has a DD. Parents were coached to describe what the child was doing without any speculation, therefore giving the child the ability to understand his or her behaviors in a verbal way. Such behavioral descriptions might also provide the child with the opportunity to learn new vocabulary. Lastly, commands were instructed to be consistent and direct, as these types of commands helped a child with DD more clearly understand behavioral expectations.

To demonstrate the effectiveness of PCIT for children with DD, McDiarmid and Bagner (2005) discussed a case study of a 3-year-old male with moderate intellectual disability and limited language. He was referred for behavior problems that met diagnostic criteria for oppositional defiant disorder and his mother reported significant levels of parenting stress. Standard PCIT protocol was implemented over the course of 14 sessions (5 CDI sessions and 9 PDI sessions). Notably, the child required more repetitions of the PDI procedures than are typically provided in order to fully understand the time-out process. At the end of the treatment, the child's behavior was rated in the normal range and he no longer met the criteria for oppositional defiant disorder. Additionally, his mother reported significantly lower levels of parenting stress and high satisfaction with treatment.

16.3.1.2 Conceptualizing PCIT-ASD

Masse, McNeil, Wagner, and Chorney (2007) were the first authors to publish theoretical justification and a conceptual model for the use of PCIT with children on the autism spectrum. Their pioneering study suggested that PCIT could be used as a supplement to other interventions to decrease destructive behaviors and increase functional behaviors in children with autism.

Similar to McDiarmid and Bagner (2005), Masse et al. (2007) explored the theoretical parallels between PCIT and well-known treatments for children diagnosed with ASD. The authors focused on six established ASD treatments (i.e., applied behavior analysis (ABA), the UCLA Young Autism Project, pivotal response training, positive behavior support, TEACCH, and DIR/Floortime). The primary similarity found across many of these ASD interventions was the role of the parent as an agent of change—which is also a hallmark of PCIT (Masse et al., 2007). Enhancing the parent-child bond, promoting generalization, and utilizing intensive compliance training are three major components found in both PCIT and well-known ASD interventions. As emphasized in PCIT, Floortime and TEACCH focus on the importance of the parent-child bond to support child behavior and verbalizations. Both PCIT and pivotal response training promote generalization by using familiar play objects in a comfortable environment. Lastly, like discrete trials seen in ABA, PCIT contains an intensive compliance training component (i.e., PDI). Masse et al.

(2007) advocated that this blend of therapeutic techniques found in PCIT may best serve to prime families for more intensive ASD treatments by enhancing the parent-child relationship and increasing child compliance. The authors proposed that because PCIT is so similar to existing treatments for ASD, it could be paired with one or more established ASD interventions to maximize the effectiveness of therapy, especially if PCIT is used as a precursor to exposure to other treatments or environments.

Another important issue that Masse et al. (2007) addressed was the existence of self-stimulatory behaviors in the ASD population and how it could become an important theoretical issue in the CDI phase of PCIT. During this phase, parents address inappropriate or undesirable behaviors by using selective attention. However, it can be unclear if self-stimulatory behaviors should be conceptualized as appropriate or inappropriate, as attempting to use parental attention to modify these frequently occurring behaviors can impede the strengthening of the parent-child relationship—the goal of CDI. Therefore, it was determined that as long as repetitive, self-stimulatory activities were not dangerous, they could be considered appropriate behaviors during CDI. However, addressing self-stimulatory behaviors is still necessary to expand a child's behavioral repertoire, a crucial component for success in future educational environments. The authors noted that in their clinical experience, parents eventually were able to elicit changes in self-stimulatory behavior through redirection during the PDI phase of PCIT.

16.3.2 Nonexperimental

Nonexperimental research provides rich and detailed information through the use of case reports. Detailed descriptions of client characteristics, interventions, and treatment outcomes can inform clinical practice and provide a basis for future experimental studies. Conversely, results must be interpreted with caution due to the inherent lack of experimental control. Seven nonexperimental articles explored the use of PCIT-ASD and provided valuable information to guide clinical practice. These varying accounts all yield helpful information considering the heterogeneity of the ASD population.

16.3.2.1 Cross-Cultural Support

Hatamzadeh, Pouretemad, and Hassanabadi (2010) demonstrated cross-cultural support for the effectiveness of PCIT with children on the autism spectrum using a convenience sample of four males with high-functioning autism ranging in age from 3 to 7. Participants in this sample from Iran met the diagnostic criteria for autism as defined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; DSM-IV-TR; American Psychiatric Association, 2000), exhibited clinically significant disruptive behaviors as measured by the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999), and demonstrated IQ scores above 70. Utilizing an A-B single-case experimental design, Hatamzadeh et al. (2010) treated participants with PCIT in weekly 1-h sessions over an undisclosed period of time. The ECBI was given to participants at six different times: 2 weeks prior to treatment, at the first treatment session, after CDI mastery, after PDI mastery, and during 2- and 4-week follow-ups.

Results suggested that child disruptive behavior decreased significantly following completion of PCIT in high-functioning children with autism (Hatamzadeh et al., 2010). From the initial assessment to follow-up, ECBI problem scores dropped 34%, 53%, 70%, and 54% in the four participants. There were similar decreases in ECBI intensity scores (19–39%) across the same period. Two limitations of these findings included the lack of a stable baseline for disruptive behavior and the reliance on maternal report for all outcome measures. Additionally, the authors' description of participants lacked sufficient detail to assist clinicians in determining which symptom presentations of ASD are most ideal for PCIT. Thus, the study's clinical utility was therefore limited.

16.3.2.2 Community-Based Mental Health Clinic Case Study

To demonstrate the diverse populations within which PCIT is effective, Budd, Hella, Bae, Meyerson, and Watkin (2011) compiled a collection of four case studies delivering PCIT in a CMH clinic. One of these case studies focused on a 5-year-old male with ASD and aggressive behavior who was referred to PCIT by his mother. Although this child was described as high functioning, he experienced speech and motor delays.

The participant and his mother successfully completed both phases of PCIT within 13 sessions. Standard PCIT was tailored to the participant based on recommendations made by McDiarmid and Bagner (2005) and Masse et al. (2007) with some adjustments; for example, therapists instructed the child's mother to ignore his stereotyped and repetitive behaviors by avoiding any reflections or descriptions while these behaviors occurred. The child also presented with some food aversions. To address the child's sensory sensitivities to some foods, therapists provided the dyad with play food to practice engaging in appropriate eating behaviors, with his mother providing subsequent positive reinforcement. During treatment, researchers measured child behavior problems using the ECBI, parenting stress using the Parenting Stress Index-Short Form (Abidin, 1995), and caregiver-child interactions and child compliance using the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014).

Following the completion of PCIT, the participant no longer met the criteria for a disruptive behavior disorder. His behaviors had come within normal limits as measured by his ECBI problem score (decreased from 15 to 7) and his ECBI intensity score (decreased from 131 to 84). There were significant decreases in some aspects of his mother's stress—particularly in her perception of her child and her total stress levels (to within normal limits). In this case example, Budd et al. (2011) illustrated the effective application of PCIT within a CMH setting for a child diagnosed with ASD and presenting with severe disruptive behaviors. They highlighted the complexity of successfully implementing PCIT in real-world service settings. It should be noted, however, that the CMH center in this study was located on a university campus, and therefore possessed additional resources that supported treatment fidelity (e.g., practicum training clinic and research-oriented supervisor) and flexibility (e.g., flexible admission criteria and adjustable attendance policy). Study limitations included a lack of experimental control and insufficient discussion of the contribution of extraneous family stressors during treatment.

16.3.2.3 Asperger's Case Study

Given the heterogeneity in clinical presentations of ASD, it is necessary to explore the efficacy of PCIT with children who fall across the breadth of the autism spectrum. Armstrong and Kimonis (2013) conducted a case study examining the efficacy of PCIT for a child diagnosed with Asperger's disorder, formerly a separate subcategory in prior diagnostic manuals (DSM-IV-TR) that was folded into the broader ASD diagnostic criteria in the DSM-5 (5th ed.; American Psychiatric Association, 2013). Children diagnosed with Asperger's disorder prior to the DSM-5 (2013) typically displayed higher verbal IQ scores and no delays in early language development (Armstrong & Kimonis, 2013). Motivated by previous findings supporting the application of PCIT in children with ASD (Solomon, Ono, Timmer, & Goodlin-Jones, 2008), Armstrong and Kimonis (2013) examined the efficacy of PCIT with a 5-year-old male experiencing comorbid Asperger's disorder and disruptive behaviors.

The participant began displaying severe and long-lasting temper tantrums at the age of 2. The participant's numerous disruptive behaviors (e.g., disobedience, running away, and destroying property) occurred at home, school, and in the community. After multiple diagnoses and numerous medications (i.e., stimulants and antipsychotics), he was referred to a university clinic with the diagnoses of Asperger's disorder, attention-deficit/hyperactivity disorder (ADHD), oppositional defiant disorder, and obsessive compulsive disorder. His caregivers and the researchers sought to decrease his disruptive behavior with alternative methods to medication. Therefore, treatment goals consisted of increasing his ability to obtain attention with appropriate behavior, follow directions, and use appropriate communication when upset.

PCIT sessions were conducted with the participant and his mother once per week for 1 h, lasting a total of 16 weeks. Two weeks before treatment, the participant was evaluated for his IQ, behavior, and Asperger's symptoms. His mother and teacher completed behavior rating scales pretreatment, posttreatment, and at a 3-month follow-up.

From pretreatment to posttreatment, there were clinically significant decreases in the participant's intensity and problem scores from both parent and teacher reports. His ECBI intensity scores remained relatively stable over time, except for large dips in the first two CDI sessions (i.e., sessions 1–2) and the final two PDI sessions (i.e., sessions 15–16). Alternatively, his ECBI problem scores showed a steady decline across treatment. Three months posttreatment, the participant's mother reported that his behavior improved at home. His teacher reported that he still had difficulties with inattentive and disruptive behaviors at school, but he had improved over the year. Subsequently, he successfully attended an all-day summer camp and was able to transition into a mainstream first-grade class. A limitation of this case study was that many of the outcome measures were based on parent and teacher report. Additionally, it should be noted that the child experienced multiple atypical environmental stressors over the course of treatment that may have impacted his progress (e.g., deployment of a parent, transition to a new classroom).

16.3.2.4 Complex Comorbidity Case Study

Agazzi, Tan, and Tan (2013) provided a case example highlighting clinical challenges, adaptations, and recommendations for a 7-year-old male diagnosed with ASD and a variety of comorbidities, including severe behavior problems, sleep problems, developmental delays, hearing impairment, premature birth, and in utero substance exposure. Following assessments by a psychiatrist, developmental pediatrician, neurologist, and pediatric psychologist, the child was found to exhibit clinically significant anxiety issues, ADHD, and conduct problems. He displayed tantrums with verbal and physical aggression toward family members, teachers, and peers, impacting both social and academic activities. Desperate for a strategy to reduce aggression and noncompliance, local physicians and psychologists referred him for PCIT. Treatment consisted of an hour-long session per week for 15 weeks. Standard PCIT was used, and the family completed eight CDI sessions and seven PDI sessions. Notably, therapists prematurely discontinued two consecutive CDI sessions due to the intensity of the child's aggressive behavior.

There were clinically significant decreases in ECBI intensity scores from the child's mother and father following the completion of PCIT, but only his father's scores were maintained at a 3-month follow-up. The ECBI's problem scores increased, perhaps due to a beginning high tolerance for his disruptive behavior. Three months after treatment, his parents requested three follow-up coaching sessions because they reported that the participant's disruptive behavior was escalating in the school setting. However, they reported that his behavioral gains remained stable in the home environment. Limitations of this study included a reliance on parent and teacher report, many complications with the participant's medications, and difficultly implementing time-out at home. First, many assessment measures were used in a multidisciplinary evaluation prior to therapy, but these were not readministered at posttreatment. Inclusion of these measures at follow-up may have complemented the ECBI scores and helped evaluate the effect of treatment. Second, the child was taking several medications that were changed three times over the course of treatment, which may have confounded any behavioral improvements. Third, his parents had significant difficulty executing time-out at home due to the severity of the child's aggression; this may have provided the child with reinforcing attention for inappropriate behaviors.

16.3.2.5 Limited Communication Case Study

Lesack, Bearss, Celano, and Sharp (2014) investigated the salience of social reinforcement by applying PCIT to a child with ASD and more severe developmental delays. They adapted components of CDI and PDI to accommodate the 5-year-old male with ASD, severe developmental delay, and significant disruptive behaviors. The child was unable to produce any words with intended meaning. His parents referred him to PCIT due to elevated rates of problem behavior including running away in public, climbing on furniture, tantrums, and self-injurious behaviors. He also displayed self-stimulatory behaviors and lack of eye contact.

Twenty-two treatment sessions were conducted once per week for 45 min each. During CDI, two adaptations were made coinciding with recommendations for PCIT with developmental delays and typically developing children (Lesack et al., 2014). First, the participant regularly engaged in solitary and self-stimulatory play; therefore toys that facilitated this type of play (e.g., eliciting sound and/or lights) were excluded in favor of other PCIT-appropriate toys (i.e., blocks, Mr. Potato Head, and wooden puzzles). Second, his vocal communication was primarily made up of single-syllable vocalizations (e.g., "ba, ba, ba," "ah") and stereotypic verbalizations without communicative intent. This impacted his mother's ability to reflect during CDI and warranted the following guidelines: his mother only reflected vocalizations with communicative intent, she ignored stereotypic vocalizations, and her reflections included both the uttered vocalization (e.g., child says, "ah," while point to a ball) and the word(s) referencing the accompanying item or action (e.g., his mother reflects, "*Ah*, you said ball"). These deliberate modifications still offered high-quality attention contingent on appropriate vocalizations while also promoting functional communication.

For PDI, five adaptations were made while carefully considering PCIT's protocol recommendations (McNeil & Hembree-Kigin, 2010). There was a concern regarding whether the participant could discriminate commands from other types of communication because he did not respond to most vocal communication directed at him. The first two adaptations were made to decrease the likelihood that noncompliance was due to receptive language difficulties, while the final three PDI adaptations were made regarding time-out procedures. First, his name was used to prompt a command (e.g., "Kevin, sit here") to help him identify the command. Second, a teaching phase including a three-step sequence (i.e., tell, show, do) was implemented to teach the child the appropriate response to specific commands. The participant was given a verbal command with a gestural cue, a verbal command with the request modeled, and a verbal command with a physical prompt. He was required to demonstrate mastery with the target command (i.e., compliance three consecutive times after a verbal or gestural prompt) before time-out was added to PDI. Third, the time-out consequence was limited to certain commands selected to address situations involving task disengagement eliciting aggression (i.e., give his mother a specified item) and safety concerns (i.e., sit in a specific spot next to mother). Fourth, time-out was decreased from 3 min plus 5 s of quiet to a developmentally appropriate 60 s plus 2 s of quiet. Fifth, a holding chair procedure was selected in place of a time-out room due to safety concerns related to the child's tendency to engage in dangerous behaviors if left alone (Hembree-Kigin & McNeil, 1995).

Researchers relied heavily on the ECBI to track the participant's progress throughout treatment. His mother filled out the ECBI once during pretreatment, every 2–3 sessions, and once during the last session. The DPICS was also used by researchers to code parent-child interactions and child compliance during sessions.

There were clinically significant decreases in the participant's ECBI problem and intensity scores from 160 at pretreatment to 106 at the last PDI coaching session. His mother also reported overall decreases in self-stimulatory behavior and dangerous activities (e.g., climbing on furniture and unscrewing light bulbs). A limitation of this study was the lack of collected data regarding the participant's vocalizations throughout treatment, although his mother reported that his overall number of vocalizations increased. Additionally, because this study only included one child, researchers were limited in their ability to make conclusions about the efficacy of adapted PCIT with an ASD population.

16.3.2.6 Intellectual Disability Case Study

Because half of the individuals with ASD have a comorbid intellectual disability, Armstrong, DeLoatche, Preece, and Agazzi (2015) conducted a case study using PCIT with a 5-year-old female diagnosed with ASD, intellectual disability, ADHD, and epilepsy. She developed typically until age 2; she then began to experience seizures which caused her motor and verbal development to regress. Her expressive language consisted of five words and she was able to follow simple instructions with gestures. Her problem behaviors included biting, pinching, hitting, and screaming. Armstrong et al. (2015) believed that these were attention-seeking behaviors, making PCIT a suitable treatment option.

PCIT treatment lasted for ten weekly sessions. The standard PCIT protocol was followed, with the addition of visual supports (e.g., visual schedules and social stories) to help the child better understand what was expected of her during treatment. Researchers created a social story to help her comprehend the discipline sequence in PDI. A visual schedule was also utilized to assist with completion of her bedtime routine. Caregiver and teacher reports of child behaviors were collected before initiating treatment, at the final PCIT session, and at 5-month follow-up. Multiple scores on parent and teacher report of child behavior decreased from the clinical to the normal ranges from pretreatment to 5-month follow-up including reductions in child intensity, problems, anxiety, oppositional defiance, and ADHD symptomology. During the follow-up assessment, researchers found that problem behavior had increased since the final PCIT session, perhaps due to the new school year beginning. Her mother reported that the family still utilized PCIT skills and their ECBI problem scores remained in the normal range at follow-up.

The first limitation of note in this study was a change in the families' insurance, causing an abrupt end to sessions. Second, because the child was simultaneously followed by a psychiatrist throughout the study, the influence of additional therapies and changes in her medications may have impacted her PCIT treatment outcomes.

16.3.2.7 PCIT and Vocalizations

The previously discussed case studies have primarily focused on the effect of PCIT on disruptive behavior. Hansen and Shillingsburg (2016) introduced a novel outcome measure in their examination of the impact of PCIT-ASD on children's production of vocalizations. They presented case studies of two males between the ages of 2 and 4 years with ASD diagnoses. Both children demonstrated considerable language impairment on either the Receptive-Expressive Emergent Language Test-Third Edition (REEL-3; Bzoch, League, & Brown, 2003) or the Mullen Scales of Early Learning (MSEL; Mullen, 1995). The first participant was diagnosed with mixed receptive-expressive language disorder at 46 months old. On the REEL-3, he demonstrated severe language impairment (scores ranked within the first percentile or below) in overall language ability and receptive and expressive language skills. The second participant demonstrated very low range scores (first percentile) on the MSEL for both receptive and expressive language.

The participants completed 1- to 2-h weekly PCIT sessions over 12 to 16 weeks. During pretreatment and posttreatment, parent-child interactions were observed and coded using the DPICS. The researchers made modifications in both phases of PCIT to accommodate the children's language abilities. In the CDI phase, mastery criteria was modified such that caregivers only needed to meet two of the three criteria for positive caregiver behaviors (i.e., ten reflections, ten label praises, ten behavior descriptions) because children with language delays often present fewer opportunities for caregivers to display reflections. Caregivers also were trained to encourage vocalizations and appropriate requests. They were given request training and taught to use stimulus-stimulus pairing strategies to reinforce child vocalizations (e.g., when a child says “mama” the mother responses by saying “mama” and then providing the child with reinforcing stimulus, such as attention). In the PDI phase, three adaptations were made to the standard PCIT protocol. First, PDI sessions did not include time-out. Second, caregivers used a three-step sequence (i.e., tell, show, do) when giving verbal commands. Third, caregivers utilized instructional fading by reinforcing compliance following a verbal or model prompt with either social praise or preferred items/activities (e.g., a snack).

At the conclusion of treatment, there was an increase in the number of positive parenting behaviors exhibited by the children’s caregivers. Additionally, one caregiver displayed decreased engagement in negative parenting behaviors, while the other caregiver showed no change in this area. However, the unique result obtained in this study was the change in child vocalizations from pre- to posttreatment. The first participant was observed vocalizing 48 words following PCIT compared to his 18 vocalizations prior to treatment aggregated across three 5-min activities (i.e., child-led play, parent-led play, and a cleanup activity). The second participant vocalized 50 words at posttreatment as compared to 5 vocalizations at pretreatment aggregated across the three 5-min activities. The authors noted that they did not control for maturation effects or the effect of outside therapies on the children’s development, which limits the conclusions that can be drawn for this study. Even so, the results suggested that modified PCIT can address both behavior and language abilities in children with ASD.

16.3.3 Quasi-Experimental and Experimental

Quasi-experimental and experimental research uses more rigorous study designs (e.g., single-subject, randomized controlled trials) to empirically establish the efficacy and effectiveness of an intervention. Experimental study designs contain strong internal validity through methods such as random assignment that add necessary support to the establishment of an evidence-based treatment. Nonetheless, as designs become more tightly controlled, internal validity often increases at the expense of external validity, making results less generalizable. Therefore, single-subject designs are experimental designs that can be ideal for the development of an EBT in highly heterogeneous populations (Byiers, Reichle, & Symons, 2012). Four quasi-experimental and experimental articles follow and provide the most rigorous support currently available for PCIT-ASD.

16.3.3.1 High-Functioning Autism Efficacy

Solomon et al. (2008) provided the first study with a strong experimental design, paving the way for PCIT-ASD research. This study piloted the use of PCIT in children with high-functioning autism using a matched waitlist case-control design. The authors examined the efficacy of PCIT in reducing child disruptive behavior, improving child adaptive and social functioning, reducing parental stress, and increasing shared positive affect between children and their caregivers. Specifically, a positive relationship between shared positive affect and improvements in child and parent functioning was expected.

The sample included 19 males, ranging from 5 to 12 years old, who met the diagnostic criteria for autism (using DSM-IV-TR criteria, the Autism Diagnostic Observation Schedule-Generic [Lord et al., 2000], and the Autism Diagnostic Interview-Revised [Lord, Rutter, & Le Couteur, 1994]) and demonstrated clinically significant externalizing behavior on the Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) Parent Rating Scale, BASC Externalizing Scale, or the ECBI Intensity Scale. Additionally, study exclusion criteria included IQ eligibility scores below 70 as well as insufficient receptive and expressive language skills, since insufficient language skills impact treatment (e.g., meeting CDI mastery criteria). Participants were assigned to matched pairs based on age, cognitive level, and severity of behavioral symptoms. After matching, a single subject from each matched pair was randomly selected to receive treatment first, while the other subject served as a control participant.

Treatment participants received an average of 12.5 PCIT sessions. Pretreatment and posttreatment assessments took place 2 weeks before and after treatment and consisted of measures of child behaviors, parenting stress, and the Shared Positive Affect Coding Adapted from Kochanska and Aksan (1995). Parent-child shared affect, measured via behavioral coding, was obtained for the first intervention group only.

Overall, results showed a significant improvement in child adaptability, parent positive affect, and shared positive affect. At posttreatment, there was no significant reduction in parent report of child disruptive behavior in the treatment group, as evidenced by scores on the Conduct Problems, Aggression, and Attention Problems scales of the BASC. However, parent ratings in the intervention group indicated a significant decline on the ECBI problem scale, indicating that parents viewed their children's behavior as less problematic and more "typical" following treatment even if actual behaviors did not lessen. Additionally, both groups demonstrated decreases in their ECBI intensity scores over the course of the study, suggesting an overall reduction in problem behavior. Children in the treatment group displayed increased flexibility following PCIT, as measured by the BASC Adaptability scale. PCIT was associated with improvements in parent positive affect and shared positive affect, with shared positive affect scores increasing significantly from baseline to mid-treatment and throughout PDI (despite the compliance training component of this phase). Notably, over the course of treatment, there was a fourfold increase in occurrences of parent positive affect being followed by child positive affect. However, in spite of improvements in parent positive affect, parents did not report significant reductions in stress. Finally, results were mixed regarding the relationship between shared positive affect and improvements in child and parent functioning.

Limitations of this study included the small sample size and reliance on parent report for most outcome measures. The participants also represented a limited sample of children (i.e., "high-functioning") on the autism spectrum, thus preventing wide generalizability of the findings. Although Solomon et al. (2008) noted that treatment fidelity was maintained throughout the study in regular team coding meetings, no formal measure was used. In addition to a measure of treatment fidelity, authors stated that including a control group would improve the reliability of the shared positive affect measure and associated analyses.

16.3.3.2 Standard Home-Based PCIT Efficacy

Although PCIT has primarily been implemented in clinical settings, emergent research is exploring the use of this treatment in families' homes (Lieneman, Brabson, Highlander, Wallace, & McNeil, 2017). Masse, McNeil, Wagner, and Quetsch (2016) examined the use of home-based PCIT with children on the autism spectrum. A nonconcurrent multiple baseline design was utilized to demonstrate the efficacy of standard PCIT protocol (both CDI and PDI phases) with this population.

Participants included three 3- to 4-year-old males recruited from local health centers. Inclusion criteria for this study consisted of receptive language skills at a minimum 24-month developmental level on the Peabody Picture Vocabulary Test-III (Dunn & Dunn, 1997), the ability to speak English, a score of 44 or higher on the Autism Behavior Checklist (Krug, Arick, & Almond, 1980), a score of 30 or higher on the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1988), and clinically significant disruptive behavior scored within clinical range on the ECBI. The Peabody Picture Vocabulary Test-III, an interviewer-based vocabulary test, assessed receptive language skills. The Autism Behavior Checklist measured parent-reported behaviors indicative of ASD, while the Childhood Autism Rating Scale measured child behavior indicative of ASD via direct behavior observation.

The first participant (age 3) was referred for behavioral concerns comorbid with ASD. The second participant (age 4) was referred for his disruptive behavior; this child received speech, physical, and occupational therapy before participating in PCIT services. The third participant (age 4) was referred by his school because he displayed severe self-stimulatory behaviors, language delays, and aggression. Each dyad was randomly assigned a number of baseline sessions to establish stability.

Researchers followed standard PCIT protocol, but implemented therapy in the home rather than an outpatient clinic. Therapists coached parents via an in-room format due to limitations with technology and other environmental factors. This technique includes sitting behind the caregiver and quietly providing feedback, presenting written coaching statements, and actively ignoring the child's advances. Researchers hypothesized that there would be improvements in caregiver-child interactions (as measured using the DPICS), decreases in the severity of the presentation of autistic behaviors, reductions in child problem behavior (as measured on the ECBI), increases in child compliance, and a high rate of treatment satisfaction.

Results indicated that child compliance rates increased for two of the three participants from pretreatment to posttreatment and for all three participants from pretreatment to 3-month follow-up. Positive parenting behaviors increased from pretreatment to posttreatment for all participants and also maintained at follow-up assessments. Child behavior problems as measured using the ECBI intensity and problem scores showed significant decreases from pretreatment to posttreatment across all participants. Caregivers also reported a moderate to high level of satisfaction with treatment. Regarding the effect of PCIT on autism-related behaviors, participants generally displayed downward trends across treatment but often remained in the clinical range. The results of this study demonstrated that standard PCIT implemented in-home can be effective in increasing compliance and decreasing behavior intensity for children on the spectrum. It was also suggested that treatment may lead to reduction in the severity of some autism-related behaviors. Limitations of this study include the possible influence of history effects on treatment outcomes (an inherent limitation for nonconcurrent multiple baseline designs) and possible bias due to the raters' knowledge of study hypotheses.

16.3.3.3 Randomized Controlled Trial

Ginn, Clionsky, Eyberg, Warner-Metzger, and Abner (2017) conducted the first and only published RCT to date examining the efficacy of PCIT for children with ASD. This experiment utilized only the CDI phase of PCIT to strengthen the relationship between the child and the caregiver. The authors asserted that if the CDI phase was found to be sufficiently effective in improving outcomes for children on the spectrum, it could be a more economic intervention as compared to completing the full PCIT protocol (i.e., CDI, PDI, and additional graduation criteria). Therefore, this initial RCT did not examine the efficacy of the full PCIT model, but provided valuable information regarding the effect of CDI on children with ASD.

The sample consisted of 30 caregiver-child dyads with children between 3 and 7 years old. Inclusion criteria involved a prior ASD diagnosis, cognitive functioning estimated to be at 24 months or higher, and the ability to speak three or more words. Caregivers were also required to meet cutoffs for minimal cognitive functioning. However, children were not required to display disruptive behavior for study inclusion. Of note, children were excluded from participation if they were receiving any additional behavioral therapies or treatments to ensure that outcomes could be attributed to the experimental intervention.

Participants in this study were assigned to either an immediate treatment group or a wait-list group. Each dyad received eight sessions of PCIT, with each session lasting 60–75 min, over a period of 10 weeks. Families on the waitlist received treatment following the immediate treatment group. Sessions followed standard PCIT protocol for the CDI phase, and content of the sessions was matched to the children's cognitive abilities. Researchers measured children's receptive language ability, behavior problems, social responsiveness, as well as child and parent behaviors during the DPICS, and parent stress at pretreatment, posttreatment, and 6-week follow-up.

At posttreatment, participants in the immediate treatment group demonstrated significantly more positive parent-following behaviors, fewer negative parent-leading behaviors, and fewer child disruptive behaviors compared to those on the waitlist. Group differences in overall maternal stress were not significant, but parents receiving immediate treatment reported less distress associated with child disruptive behaviors at posttreatment. This finding may suggest greater parental self-efficacy in their behavior management skills following CDI. Children in the two groups did not display significant differences in language ability at posttreatment; this unexpected result may have been due to the majority of the sample (86%) displaying adequate language skills prior to treatment. Similarly, there were no significant group differences in social responsiveness at posttreatment, but children in the immediate treatment group displayed improved levels of social awareness. All treatment gains were maintained at a 6-week follow-up. It should be noted that growth in parenting skills (specifically, reduction in negative "leading" behaviors) significantly mediated improvements in child behavior problems, aligning with previous research on PCIT in typically developing populations (Bagner & Eyberg, 2007).

Although this study provides the most rigorous experimental design in the current PCIT-ASD literature, some limitations can be recognized to inform future research. The sample size used is the largest among all available PCIT-ASD studies but is still relatively small for an experimental treatment study. While the exclusion of participants receiving other behavioral treatments (i.e., ABA) increased internal validity, it conversely limited the generalizability of these findings, as many children with ASD receive multiple behavioral therapies. Furthermore, the measures utilized in this study may not have fully depicted the type of behavior change found in this unique population. For example, future research may benefit from including direct observation of child social behaviors.

16.3.3.4 Standard PCIT Efficacy

Zlomke, Jeter, and Murphy (2017) examined the efficacy of standard PCIT for children on the autism spectrum. This study included a sample of 17 caregiver-child dyads with children between the ages of 2 and 8 years who demonstrated clinically significant behavior problems and a prior ASD diagnosis. Researchers examined the impact of PCIT on child disruptive behavior, effective parenting skills, and social-emotional symptoms associated with ASD (e.g., social skills and adaptability).

Participating families received treatment weekly for approximately 60–90 min per session, with an average of 19 sessions per dyad. PCIT mastery criteria for some families were modified (as suggested in the PCIT Protocol Manual; McNeil & Hembree-Kigin, 2010) due to limited child verbalizations. The ECBI and DPICS were administered throughout treatment. Measures of general child behaviors, autism symptoms, and attitude toward therapy were administered at pretreatment, mid-treatment, and posttreatment.

Results indicated statistically significant decreases in ECBI problem and intensity scores as well as measures of externalizing problems and other behavioral symptoms. A significant improvement in child compliance was observed from pre- to posttreatment. Caregivers also displayed significantly more positive following behaviors and fewer negative leading behaviors over the course of treatment, as measured by the DPICS. Notably, decreases were also observed in parent report of children's hyperactivity, aggression, and atypicality levels. Additional analyses showed improvements in child adaptive functioning, including a significant increase on measures of children's social skills.

Significant changes on many of the aforementioned outcome measures were observed from pretreatment to mid-treatment, suggesting that the CDI phase of PCIT may be particularly effective in addressing symptoms in children with ASD. This provides support for a strong emphasis on CDI in PCIT-ASD. Additional decreases in caregiver-reported problem behavior intensity and frequency were observed during PDI, highlighting that the PDI phase is still an essential aspect of the intervention when implemented with an ASD population. Limitations to this study include the lack of a control group, absence of coding for some dyads during certain sessions due to a technological error, a relatively small sample size, and uncertain generalizability to children with various levels of functioning on the autism spectrum.

16.4 Discussion

There has been a proliferation of research into the application of PCIT-ASD within the past decade (for a summary, see Table 16.1), mainly because social contingencies were recognized as reinforcing for children on the autism spectrum (McNeil & Hembree-Kigin, 2010). Additionally, clinicians encounter many children on the spectrum with disruptive behaviors as the primary treatment concern and require an effective and timely treatment option (Mandell et al., 2005); commonly, disruptive behaviors detrimentally impact family functioning as well as impede readiness and success in other comprehensive ASD treatments. Although gaps still exist in the literature, current research supports the application of PCIT for children on the autism spectrum in reducing disruptive behavior. To inform effective PCIT-ASD practice, a discussion on what child is most likely to benefit from PCIT-ASD (e.g., ASD subpopulations and presenting problems) and suggestions for future research is outlined below.

16.4.1 Inclusion Criteria

16.4.1.1 Age Range

Most children participating in PCIT-ASD studies ranged in age from 2 to 6 years, the recommended age range for standard PCIT (McNeil & Hembree-Kigin, 2010). A few studies slightly extended the age range of participants to 7-year-olds (Agazzi et al., 2013; Ginn et al., 2017; Hatamzadeh et al., 2010) and 8-year-olds (Zlomke et al., 2017). However, Solomon et al. (2008) sampled children ranging in age from 5 to 12 years, as they viewed the mental age of participants as more relevant to treatment fit than their chronological age. Successfully adapting PCIT to older children requires careful consideration and review of the literature to make appropriate modifications because the size of the child, not just mental age, becomes an issue in the application of PCIT in older populations (Stokes, Scudder, Costello, & McNeil, 2017).

16.4.1.2 Behavioral Problems

Across most of the PCIT-ASD studies, participants presented with clinically significant behavioral problems. Screening for the presence of disruptive behaviors is the first step in determining if PCIT-ASD is an appropriate treatment option, because not all children on the spectrum exhibit disruptive behavior. Eight of eleven PCIT-ASD studies reported clinically significant ECBI intensity scores at pretreatment, whereas only one study reported scores that did not reach clinical significance for all participants (Hatamzadeh et al., 2010). Although nearly all studies noted the severity of disruptive behavior, future PCIT-ASD research would benefit from routine reporting of pretreatment and posttreatment ECBI scores to examine changes in child behavior. Additionally, future studies should incorporate multiple measures of disruptive behavior to capture a wider array of externalizing behaviors in the ASD population.

Table 16.1 Research on PCIT with children on the autism spectrum

Authors	Article type: study design	*N*, gender	Diagnosis	Presenting problem	Follow-up	Primary findings	Adaptations and tailoring
Zlomke et al. (2017)	Quasi-experimental: Open-label pilot	17, 82% male	ASD	Clinically significant behavioral problems	Posttreatment only	ECBI scores significantly decreased	*Adapted* CDI by modifying mastery criteria
Ginn et al. (2017)	Experimental: Randomized control trial	30, 80% male	ASD	63% of treated participants demonstrated clinically significant disruptive behavior	Posttreatment and 6-week follow-up	Posttreatment ECBI scores significantly decreased Posttreatment Social Awareness subscale scores significantly increased	*Adapted* treatment by delivering only one treatment component (i.e., CDI) for only eight sessions
Hansen and Shillingsburg (2016)	Quasi-experimental: Case study	2, 100% male	ASD, language impairment	Language impairment, minor behavioral problems	Posttreatment only	Children's total vocalizations increased	*Adapted* CDI by modifying mastery criteria and providing parents with request training and stimulus-stimulus pairing strategies *Adapted* PDI by excluding time-out, using a three-step sequence with instructional fading
Masse et al. (2016)	Quasi-experimental: Nonconcurrent multiple staggered baseline	3, 100% male	ASD	Clinically significant behavioral problems	1-week, 10-week ($n = 1$), 12-week ($n = 2$) follow-up	ECBI scores decreased to nonclinical range	*Adapted* treatment context by implementing in client's home for 1-h sessions twice a week
Armstrong et al. (2015)	Nonexperimental: Case study	1, female	ASD, intellectual disability, ADHD, epilepsy	Clinically significant behavioral problems	Posttreatment and 5-month follow-up	ECBI scores decreased to nonclinical range	*Adapted* treatment to include visual supports and personalized social story; explain the treatment to the child

(continued)

Table 16.1 (continued)

Authors	Article type: study design	*N*, gender	Diagnosis	Presenting problem	Follow-up	Primary findings	Adaptations and tailoring
Authors	Article type: study design	*N*, gender	Diagnosis	Presenting problem	Follow-up	Primary findings	Adaptations and tailoring
Lesack et al. (2014)	Nonexperimental: Case study	1, male	ASD, delayed language skills	Disruptive behaviors	Posttreatment only	ECBI scores decreased to subclinical range	*Adapted* CDI by excluding toys that facilitate solitary, self-stimulation play with other appropriate PCIT toys *Adapted* CDI by reflecting vocalizations with communicative intent, preface reflections with the uttered vocalization, and ignore stereotypic vocalizations *Adapted* PDI by prompting a command with the child's name and including a three-step sequence teaching phase requiring mastery before introducing time-out *Adapted* time-out by decreasing length to a developmentally appropriate amount of time *Tailored* time-out by limiting commands to target specific problem behaviors and use an alternative time-out procedure when a back-up room presents safety concerns
Agazzi et al. (2013)	Nonexperimental: Case study	1, male	ASD	Disruptive behaviors	3-month follow-up	One parent reported that ECBI scores decreased to nonclinical range, while the other parent reported relatively no change in ECBI scores	No adaptations or tailoring reported
Armstrong and Kimonis (2013)	Nonexperimental: Case study	1, male	Asperger's disorder, ADHD, ODD, OCD	Clinically significant behavioral problems	Posttreatment and 3-month follow-up	ECBI scores decreased to nonclinical range	No adaptations or tailoring reported

Authors	Article type: study design	*N*, gender	Diagnosis	Presenting problem	Follow-up	Primary findings	Adaptations and tailoring
Budd et al. (2011)	Nonexperimental: Case study	1, male	ASD	DBD-NOS	Posttreatment only	ECBI problem scores decreased to nonclinical range. ECBI intensity scores decreased. No longer met the criteria for DBD-NOS	*Adapted* CDI to code harmless, repetitive, self-stimulatory behaviors as appropriate behaviors, but refrain from reflecting or describing them *Tailored* treatment to address food sensitivities by using play food to practice and reinforce behaviors related to eating
Hatamzadeh et al. (2010)	Nonexperimental: A-B, single case	4, 100% male	ASD	Clinically significant behavioral problems	Posttreatment, 2-week, and 4-week follow-up	ECBI scores decreased	No adaptations or tailoring reported
Solomon et al. (2008)	Quasi-experimental: Matched waitlist control group	19, 100% male	ASD	Clinically significant behavioral problems	Posttreatment only	ECBI problem scores significantly decreased ($p = 0.015$). ECBI intensity scores decreased to nonclinical range	*Adapted* CDI by allowing the parent to redirect the interaction at times *Adapted* treatment by coding repetitive, circumspect interests as inappropriate and providing big, labeled praises following child-initiated interactions
Masse et al. (2007)	Theoretical: Exploratory study	N/A	ASD	Co-occurring behavioral problems	N/A	N/A	*Adapt* CDI to code harmless, repetitive, self-stimulatory behaviors as appropriate behaviors, so the behaviors are not modified through selective attention during CDI
McDiarmid and Bagner (2005)	Theoretical: Exploratory study	N/A	Developmental disabilities	Co-occurring behavioral problems	N/A	N/A	*Adapt* praise to the child's ability to comprehend the praise; using hugs/pats may be more effective for some *Adapt* behavioral descriptions to ensure clarity and concision *Adapt* effective commands to ensure consistent and direct usage

Note: *ADHD* attention-deficit/hyperactivity disorder, *ASD* autism spectrum disorder, *CDI* child-directed interaction, *DBD-NOS* disruptive behavior disorder-not otherwise specified, *ECBI* Eyberg Child Behavior Inventory, *OCD* obsessive-compulsive disorder, *ODD* oppositional defiant disorder, *PCIT* Parent-Child Interaction Therapy, *PDI* parent-directed interaction

16.4.1.3 Language Impairment

Although children on the spectrum often experience language delays that may contribute to their disruptive behavior, only four studies measured language impairment. Two studies excluded children with receptive language skills below 24 months (Ginn et al., 2017; Masse et al., 2016), while another two studies included children with these lower levels (Hansen & Shillingsburg, 2016; Lesack et al., 2014). Solomon et al. (2008) excluded participants that did not demonstrate sufficient receptive and expressive language to participate in treatment. Lesack et al. (2014), however, looked at the effect of PCIT on increasing children's vocalizations and found vocalizations to be sporadic and highly variable across treatment. Hansen and Shillingsburg (2016) found increases in the number of child vocalizations from pre- to post-treatment aggregated across three 5-min activities (i.e., 18–48 and 5–50). Overall, language level impacts many areas of treatment, and practitioners should assess language ability in deciding the appropriateness of PCIT for a child with ASD. The more controlled studies examining the effect of PCIT-ASD on disruptive behavior focused only on children with receptive and expressive language ability at or above the level of 24 months. Future research should build upon the work of Hansen and Shillingsburg (2016) and Ginn et al. (2017) by looking at changes in child vocalizations from pretreatment to posttreatment.

16.4.1.4 Cognitive Functioning

The literature does not provide clear guidance on whether a child with ASD is appropriate for PCIT based on cognitive functioning. Some studies did not specify or exclude participants based upon IQ requirements. For example, Masse et al. (2016) recruited participants with IQ scores both above and below 70. Two studies even included participants with very complex diagnoses (e.g., Armstrong et al., 2015; Armstrong & Kimonis, 2013). It may be easiest for practitioners to apply PCIT-ASD to children with IQ scores above 70 and language skills at 24 months or higher because this population would be expected to require the least amount of adaption from standard PCIT implementation. For example, parents of children with lower language abilities may significantly benefit from PCIT-ASD, but treatment may require more adaptations for use with those experiencing serious language delays. This does not exclude PCIT from use with other ASD subpopulations, as the PCIT-ASD literature provides helpful adaptations for children with limited language skills as well as rich case reports to help guide complex and unique ASD presentations (e.g., Budd et al., 2011). Additional training in implementing these adaptations safely and effectively may be required for clinicians however looking to use PCIT with more severe ASD cases.

16.4.2 Future Directions

16.4.2.1 Strengthening the PCIT-ASD Evidence Base

Evidence-based practice (EBP) constitutes an integration of empirical evidence, clinical judgement, and client values (American Psychological Association Presidential Task Force on Evidence-Based Practice, 2006). Guidelines for establishing EBPs help ensure that patients receive the best interventions; however, the definitions of EBPs vary across, even within, divisions of professions (Reichow & Volkmar, 2011). For instance, Reichow and Volkmar (2011) note that the medical community often rates randomized controlled trails (RCTs) as the gold standard of empirical evidence. While RCTs provide strong support for the efficacy of an EBP, Lord et al. (2005) emphasize the difficultly of conducting a highly controlled RCT with the autism community due to treatment switching, contamination (e.g., parents seeking out the most useful treatments), and funding constraints. Future research should add more methodological diversity to the PCIT-ASD literature by adopting more creative and tactful experimental designs such as cross-site replication and partial factorial designs, including underrepresented populations (e.g., geographic location, ethnicity), and examining relationships between child characteristics and treatment outcomes (Lord et al., 2005).

16.4.2.2 Social Interactions and Child Functioning

The literature provides some support that PCIT improves social interactions for children with ASD, although additional research should include measures to assess these child outcomes (see Chap. 31 in this handbook for more information about assessments for ASD). Four studies evaluated children's social skills using observational and parent-report measures (Ginn et al., 2017; Masse et al., 2016; Solomon et al., 2008; Zlomke et al., 2017). These procedures should be incorporated in future research to effectively describe sample characteristics and determine any changes that occur in the research sample. Solomon et al. (2008) and Zlomke et al. (2017) used the general measure of child behavior, the BASC which broadly examines a variety of internalizing and externalizing behaviors and symptoms but also includes potentially useful subscales. For example, Zlomke et al. (2017) explored changes in social, emotional, and adaptive functioning on the BASC. Ginn et al. (2017) used the Social Responsiveness Scale (Constantino & Gruber, 2005) to obtain a more in-depth examination of social awareness and other ASD-specific symptoms. Other ASD-specific measures may provide similar benefits to the Social Responsiveness Scale. For instance, Masse et al. (2016) included the Autistic Behavior Checklist to study the impact of PCIT on ASD-related behaviors. The Autism Diagnostic Observation Schedule (Lord et al., 2012), although a diagnostic measure, is a structured, observational measure that researchers may consider using to indicate change over treatment. Furthermore, teacher-report measures complement parent-report measures to depict a fuller picture of children's functioning in multiple settings, as shown in two studies (Armstrong et al., 2015; Armstrong & Kimonis, 2013).

16.4.2.3 Adaptations

Adaptations serve an extremely important role in the application of PCIT with children on the autism spectrum. Due to the heterogeneous symptomology of ASD, adapting and tailoring (Eyberg, 2005) the standard PCIT protocol may be necessary to obtain successful treatment outcomes. However, whimsical or unplanned adaptations can undermine treatment integrity and compromise client outcomes. Whether adaptations are minor or significant, they should be made only when necessary and with careful concern for maintaining treatment fidelity. To assist with the development of appropriate adaptations for future PCIT-ASD studies, Table 16.2 outlines changes made in the existing PCIT-ASD research, mapped onto a framework of 12 previously identified content adaptations (Stirman, Miller, Toder, & Calloway, 2013). Forthcoming PCIT-ASD research would benefit from using an adaptation classification system to help identify which adaptations are most salient for specific ASD subpopulations.

16.5 Conclusion

In summary, PCIT is an emerging and promising treatment for disruptive behavior in children with ASD. Children with ASD may also make improvements in social awareness (Ginn et al., 2017), adaptability (Zlomke et al., 2017), and positive affect (Solomon et al., 2008) after receiving PCIT. The literature has focused on applying PCIT to children with a mental or chronological age of 3–7 years and language ability consistent with a typically developing 24-month-old. However, some clinicians have found improvements in disruptive behavior for lower functioning children when they have made necessary and appropriate adaptations (e.g., Lesack et al., 2014). Future research should add methodological diversity to the PCIT-ASD literature by conducting creative and thoughtful experimental designs, adding evidence to the efficacy and effectiveness of PCIT-ASD, while simultaneously identifying interactions between subgroups of ASD children and PCIT-ASD treatment components to guide timely, effective treatment practice.

Table 16.2 Overview of content adaptations in PCIT-ASD

Adaptation classification	References	Adaptation details
Tailoring/tweaking/refining	McDiarmid and Bagner (2005)	Provide positive physical touches (e.g., hug) as an alternative to verbal labeled praise
		Emphasize correct word use, gesticulate, and use short behavioral descriptions
	Masse et al. (2007)	Harmless, repetitive, self-stimulatory behaviors should not be modified through selective attention in CDI
	Solomon et al. (2008)	Do not mention a child's intense, circumspect interests
	Budd et al. (2011)	Harmless, repetitive, self-stimulatory behaviors should not be modified through selective attention in CDI, but do not reflect or describe these behaviors
		To reinforce proper food behaviors, incorporate play food into treatment
	Lesack et al. (2014)	Exclude toys likely to facilitate solitary, self-stimulation play for other PCIT-appropriate toys
		Reflect vocalizations with communicative intent, prefacing the reflection with the uttered vocalization
		Ignore stereotypic vocalizations
		Prompt commands with the child's name
		Decrease time-out to a developmentally appropriate duration
		Limit commands in PDI to target specific problem behaviors
Adding elements	Solomon et al. (2008)	Provide lots of praises when a child initiates interactions
Removing elements	Ginn et al. (2017)	Exclude PDI and conduct only CDI for eight sessions
Shortening/condensing	Hansen and Shillingsburg (2016)	To meet mastery in CDI, the caregiver must meet two of the three criteria (i.e., 10 reflections, 10 labeled praise, 10 behavior descriptions)
	Zlomke et al. (2017)	To meet mastery in CDI, the caregiver must meet the following criterion: 10 labeled praises, 20 combined reflections and behavioral descriptions, as well as no more than 3 questions, commands, or criticisms. The caregiver must also consistently ignore nonharmful inappropriate behaviors
Lengthening/extending	N/A	N/A
Substituting elements	Lesack et al. (2014)	Use an alternative time-out procedure when a backup room presents safety concerns
	Masse et al. (2016)	Implement treatment within the client's home, twice weekly for an hour
	Hansen and Shillingsburg (2016)	Replace time-out with a three-step sequence with instructional fading
Reordering elements	Masse et al. (2007)	For extreme disruptive behavior, consider conducting PDI first and then moving to CDI
Integrating another approach into the intervention	Lesack et al. (2014)	Include a three-step sequence teaching phase requiring mastery before introducing time-out
	Armstrong et al. (2015)	Include visual supports
		Include a personalized social story to explain treatment to the child
	Hansen and Shillingsburg (2016)	Provide parents with request training, as well as stimulus-stimulus pairing strategies
Integrating the intervention into another approach	N/A	N/A
Repeating elements	N/A	N/A
Loosening structure	Solomon et al. (2008)	At times, parents would redirect child-led interactions in CDI
Departing from the intervention ("drift")	N/A	N/A

Note: *CDI* child-directed interaction, *PCIT* Parent-Child Interaction Therapy, *PDI* parent-directed interaction

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17

Child-Adult Relationship Enhancement for Children with Autism Spectrum Disorders: CARE Connections

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Abstract

An estimated 1 in 59 children in the USA is diagnosed with an autism spectrum disorder (ASD; CDC, Morbidity and Mortality Weekly Report. Surveillance Summaries 67(6):1–23, 2018). While all children diagnosed with ASD experience some level of difficulty with social communication and restricted, repetitive interests, many also exhibit problematic disruptive behaviors across settings. Parents and other adults in the children's lives (e.g., family members, teachers, medical and mental health professionals, community members) are important in helping children with ASD meet their potential. Although several interventions exist that target children with ASD, their parents, and teachers, there are no widely available, evidence-based programs designed to help other adults who interact with children with ASD but who do not have a major caretaking role. Child-Adult Relationship Enhancement (CARE) is an intervention for all adults in provider roles based on evidence-based parenting programs (including Parent-Child Interaction Therapy; PCIT) designed to strengthen social relationships and improve child compliance for minor to moderate difficulties. Early findings related to CARE show that it is a promising intervention for improving relationships and behavior in several populations. Specifically, CARE Connections is an adaptation developed for all adults interacting with children with ASD. CARE Connections incorporates adult learning principles, live feedback, and ASD-specific examples to increase program uptake and implementation for care providers in a child's life. CARE Connections may be an important step for all adults to learn more effective means of communicating with children with ASD with the goal of improving the child's overall development (e.g., social development).

Children with autism spectrum disorders (ASD) have deficits in social communication, repetitive behaviors, and restricted interests (American Psychiatric Association, 2013). Many of these children display challenging behaviors including aggression, hyperactivity, impulsiveness, and noncompliance (Simonoff et al., 2008; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). With an estimated 1 in 59 children diagnosed with ASD (CDC, 2018), many families, schools, and

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communities are tasked with meeting the special needs of these children who may present with these behavioral and developmental difficulties. However, few adults are familiar with strategies for positively interacting with individuals with ASD. Moreover, techniques that many adults use to interact with children may backfire when applied to children with ASD, resulting in unexpected and challenging behavior.

Consider a few examples of interactions children with ASD may have with adults:

1. Jaxon refuses to put on his batting helmet during a baseball game in which he will be batting soon. The coach asks Jaxon what is wrong, but Jaxon does not respond. At that point, the coach tries gently to put the helmet on for Jaxon. Jaxon responds by screaming and kicking the coach.
2. During a camping trip with her scout troop, Lexie's troop leader notices that Lexie is hanging back and being quiet. Lexie's troop leader allows her this extra space to adjust to a new environment and change in routine. However, a parent volunteer from another troop sees Lexie lagging behind and directs her to join the group. When Lexie does not approach the group, the parent repeats the direction, with a warning that if she does not join the group, she will not be able to participate in campfire at the end of the day. Lexie responds by telling the parent that she is mean, at which point the parent takes Lexie to the front of the line and tells Lexie's troop leader about her behavior. Although the troop leader explains to the parent that Lexie needs extra space and does not punish her, Lexie refuses to participate in any activities for the remainder of the day.
3. Adam is a 15-year-old boy with ASD. He carries all of his books with him in a rolling backpack instead of using his locker to store them between classes. A teacher who is monitoring the halls between classes directs Adam to put any books he does not need for the next class period in his locker. The teacher explains how using the locker would be easier, and offers to help Adam put his books away. Adam does not respond and begins walking to his next class while the teacher is still talking. The teacher gives Adam a detention for being rude.

These examples highlight ways in which it can be difficult for well-meaning adults to know the best way to interact with children who have the social, language, and behavioral difficulties characteristic of ASD. Parents of children with ASD often report feeling high levels of parenting stress (Eisenhower, Baker, & Blacher, 2005) as well as a lack of social support, in part due to poor understanding from friends, family, and community members of what comprises ASD (Altiere & von Kluge, 2009; Ludlow, Skelly, & Rohleder, 2012). Children often have a wide social support network that includes family, friends, members of religious organizations, school personnel, sports and activities leaders, service providers, first responders, and many more. If this support system understands the needs of children with ASD, these children and their families may experience less stress and isolation.

Because of the large role school and school personnel play in a child's life, the response of school personnel to children with ASD can have a large impact on the child's development. Schools have responded to the challenges of educating children with autism by hiring more personnel, often paraprofessionals. Employing paraprofessionals to work with children with autism has been controversial as many paraprofessionals lack specialized training and experience that may be necessary to contribute to the care and education of children with special needs (Giangreco, Suter, & Doyle, 2010). However, many studies have shown that, with proper training, paraprofessionals are able to implement evidence-based interventions and improve student outcomes (Mrachko & Kaczmarek, 2016; Rispoli, Neely, Lang, & Ganz, 2011). With parents and paraprofessionals often working intensely and closely with the child on a daily basis (Rispoli et al., 2011), it is important that they have access to evidence-based skills and strategies that will help them make the greatest impact for children with ASD.

Specifically, supportive adult helpers in the families' lives include lay people and paraprofessionals, such as school bus drivers, aides, and center staff. Medical, mental, and allied health professionals as well as school personnel serve as important resources and supports to families. These adult helpers are critical in many ways to facilitate child learning and allowing children to become active members of the community. In addition, they can provide support as the child's primary caregivers work to bring their child high-quality care. All can aid in the overall development of children with ASD. Sadly, untrained yet well-meaning adults can also inadvertently create stress for the children and can intensify social-emotional challenges. The resulting negative behaviors may adversely impact learning potential, social skill advancement, and the effectiveness of other allied health services (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2015). Providing adult helpers with evidence-based training can improve their ability to interact more effectively with children with ASD to increase the child's likelihood of success.

17.1 Challenges Faced by Those Working with Children with ASD

Characteristics of ASD include difficulties with social communication and interaction, as well as restricted or repetitive patterns of behavior, interests, and activities (American Psychiatric Association, 2013). Social interaction difficulties may present in many ways and with varied degrees of severity, including limited or lack of speech, poor understanding of others' emotions or nonverbal communication, strong preference for playing alone, or difficulty maintaining a back-and-forth conversation. Restricted interests and repetitive behaviors also present in a variety of forms. Children with ASD may play with toys in unintended ways, such as repeatedly lining them up or focusing on unusual details, or show unusual focus on items that are not traditionally of interest to children, like vacuum cleaners, wooden spoons, or license plates. They may also engage in strict behavioral routines, such as eating each meal by eating one food at a time, in the same order each time (e.g., meat, then vegetables, then other foods). Increased or reduced sensitivity to sensation (e.g., touch, sound, taste) is also characteristic of ASD and may appear as picky eating habits, refusing to wear certain types of clothing, or covering ears when there are loud noises. Children with ASD vary widely in how they may exhibit these symptoms, or how severe these symptoms may be, adding to the challenge in educating adults on how to successfully interact with individuals with this diagnosis.

17.1.1 Distress

Due to the differences in the ways in which children interact with and respond to the environment, it may be difficult for others to understand their behavior, particularly when the individual with ASD is distressed. Children with ASD may appear anxious if they are put in situations which challenge or exceed their social communication skills (Rodgers, Glod, Connolly, & McConachie, 2012). This distress/anxiety may be seen in situations such as a birthday party where they are expected to interact with many children and adults in specific ways. They may also appear distressed when their restricted or repetitive behaviors are thwarted or inhibited, including changing their routine because their teacher is out sick one day or preventing access to a preferred activity such as removing toy cars from the playroom at church. Loud noises, getting dirty or wet, or touching something gooey may also distress a child with ASD. Because children with ASD may become distressed by many everyday situations, such as a favorite cup going missing or an accident stalling traffic on the way to dance class, it can be difficult for adults to predict or interpret their behavior.

Difficulty adults may have in interpreting the distress experienced by children with ASD may be worsened by the communication skills most adults use to address distress in children. Using common strategies such as getting close to the child, offering a hug, or providing a thorough explanation may interact negatively with the communication difficulties and sensory sensitivities of a child with ASD, thereby exacerbating their distress. When children with ASD are approached by adults in ways they may not easily understand, they may react unpredictably. Therefore, untrained adult helpers may trigger a child's emotional "meltdown," resulting in the undesired or unexpected behaviors. Furthermore, when the child is triggered and begins to escalate, many adult helpers will naturally attempt to talk with or reason with the child to calm him/her down. Unfortunately, the adult's actions may further escalate the child's distress. This cycle of escalation may be even more challenging if the child has limited language or speech skills to explain their distress or request appropriate assistance. Even supportive adults with extensive knowledge of behaviors associated with an ASD diagnosis may not have sufficient skills to help manage the child's social-emotional challenges.

Helpers trained in skills designed for directing the child's behavior and strengthening child-adult relationships may increase their likelihood of effectively assisting the child in emotional control throughout the day (Masse, McNeil, Wagner, & Chorney, 2007). For example, when a child with ASD is asked to perform a task that is outside of his/her normal routine such as taking a test or moving to a new room, this may be distressing. The behaviors that accompany this distress may lead his/her teacher to attempt to reduce the anxiety by negotiating with the child or trying to convince the child that there is "no reason" for the distress. However, the child may become entrenched in repetitive thoughts or behaviors, unable to explain the cause of the anxiety. The result may be a distressed child as well as a distressed teacher.

17.1.2 Communication Deficits

Children with ASD may not be able to adequately verbalize their needs, wants, opinions, or concerns. If child's nonverbal cues are unavailable, missed, or misread by adults, children's distress may increase until it becomes unmanageable. Moreover, children may act out behaviorally or withdraw into stereotypic behaviors. For example, a young child may not be able to appropriately communicate that she is afraid of a bug that is near the classroom door. Instead, she may resist when told to line up to leave the class, even though this is part of her normal daily routine. If her resistance is not interpreted as fear (a typical fear for a child her age) but rather insolence, she may be directed more firmly, and ultimately given a negative consequence for noncompliance, which, of course, could result in more challenging behaviors. The antecedents, behaviors, and resulting consequences can be difficult for adults working with children with ASD to understand, because these outbursts often seem to have no discernable pattern. As in this example, the adult may have observed the child starting to line up and then suddenly becoming resistant or engaging in self-stimulatory behavior, refusing adult attempts to change her behavior or to use words to explain it. Without any observable trigger, adults may assume that the children are being purposefully oppositional or defiant. This assumption may lead to children with ASD being threatened with punishment (when punishment may be inappropriate).

Communication challenges may also extend to information processing as children with ASD often need more time to manipulate information and may fail to understand indirect or subtle adult directives. Well-meaning adults may push for quick responses to questions and instructions. As a result, the child is perceived as purposefully being noncompliant which may be further reinforced once the child begins to show indications of distress or misbehavior. It is common for adults to issue a simple directive that the child may be able to follow; however, the adult may repeat the command in rapid succession (e.g., "sit in your seat [2 second pause], sit in your seat [2 second pause]. Scott, you are supposed to be sitting in your seat."). Then, the child's behavior may escalate and communication problems may also increase.

Communication deficits, such as poor eye contact with an adult who is speaking to them or repeating what the adult has said using the same words and tone, may be misinterpreted as insolence or disrespect by adults unfamiliar with these common ASD characteristics. It is not uncommon for adults to direct a child to make eye contact with them, particularly when the child is being reprimanded. Although this eye contact is often difficult for typically developing children, it can be especially challenging for children with ASD. If they refuse to look the adult in the eye, the situation may escalate on behalf of the adult and the child. In addition, if a child communicates by repeating lines from a popular movie, an adult may assume that the child is being facetious when they respond to a question with “These aren’t the droids you’re looking for,” or “I have a bad feeling about this.”

17.1.3 Following Rules and Directions

Children with ASD may not respond to traditional strategies for managing child behavior. For example, a child with ASD may be less likely to respond to peer pressure, such as a dance teacher pointing out, “Maddie has her shoes on. Don’t you want to get your shoes on like Maddie did?” They also tend to interpret situations very literally, so some efforts to make compliance into a game may backfire. If a bus driver asked “Who’s going to be fastest to get in their seat?” a child with ASD might not understand that question as a prompt to quickly find a seat. Instead, he may answer, “I don’t know,” and continue standing. Humor or metaphors also are often misunderstood by children with ASD who process language very literally. Therefore, a statement such as “Last one in their chair is a rotten egg” may be confusing to a child with ASD, and would possibly not result in the expected behavior. Because of this characteristic, children with ASD may sometimes have difficulty engaging in adult-led activities such as Sunday school or team sports. This difficulty may also extend to challenges in therapeutic settings, such as cooperating with occupational or speech therapy.

One method of providing positive behavioral supports to all children regardless of disability is to offer rewards for positive behaviors. Like typically developing children, children with ASD have motivators (e.g., preferred items or activities) that can reinforce appropriate behaviors. However, these motivators may be more difficult for adults to identify or easily understand. Although the child with ASD may be excited to receive a special Captain America sticker for good behavior, they may respond with “I don’t care,” if loss of that sticker is threatened while they are misbehaving (or considering misbehaving). Children with ASD may also quickly learn that misbehavior may help them escape from an undesired activity (such as playing with PlayDoh during an occupational therapy session if the child has significant sensory issues). When behavior such as this is reinforced by the escape, it is likely to continue at each session. Helping adults to understand better ways of interacting with children with ASD, identifying motivators, and providing clear directives can help prevent these flight-or-fight moments, increasing the gains made from their interactions with adults (e.g., allied health specialists).

17.1.4 Social Difficulties

Although many children with ASD express a desire to have friends, making and keeping friends can be difficult. Even helping adults who recognize the social communication challenges faced by children with ASD may not know how to respond to a child’s restricted interests—which may dominate their communication attempts and interfere with more appropriate peer relationships. They may kindly try to play along and humor the child; however, this may turn into frustration for the adult when the child persists with the behaviors at length. ASD-related communication deficits may also include asking invasive or inappropriate questions, which may be off-putting, embarrassing, or seen as disrespectful for some adults who are not familiar with this symptom or how to manage it. For example, if a child asks an adult what kind of car they drive, the question might be perceived as unusual and mildly invasive, but the adult may choose to answer. However, if the child then asks what color it is, how many miles does it have on it, and how much it cost, the adult may lose patience or become uncomfortable, resulting in an overall awkward or negative interaction. Conversely, ignoring the child's questions may result in negative behavior from the child as well. Given that these behaviors are difficult for adults to manage, they can be even more difficult for children to accommodate. This lack of understanding may result in bullying, victimization, or avoidance by peers. Moreover, children with ASD may not understand or report what is happening. Helping adults, in turn, may be unaware of these negative situations and actions. Having supportive adults in any setting can improve the children's ability to recognize problems or increase likelihood of child sharing their experiences.

Difficulty understanding social cues (e.g., facial expressions) or norms (e.g., saying "thank you" even if you do not like a gift) is common among children with ASD. Adults may become short-tempered and be more likely to punish children with ASD who do not understand social cues or norms. For example, a child may notice a person with a physical disability or an obese person in a public place. The child may ask in a loud voice why the person looks that way. The helping adult may be taken aback and try to correct or discipline the child for a behavior that the child does not understand is inappropriate. This "miscommunication" can lead to distress in the child and increase the risk of negative behaviors. In another case, a child with ASD may cut in line when he/she is supposed to wait to have his/her pictures taken for his/her sports team. While adults may expect him/her to understand this behavior is not acceptable, the boy/girl may simply have failed to recognize the other children in line or missed the nonverbal irritation that the other children displayed when he/she jumped ahead of them. For younger children with ASD, their rigid routines for play may interfere with sharing toys nicely with peers. For example, say Tia is building a tower of green blocks with Henry. She may take a yellow block out of Henry's hands because she believes only green blocks should be on the tower; unfortunately, the teacher may think Tia is simply bullying Henry. When told she is not nice and directed to give the yellow block back, Tia may refuse. Tia's inflexibility and rule-oriented nature, characteristic of ASD, may then cause Tia significant distress as she does not want to break her stacking "rule." Upon further explanation by the teacher of how Henry feels, Tia still does not understand and cannot communicate why she feels distressed leading to greater dysregulation and possible tantrum behaviors.

The above characteristics of children with ASD can create challenges for all helping adults. These challenges are present in daily interactions and activities as well as in special situations such as when conducting assessments of progress or skills or field trips. For example, if a teacher is unaware that the child with ASD may have problems responding to a standardized assessment due to unfamiliar settings and items (Bacon et al., 2014), the teacher may not recognize that results may be an inaccurate assessment of true abilities. Instead, increasing adults' understanding that the incorporation of motivational and attentional strategies and preferred activities following compliance is a more effective means of soliciting accurate child responses (Koegel, Koegel, & Brookman, 2003; Koegel, O'Dell, & Koegel, 1987) may lead to greater insight and knowledge of a child's abilities.

17.1.5 Treatment

While children with ASD may present with a number of challenging behaviors (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005), learning to identify and build on the child's strengths can improve their overall development and relationships with the adults around them. Improving the child-adult relationship can lead to greater (and faster) gains in therapeutic programs (e.g., speech/language, physical and occupational therapy, mental health interventions). More positive child-adult relationships may also improve behaviors in more settings (e.g., home, school, centers, extracurricular activities; Masse, McNeil, Wagner, & Quetsch, 2016). Through strong relationships, the full potential of a child with ASD may be better realized, benefitting not just the child, but the child's family and community as well.

17.1.5.1 Common Evidence-Based Treatments

There is a growing body of evidence demonstrating treatments that are effective in treating the core symptoms of ASD (Smith & Iadarola, 2015). The treatments with the most empirical support are generally based on applied behavior analysis (ABA), which was first championed by Lovaas (1987). Treatments range from functional analysis and skill building (Green, 1996) to intensive discrete trail training (Lovaas, 1987). These treatments may focus on improving specific areas of development (e.g., speech/language, physical or occupational therapy) as well as social-emotional development (e.g., social skills, parent-child relationships). Treatments vary by who is included in the sessions. Some are child-only while others involve the child and the parent (Kaat & Lecavalier, 2013; Masse et al., 2007). One evidence-based treatment method is pivotal response training; this intervention focuses on building a child's skill sets across multiple areas of functioning to increase generalization using ABA principles (Koegel et al., 1987, 2003). Another commonly used treatment is the relationship-based model known as DIR/Floortime (Greenspan, 1992), which focuses on children's individual differences and overall development and includes parents actively in treatment. Two additional treatment formats, positive behavior support (Carr et al., 2002) and Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH; Schopler, 1994), include adults in the child's environment (e.g., teachers) as well as intensive parent involvement to attain targeted child behavior change. While these interventions vary in their delivery method, all require intensive efforts with therapists and/or parents and teachers to meet treatment goals for the child. Regardless of modality, all of these treatments seek to facilitate the development and improve the behavior of children with ASD.

17.1.5.2 Parent-Child Interaction Therapy

For more than a decade, Parent-Child Interaction Therapy (PCIT) has been used with children with ASD and their parents (Masse et al., 2007). In their literature review of best practices for working with children with ASD, Smith and Iadarola (2015) note that elements of PCIT should be included: establishing a strong parent-child bond, accepting child behaviors and verbalizations, and using familiar play objects to help with skill acquisition and generalization. Furthermore, additional components of PCIT have been shown to reduce and prevent behavior problems in children with ASD including modifying the child's environment in all settings as well as providing direct instruction around appropriate behaviors (Horner, Carr, Strain, Todd, & Reed, 2002). Greater parent-child attunement can lead to better language development and attention (Siller & Sigman, 2002). Research related to PCIT as applied to children with ASD and their families has found decreases in negative behaviors and improved compliance (Ginn et al., 2015; Masse et al., 2007), improvements in adaptability and shared positive affect (Solomon et al., 2008), and improvements in pro-social verbalizations (Abner, 2018; Abner et al., 2008).

While positive results have been reported with all of these treatments, they are time intensive, expensive, and frequently limited in availability—all barriers that are important to address if more families of children with ASD are to be reached. In addition, there remains a need for an intervention designed to help any adult who interacts with children with ASD (who is not a primary caregiver or educator) learn how to develop better relationships with these children.

17.2 CARE and CARE Connections

PCIT therapists at all levels look to spread the principles of this effective treatment to various populations and age groups. They also seek ways to share PCIT with adults other than the child's caregiver(s) to maximize the generalizability of child gains. Due to the effectiveness of the treatment, there are frequent requests from professionals, paraprofessionals, and lay people outside of the mental health field for PCIT training. However, PCIT training is restricted to licensed mental health professionals (PCIT International, 2018) and can be costly and time intensive, limiting its accessibility for a large population of lay people or paraprofessionals. Because of the many need-derived queries for dissemination of effective adult-child interaction skills, Child-Adult Relationship Enhancement (CARE) was developed (Gurwitch et al., 2016). CARE is a trauma-informed set of skills for *any* adult interacting with children and teens (2–18 years of age) to improve relationships and reduce mild-to-moderate behavior difficulties. CARE is *not* a therapy, but it incorporates skills and principles found in the strongest evidence-based parenting programs including PCIT (Brinkmeyer & Eyberg, 2003), Helping the Noncompliant Child (Forehand & McMahon, 1981), Incredible Years (Webster-Stratton & Hammond, 1998; Webster-Stratton & Reid, 2003), and Parent Management Training-Oregon Model (Forgatch, Bullock, & Patterson, 2004). CARE is designed to strengthen the relationship between an adult and a child or teen and to improve the likelihood of compliance with adult directives. Although CARE is not intended to address significant behavior problems, it may compliment ongoing treatment for such problems (Gurwitch, Messer, Warner-Metzger, Masse, & Abner, 2017). The general CARE application is appropriate for a multitude of groups including parents and other caregivers, health and mental health professionals, school personnel, shelter and treatment center staff, allied health professionals, child welfare staff, and in-home visitors (see Table 17.1). CARE has been adapted for use across a variety of settings and populations with a growing evidence base.

Table 17.1 Settings and adults receiving CARE training

Settings	
School	Residential facility
Child care program	Shelter
Treatment center	Religious setting
Hospital	Family court
Military	Child welfare agency
Family-oriented community site	
Trained adults	
Parents/adoptive parents	Military service providers
Foster/kinship parents	Allied health professionals
Medical professionals and related personnel	Drug and family court personnel
Mental health professionals	School staff
Child welfare agency employees	Extracurricular activity staff (e.g., coaches, dance instructors)
Domestic violence agency personnel	
Religious organization personnel	Disaster response team members

17.2.1 Foster Families

Currently, two studies have been completed with a sample of foster parents. In the pilot study by Messer and colleagues (Messer et al., 2018), foster parents were randomly assigned to CARE training or to a trauma-informed parent training. This trauma-informed parent training included (a) information and discussion on the effects of stress and trauma on children and the links between toxic stress and the toxic triad (cruelty to animals, child abuse, and domestic violence); (b) information and discussion about the Adverse Childhood Events Survey (Felitti et al., 1998); (c) activities from the Ohio Child Welfare Training Program foster caregiver curriculum (Ohio Child Welfare Training Program, 2007); and (d) use of the Trust-Based Relational Intervention (TBRI) video series (Parris et al., 2015). Each program was composed of two 3-h sessions delivered 1 month apart. At the 1-month follow-up, caregivers who received CARE training were 2.98 times more likely to give positive parenting statements ($p < 0.001$) and 0.68 times less likely to use negative parenting statements than caregivers who received standard training ($p = 0.037$). Foster caregivers in the CARE training group reported significantly fewer anxiety problems in their foster children on the Trauma Symptom Checklist for Young Children (TSCYC; Briere et al., 2001) at 3-month follow-up compared to caregivers in the standard training group. While symptoms of anger/aggression and posttraumatic stress arousal in the foster children significantly decreased over time in both training groups ($p < 0.01$), by 3-month follow-up, arousal symptoms were lower in the CARE training group than in the standard training group, approaching, but not reaching, statistical significance ($p = 0.07$). In the other study conducted for foster families with CARE, Wood and colleagues (Wood, Dougherty, Long, Messer, & Rubin, 2017) enrolled children (ages 3–8 years) who had newly entered two foster care agencies in Philadelphia. Furthermore, one child with significant behavior problems also received PCIT. These 19 children who entered foster care over a 1-year period were compared to historical controls from the same agencies. Results of this quasi-experimental design found reductions on the Child Behavior Checklist (Achenbach, 1991, 1992) for total score, externalizing and internalizing problems in the CARE group compared to those in the control condition ($p < 0.05$).

17.2.2 Primary Care Settings

In addition to foster families, CARE has also been explored in primary care settings (PriCARE). Schilling and colleagues (Schilling et al., 2017) examined PriCARE delivered in a group format for six weekly 90-min sessions. Although children did not participate in these sessions, caregivers were expected to practice CARE skills with their children each day. This randomized controlled trial (RCT) included 40 families in the CARE condition and 80 in the waitlist control condition. Families completed the Eyberg Childhood Behavior Inventory (ECBI; Eyberg & Pincus, 1999) and the Adolescent Adult Parenting Inventory 2 (AAPI2; Conners, Whiteside-Mansell, Deere, Ledet, & Edwards, 2006) at baseline, 6 weeks (end of the program), and 14 weeks (2-month follow-up). Results showed greater improvements in behavior in the PriCARE group compared to control (i.e., ECBI). Specifically, the mean behavior intensity raw score decreased by 22 in the PriCARE group compared to 7 in the control group. Moreover, the mean problem raw score decreased by 5 points in the PriCARE group and by 2 in the control group (p's < 0.01). On the AAPI2 the PriCARE group showed significant positive changes in parenting attitudes surrounding empathy towards children's needs ($p < 0.04$), the use of corporal punishment ($p < 0.01$), and supporting children's power and independence compared to the control group ($p < 0.01$).

17.2.3 School Settings

Another adaptation of CARE is "CARE in the Classroom" which works with children from preschool through high school (Gurwitch & Abner, 2017; Gurwitch, Messer, Warner-Metzger, & Berkowitz, 2017). The state of Delaware included this program in the Delaware "Bringing Evidence-based Systems of care and Treatment" (B.E.S.T.) dissemination project for young children; this rollout also included the implementation of PCIT and Teacher-Child Interaction Training (Janney, Masse, & King, 2014). As part of a statewide effort, PCIT training was provided to 210 clinicians in 39 agencies, TCIT was provided to 40 early childhood education providers across 35 classrooms (Beveridge et al., 2015), and CARE was provided to 1642 professionals across 126 trainings. Satisfaction was high, and trainees reported continued implementation in their classrooms after training efforts were complete (Gurwitch & Masse, 2018; Janney et al., 2014).

In an ongoing RCT of the CARE in the Classroom program in early childhood classrooms in Southeastern Ohio, significant changes in the social-emotional scales on the Devereux Early Childhood Assessment (LeBuffe & Naglieri, 2012) and the Sutter-Eyberg Student Behavior Inventory (Eyberg & Pincus, 1999) are emerging for classroom teachers receiving the CARE intervention versus waitlist control classrooms. Teachers received live feedback on a weekly basis for 6 weeks, and then received weekly calls for the following 3 months. This live feedback was believed to be important to the uptake and implementation of the CARE skills (Lucas & Embaye, 2017). Further analyses are being conducted, but bode promising findings for the CARE in the Classroom model.

Another implementation of CARE in the Classroom has been examined in high school settings. The program was delivered as part of a larger study to create ten trauma-informed high schools in the Chicago Public School system as a way to improve student resiliency. Schools were selected based on recent shooting(s) in proximity of school, high rates of civil unrest and trauma exposure, high counselor/school social worker to student ratio, and principal commitment demonstrated by placing social-emotional learning as a priority for the school. To date, approximately 145 staff were trained with high satisfaction for the program, and close to 100% of participants reported increased knowledge of using CARE skills in their classrooms (Gurwitch, Messer, Warner-Metzger, Masse, & Abner, 2017). Again, CARE in the Classroom has demonstrated versatility in its success for the students it targets.

17.2.4 New Adaptations

New or currently underdevelopment adaptations of CARE, with plans for implementation and evaluation, include “CARE for Those who Serve” (Gurwitch, 2017a, 2017b, April; November), addressing military and veteran families; “FosterCARE,” targeting foster and kinship caregivers and others involved in the foster care system; and “IntegratedCARE": A brief intervention for improving family relationships,” applying skills within a true integrated health treatment model. With each adaptation, CARE includes the skills as well as the rationale for application and examples for the particular population.

17.2.5 Core CARE Training Components

All CARE trainings include background on the impact of trauma on child development, behaviors, relationships, and learning. CARE trainings are conducted with a small trainer-to-participant ratio (1:10–15) and range from 3 to 6 h in length. CARE trainings combine didactic information, participant discussion, and videos and games to support skill learning. Most importantly, CARE training includes practice of skills with real-time live feedback. Through multiple role-plays, participants practice the skills and learn how to give feedback on observed skills to others. CARE is divided into two parts: (1) skills to enhance the child-adult relationship and (2) skills to increase compliance with adult directives. To date, CARE training has been provided to several thousand adults across the United States and in Japan (Fukumaru, 2010; Messer, 2016).

17.2.6 CARE and ASD

CARE providers have repeatedly expressed interest in adapting and understanding how to integrate CARE skills for children with ASD. As noted, CARE is derived from PCIT and other evidence-based parenting programs; therefore, many of the theoretical and structural components of these programs, most importantly the focus on improving relationships, are reflected in CARE. Thus, it seemed appropriate to find ways to adapt CARE for effective use with a population who exhibits difficulties in social communication and, often, disruptive behavior. Furthermore, while several studies have examined the use of largely unaltered PCIT with ASD with positive results (e.g., Armstrong, DeLoatche, Preece, & Agazzi, 2015; Ginn et al., 2015; Masse et al., 2016; Solomon et al., 2008), many children with ASD struggle across multiple settings. Caregivers with children who may not be appropriate for the full course of PCIT have sought to incorporate PCIT ideas into other treatments. Other adults in the child’s life (e.g., ABA specialists without a mental health license) see the benefits of PCIT and have expressed an interest in brining PCIT skills to their work. Because of the strong identified need for principles common in PCIT and other evidence-based parenting programs, “CARE Connections: Improving relationships for children with ASD" was developed (Abner, Gurwitch, Masse, Messer, Warner-Metzger, & Nelson, development team). This adaptation of CARE is an expanded way to bring the relationship-building skills shared in effective parenting programs and consolidated in the CARE program to all those working with this population; these skills can be uniformly helpful in working with children with ASD (Abner et al., 2008).

17.2.6.1 Psychoeducation

Just as standard CARE provides psychoeducation regarding trauma and its effects on children and teens, CARE Connections provides an overview of ASD, engaging participants in discussion of how common characteristics of ASD impact social relationships, behavior, and learning. This didactic information is reinforced by activities and specific examples designed to help participants recognize situations in which children with ASD may be challenged. This understanding of ASD is then used to support each of the CARE Connections skills.

17.2.6.2 CARE Connections Skills

The CARE Connections skills were chosen to help adults learn to use positive attending skills to strengthen the child-adult relationship. They are taught as the "Ps and Qs." The Qs are similar to the Avoid Skills in PCIT and other programs serving as the basis for CARE (e.g., questions, commands, and criticism). These are (1) Quash the need to lead, (2) Quit unnecessary questions, and (3) Quiet the criticisms. These "Qs" help the adult follow the child's lead in play, which is helpful in developing a positive relationship.

Children with ASD focus on their ideas for play, including repetitive activities and restricted use of toys. Examples include lining up toys, creating rigid patterns with blocks, or only playing with specific toys. Children with ASD may have delays in play skills, such that they are more comfortable playing with toys in an immature fashion (e.g., playing with toy food or soft blocks by putting them into a bucket and then dumping them out again). Similar to other recommendations made in PCIT for ASD adaptations (Abner et al., 2008; Ginn et al., 2015), CARE Connections encourages adults to join in the play rather than ignoring or redirecting this repetitive play. Adults are encouraged to spend a brief period of time with the child with ASD in a 1:1 situation, join in the play with the child's preferred activities and toys, and allow the child to lead and follow in a similar manner.

One slight change in CARE Connections for the skill "Quashing the need to lead" is that adults are encouraged to expand the child's play. For example, if the child lines up toy animals, the adult will also line up animals; in turn, the adult expands the play by pushing his/her animals while saying, "all the animals are lined up and are walking to the zoo," or "the animals are getting ready for a parade." By adding a purpose or expanding the play, the adult can help the child move beyond the stereotypic play. By increasing the number of individuals in children's lives who provide the same types of responses to their play, there is the potential of increasing children's engagement to include others in their play (Solomon et al., 2008) and development of more advanced pretend play skills.

By encouraging adults to avoid unnecessary questions, CARE promotes adults placing less demand on the communication skills of children with ASD. CARE recommends that adults consider the questions they ask a child with ASD. Is this question absolutely necessary to ask? For a few minutes each day during time together, questions are encouraged to be completely absent from the interaction, thus reducing any demands for response on the part of the child. Participants in CARE trainings routinely report that this "Q" is the hardest one to reduce in practice. During CARE skills practice with live feedback, adults are provided with information about their use of questions as well as their abilities to "catch and restate" the information, using positive CARE skills. Compared to standard CARE practice, this skill is also slightly modified in that children with ASD may not have the skills for asking appropriate questions, so adults may model these. For example, when a child with ASD with the language skills of a typically developing 5-year-old repeatedly says the name of a toy animal, the adult is taught to wait silently for a couple of seconds, and then to model how to ask the questions, "May I have the lion please?" Then, give the lion.

Like in PCIT, criticisms can quickly alter a positive interaction. Most often, criticisms tell a child what he/she is doing wrong (Eyberg & Funderburk, 2011). Children with ASD may not have the flexibility of thinking to know what is expected. They may also have difficulty processing the negative, thus continuing to engage in the unwanted behavior. The final "Q" in the CARE program, "Quiet the criticisms," stresses that critical words are reserved for behaviors that present a safety concern to the child or to others (e.g., harming self or others). For example, participants may be encouraged to give attention to a child's appropriate behavior (e.g., playing quietly with a toy) while ignoring a less desirable behavior (e.g., taking a toy from the adult without asking). Participants are instructed to look for appropriate positive behaviors as a focus of attention. Discussion and activities such as a positive opposite worksheet reinforce this idea, with special attention to common behaviors noted in children with ASD.

To balance the three "Qs" in CARE (which help adults know behaviors to avoid), the three "Ps" are skills for adults to use as ways to increase positive interactions with children. Again, drawing from PCIT and other evidence-based parenting programs, the CARE Ps are Praise (Specific), Paraphrase, and Point-out (Gurwitch et al., 2016). While many researchers in the past believed that social reinforcers did not have an impact on children with ASD, current research suggests that social reinforcers can be quite powerful when the child can understand the situation (Abner, 2018; Ginn et al., 2015). Therefore, CARE Connections stresses the importance of recognizing language easily understood by the child and using this language to provide specific praise for desired behaviors; this can both reinforce the behavior and strengthen the adult-child relationship. Discussions with CARE Connections participants focus on the identification of pro-social behaviors that would be beneficial to increase in children with ASD. For example, consistent eye contact and similar behaviors are common deficits in children with ASD (Masse et al., 2007; Solomon et al., 2008). To increase these pro-social skills, specific praise is used for behaviors such as turning to the adult when the child's name is used, looking at the adult's face when the adult is speaking, and any positive affect (e.g., smiling at the adult). Similar pro-social behaviors are also reinforced with specific praise including (a) interactive actions (e.g., "Good job of letting me have a turn to talk/pick a toy," or "I like when you hold my hand," or "I love the way you are sharing your animals with your friend"); (b) initiating conversations (e.g., "Thank you for telling me with your words"); and (c) emotional regulation (e.g., "I'm so proud of you for staying calm," or "I like it when you keep your body calm"). Participants also are strongly encouraged to use this "P" when these behaviors occur outside of 1:1 time. During training, participants practice using specific praise with a partner so they know how and when to incorporate this skill when working with children with ASD.

Children with ASD, even those at the higher functioning end of the spectrum, often have difficulties with language and communication skills (Ginn et al., 2015). The second "P" in CARE Connections is Paraphrase. Similar to Reflections in PCIT, the Paraphrase skill is designed to improve and expand language production. The literature surrounding PCIT with children with ASD and/or intellectual disability has found improvements in language production due to the high rate of listening and reflecting the child (Abner, 2018; Bagner & Eyberg, 2007). Therefore, adults in CARE are instructed to repeat back sounds, words, phrases, or any other appropriate verbalization produced by the child. When a child is not engaging in appropriate speech (e.g., screaming), adults are instructed to ignore the behavior, wait for an appropriate verbalization, return attention, and give a specific praise to the child. The adult is also encouraged to expand a child's verbalizations by creating a simple phrase from sounds or a complete sentence from a phrase. Rather than simply repeating the child's words exactly, the expansion has the added benefit of interrupting repetitive phrases or sounds. As an example, an adult might reflect a child who is talking at length about Iron Man by saying, "Iron Man can fly," but also extend the interaction by adding, "Thor is my favorite Avenger. His hammer helps him to fly." Through the expansion, the phrase moves the communication forward while maintaining a portion of the child's verbalizations. Paraphrase is often combined with Specific Praise for use of words coupled with responding to the child. In this way, adults paraphrase what the child says, but add, "Thank you for telling me about Iron Man. I love talking with you about the Avengers." It is strongly believed that if all adults in the child's life utilize this skill, there are more opportunities for the child to (a) hear appropriate language, (b) have grammar and syntax modeled, and (c) expand their vocabulary. Exercises to practice the Paraphrase skill are incorporated into the training to allow participants to feel comfortable with this particular CARE skill. Outcomes appear to be promising. For example, an application of CARE by over 70 speech pathologists and other allied personal in a major medical center in Mississippi reported a greater accomplishment of session goals and improved child behaviors when CARE skills had been incorporated (D. E. Sarver, personal communication, March, 20, 2018).

The third "P" in CARE is Point-Out. Similar to Behavior Descriptions in PCIT, the adult provides a running commentary on the child's behavior. This increases the child's exposure to language. For children with ASD, pointing out behavior can also draw the child's attention to the adult-child interaction. In CARE Connections, the adult's comments involve not only what the child is doing, but also how the adult is engaged in the play. This helps facilitate the child's development of cooperative play skills and perspective taking. For example, if the child is lining up animals, the adult would point this out with "You are lining up the animals. You are lining up the elephant behind the lion and the zebra behind the elephant." Then, the adult would add "I am lining up my animals, too. I am making a line for the animals to visit the zoo. We are playing together with all the animals." As with the other "P" skills, participants practice using this skill with a partner to increase their comfort in using the skill with children.

Like with PRIDE skills in PCIT, CARE Connections interweaves all the Ps throughout the play, paying particular attention to positive social behaviors (e.g., eye contact, turn-taking, verbalizations) directed toward the adult. Joining and expanding what the child is doing are stressed with all Ps in CARE Connections. During training, participants are divided into small groups to practice using all the Ps while avoiding the Qs, switching between role-playing the adult and the child. When not in either of these roles, the participant serves as a tally marker to count each P and Q skill used by the adult trying to implement the skills. Tally markers provide the one practicing the skills with quantitative information about how frequently they used the skills, with a focus on the Ps. By taking each role, participants have an opportunity to learn through practice (adult) and learn to identify skills (tally marker). All benefit from the live feedback of the CARE Connections trainer who prompts for P skills. Discussions about the role-play occur between each rotation.

CARE Connections teaches adults the importance of how to give effective instructions to children and teens with ASD. These follow the same ideas as effective commands in PCIT and the other programs on which CARE is based. Commands used in CARE Connections are (1) developmentally appropriate, (2) polite, (3) neutral, (4) clear and direct, (5) positively stated, (6) one at a time, (7) specific, and (8) incorporate choice when appropriate. In the ASD literature, child compliance has improved when commands are given as direct instructions (Horner et al., 2002). Experiential activities and ASD-specific examples are included in CARE Connections training to teach participants how to give effective instructions with attention to the child's environment. Special attention is paid to determining what types of commands are developmentally appropriate considering the challenges faced by children with ASD. There are two strategies believed to further increase compliance to adult instructions. First, participants are taught to wait for 5 s before repeating the instruction. This instruction is to be repeated *exactly* the same way a second time, again waiting for 5 s. With the third instruction (repeated the same way), the adult also lets the child know what consequence will happen should noncompliance occur. The use of this "broken record" technique is believed to help adults remain calm in seeking compliance as well as increasing the likelihood that instructions will be followed. As agencies and individuals differ with rules related to discipline and consequences, CARE Connections does not teach any one method. However, discussion and guidance about consequences are part of a participant group activity.

The second important component to increase child compliance with instructions involves the use of a rationale. Adults are taught to provide a brief (one sentence) rationale before every instruction. By doing so, this may help orient the child to the adult speaking so the child is more likely to hear the instruction. For some children, saying their name before the rationale can help gain the child's attention; if the child looks to the adult, a specific praise for looking at the adult's face is given. After any compliance, adults are taught to use a specific praise for both listening and following instructions.

One way in which CARE Connections is tailored to the needs of children with ASD involves the use of visual cues. Adults are encouraged to use visual means, combined with verbal information, when making expectations known or giving directions. Visual cues may be as simple as developing a hand gesture that adults can give each time they need the child's attention, such as tapping their nose. In this way, the child will learn that when the adult is tapping his/her nose, the child is expected to pay attention to what the adult is saying. Adults may also use a visual schedule which can be as simple as writing down (for a child who can read) "one math page → snack" or as detailed as an agenda of the day's planned activities. Adding pictures to this visual schedule is a plus, particularly for children who are not strong readers.

The CARE Connections program recognizes the importance of consistency, predictability, and follow-through for children with ASD, as these concepts are cornerstones of all effective parenting programs. Importantly, adults are encouraged to create a consistent and predictable environment. Whether in a center, unit, classroom, or home setting, visual schedules for the activities need to be posted and followed. When transitioning to a new activity on the schedule, the adult is taught to give the brief rationale (e.g., "We are going to have lunch now") followed by the instruction matching the schedule (e.g., "Please come to the table"). Lastly, compliance is reinforced (e.g., "Thank you for coming to the table and listening to my instructions").

CARE Connections training can be provided to all adults interacting with children with ASD in 3–6 h. It is a combination of didactic material about ASD, discussion, videos, and interactive activities and games to reinforce all CARE skills. Most importantly, live practice and immediate trainer feedback are integral to the training as an essential exercise to aid skill uptake and increase participant confidence with CARE skill implementation. All aspects of the CARE Connections training incorporate a rationale, examples, modeling, and application for use with children with ASD across a variety of settings and situations. The goal of CARE Connections is to improve every adult-child relationship, with the added benefit of reducing negative behaviors and interactions for children with ASD.

17.3 Conclusions and Future Directions

The number of children with ASD diagnoses is growing (CDC, 2018). While numerous intensive interventions exist with promising results (Masse et al., 2007), barriers of access, time intensity, and cost make attaining services a challenge for many of these families. Furthermore, traditional services and training in the intervention include a trained therapist that works solely with the child, and possibly with parents or teachers, even though there are typically many adults that interact with the child on a daily basis. Derived from evidence-based parenting programs like PCIT, CARE Connections takes the shared relationship-building skills from these programs and expands them to include skills for improving compliance, increasing social-emotional development, and generalizing positive behaviors to multiple settings. While it is important to maximize the number of trained adults, the creators of CARE Connections recognize that continued feedback and opportunities to discuss any barriers to skill use are important to implement the core skills effectively. Therefore, when adults are trained in CARE Connections, having a licensed mental health professional (e.g., therapist) with an understanding of ASD and evidence-based parenting programs available to provide ongoing, periodic live feedback to skill implementation is recommended. For example, in a specialty center, the therapist could provide live feedback about the use of CARE Connections skills to staff during various times in the day (e.g., mealtime, center time, transitions). Similarly, consultation could be provided by therapists to allied health professionals (e.g., speech/language pathologists, occupational and physical therapists, ABA providers) to enhance implementation of the learned CARE skills.

It is believed that having CARE Connections skills available for all adults in the life of a child with ASD would provide consistency of skills across settings and may help improve a child's problematic behaviors. Importantly, although data exists for the positive impact of parents using these types of skills with children with ASD, and research has shown the standard CARE program to have positive effects on several populations of children, efficacy studies are needed with the CARE program to determine its specific impact on children with ASD. Additional research evidence is needed to support the dissemination of the CARE Connections program as another important strategy for improving the lives of children with ASD. In sum, the Care Connections program is a means for creating a positive environment for a child on the autism spectrum that includes a well-trained team of parents, teachers, family members, community members, paraprofessionals and others. Together, this team can encourage the child's development of social communication and emotional regulation. By working together, parents and others may have the opportunity for increased social support. All of those who care for the child will have the skills necessary to encourage the child's positive development.

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18

Core Training Competencies for PCIT and ASD

Christina M. Warner-Metzger

Abstract

Rooted deeply in behavioral theory and knowledge of Patterson's coercive cycle, Parent-Child Interaction Therapy (PCIT) works with both caregivers and children to restore balance and positivity to family dynamics. PCIT uniquely implements live coaching to change maladaptive interactional patterns within caregiver-child dyads, with therapists collecting observational data to inform the progress of therapy. Due to the specialized skillset necessary to delivery this highly specified therapy, standardized training requirements and a certification process guide the practice of PCIT internationally. This chapter reviews the prerequisite education, basic training, clinical competencies, and case consultation required to become a PCIT Therapist. Additional recommendations are provided for supplemental training in autism spectrum disorders (ASD), including knowledge of diagnostic methods, connection with available ASD resources, and identifying ongoing educational outlets. Considerations for PCIT-ASD training are suggested.

18.1 The Importance of Interaction to PCIT Core Components

18.1.1 Putting the "I" in PCIT

To fully understand the necessary steps to become trained in Parent-Child Interaction Therapy (PCIT), it behooves us to first return to the basic premise of the treatment. As the name suggests, Parent-Child *Interaction* Therapy (italics added) works with the caregiver and child together to impact change within the family. The point of intervention is neither the child alone nor the caregiver alone; rather, PCIT targets the *interaction* between the parent and child as the focal point of conflict. As such, it is not the child's symptoms of oppositionality in isolation that are problematic (i.e., on rare occasion has a child sought treatment admitting their defiance disrupts the family), and it is not the caregiver's parenting style in isolation that is problematic (indeed, many caregivers report their parenting style works well with other children in the household). However, when the mismatch of the child's behaviors collides with the caregiver's parenting style, subsequent maladaptive patterns may form. Thus, PCIT accepts the basic tenet that both caregiver and child contribute to the relational pattern developed over time, with some interactional styles leading to more or less conflict.

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18.1.2 Underlying Interactional Theory

Family conflict is repeatedly indicated in the literature as a direct contributor to the maintenance of child disruptive behaviors. One of the most comprehensive models of negative parent-child interactions is Patterson's coercion cycle (1982, 2002; Patterson, Reid, & Dishion, 1992). This model explains how negative exchanges between a caregiver and child become increasingly coercive and cyclical in nature, further intensifying the child's disruptive behaviors and the caregiver's inconsistent discipline practices over time. Patterson's model posits that the caregiver reacts to the child's expression of disruptive behavior with aggressive responses (e.g., yelling, threatening, hitting), nonresponsive discipline (e.g., concession to the child's defiant and aggressive behavior), or a combination of both practices.

The use of aggressive responses results in temporary cessation of the child's negative behavior, which reinforces the parent to engage in such discipline practices in the future. Problematically, this approach models the use of threatening and aggressive tactics for the child. Moreover, caregivers also develop a pattern of inconsistency within the coercive cycle, as they may vary the number of threats delivered in this process before applying aggressive punishment. However, children may "play the odds" of their noncompliance by testing the likelihood of their caregiver's inconsistent threats coming to fruition. Anecdotally, caregivers caught in this cycle often report "my child only listens to me when I yell or threaten to spank them." As referenced in Fig. 18.1, the following steps contribute to the cycle:

1. The caregiver gives a command: Put on your shoes.
2. The child does not comply with the command: (*whining*) But I don't want to leave!
3. The caregiver responds to the child's noncompliance with aggression: (*yelling*) I've had it with you! Either put on your shoes, or I'll give you something to cry about!
4. The child puts on the shoes to avoid harsh punishment, reinforcing the caregiver's use of aggression.

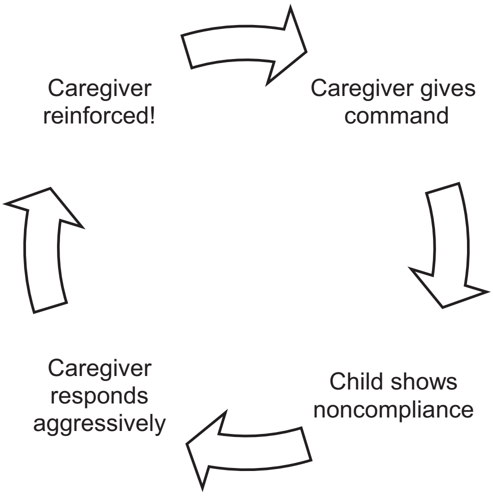

Fig. 18.1 Patterson's coercive cycle: Aggressive discipline

Similarly, the use of nonresponsive discipline results in the parent negatively reinforcing the child's escalation of oppositionality and aggression as the child escapes from a parental command or avoids punishment. Over time, the child becomes more noncompliant and the caregiver becomes less directive, which in turn increases child noncompliance in the future. Clinically, caregivers gripped in this cycle frequently comment "I find it easier if I just do it for my child or if I don't enforce too many rules." Figure 18.2 depicts the following cyclical events:

1. The caregiver gives a command: Put on your shoes.
2. The child does not comply with the command: (*whining*) But I don't want to leave!
3. The caregiver responds to the child's noncompliance with nonresponsiveness by conceding to the child: I know it's hard, honey, so I'll just put your shoes on for you. Mommy will make it better.
4. The child avoids punishment for noncompliance and is reinforced to act defiantly to future parental directives.

The coercive cycle is further complicated when both nonresponsive and punitive discipline are used inconsistently. With caregivers

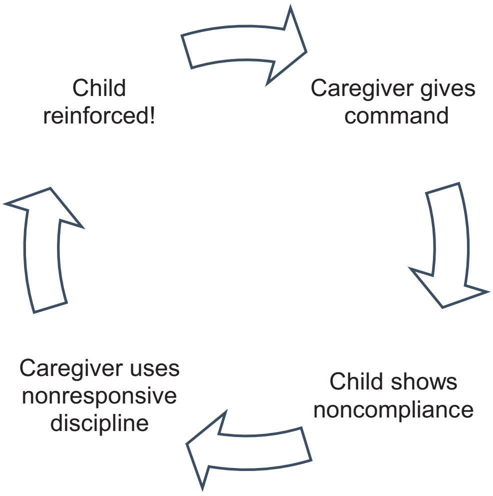

Fig. 18.2 Patterson's coercive cycle: Nonresponsive discipline

occasionally implementing discipline while periodically acquiescing to the child's demands, the child learns to escalate until demands are met. Consequently, caregivers may fall into a contradicting pattern of frustration and aggression combined with permissiveness and accommodations in attempts to manage their child's noncompliance or disruption.

Of importance, coercive caregiver-child interactions are recognized as bidirectional patterns, meaning the child's behavior influences the caregiver's reaction and vice versa (Lytton, 1990; Patterson, Reid, & Eddy, 2002). In essence, over an extended period of time, family members "train each other to be aversive and aggressive" (Patterson et al., 2002, p. 9). Regardless of whether the caregiver initially takes an aggressive or nonresponsive role, with ongoing coercive exchanges, the child's aggression can escalate from minor oppositionality to violent behavior (Snyder & Stoolmiller, 2002). In addition to affecting family functioning, the coercive cycle also begins to generalize to the child's interactions with peers and teachers (Patterson et al., 1992). With increasingly maladaptive interactions with others, the coercive cycle maintains disruptive behavior by generalizing to contexts outside the home.

Unfortunately, engaging in the coercive cycle with children who have disruptive behaviors tends to worsen the problem by teaching them ineffective social skills, rather than achieving the intended amelioration of behavior problems. Therefore, it becomes necessary to intervene specifically within the caregiver-child interaction to interrupt the negative cycle at its source. Further, a new adaptive interactional style must be built to restore balance to the family dynamic. While many other evidence-based parent management training programs similar to PCIT provide caregivers with behavioral techniques via psychoeducation or behavioral practice (such as role-playing), PCIT uniquely uses live coaching to leverage the caregiver-child interaction as the mechanism for change within the dyad and consequently the family structure.

18.1.3 Core Components of PCIT

In Eyberg's (2005) discussion of tailoring and adapting PCIT, the author identifies several core components that characterize PCIT. Specifically, both the caregiver and child are required to attend sessions together. With few exceptions in protocol, each therapy session includes the therapist using an observational coding system as the caregiver and child interact in play. Data from the observation drives the goals for each session and informs the therapist to coach the caregiver in a prescribed set of parenting skills intended to restructure interactional patterns. The therapist remains "outside" the caregiver-child interaction (usually behind a one-way mirror), but guides the caregiver through a bug-in-ear device (e.g., Bluetooth ear piece) to use positive parenting skills (labeled praises, reflections, behavior descriptions, imitation, enjoyment), avoid negative parenting skills (commands, questions, negative talk/criticism), and decrease the likelihood of child defiance or noncompliance. Through select "teach" sessions and coaching, caregivers learn overarching behavioral principles (e.g., antecedents, behaviors, and consequences). A therapeutic "parallel process" occurs in which the therapist uses a particular set of skills with caregivers, and caregivers in turn recreate (or parallel) the use of the skills with their children. While PCIT is considered a child-oriented therapy, it interestingly allots minimal interaction between the therapist and child during sessions, but for good reason: the mechanism for change is delivered directly via the caregiver to the child.

18.2 PCIT International Therapist Training Requirements

Because PCIT focuses on collecting observational data using a structured coding system and delivering live coaching during caregiver-child interactions (skillsets that are rarely employed in other child therapies), standards for training were developed to ensure those interested in becoming certified PCIT Therapists could adhere to the rigorous PCIT protocol (Eyberg & Funderburk, 2011) and use the robust techniques proven efficacious by almost 50 years of research. In other words, families should experience a consistent intervention from one PCIT Therapist to another. Furthermore, PCIT is currently implemented in approximately 12 countries worldwide, requiring standardized training to ensure the core components of PCIT are retained despite adaptations to address cultural sensitivity. To this end, PCIT International, Inc., determines and approves the *Training Requirements for Certification as a PCIT Therapist*. The *Training Requirements* in their most current form, available trainings, certified trainer information, and contact information for training and certification inquiries, among other professional resources, are available at www.pcit.org. The following narrative provides an overarching description of the basic components for PCIT training, but it does not constitute or replace the published *Training Requirements*, which are subject to change.

18.2.1 Overview of Training Models and Trainer Types

Although models of PCIT training vary in structure, number of total training days, and consultative methods, PCIT International Certified Trainers engage in teaching a common set of essential elements. Modalities of trainings may also differ by the certification level of the trainer. Specifically, there are three levels of trainership defined by PCIT International (see Fig. 18.3):

1. *Level I Trainers* are designated as within program or within agency trainers at their physical site and may train providers to become PCIT Therapists.
2. *Level II Trainers* are qualified as regional (typically defined as a state) trainers who may teach and oversee therapists who reside within the trainer's region, as well as train Certified Therapists to become Level I Trainers.
3. *Master Trainers* are vetted as international trainers who may train providers to become PCIT Therapists, Level I Trainers, or Level II Trainers.

18.2.2 Prerequisite Education

Since PCIT is deemed a mental health therapy, potential trainees are required to possess a master's degree or higher in a mental health field. This includes Board Certified Behavior Analysts (BCBAs) at the master's level. In turn, as PCIT is implemented worldwide, international equivalents of a master's degree or higher in a mental health field are welcomed. Practitioners must also maintain an independent license as a mental health service provider or function under the supervision of a licensed mental health provider. As a standard of comparison, those who are eligible to bill services as "psychotherapy" often meet the educational and licensure requirements to practice PCIT. As an inclusive measure for psychology students in training, students may begin their PCIT training early in their graduate careers, but must complete their master's degree or third year of doctoral training before becoming eligible to apply for PCIT Therapist certification. When conducting PCIT under student status, the individual must perform their clinical work under the supervision of a licensed mental health service provider.

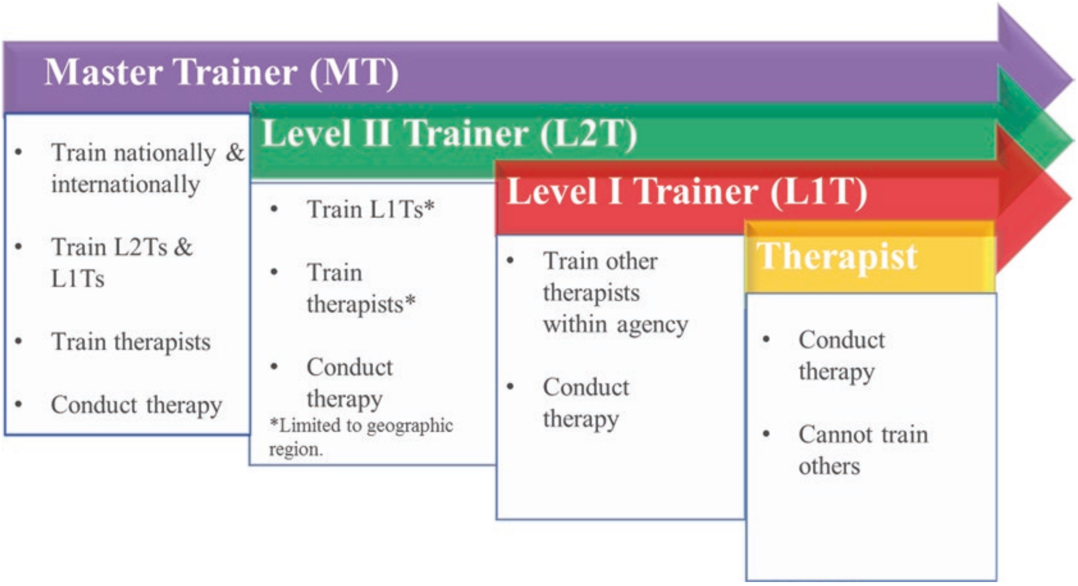

Fig. 18.3 Levels of PCIT certification

18.2.3 Initial Training

To begin training, potential PCIT Therapists must complete a minimum of 40 h of face-to-face training with a Certified PCIT Trainer. A portion of the face-to-face time may be conducted via online or video training. The initial training incorporates discussion of the theoretical underpinnings of PCIT, review of the current PCIT protocol, practice in a specified coding system (Dyadic Parent-Child Interaction Coding System; DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014), observation of cases, and exercises in coaching. For those receiving face-to-face training from Level I Trainers within their agency, a mentorship model of training is used with the Level I Trainer completing a minimum of 20 h of face-to-face training in co-therapy and/or live supervision with the trainee. Thus, training accrued in a mentorship model contributes to the overall minimum 40 h of face-to-face time.

18.2.4 Continuation Training

Potential PCIT Therapists must also undergo a period of case consultation with a Certified PCIT Trainer covering complex treatment issues. During this time, the trainee actively implements PCIT with clients, practices DPICS coding, and builds coaching skills. Continuation training lasts approximately 1 year in which the trainee may be involved in an amalgamation of workshops, online training, and/or activities within a mentorship model. This phase of training must include skill review, case experience, and ongoing assessment of therapist competencies. When training under a Level II Trainer or Master Trainer, trainees attend at least twice monthly consultation. Consultation is typically conducted via phone or web conference and may be delivered in an individual or small group format. For those working with a Level I Trainer, consultation occurs within the mentorship model until therapist competencies are met; thereafter, trainees attend at least twice monthly consultation until training case requirements are met.

While select competencies are assessed during the initial face-to-face training, to determine competency in applied skill, a Certified PCIT Trainer observes video recordings or live sessions conducted by therapists. Competencies evaluated include assessment skills (i.e., appropriately using the ECBI, administering the DPICS, and achieving coding reliability), CDI-related therapist skills (i.e., performing the CDI Teach session with integrity, meeting the CDI Mastery criteria, and using DPICS to set CDI coaching goals), PDI-related therapist skills (i.e., conducting the PDI Teach session with integrity, and managing initial and advanced PDI coach sessions), and general coaching skills (i.e., exhibit "adequate and sensitive" coaching, model CDI skills in interactions with caregivers and children). As a capstone to continuation training, trainees must complete at least two (2) cases to PCIT graduation criteria while under consultation with a Certified PCIT Therapist.

Table 18.1 Recommended PCIT training readiness assessment

Considerations for general PCIT training
1. I receive adequate referrals for children between 2 years and 6 years, 11 months with primary or secondary disruptive behavior problems to support an ongoing caseload of four to six PCIT clients for the upcoming year.
2. I agree to use the ECBI at every session (average 16–20 sessions) for each client throughout the course of therapy.
3. I agree to use the current DPICS during each session to ascertain treatment progress and coaching goals.
4. I have an installed audiovisual system that allows me to observe caregiver-child interactions from a separate room.
5. I have a reliable bug-in-the-ear device that allows me to discretely coach the caregiver.
6. I have 6–10 toys appropriate for children between the ages of 2 years and 6 years, 11 months that are consistent with PCIT requirements.
7. I am aware PCIT uses a specified time-out procedure and am willing to follow the step-by-step protocol.
8. I have the necessary space to safely and appropriately implement the time-out backup as indicated by the current PCIT protocol.
9. I have the video and audio equipment necessary to produce recordings of sessions (including audio and video of the caregiver-child, as well as audio of the coach) for review by a Certified PCIT Trainer.
10. I have consulted with my compliance office regarding procedures necessary to release video recordings of client sessions to my Certified PCIT Trainer for the purposes of training.
11. If training with a Level II Trainer or Master Trainer: I have administrative support and the necessary technology (e.g., phone, tablet, computer with web camera) to attend a minimum of twice monthly consultation (or more, if prescribed by my trainer) via phone or web conference.
If training with a Level I Trainer: I have administrative support to engage in a mentorship model for a minimum of 20 h of face-to-face time. Upon completion of my therapist competencies, I am available to attend a minimum of twice monthly consultation until case requirements are met.
12. I have identified common barriers to treatment participation within the population I serve. I have planned accordingly to provide supports around these issues to decrease the likelihood of attrition (e.g., providing transportation vouchers, child care, appointment reminders).

18.2.5 Recommendations from the Field

Before embarking on PCIT training, it is highly recommended that providers consider the fit of their general clinical practice to PCIT implementation. Potential PCIT trainees should consider the resources necessary to conduct sessions (e.g., money to fund technology, space for therapeutic facilities; refer to Chap. 13 in this handbook), as well as the agency's tolerance for treating children who may become highly destructive and loud during sessions. While a seasoned PCIT Therapist may endure long sequences of ignoring a screaming child, the therapist's professional neighbor may be less inclined. Additionally, while experimental approaches exist for children in younger and older age ranges, the primary application of PCIT as an empirically supported treatment is for children between the ages of 2–6 years, 11 months (Eyberg & Funderburk, 2011, p. 7). Importantly, agencies should have a plan for recruiting families of children with externalizing behavior problems within this age range if a referral flow is not established. Questions to assist therapists in determining their professional and agency readiness for PCIT are presented in Table 18.1.

18.3 ASD Training Recommendations

18.3.1 Understanding the Assessment and Diagnosis of ASD

While the reader is referred to earlier chapters in Part I of this handbook regarding the specific diagnostic criteria and assessment methods for autism spectrum disorder (ASD), it is worth revisiting the need to develop a clinical sense and familiarity for the symptom clusters that uniquely define ASD, as well as the methods that constitute adequate ASD assessment. When working with children with ASD, therapists should consider the source and methods used for determining the child's ASD diagnosis.

Possible questions the therapist should ask include:

- What is the professional background of the provider who assigned the diagnosis of ASD?
- Were multiple disciplines involved in determining the diagnosis?
- What standardized ASD assessment measures were used?
- Did the ASD evaluation include "gold standard" measures, such as the *Autism Diagnostic Observation Schedule* (Lord et al., 2012) or the *Autism Diagnostic Interview—Revised* (Rutter, LeCouteur, & Lord, 2008)?
- Were assessment methods multi-modal (e.g., clinical interview, rating scales, clinical observation, direct test administration) and comprehensive across developmental spheres (e.g., cognitive, speech/language, adaptive, socioemotional, and motor skills)?
- Were other diagnoses considered and ruled-out?

Although the *Diagnostic and Statistical Manual of Mental Disorders—fifth edition* (DSM-5; American Psychiatric Association, 2013) subsumes communication within the social communication/interaction domain (Criterion A), prominent ASD assessments—such as the *Autism Diagnostic Observation Schedule*—categorically separate social affective characteristics from communication skills for evaluative purposes. From a symptoms-level perspective, therefore, ASD is not merely a social disorder, rather it is a unique combination of deficits in social affective, communication, and restricted/repetitive behaviors. Thus, each cluster of symptoms and the presence or absence of symptom overlap with other domains should be considered during differential diagnosis to determine the categorization that most accurately represents the child's presenting concerns. Referrals for an ASD rule-out assessment often describe a child who is socially awkward, who becomes irritated with peers who do not follow the child's prescribed rules or rituals, and who demonstrates variable eye contact. While these symptoms are consistent with those of ASD, they may also indicate signs of other disorders (e.g., an obsessive-compulsive disorder, possible social anxiety presentation), which underscores the importance of a careful evaluation. Other children may instead be referred for difficulties with social communication without accompanying restricted interests. Further, some children may present with language delays combined with hand-flapping and repetitive play without apparent restrictions in social affect or interaction, which is often found in children with cognitive or developmental delays.

As these differential diagnosis considerations illustrate, it is imperative those working with the ASD population recognize the unique overlay of social, communicative, and repetitive behavior symptoms that specify an ASD diagnosis. Figure 18.4 depicts one possible conceptualization of various symptoms contributing to an ASD diagnosis, as well as similar symptom clusters representing other conceivable diagnostic categories. This visual highlights how therapists working with the ASD population should be

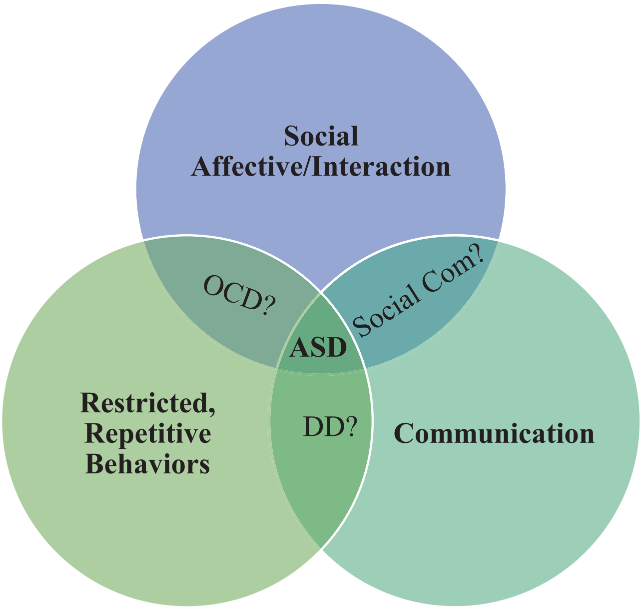

Fig. 18.4 Conceptual example of ASD symptoms and differential diagnosis. *DD* developmental delay, *OCD* obsessive compulsive disorder, *Social Com* social communication disorder

professionally comfortable comparing and contrasting differential diagnoses that share the intersecting features similar to ASD.

18.3.2 Connecting with Professional and Family Resources for ASD

Therapists who work with children with ASD quickly recognize the value of the ASD community, both in terms of family and professional resources. As a practitioner who is interested in using PCIT with the ASD population, it is wise to familiarize oneself with ASD professionals working in the community and region. Because ASD mental and medical health is often considered a specialty area and such professionals may be scarce in rural areas, children often travel to larger medical centers to receive a formal diagnosis. Since coordination of care is often key to the successful treatment and support of an ASD diagnosis, PCIT Therapists will benefit from identifying the spheres of professional influence around them, creating partnerships and collaborative consultation models with area ASD professionals. Researching and creating a list of evidence-based providers in a practitioner's particular location not only provides caregivers with quick connections to additional supports (if needed), but also develops a referral network for the therapist's PCIT practice. Reputable ASD organizations at the national level, including Autism Speaks and the toolkits provided by the Autism Treatment Network, may also provide valuable clinical and family resources.

18.3.3 Possible Mechanisms for ASD-Specific Training

When committing to work with children on the autism spectrum, it is imperative to develop a strong background in the understanding and application of behavioral theory. At basic levels, a clear comprehension of classical conditioning, and, more importantly, operant conditioning, is critical to working with children with ASD. Because PCIT is strongly rooted in behavioral theory, PCIT-trained therapists may naturally take to the extension of PCIT to ASD populations. For those with less behavioral background, determining the antecedent, trigger, or reason for particular behaviors demonstrated by a child with ASD may be more difficult. In particular, therapists should grasp the basic concepts of functional behavioral assessment. A fundamental working model suggests behaviors are initiated for a reason and in response to discernible events, behaviors are strengthened or weakened by their consequences, behaviors are a form of communicating needs, and perceived misbehavior may be adaptive within particular circumstances. Thus, to decrease undesired behaviors, the therapist must aptly identify target behaviors, the purpose for the behaviors, and the mechanism maintaining the behaviors. Logically, the additional overlay in skillset and training of a BCBA, behavioral specialist, or applied behavior analysist background may nicely compliment an eligible PCIT Therapist's work with the ASD population.

If considering professional training in ASD, undergraduate or graduate students should seek opportunities early in their educational training, when possible. Students are encouraged to strategically develop foundational skills with coursework in child development, psychopathology, and assessment, as well as specific study in developmental disabilities and behavioral approaches. Also pursuing practica, internships, and fellowships focused on developmental disabilities and ASD will build the strong clinical sense necessary to work with the often complex presentation of ASD. Respected national programs dedicated to education, research, and service in developmental disabilities include Leadership Education in Neurodevelopmental and Related Disabilities (LEND), University Centers for Excellence in Developmental Disabilities (UCEDDs), Intellectual and Developmental Disability Research Centers (IDDRCs), and Association of University Centers on Disabilities (AUCDs).

For providers established in their careers who are interested in further education regarding the ASD population and related areas, several professional education outlets exist. First, seek local, regional, and web-based continuing education programming focused on ASD and developmental disability topics. Second, collaborate with local hospitals, attend public grand rounds, or pursue professional presentations focused on specialty topics. Third, consider course offerings and graduate certificates in ASD-related curriculum from accredited colleges or universities. Fourth, research the possibility of training in ASD-specific batteries or evaluative methods. Lastly, identify self-guided training opportunities, including publications and online resources from nationally recognized organizations on ASD, such as the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD), the Autism Centers of Excellence (ACE) Program, and Autism Speaks/Autism Treatment Network professional toolkits.

18.3.4 Consideration for Specified PCIT-ASD Training Requirements

At the time of this publication, PCIT International did not have established or endorsed training requirements specific to PCIT-ASD. Experienced PCIT trainers who also work with children with ASD find it beneficial for beginning PCIT practitioners to first meet therapist competencies with an understanding of basic PCIT implementation (i.e., within intended age range, with "classic" clinical presentation of disruptive behaviors). Once these foundational skills are developed and a therapeutic framework is set for working with children with "neurotypical" (non-ASD) development, PCIT Therapists should consider seeking additional training and consultation with a Certified PCIT Trainer before making adaptations to protocol or before applying PCIT to novel populations (see Table 18.2). Likewise, therapists who may be skilled in using PCIT with the general population but who are newly embarking on implementing PCIT with the ASD population should consider consultation specific to applying PCIT to children with ASD. Moreover, as PCIT with the ASD population evolves, interested practitioners are encouraged to attend updated research presentations and clinical workshops offered by expert trainers at PCIT regional and international conventions, as well as hosted by centers of PCIT-ASD expertise.

In summary, when considering competency in implementing PCIT with the ASD population, therapists are recommended to develop a solid

Table 18.2 Recommended PCIT training readiness assessment—ASD supplement

Considerations for applying PCIT to the ASD population
1. I have training and experience in diagnosing children with ASD.
2. I have training and experience working therapeutically with children with ASD.
3. I have a solid background in behavioral theory, including foundations in functional behavioral analysis and an understanding of operant conditioning (e.g., reinforcement and punishment).
4. I am aware of local and/or national advocacy and supports for children with ASD.
5. I understand that treating children with ASD, a population that presents with a true spectrum of symptomatology, may require additional training and consultation from a Certified PCIT Trainer.

Notes. ASD autism spectrum disorder, *DPICS* Dyadic Parent-Child Interaction Coding System, *ECBI* Eyberg Child Behavior Inventory, *PCIT* Parent-Child Interaction Therapy

understanding of behavioral and interactional theories impacting the caregiver-child dynamic. Interested practitioners should assess their eligibility in meeting the prerequisite education requirements and ascertain their practice readiness or "fit" for PCIT before seeking formal PCIT training from a Certified PCIT Trainer to achieve competency in the core components of the intervention. Clinical experience suggests it is beneficial for PCIT Therapists to first conduct the therapy with the primarily disruptive behavior population before embarking on PCIT practice with the ASD population. Additionally, familiarity with ASD assessment, diagnosis, and professional and family resources further bolsters a therapist's PCIT-ASD work. Where identified gaps in clinical knowledge, experience, or skill exist, it may be beneficial to seek additional training and consultation to sustain PCIT implementation with the ASD population.

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Part IV

Clinical Considerations in Using PCIT for ASD

19

Autism Spectrum Disorder and Family Functioning: A Therapist's Perspective

Susannah G. Poe and Christopher K. Owen

Abstract

With two decades of experience diagnosing and providing intervention support for families and their children on the autism spectrum, I (Dr. Susannah Poe) have had the privilege of working with families and learning how an autism diagnosis can impact the entire family. This chapter opens with an exploration into three diverse stages of readiness parents arrive with when obtaining an autism diagnosis (i.e., prepared, apprehensive, and unaware) as well as advice on how to best support and empower each family. Following a diagnosis, families with a child on the autism spectrum must alter expectations and formulate a new understanding of "normal." Families entering into this new normal must reconcile with their child's autism diagnosis, navigate confusing service systems, provide constant care and supervision for their child, cope with unwelcoming communities, and face financial difficulties. Providers should be aware of the diverse challenges families with children on the autism spectrum may encounter and be prepared to give them guidance and support. With the right support and guidance, these families become skilled caregivers, expert advocates, and community builders—enabling them to provide support for their child as well as other families.

19.1 Autism Spectrum Disorder and Family Functioning

Two decades of diagnosing and providing evidence-based treatment of young children with autism has provided me with a window on the experiences of parents and caregivers as they receive a diagnosis on the autism spectrum for a child they care for, and then on how they approach the challenges that accompany that news. During those hours spent with families, I have come to honor and respect the powerful impact the diagnosis of autism may have on a family. In most cases, it is a life-changing moment. The impact of those words will resonate throughout the coming years in ways the family never expected.

> In our family, our history is divided into 'before' and 'after' the diagnosis. Before we heard the 'A' word said aloud, even though we suspected it, we could pretend that we were a regular family. We could convince ourselves that Josh's behavior was related to a speech delay, and as soon as we could get the right services, he would catch up. When the diagnosis was given, the verdict read, I stopped hearing anything that followed.

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It is rare for a family to come into a diagnostic clinic without some trepidation. The journey to that first clinic appointment is often long and scattered with roadblocks. While some parents know from the moment that the infant is born that he or she is different, others report that their child developed as expected until they were around 12–18 months—when differences in development between a child on the spectrum and typically developing peers become clearer. Along the way, there may have been private moments of worry, questions from well-meaning friends or relatives, as well as assurances from others that "every child is different" and "he'll grow out of it, give him time."

Many parents have brought their concerns up with their pediatrician, only to be told to "give him time" or "her brothers talk for her, she'll be fine." Professionals may often avoid discussing an autism diagnosis because many view the diagnosis as controversial, a "touchy label," and a "sensitive subject" (Nissenbaum, Tollefson, & Reese, 2002, p. 33). Too often, parents are lulled by well-meaning community providers unfamiliar with autism. These providers may seek to reassure the family that the child does not have autism, not because they have the ability or experience to provide an accurate diagnosis, but because they want to comfort a worried parent. Alternatively, the child may not fit the description of a prototypical autism case with which providers are acquainted. This statistical discrimination model may account for racial and ethnic disparities in the identification of autism because providers may be applying rational—but faulty—algorithms on the likelihood of a child having the disorder (Mandell et al., 2009). According to Mandell et al. (2009), providers may correctly believe that autism is more common among males, while erroneously applying this statistic and diagnosing females less often. Following this line of thought, with similar sets of symptoms, providers are more likely to diagnose autism in white children and intellectual disability in nonwhite children (Mandell et al., 2009).

19.2 Diverse Families at Diagnosis

In a sample of over 1000 parents, researchers found that parents usually waited about a year before contacting a professional after first becoming concerned with their child's development (Crane, Chester, Goddard, Henry, & Hill, 2016). As a child on the autism spectrum grows, his or her social, behavioral, or communication differences become more defined. Because of this, parents begin to seek answers for what is happening with their child and to learn how best to cope with those challenges. After parents first contact a healthcare professional, they typically do not receive a formal diagnosis of autism until an average of 3.5 years later; in total, the delay between parents' first concerns with their child's development and receiving a formal autism spectrum disorder diagnosis can often be around 4.5 years (Crane et al., 2016).

While every family's story is different, in my experience, most families fit into one of the three stages of readiness to learn about the diagnosis: (1) prepared, (2) apprehensive, or (3) unaware. Parents often describe autism as a "death sentence" or "lifelong sentence," which might account for why many professionals view an autism diagnosis as difficult to approach (Nissenbaum et al., 2002, p. 33). Considering that professionals and parents both find autism to be a difficult topic to discuss, it is important for providers to know how to confidently and empathically navigate the diagnostic experience.

19.2.1 Prepared Families

> The tall woman strode down our hallway, leading her son toward us as he stared at the wallpaper border he was passing by. Turning into our clinic room and sitting down, she asked, "What all do you want to see," as she pulled out a notebook stuffed with papers with "Michael" penned across the front. "I have all the reports from Birth to Three and from his doctor, and here is a form I found online that screens for autism. I am pretty sure he has it." Michael sat in front of a box of blocks and began to sort them by color and shape, ignoring our efforts to interact with him. "See what I mean?" she

> asked. “He doesn’t talk, and he doesn’t look at people. He needs intervention, but we have to have a formal diagnosis. That’s why we are here.”

In most cases, parents’ intuition about their child’s behavior is not wrong. As a diagnostician, it is refreshing when a parent comes to an appointment with information about autism, inquiries about resources, and a beginning plan for treatment. They are armed with research, and request confirmation for what they believe is an accurate diagnosis. They come to us simply to take the next step toward helping their child. In some instances, these parents may have already reached out for services, but find that the child needs a formal diagnosis before they can move forward to receive treatment and see improvement.

For the more prepared families, it is important to find out what they have learned and from what source. Additionally, providers must complete and explain the results of the appropriate tests and screens used by the clinic for diagnosis. Once the family has an individualized assessment, providers can counsel the parent on the next steps. Many find relief in knowing that they are starting down a path that can make a positive difference for their child; this empowers families. It is important for providers to support parents in navigating the healthcare system (e.g., provide precise information, connect with external contacts, paperwork to complete) as parents without guidance tend to rely on online information (Carlsson, Miniscalco, Kadesjö, & Laakso, 2016). It is unfair and dangerous to expect parents to become autism experts due to the difficultly in digesting and critically examining online information. In order to help parents get started in finding appropriate resources, I routinely provide these families with information about evidence-based treatment resources, local support organizations, potential funding sources, and state and federal laws pertaining to education of a child with a disability.

19.2.2 Apprehensive Families

> Three-year-old Allen came into our office with his mom and dad, neatly dressed in an ironed shirt and khaki pants, his dark hair slicked back. His parents each held a hand, looking around nervously as they sank into the clinic room chairs. Pulling away, Allen ignored a trunk full of toys, sat on the floor under a nearby chair, twisting two battered spoons he had brought with him. He didn’t look up when I walked in and greeted him, touching his shoulder and saying his name. He pulled away slightly as his mother immediately instructed him, “Say ‘hello’ to the doctor.” She explained, “Oh, he’s having a bad day. Give him time. I am sure he will warm up to you.”

A more challenging situation for the practitioner is when a family arrives filled with anxiety and fear of what they may learn. Some parents may express their anxiety up front, such as proclaiming, “I am so nervous.” Another way anxiety may manifest is through protectiveness and denial. For instance, a parent may proclaim, “I have never seen him do that before,” as the child runs in a pattern across the room and engages in self-stimulatory behavior (e.g., hand flapping) even when there is history of similar behavior reported by the school or daycare. Others will come in assuring, “I know he doesn’t have autism.”

When a family presents with anxiety or denial, it is important for me to reflect what I am seeing and what I have read in the history. I may also identify the behaviors I see occurring (e.g., stimming) and explain to parents that children are often referred to diagnostic clinics when they engage in similar behaviors because those can be an indication of developmental differences. I find it important to call the parent’s attention to the child’s actions as we talk. When identifying typical autistic behaviors, it may be important to reassure parents that the etiology of autism is complex, but not due to parenting practices. Because we cannot expect all parents to be experts in child development, we need to recognize that some parents may incorrectly attribute these developmental differences as faults of their parenting: “So I thought something was wrong with me … because I could not understand him” (Carlsson et al., 2016, p. 332).

It is just as important to listen to the family members and acknowledge that they know their child better than anyone. The job of the diagnostician is not to argue with the family, but to use informed judgment to provide an honest evaluation and then assist the family in understanding what that means. Part of that information could include findings of appropriate screening and diagnostic tools, divulged sensitively and as positively as possible, while being clear about the results. I try to use examples from the test results to relate back to what the family has listed as a concern, not just to indicate that I have heard them, but that this impartial test has agreed with them. For example, if the parent reports that her child doesn't play like other children, you can show the parent that the child's gross motor and social/emotional developmental skills are lower than the child's chronological age. In other words, you can confirm her concern that the child is not yet able to demonstrate age-appropriate skills in those areas.

When a family is certain that the diagnosis of autism given to the child is wrong, I will urge them to get a second or third opinion. Moreover, I will tell them that I hope I am wrong and that another professional with experience in autism diagnosis may interpret the evaluation results differently. It's important to remember that the family has come to you because of your expertise in diagnosis and your familiarity with recommendations for appropriate treatment, so even though you may know what they are hoping to hear, it is your responsibility as a diagnostician to provide honest, respectful, helpful, and encouraging feedback. It's tempting to defend an unwelcome diagnosis, but I remind myself that convincing a family I am correct is not what matters. What is true will be true with the next diagnostician and almost always the family will come to realize the reality of the diagnosis in their own time and in their own way.

When a parent is disagreeing with the label the child has received, I will sometimes agree that it doesn't matter what we call the concerning behaviors; what matters is getting the child the help he or she needs in the areas where he or she differs from typical development. That's where a good developmental profile can be a helpful tool. With those results, you can illustrate the challenges the child faces with scores—based on what the parents report—and then encourage therapies that will be helpful (regardless of diagnosis) to treat the child's challenges (e.g., speech, occupational therapies). As a clinician, it is important to hear and respect where each family is at the time of diagnosis, and assist them in understanding what they want to learn at that moment.

19.2.3 Unaware Families

> When Nora's mother called for the appointment, she explained that she had been told to come to our center for help. Her Birth to Three worker had encouraged her to make the appointment before Nora would transition into school at age 3 because she "might need extra help." Mom didn't agree though and described Nora as "just shy." After working out a date for an appointment, she asked, "What is it that you all do?"

Finally, some families arrive seemingly unconcerned about the prospect of a diagnosis. Although many parents often report having an inkling that their child was different compared with other children prior to an autism diagnosis, many say that as long as everyday life was going smoothly, they did not feel an urgency to seek an assessment (Carlsson et al., 2016). Some may not even know the purpose of a diagnostic clinic because someone else (e.g., family member, school system, early intervention program) has referred them without divulging much information. As the autism professional takes a history, these families may report some troubling behaviors that they have experienced. For example, one parent couldn't take her child into Walmart because he refused to cross through the hydraulic doors and wouldn't go near the "industrial toilet" found in most public restrooms. These parents often welcome insight into how to change that behavior, but may not always consider the presence of a disorder as the root of those behaviors.

19.2.4 Recommendations at Diagnosis

Regardless of the presentation of the parent's concerns, I have found it critical to listen, respond with compassion, and be the support that the family needs in the moment. Some parents are ready to go to battle and need an effective war plan. Others are stunned and need to absorb and assimilate the new information. Some families will disagree with your findings and challenge the diagnosis; it is important to listen and respect that while confirming your impressions. It is likely that providers may encounter parents who have never heard of autism; it is therefore essential that providers accurately explain the disorder without focusing entirely on negative outcomes (Nissenbaum et al., 2002). For example, providers should make parents aware that interventions will not cure autism and encourage parents to be critical of any intervention that is presented as a cure.

I find it most helpful to have tangible information for the family, including an individualized developmental profile of the child and the written results of an appropriate autism assessment (that they have contributed to), to go over with the family to illustrate the findings. Parents suggest that it may be valuable to separate the diagnosis appointment into two appointments (i.e., receive the diagnosis, receive more specific and practical information) to give them time to digest the diagnosis and formulate questions (Carlsson et al., 2016). In addition, providing a written summary of the visit completes a packet that the family can take with them and refer to as they absorb the information from the appointment. This summary may include the parent's contributions and concerns, test results, recommendations, and a list of local resources. I never get used to hearing an incorrect claim the family has made following the appointment such as "the doctor says he will never talk," or "she will never be independent," when I know that was not part of the message I provided. I have learned that, in spite of my best intentions, I can't always control the message that is taken home. Therefore, I strive to provide the family with clear and practical information, make sure that I answer their concerns and questions in a way that they understand, provide the same feedback in writing, and encourage them to call or come back with questions or concerns. While it is important to be realistic and honest, it is also important to accent the positives from the evaluation and leave them with hope for improvement.

An experienced clinician assesses the type of diagnostic information the parent is able to absorb effectively. I always ask the family, "What would you like to leave here knowing today?" or "What is your biggest concern [from our first contact]?" I then tailor the information I provide the family based on what they stated was important to them. A thorough diagnostic visit includes the results of previous testing as well as a detailed review of the child's social, medical, and educational history. This is done before the family's visit so I can refer to that history as I talk with the parents and observe the child. For families who feel especially reluctant to hear a diagnosis, it can be helpful to ask what they think is going on with the child, and then frame a response around their idea of the problem. For example, if someone has suggested that the child has attention problems, I would refer to the question of the nature of the child's attention difficulties and how they relate to autism rather than an attention-deficit disorder. Again, this is especially helpful accompanied by a developmental profile that will illustrate where the child falls in each domain.

The clinician's job is to hear the family's concerns; use clinical judgment; and incorporate history, testing, and observation to formulate an honest and clearly articulated evidence-based answer to the posed question. In addition, the clinician must provide information and recommendations to prepare the family for the next steps of their journey. Finally, clinicians should consider the well-being of the parents as an autism diagnosis carries with it many challenges which often go overlooked (e.g., stress, sorrow; Bonis, 2016; Coughlin & Sethares, 2017). Parents may have difficultly self-advocating for their own needs because they are often focused entirely on their child. It is beneficial for providers to advocate for parents' well-being in a sensitive way (Carlsson et al., 2016) while addressing the needs of their child.

19.3 The New Normal: Families After the Diagnosis

> The doctor's words hit me like a ton of bricks. I had known he could have autism, but when I heard her say the word it seemed like the whole world, and my child, were different than they had been just a minute before.

Seideman and Kleine's (1995) theory of transformed parenting is a realistic interpretation of the stages that I have seen families pass through following the diagnosis of autism. The word "transformed" is used to indicate the change that occurs from the pre-diagnosis role of the parent to the form of parenting that evolves after the diagnosis—one that goes beyond the originally envisioned role (Seideman & Kleine, 1995). Seideman and Kleine (1995) identify the *entrance* stage, when the parents receive and respond to the diagnosis; following the entrance, the *accommodation* stage relates to the new framework the family creates to accommodate the needs of the child and come to a new sense of normalcy. Finally, families move into the stage of *operating processes* when they hope for a positive outcome while accepting the challenges of the situation (Seideman & Kleine, 1995). An enduring part of the operating process, quite familiar to those who work with families with autism, is known as chronic sorrow (Coughlin & Sethares, 2017). Parents experience recurring sorrow when faced over and over again with the child's ongoing impairment, especially when he or she cannot participate in rites of passage that more typical families experience (e.g., learning to drive, graduation, committed relationships, grandchildren).

> I thought we had gotten past all the feelings that came with the diagnosis … the regret and guilt and what if's, but when we started getting graduation announcements and college acceptance emails from the neighborhood kids who he grew up with, it all hit me again.

Having a child with a chronic childhood illness, such as autism, has been shown to increase the stress levels of the affected family (Bouma & Schweitzer, 1990). For example, Weiss (1991) found that parents of children with disabilities experience a familiar list of major stresses: dealing with professional and support services (e.g., school services), strains within the family (e.g., financial difficulties and the experience of siblings), stigmatization, child behavioral difficulties, and concerns about the child's future.

> Autism never ends for me. There are no days off, no sick leave, no holidays, and that takes a toll on our marriage, his sisters, and everyone around us. And as hard as that is, I stay awake at nights scared for him because I will not always be here. I can never die—I don't know who will care about him.

19.3.1 Dealing with Professional and Support Services

Families who come to medical settings with physical health concerns about their child almost always leave with a prescription, a plan, and an idea of the outcome. For example, their child comes in with a sore throat, undergoes an exam and a throat culture, and receives appropriate medication and an appointment to come back for a follow-up in 2 weeks—problem solved. But in many areas of the country, treatment services for autism spectrum disorder are scarce, or what is offered is not evidence based. Parents who come to a clinic and receive a diagnosis of autism for their child aren't handed a prescription and a follow-up appointment; instead they are encouraged to seek evidence-based treatment with a caveat of how few there are. Unfortunately, as parents reach out to these recommended treatment services, they often find that the recommended services have long waiting lists. For the few that can obtain the in-demand services, the cost of the services is frequently not fully covered by health insurance, state waivers, or federal disability waivers.

> Hadley and Tobias got diagnosed 4 months apart. It came with a recommendation for 25–40 hours per week of ABA therapy, speech therapy, occupational therapy, and a pat on the back from the psychologist with their most sincere wish for good luck. Because ABA wasn't covered by insurance in 2010, it cost an average of $50,000 per year per child. And even **if** I could find a way to pay for it, nobody locally offered it 40 hours per week.

Research on parent perspectives in accessing community mental health services for children on the autism spectrum has found that parents face constant challenges navigating the service system, are frequently ineligible for services, and rate these encounters as particularly daunting and stressful overall (Brookman-Frazee, Baker-Ericzén, Stadnick, & Taylor, 2012). Parents reported that institutions seemed complex (e.g., community mental health services, education system) and were set up to disqualify their children from help by tossing the responsibility around like a game of hot potato.

> They don't offer ABA in the school system here so I have to get a prescription from their doctor and take it to school. I have to pull them from school and take them to therapy three days a week. I have paperwork there and I'm given goals and programs to do at home with them—which also requires daily attendance records so the school system doesn't turn me in for truancy.

Parents are often relieved to learn that Section 504 and Title II of the Individuals with Disabilities Act require public schools to provide appropriate education and modifications, aids, and related services free of charge to students with disabilities and their parents or guardians (U.S. Department of Education, Office for Civil Rights, 2010). The "appropriate" component means that this education must be designed to meet the individual educational needs of the student as determined through appropriate evaluation and placement procedures.

Knowing this, they approach their local school requesting that their child receive the recommended evidence-based intensive, one-on-one individualized therapy, most often utilizing the methods of applied behavior analysis (National Standards Project, Phase 2, 2015). Until recently, most schools—especially those in rural areas—had neither the funding nor the professionals experienced in effective individualized treatment. Therefore, children may be added to classrooms of typically developing children without proper support. Another option is that children are assigned to a classroom of special-needs children. In these special-needs classrooms, staffing rations make it difficult to provide the amount of individualized intervention recommended. Parents who realize that their child is not in the expected setting often lower their expectations or instead try to obtain appropriate services through legal action. For parents who pursue legal action, this means engaging in an expensive and time-consuming alternative to what should be provided with adequate staff and training. Even though school systems are required to provide a series of federally mandated complaint processes for parents who are unhappy with services, these procedures can take significant time, money, and work on behalf of the parent to be successful. Importantly, appropriate services are an immediate need for a child with autism.

19.3.2 The Need for Constant Supervision

> My 7-year-old child cannot be left alone. You expect your child to grow up and learn independence, but when your child has autism, it is a risk to even go to the bathroom. He has no language, no concept of danger, and he is always looking for sensory stimulation. For example, he is fascinated by water but he can't swim, so he can't leave the house without me. He can be gentle and loving one minute and then violent the next. He has the kind of autism no one talks about: he will smear feces and eat money and dump the contents of the refrigerator if I leave him one minute, if I am not vigilant. I do not want to live like this, but I have no choice.

The most exhausting and debilitating stress for many parents with a child on the autism spectrum is the reality of constant care. Parenting is a full-time responsibility with little time off. When a child is not able to be left alone, year after year, the weariness can become overwhelming. Additionally, many children with autism have disturbed sleep and can stay awake for hours, necessitating round-the-clock supervision.

> One mom of twins reported, "They require assistance with all activities of daily living. This includes dressing and feeding and bathing. My severe daughter requires one-on-one assistance with feeding to make sure she eats a decent variety of foods. She requires one-on-one assistance in the bathroom for potty training. The twins are wanderers and have low safety awareness so they have

> Project Lifesaver anklets on which require daily checks on the transmitter they wear plus a monthly battery change from the sheriff."

Raising a child on the autism spectrum is difficult, and it becomes particularly hard when families try to include their child on the spectrum in mainstream community activities. This lack of everyday opportunities can be isolating to families. Also, this can be especially challenging for families with a typically developing child in addition to a child with autism. For these families, it is sometimes difficult for the typically developing children to enjoy activities their peers enjoy because they are restricted by their sibling with autism who cannot participate. For many years, recreational community programs that provided appropriate activities for special-needs children were rare. More recently, many have begun to offer inclusive events specifically for children on the spectrum, including sensory-friendly theatre performances, museum visits, and library activities, as well as low-key visits with Santa. These sensory-friendly activities allow children with sensory concerns to enjoy community activities that others have access to every day and often take for granted.

19.3.3 Strains on the Family

> I lost my job because I had to leave work whenever the school called to come get my son. They couldn't handle his meltdowns, and so they called me to come get him. He learned really quickly that if he acted out, he would get to go home, and I ended up being a stay-at-home mom because the school didn't know how to handle him.

Relationships often crack under the stress of a caring for a child who requires round-the-clock support. Past studies have shown that couples who have children diagnosed with autism experience divorce more than other families (Bonis & Sawin, 2016). And the costs associated with autism, from intensive treatments to continuous care, mean that many parents must leave jobs to provide the full-time support their child needs. Cidav, Marcus, and Mandell (2012) recently published findings on the implications of childhood autism on parental wage loss: mothers of children with autism are less likely to work, work fewer hours per week, and earn substantially less. Mothers of children on the autism spectrum work 7 h less per week and are 6% less likely to be employed than mothers of children with no health limitations (Cidav et al., 2012). Furthermore, mothers of children on the autism spectrum earn 35% less than mothers of children with another health limitation and 56% less than mothers of children with no health limitation (Cidav et al., 2012).

> I had a lot of … financial worries which were tearing me away and working late at night to make up for hours I was missing because of [Child] … All my energy was focused in so many places but I was fighting for all these other services for him (Brookman-Frazee et al., 2012. p. 540).

For some, the stress from living with autism can be overwhelming. For those with few support systems, comorbid mental health or health conditions, and/or a child with severe behavior problems, the combination of caring for that child with autism and the challenge of handling the other illnesses can sometimes be lethal.

> I only knew her from online contact, but we had been part of the same chat group for years, and I feel like I lived every frustration and triumph with her and her family. When I received the call that she had attempted to take her own life, as well as her child's with autism, it chilled me to the core. What was as chilling were the emails from fellow members of the group, who write that they understood what she had done and had considered the same.

Perhaps the most heartbreaking situation for families who have a child on the severe end of the autism spectrum is the unintended threat their child can be to their own health and safety, as well as other family members. The mom described in the vignette above had been hospitalized twice previously after her 14-year-old daughter had injured her during meltdowns. In addition, other family members had been harmed as well. This child had parents who had advocated for her, sought resources, and asked for help, but there were few resources available to help at the time of the crises. This mom had documented her efforts to get relief: reaching out to schools, community respite, physicians, and other caregivers—only to be met with brick walls. Exhausted, she concluded that the best way to keep the rest of her family safe—who were under a daily barrage of aggression—was to accompany her and leave the family without the stress of living with autism. Unfortunately, this is a true story (Rosin, 2014) and it is repeated again and again across the USA. Parents reach the end of their ability to cope, unable to see hope or locate help (Rosa, 2015).

One of the most important challenges the autism community faces is how to respond to these families in effective and supportive ways. Access to community advocates, church communities, and disability support groups can provide respite and resources for caregivers who are exhausted and in need of support. In some autism communities, hotlines have been established to assist families who need immediate help to cope with the demands of 24-h care. Autism Speaks has put together resources to help members of the autism community—individuals with autism, families, friends, and caregivers—with accessing support and resources needed to manage a crisis situation. They offer tools that can help families learn about and access ongoing autism services, treatments, and interventions (Autism Speaks, n.d.).

19.4 Conclusion

Regardless of what the family may understand at the time of diagnosis, most families come to their "new normal" and become skilled caregivers and seasoned advocates for their child—and often for other families. With the right guidance, they quickly become the experts on what their child needs. In turn, they develop a community of others that share common challenges while negotiating their journeys with their child with autism. As an autism professional, I believe that one of the best resources for families who have a newly diagnosed child is a local family with a diagnosed child who are a few steps ahead in age and service advocacy.

> Our biggest help was meeting up with another family in our neighborhood who had a child on the spectrum a few years older than our son. They had been through the early years of Early Intervention and told us what to expect when he started school –even the teacher to request who had helped her son.

In our clinic, we often pair a newly diagnosed family with an appropriate family who has traveled a few steps ahead of them on the journey. We have frequently been told that this pairing was the most helpful resources they contacted. We have found that alumni parents are the honest brokers of effective support in each community, and are usually very willing to help newly diagnosed families find their way through the post-diagnosis maze.

Parents face many challenges in raising a child with special needs, and many of them could be reduced or alleviated with improved support for evidence-based treatment, access to well-trained respite providers, and sustainable networks of support that offer hope and support. Often, support groups are mostly comprised of families with young children, those newly diagnosed, and those seeking information. Once these families accomplish the stages of Seideman and Kleine's (1995) accommodation and operating processes, they turn their energy back toward their growing child and family. To aid in families' transitions to the *operating process* stage, community-financed or university-run and funded support systems are invaluable for those needing initial information as well as continual fellowship. This is particularly true for ongoing and emergency respite services (to help the family when everything is falling apart) and for families with older children who are more severely affected (as they become more physically mature but lack many communication and self-regulation skills).

Ideally, educational systems should support evidence-based treatment for young children with autism, as well as any other special diagnosis. Even though the law states that children are entitled to a free and appropriate education, most parents will report that their child does not receive the specific help he or she needs as intensively as research recommends. If the family turns to a private provider for the services that will give the child the best chance for independence, those resources are frequently rare and very costly. An intensive behavioral treatment program for a young child with autism is estimated to cost, on average, $50,000 per year (Special Learning Inc., n.d.).

Because of the advocacy of Autism Speaks and hundreds of parents and autism professionals, most states now mandate that autism be covered by insurance companies doing business in their area. Sadly, there are many loopholes that prevent that funding from reaching the families in need. For example, in West Virginia, the legislature requires insurance companies to cover $30,000 a year in behavioral treatment—but only for 3 years, when the amount drops to an annual maximum of $24,000 until the child reaches the age of 18. Coverage is available only if the insured person works for a company with more than 25 covered employees, and if the company does not have a self-funded policy (National Conference of State Legislatures, 2017). Add to that the copays required for intensive treatment, and the insurance option is no longer helpful for many families. Moreover, in some states, Medicaid is the only insurance to which families have access. Until recently, Medicaid did not offer a path to evidence-based treatment. In West Virginia, the 25th state to pass autism insurance legislation, fewer than 23% of families were eligible for insurance coverage.

One way a family can adapt to the diagnosis is by becoming an advocate for better services for all families with autism. As Shelley Hendrix (2018), president of Unlocking Autism and an autism mom, recently stated after an advocacy visit abroad … "Talked with autism families in Scotland, Ireland, Canada, & Germany in the last 5 days. Just random people in my travels. Everyone had the same story: wait lists, hard to access care, limited treatments, insurance coverage, government services … SO bloom where you are planted. Stop moving around if you don't have to. Get involved and make your city better! You have a purpose and so does the person you love with autism. Figure out what you can do, do it, get more people involved and get it done people."

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20 Sleep Concerns in Children with Autism Spectrum Disorder

Jenna Wallace, Jodi Lindsey, Victoria Lancaster, and Meg Stone-Heaberlin

Abstract

Children with Autism Spectrum Disorder often display disrupted sleep patterns that may include fewer hours of total sleep, difficulty falling asleep, middle of the night awakenings, and high activity levels when waking at inappropriate times of the night. These sleep disturbances negatively affect children's mood, activity levels, attention span, and safety. Family functioning is impaired by the associated effects on caregiver sleep and the stress associated with the possibility that the child might be harmed when engaging in unsupervised activities during the night. This chapter provides therapists with psychoeducation about incidence, characteristics, and etiology of sleep problems in this population. Information is also provided about behavioral and pharmacological treatments used to intervene with these challenging behaviors.

A baseline understanding of the "neurotypical" sleep-wake cycle is important when considering appropriate interventions for children on the autism spectrum. The typical development of sleep in children begins with a polyphasic pattern of sleep in newborns, with increasing periods of daytime wakefulness. In later infancy, daytime naps are further reduced with increased nighttime periods of sleep. Eventually daytime napping is discontinued, beginning around 3–4 years of age. Factors that help guide the sleep-wake cycle include light-dark cycle and routine events in a child's daily life that surround their feeding and social interaction.

Key biological and environmental factors guide sleep behaviors and contribute to the development of appropriate sleep patterns. In the literature, sleep problems are defined as "any sleep behavior that is disturbing to the child, the child's parents or family, or a combination of both" (Richdale, 1999). This is different than a *sleep disorder*, which implies an underlying physiologic cause. Common sleep problems found in children can be divided into issues with insomnia, parasomnia, and hypersomnia.

Insomnia may include problems related to settling difficulties, co-sleeping, night waking, early

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waking, difficulty with bedtime routines, and daytime sleepiness. *Parasomnia* refers to nightmares, night terrors, confusional arousals, sleepwalking, and nocturnal enuresis. *Hypersomnia*—the excessive need for sleep—can be influenced by coexisting insomnia, narcolepsy, and other environmental factors (Liu, Hubbard, Fabes, & Adam, 2006).

Sleep problems in children have a pervasive effect. They not only impact the quality of the individual's sleep, but also have a dramatic impact on their social environment. Children who are sleep deprived show elevated symptoms of daytime somnolence, hyperactivity, inattention, anxiety, impulsivity, aggression, poor adaptive skill development (Richdale, 1999), and altered developmental progression. For parents and caregivers, sleep deprivation can lead to poorer mental health and increased stress levels (Lopez-Wagner, Hoffman, Sweeney, Hodge, & Gilliam, 2008).

Sleep problems are the most common concurrent medical condition associated with Autism Spectrum Disorder (ASD). The incidence of common sleep problems in a neurotypically developing child age 0–6 years is 50% and 25% thereafter (Richdale & Schreck, 2009). The incidence of sleep problems in children with ASD ranges in the literature from 40% to 80% (Cortesi, Giannotti, Ivanenko, & Johnson, 2010). The most commonly reported sleep problems in children with ASD surround issues related to insomnia. These can include settling difficulties leading to a prolonged sleep latency (usually greater than 1 h), night waking with extended duration of wakefulness (compared to typically developing peers), and reduced total sleep with decreased sleep efficiency. Infants with ASD may also exhibit early morning awakenings and/or later sleep onset in the evening.

20.1 Specific Sleep Concerns in ASD

Sleep is an important key to development, and families of children with ASD are often desperate for education and assistance regarding their children's sleep difficulties. Schreck, Mulick, and Smith (2004) demonstrated an association between increased sleep problems and symptom severity in ASD, with individuals who slept fewer hours per night demonstrating increased overall ASD symptom scores and social skills deficits. The literature also suggests that children with ASD diagnoses who experienced developmental regressions demonstrate higher levels of delayed sleep latency, inefficient sleep, waking after sleep onset, and longer REM latency compared to those who had no history of regression (Giannotti, Cortesi, Cerquiglini, & Bernabei, 2006). Next, we will take an in-depth look into common sleep problems, including maintaining factors, appropriate clinical assessment of the problems, and general treatment options for children with ASD.

20.1.1 Insomnia

Insomnia is the disorder of initiating and maintaining sleep and can include delayed sleep onset, early morning waking, decreased total sleep time, bedtime resistance, and difficulties with sleep associations. For each individual, the nature of insomnia can be a combination of contributing biological and environmental factors. Poor or variable sleep hygiene practices are common environmental contributors to sleep difficulties for children with ASD. Sleep hygiene practices refer to the establishment of a bedtime routine, limiting electronic use and excessive stimulation prior to bedtime, creating a consistent sleeping environment, and modifying or eliminating co-sleeping environments, when appropriate. The primary treatment of insomnia should include improvement of sleep hygiene practices, caregiver education, and implementation of behavioral interventions that will be outlined further in this chapter.

Proposed physiologic causes of sleep dysregulation in ASD include abnormalities in the hypothalamic-pituitary-adrenal axis, alteration in melatonin and serotonin production, altered GABA-related gene signaling, dopaminergic transmission, iron metabolism, and polymorphisms in clock genes. Multiple studies have demonstrated abnormal melatonin regulation in individuals with ASD in comparison to controls, including elevated daytime levels of melatonin with lower nighttime levels (Cortesi et al., 2010). Other studies have demonstrated a correlation between lower levels of melatonin and increased symptomatology in ASD. Melke et al. (2008) discovered abnormal melatonin levels in unaffected parents of children with autism, further suggesting a genetic origin of this abnormality.

Additional biologic contributions may include elevated anxiety levels, hyperarousal, medication (either sedating or stimulating), and circadian rhythm sleep disorders. Medically, children with ASD experience increased incidence of conditions such as epilepsy and gastrointestinal disturbances (e.g., reflux), which can negatively impact sleep (Veatch, Maxwell-Horn, & Malow, 2015). When assessing insomnia in the clinical setting, providers are encouraged to utilize sleep journals/logs and standardized checklists (Malow, Byars, & Johnson, 2012), in addition to parent and child reports of symptoms. Thorough and specific reviews of environmental and social factors in the home are important in establishing the correct avenue for intervention. In a medical setting, evaluation may also include the use of polysomnography to identify any potential underlying sleep disorders and to quantify sleep quality (i.e., total sleep time, sleep efficiency, latency to sleep onset, and latency to REM sleep).

Medical treatment for insomnia in children with ASD commonly includes the use of melatonin (Wirojanan et al., 2009). In a retrospective study of over 100 children with ASD, Andersen and colleagues discovered an 85% improvement in sleep with minimal adverse effects with the use of melatonin (Andersen, Kaczmarska, McGrew, & Malow, 2008). Other double-blinded studies demonstrated similar results and low side effect profile between drug and placebo groups (Cortesi et al., 2010). Most studies demonstrate some effect with as low as 3 mg of melatonin and up to a maximum of 10 mg nightly. In one open-label controlled study, controlled-release melatonin was superior to behavioral therapy for children with ASD and included improvements in sleep onset latency, night-to-night changes in sleep schedule, decreased nightly waking, and increased sleep duration (Giannotti et al., 2006). Less frequently, prescription medications are used to assist with sleep onset and include Clonidine, Trazodone, SSRIs, and antipsychotics. Clonidine use in children with ASD has demonstrated improvements in sleep latency and nighttime awakenings in children ages 4–16 (Ming, Brimacombe, Chaaban, Zimmerman-Bier, & Wagner, 2008). Dosage used for the study was 0.05–0.1 mg nightly. Risperidone (Risperdal) showed improvement in sleep latency in one study but was not found to improve sleep duration (Aman et al., 2005), and there were high associated rates of adverse outcomes. There is some evidence of efficacy of Mirtazapine (Remeron) for improved sleep quality in children with ASD (Posey, Guenin, Swiezy, & McDougle, 2001) and Niaprazine (Nopron) has demonstrated improvements in sleep latency and night waking in children with ASD in Europe (Rossi, Posar, Parmeggiani, Pipitone, & D'Agata, 1999). Notably, there are no FDA-approved medications for the treatment of insomnia in children (Malow et al., 2012), and medication should be considered adjuvant treatment in conjunction with behavioral intervention, if necessary.

20.1.2 Parasomnia

Parasomnias are a category of sleep disorders that involve undesirable physical events or experiences that occur during the onset of sleep, during sleep, or during arousal from sleep (Fleetham & Fleming, 2014). Parasomnias can occur at any age but are most common in children. The International Classification of Sleep Disorders (ICSD) divides parasomnias into six categories. These can emerge either from non-REM (NREM) or REM sleep. Disorders of arousal from NREM sleep include sleepwalking, confusional arousals (e.g., slowed speech and acting in a confused manner while waking or after waking), and night terrors. Parasomnias usually associated with REM sleep include nightmares, sleep paralysis, and REM sleep behavior disorder (Fleetham & Fleming, 2014). Other parasomnias can include nocturnal enuresis, sleep-related groaning, and sleep-related hallucinations, and are categorized as due to associated medical conditions or drug or substance use (Mahowald, 2012). Although the factors contributing to parasomnias are complex and largely unknown, they commonly occur in children with ASD and are a focus of intervention in the clinical setting. Like insomnia, the clinical assessment of parasomnia also includes caregiver and child reports of symptoms, use of sleep journals and sleep logs, use of standardized checklists and interview schedules, and a review of environmental and social factors in the home. Medical evaluation may also include the use of polysomnography to identify any potential underlying sleep disorders as well as overnight EEG monitoring to identify potential seizure activity.

The treatment of parasomnias varies depending on the underlying cause of the disturbance. For example, scheduled nocturnal awakenings have demonstrated efficacy in decreasing night terrors (Vriend, Corkum, Moon, & Smith, 2011) and nocturnal enuresis (Evans, 2001). Nocturnal enuresis treatment may also include bedwetting alarms, addressing social stressors, and the use of Desmopressin. Although some providers use Imipramine (Tofranil) for the treatment of nocturnal enuresis, this medication can increase heart rate and blood pressure and should only be considered when other treatments have failed (Thiedke, 2003). Additionally, there is no clear evidence to support the use of chiropractic treatment, hypnotherapy, acupuncture, or fluid restriction as treatment for nocturnal enuresis (Evans, 2001). In clinical practice, providers should evaluate for and treat any underlying medical condition(s) that may cause nocturnal enuresis (e.g., obstructive sleep apnea, constipation, and epilepsy). When comorbid conditions exist, management of any underlying medical and/or psychiatric problems may be helpful in decreasing parasomnias (Fleetham & Fleming, 2014). Behavioral interventions should also be implemented in addition to any medical treatment when sleep disturbances are present.

20.1.3 Sleep Disordered Breathing

Current research suggests that obstructive sleep apnea (OSA) occurs in approximately 8% of children with ASD, compared to 1–4% prevalence in the general pediatric population (Harris, Malow, & Werkhaven, 2018). Children with OSA often demonstrate increased daytime somnolence, elevated anxiety levels, and behavioral concerns.

In our experience, the clinical assessment of OSA is often overlooked in the ASD population. We routinely screen for symptoms by inquiring about the presence of snoring, mouth breathing, observed pauses in breathing, nocturnal enuresis, frequent nighttime awakenings, and daytime somnolence, which can all be indicative of OSA. Risk factors that contribute to OSA in children with ASD include comorbid sleep problems, dysregulation of the sleep-wake cycle, hypotonia (decreased muscle tone), enlarged tonsils and adenoids, gastroesophageal reflux, body habitus (i.e., overweight or underweight), and use of sedating medications. The assessment of OSA should include polysomnography and an evaluation by a sleep disorder specialist and/or otolaryngologist.

Surgical intervention, such as tonsillectomy or adenoidectomy, is the most common treatment of OSA in children. The use of medications such as Fluticasone Furoate and Montelukast (Singulair) to treat upper airway inflammation is common. More rarely, continuous positive airway pressure (CPAP) machines are utilized to treat OSA in children. CPAP is most often used in adults with obstructive sleep apnea, but may be recommended for children with moderate to severe OSA, and/or when OSA persists despite surgical intervention (Ahn, 2010). CPAP adherence problems are likely for children with ASD, making it a difficult intervention for families to rely upon.

20.1.4 Sleep-Related Movement Disorders

Sleep-Related Movement Disorders (SRMD) are typically characterized by simple, often stereotyped, movements that disrupt sleep and include increased periodic limb movement of sleep (PLMS), Rhythmic Movement Disorder (RMD) and restless sleep (Veatch et al., 2015). Occurrence of these movement disorders is often reported in children with ASD, although more research is necessary to determine the exact prevalence within the ASD population.

Clinical assessment of SRMD includes polysomnography, lab work (including serum ferritin levels), and the review of concurrent use of medication. EEG monitoring may be an additional component of the clinical workup in order to rule out seizure activity, depending on the quality of movements described and/or observed.

The treatment of SRMD focuses on the underlying cause of the disturbance and may include iron supplementation for serum ferritin levels <50 ng/mL, the removal of offending medication if indicated, and the treatment of other comorbid sleep disorders, such as OSA. Dosman et al. (2007) demonstrated improvements in restless sleep in children with ASD between the ages of 2 and 5 with iron supplementation (6 mg elemental iron/kg per day). Rarely, use of medications such as Clonidine, Pregabalin, or Gabapentin may be implemented to treat SRMD.

20.2 Behavioral Treatment of Sleep Problems

Treatment strategies for sleep problems in children with ASD do not differ in theory from strategies that we use in typically developing children. Strategies are founded on basic behavioral principles of reinforcement and punishment and can assist families in experiencing significant relief from nighttime disturbances. However, there are additional factors that must be taken into consideration when treating sleep problems in children with ASD due to their higher incidence of comorbid psychiatric and/or medical conditions compared to typically developing children. Johnson et al. (2013) demonstrated the efficacy of a manualized behavioral parent training program for parents of young children with ASD in a small clinical trial. This study highlighted the importance of behavioral intervention that is flexibly implemented by providers who are able to assess progress and implement relevant strategies for families.

When considering appropriate intervention for sleep behaviors, a Functional Behavioral Assessment (FBA) is recommended. The FBA is an evidence-based, clinician-led process that is used to determine the antecedents and consequences that affect a challenging behavior (McLay, France, Blampied, Danna, & Hunter, 2017). Antecedent strategies involve the elimination or manipulation of environmental variables that may interfere with sleep onset or duration. Whereas, consequence-based strategies involve a parent or caregiver's response to behaviors that interfere with sleep onset or duration. Another helpful tool that is easily accessed by parents is a sleep diary, which is used to document information regarding the child's bedtime routine, time of sleep onset, frequency and duration of nighttime awakening(s), and time of morning awakening to document the child's total sleep time. Additional information may also include the child's quality of sleep (e.g., restless or sound) and any notes documenting external factors that may have disrupted sleep (e.g., noise, lights, pets, or stress). We recommend that data be gathered by the parent or caregiver across consecutive days for 1–2 weeks at the onset of treatment. This information is a useful component of the FBA and provides information that is often forgotten in the clinical setting (Abel, Kim, Kellerman, & Brodhead, 2017).

20.2.1 Antecedent-Based Strategies

The choice of intervention is driven by the variables precipitating and maintaining a challenging behavior—in this case, sleep problems. Oftentimes, the antecedents to sleep behaviors are hindrances in the establishment of appropriate sleep patterns. The initial approach to such disruptions is to improve the child's sleep hygiene, which includes the development of a healthy bedtime routine. Clinicians should assist families in evaluating their current routine and establishing a list of fixed activities that lead up to bedtime. For example, a family may start their routine with dinner, followed by play time, bath time, hygiene activities, reading a book, and then cuddles and bedtime. We frequently advise families of children with ASD that the *time* at which this sequence occurs is less important than the *consistency* of the routine. Caregivers are encouraged to add 1–2 calming activities to the bedtime routine in order to decrease stimulation and provide a pleasant sleep environment. Depending on the child's temperament, this may include a warm bath, reading a book, or listening to calming music.

Sleep hygiene strategies focus on increasing the power of the sleep stimulus (i.e., the bed) and should include limiting the amount of time the child spends on the bed during the day. Thus, play and other daytime activities (e.g., television watching) should occur in other areas of the bedroom or in other rooms in the home. This restriction assists caregivers in pairing the child's bed with relaxation and sleep, rather than boisterous activity.

Other common sleep hygiene strategies for children with ASD may include increasing activity levels during the day (e.g., at least 20–30 min of active exercise), avoidance of foods and drinks containing caffeine or excess sugar (e.g., soda, candy, juice) for at least 3 h before bedtime, minimizing light in the child's room, achieving a comfortable room temperature, eliminating excess noise, and turning off televisions and electronic devices at least 1 h before bed time to allow the child to wind down (Byars, Gray, Loring, & Malow, 2014; Weiss & Malow, 2012).

The improvement of sleep hygiene can be a powerful change for many families. However, when this alone is not enough, improving sleep hygiene should be combined with other antecedent and consequence-based strategies.

Visual strategies, such as a visual schedule, are often effective for children with ASD (Weiss & Malow, 2012). These strategies can provide additional support for the bedtime routine and help to increase predictability of events with the intention of improving compliance. The visual schedule serves as a prompt of the steps necessary to get ready for bed. For example, a bedtime visual schedule may include visual prompts for taking a bath, putting on pajamas, brushing teeth, reading a story in bed, a hug from the caregiver, and lights out for sleeping. This intervention is adapted to the child's level of understanding and cognitive flexibility. For example, a child who is unable to read may benefit from photos, while an older child may prefer written step-by-step directions. The parent or caregiver guides the child through the steps to teach the routine and rewards the child for following the routine through praise, a preferred token (established by the FBA), or pleasant but calming bedtime activities, such as an extra story or bedtime song.

Faded bedtime is another effective antecedent-based strategy used to target problems with sleep onset. It involves delaying bedtime until close to the natural sleep onset period (Abel et al., 2017). For example, if natural sleep onset is occurring around 11:00 PM, the caregiver may begin with a 10:45 PM bedtime. By doing so, this decreases the likelihood of tantrums and increases the association of a positive bedtime routine with natural sleep onset. The caregiver then slowly moves the bedtime forward until an appropriate bedtime is reached. Clinicians assist in this process by helping families to establish a schedule of fading and appropriate methods of reinforcing good sleep behaviors. Oftentimes, parents are overwhelmed by the thought of allowing their child to stay up late; however, when they realize that their "sleep battles" already result in late bedtimes, they see the benefits of this approach.

Sleep restriction involves allowing the child to sleep for about 90% of his or her natural sleep duration, then waking the child before he or she is fully rested. By doing so, the child is slightly more fatigued during the day and more likely to initiate or comply with bedtime the next night. Once the child's sleep routine improves, this can be faded out (Turner & Johnson, 2013). Similarly, daytime napping may be eliminated to increase fatigue at appropriate times of the evening. If a nap is needed, it should be less than 45 min and should not occur past 4:00 pm (Byars et al., 2014). Families may have a difficult time waking their child, due to the daytime irritability that will likely ensue. We recommend clinician support and parent education prior to attempting this strategy in order to ensure that parent fatigue does not interfere with the efficacy of treatment.

For children that wake during the middle of the night, a *nighttime awakening* procedure may be effective. This strategy requires the parent to wake the child approximately 15 min prior to the natural early wake time. When the child is awoken, the parent responds to the child as though the awakening was spontaneous or accidental. The parent or caregiver then offers brief comfort to the groggy child, followed by leaving the room. Like other strategies, awakenings are gradually faded to occur following longer intervals of sleep until they are eventually eliminated altogether (Turner & Johnson, 2013).

These antecedent-based strategies may be implemented in a stepwise fashion or in conjunction with one another, depending on the specific needs of the child and family. During the period of intervention, we recommend continuous gathering of data in order to modify the FBA and assist with the modification of strategies.

20.2.2 Consequence-Based Strategies

Consequence-based strategies focus on the modification of behavior based on salient reinforcement. In order for reinforcement strategies to be effective, the reinforcer needs to be both desirable for the child and feasible for the family. Therefore, clinicians and families should collaborate to conduct a *preference assessment*, which can help determine what types of items, snacks, and activities may serve as effective reinforcers.

Extinction involves withholding reinforcement following an undesired behavior when the child should be sleeping. For example, if a child cries before sleep onset or during a nighttime awakening, standard extinction procedure suggests that the caregiver ignore this behavior until the child falls back to sleep. When teaching extinction, it is critical that the caregiver or parent understands and knows how to respond to an extinction burst, which is an increase in the challenging behavior before a decrease occurs. Should the caregiver offer comfort or attention during an extinction burst, it is likely to increase the challenging behavior in the future (Turner & Johnson, 2013). Although this method is commonly used in behavioral practices, it is often difficult for caregivers to abide by.

In this case, *graduated extinction* may be more beneficial. Graduated extinction involves the parent or caregiver entering the room on a set schedule to check on the child (e.g., every 20 min until the child is asleep). This checking schedule should not be contingent on crying or another challenging bedtime behavior, in order to avoid the reinforcement of unhelpful sleep behaviors. The set interval is then gradually increased over time (e.g., from 20 to 30 min), until it is faded out and the child is able to fall asleep without check-ins from the parent (Turner & Johnson, 2013). Alternatively, the parent or caregiver may wait a set amount of time before entering the room once the child begins to cry (e.g., 5 min). The parent then enters the room for a brief interaction (i.e., states “It’s time to go to sleep”) and then leaves the room again. This set time is slowly increased until the parent is no longer entering the room during sleep onset (Abel et al., 2017).

For many children who experience difficulty remaining in bed throughout the night or for those who rise too early, the use of *positive reinforcement* is effective. Notably, this strategy is most effective with children with ASD who have sufficient language and cognitive abilities to delay gratification until the morning time. Specifically, an agreement is made that the child can only get out of bed a certain number of times (i.e., two times) to “check in” with parents. If they abide by the established bedtime rule, they receive a salient reinforcer in the morning. For example, if a child normally awakes and comes to the caregiver’s room an average of three times per night, the reinforcer is provided if the child only comes to the caregiver’s room two times per night. This is eventually faded until the child receives consistent reinforcement for remaining in the bedroom all night.

We recommend the use of a *bedtime pass* or *token strategy* that can assist children with organization and planning. In this case, the child would trade in the bedtime pass (e.g., a card or object) for a desired response (e.g., a hug from parent, glass of water, 5 min parent visit). The child is taught that he or she can only use the pass one time per night. Once used, it is kept by the parent and returned the following day with a contingent reinforcer. If the pass is not used, it can be traded for an additional morning reinforcer (Friman et al., 1999). This behavior may be shaped, beginning with multiple bedtime passes and the agreement that the child can receive the reinforcer if there are no additional attempts to get out of bed when the bedtime pass(es) have been exchanged for parent check-ins.

Alternatively, with a child that can tell time, an agreement can be made that the child cannot get out of bed until after a certain time (such as 5:00 AM) to receive the reinforcer. If the child waits to leave his or her room after this time, the reinforcement is provided. Similar to other procedures, the reinforced time is increased over time to a more desirable or appropriate hour (e.g., 5:00 AM to 5:30 AM, and then to 6:00 AM). For younger children who are adherent to such routines, parents may use a visual cue, such as a nightlight or stoplight that is attached to a timer and prompts the child when he/she can leave the bed in the morning.

Like antecedent-based strategies, consequence-based strategies may be implemented stepwise and should be regularly monitored for efficacy and progress.

20.3 Other Clinical Sleep Concerns

Many parents of children with ASD report concerns related to their child and family's safety during the night. Perhaps their child is prone to unlocking doors, escaping from rooms, wandering the house at night, or seeking stimulation while family members sleep. Supervision at night is difficult to maintain, given the parents' biological needs for sleep and other factors (e.g., parent's location in the home, younger siblings who require nighttime assistance). We often recommend magnetic alarms that can be placed on door and window frames (easily purchased online or in superstores), bells on door handles, and audible indications that the child has left the bedroom. We also encourage caregivers to create bedroom environments that are safe for their children and to stow away dangerous chemicals, weapons, and other environmental hazards in the home.

For children prone to eating at night, we recommend similar alarms for the refrigerator or pantry, as well as prevention efforts (e.g., by offering a bedtime snack and incorporating meals into picture schedules). We strongly discourage locking children in their rooms and often broach the subject as anticipatory guidance for families who have children with ASD. Rather, we encourage parents to work with behavioral specialists to assist in training children to stay in their bedrooms at night, even when sleep is difficult for them to achieve or maintain.

20.4 Emotional Impact on Caregivers

While much attention is given to the sleep problems that children with ASD experience, less is focused on the impact of these problems on parents and caregivers. Lopez-Wagner et al. (2008) evaluated parent and caregiver reports of sleep quality and child sleep habits for children with ASD and typically developing children. As expected, parents of children with ASD reported an increase in personal sleep problems as well as elevated child sleep problems when compared to parents of typically developing children. Sleep deprivation in primary caregivers is often compounded by the presence of additional daytime stressors and can lead to significant emotional distress when left untreated. It is also important to provide education for primary caregivers about how these sleep problems can negatively affect their own well-being in addition to the well-being of their affected child(ren).

We recommend routinely assessing children with ASD and their family members for lack of sleep, elevated emotional concerns, and/or other significant stressors in order to guide them toward appropriate professionals and services. It should be noted that poor quality or disrupted sleep is often associated with exacerbation of the main impairments seen in children with ASD. This includes an increase in symptoms such as hypersensitivity to environmental stimuli, restrictive and repetitive thoughts and/or behaviors, and difficulty understanding social/communication cues (Veatch et al., 2015).

20.5 Summary

Sleep problems are commonly reported among children with ASD, and research has shown that these issues are often due to and compounded by a number of complex and overlapping factors. Children with ASD should be routinely assessed for sleep-related concerns, given the negative impact these sleep problems have on behavior, development, and overall health. Due to the challenging nature of identifying and treating sleep problems in children with ASD, it is important to approach the assessment and management of each individual's symptoms from a multidisciplinary angle. Treatment should always include behavioral strategies that promote healthy sleep patterns and habits, and patients should also be screened for symptoms of underlying medical conditions that may be contributing to their sleep disturbances. Medical conditions such as obstructive sleep apnea, epilepsy, and gastrointestinal reflux are highly associated with sleep-related problems, and these conditions are more common among patients with ASD. When indicated, referrals should be made to appropriate specialists for treatment of any such comorbidities.

Although more research is necessary, physiological causes of sleep dysregulation in children with ASD are well documented in the literature, most notably in regard to abnormal melatonin. Children with ASD who receive melatonin supplementation in addition to sleep-related behavioral interventions have demonstrated marked improvements in sleep onset latency, decreased nighttime waking, and increased sleep duration with little to no adverse effects reported. Additionally, supplementation with ferrous sulfate may be indicated in children with low serum ferritin levels who demonstrate symptoms of restless sleep. Less commonly, prescription medications including Clonidine, Trazodone, SSRIs, and/or antipsychotics are used for a variety of variable and often confounding symptoms seen in children with ASD. However, it is important to note that there are no FDA-approved medications to treat insomnia in children. Clinicians who interact with children who have ASD should be knowledgeable regarding behavioral intervention strategies, regardless of any adjunctive treatment with supplementation and/or other medication(s).

With the help of ongoing research, there has been significant progress in understanding the mechanisms and biology behind sleep problems in children with ASD; however, the treatment of these problems remains incredibly challenging. Multiple environmental, physiologic, and/or genetic factors contribute to sleep problems within this population, and further research is necessary to determine how these factors contribute to the symptoms and disease processes in order to better guide treatment recommendations.

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Autism Spectrum Disorder and Attachment: Is an Attachment Perspective Relevant in Early Interventions with Children on the Autism Spectrum?

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Abstract

The ability to establish an attachment bond with a caregiver, an evolutionary process that keeps a child safe and nurtured, is a phenomenon that occurs naturally in all young children. Historically, however, children with autism spectrum disorder (ASD) were thought to be unable to form such bonds (American Psychiatric Association, 1980). This chapter describes the current research evidence on ASD and infant–caregiver attachment relationships. The chapter begins by providing an overview of attachment theory and assessment methods. It then reviews the history of thought around ASD and infant–caregiver attachment relationships, discussing the literature on the development of secure and insecure attachment patterns, the positive outcomes associated with secure attachment patterns, and factors influencing attachment formation in children with ASD. The chapter also explores the value of Parent-Child Interaction Therapy (PCIT), an intervention with theoretical underpinnings in attachment theory, as a treatment option for children with ASD and behavioral difficulties.

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21.1 Attachment and Measurement: What Is Attachment and How Is It Measured?

21.1.1 Brief History of Infant-Caregiver Attachment

Attachment is a term used to describe the bond that humans have with significant people in their lives (Berk, 2009). Attachment relationships begin to form during early infancy as infants develop connections to their primary caregivers (Cassidy, 2016). Early theories regarding attachment formation proposed that the infant–caregiver bond arose because the infant's needs were being satisfied by the caregiver. The psychoanalytic perspective suggested that infant feeding and satisfaction of the hunger drive led to the development of the infant–caregiver bond (Berk, 2009; Cassidy, 2016). Feeding was also central to the behaviorist perspective which argued that the infant–caregiver bond was a product of learning (Cassidy, 2016). That is, the infant was thought to form an attachment to the caregiver because he or she learned that the caregiver would meet his or her needs (Cassidy, 2016). The primary need during infancy is feeding, thus caregivers would be paired with the infant's hunger needs being met, and the attachment bond would be formed (Berk, 2009).

John Bowlby was the first to observe that the human infant forms an attachment to their primary caregiver, even when the caregiver was not meeting his or her physical needs (Bowlby, 1969). He also noticed that infants became distressed when separated from their primary caregiver and that this distress was present even when the infant was left in the care of another individual who was capable of satisfying their physical needs (Bowlby, 1969; Cassidy, 2016). These observations, together with his observations of troubled youth and their relationships with their mothers, led Bowlby to formulate the Ethological Theory of Attachment (Bowlby, 1969), often referred to as Attachment Theory. Attachment Theory proposes that attachment behaviors—behaviors that infants engage in to gain and sustain closeness to their attachment figures (e.g., crying, smiling, making vocalizations)—are the result of human evolution rather than learning (Bowlby, 1969; Cassidy, 2016). Bowlby argued that attachment behaviors are fundamental to human survival as they increase the likelihood of an infant gaining proximity to his or her caregiver, which, in turn, increases the chances of the infant's needs being met (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1969; Cassidy, 2016).

21.2 Measuring Infant Attachment

During the time that Bowlby was formulating his Attachment Theory, Mary Slater Ainsworth, a developmental psychologist from Canada, worked in Bowlby's research team. She later undertook naturalistic observations of infants and mothers in Uganda and Baltimore during the 1950s and 1960s (Ainsworth, 1967; Ainsworth et al., 1978). In this time, she noticed that not all infants displayed the same pattern of behavior when separated from their mothers. Based on these observations, Ainsworth developed the Strange Situation Procedure (SSP), a laboratory procedure designed to assess attachment behaviors in infants (Ainsworth et al., 1978).

21.2.1 Strange Situation Procedure

The SSP is comprised of eight episodes in which a 12- to 18-month-old infant is gradually exposed to situations of increasing stress (Ainsworth et al., 1978). The procedure was designed to intensify an infant's attachment behaviors by exposing him or her to situations that evoke distress but also resemble real-life situations (e.g., being separated from the primary caregiver for a short period of time; Ainsworth et al., 1978).

21.2.1.1 Attachment Categories

Based on infant responses during the SSP, Ainsworth and colleagues identified three primary categories of attachment behavior: (1)

insecure-avoidant (category A), (2) secure (category B), and (3) insecure-ambivalent/resistant (category C). Infants with a secure attachment pattern displayed distress (e.g., crying, reduced exploration of their environment) when separated from their caregiver (Ainsworth, 1979). Upon being reunited with their caregiver after a separation, these infants actively sought interaction/contact with the caregiver (e.g., moving towards caregiver, smiling at caregiver). Once interaction with the caregiver was obtained, the infant's distress reduced quickly and exploration of the environment was resumed (Ainsworth, 1979). In contrast, infants with an insecure-avoidant attachment pattern did not display outward distress when separated from their caregiver and often actively avoided the caregiver upon reunion (e.g., turning away from caregiver, moving past caregiver; Ainsworth, 1979; Ainsworth et al., 1978). Finally, infants with an insecure-ambivalent/resistant attachment pattern displayed distress upon separation from their caregiver, but when reunited with their caregiver, simultaneously sought contact and tried to resist interacting with the caregiver (Ainsworth, 1979; Rutgers, Bakermans-Kranenburg, Ijzendoorn, & Berckelaer-Onnes, 2004).

21.2.1.2 Disorganized/Disoriented Attachment (Category D)

In 1990, Main and Solomon observed that the attachment pattern of a small group of children could not be classified under any of the attachment categories outlined by Ainsworth and her team (Ainsworth et al., 1978; Main & Solomon, 1990). They consequently proposed a fourth attachment category, disorganized/disoriented attachment (category D), which encompassed the behaviors displayed by this small group of children. Infants with a disorganized/disoriented attachment pattern were described as displaying contradictory attachment behaviors towards their caregiver during separation and reunion episodes (e.g., incomplete or undirected behaviors; confusion, helplessness, and depressive behaviors; fearfulness of caregiver; Main & Solomon, 1990). As a result of Main and Solomon's (1990) contribution, infants can be classified as securely attached or insecurely attached (insecure-avoidant or insecure-ambivalent or resistant), which are both considered organized attachment patterns, or as having a disorganized attachment pattern. Approximately 60% of typically developing children fall within the secure attachment category, 15% fall within the insecure-avoidant category, 10% percent fall within the insecure-ambivalent category, and 15% display a disorganized attachment pattern (Berk, 2009).

21.2.1.3 Psychometrics

The reliability and validity of the SSP have been well established. Ainsworth et al. (1978) examined interrater reliability of the SSP by using two independent scorers to assess infant behaviors directed towards mothers during the SSP in 14 mother–child dyads. Interrater reliability was found to be 0.93 for contact-seeking behaviors, 0.97 for contact-maintaining behaviors, 0.96 for resistance behaviors, 0.93 for avoidance behaviors, and 0.94 for search behaviors (Ainsworth et al., 1978). Interrater reliability was further assessed by two independent scorers who observed 23 mother–child dyads interacting during the SSP and then coded for attachment behaviors. The overall correlation between the two independent scorers was found to be 0.85 (Ainsworth et al., 1978). Furthermore, SSP test-retest reliability studies have found attachment classifications to have high stability when there is a 6-month period between assessments (Solomon & George, 1999). Main, Kaplan, and Cassidy (1985), for example, looked at attachment classifications in a sample of 40 parent–child dyads at 18 months of age and then again when the infants were 6 years old. They found that the children's attachment patterns remained relatively stable between assessments (r = 0.76). These findings are consistent with longitudinal research showing that attachment patterns tend to remain stable across the life span (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000). Waters et al. (2000) assessed the attachment patterns of a group of 60 infants at 12 months of age using the SSP and then reassessed attachment patterns in 50 of the original participants 20 years later using the Adult Attachment Interview (George, Kaplan,

& Main, 1996). Their results revealed that 72% of participants received the same attachment classification in adulthood as they had during infancy (κ = 0.46). The study also showed that negative life events contributed to changes in attachment classifications with 44% of participants who had experienced negative life events changing attachment classifications from secure to insecure from infancy to adulthood.

In regard to the validity of the SSP, Ainsworth and colleagues validated the procedure against narrative records of observations that Ainsworth had made of 23 babies during their first year of life (Ainsworth et al., 1978; Solomon & George, 1999). Ainsworth made monthly visits over the course of a year to the infant's homes and wrote detailed records of the infant's behaviors during this time (Ainsworth et al., 1978; Solomon & George, 1999). These detailed records were then referred to during the development of the SSP to help construct attachment categories (Ainsworth et al., 1978). More recently, the SSP has been found to have good convergent validity with the Attachment Q-Sort (an alternative measure of infant attachment; r = 0.31; Waters & Deane, 1985). Support for the predictive validity of the SSP has also been provided by research examining factors that affect attachment formation. In a meta-analysis of 66 studies, for example, De Wolff and Ijzendoorn (1997) examined the association between caregiver sensitivity (ability to see things from an infant's point of view and then respond to the infant's needs/cues quickly, appropriately, and consistently) and infant attachment classification. These authors found a significant positive association between infant attachment patterns, as assessed by the SSP, and caregiver sensitivity ($r = 0.24$). In addition to caregiver sensitivity, culture (Rothbaum, Weisz, Pott, Miyake, & Morelli, 2000), caregiver attachment representations (Seskin et al., 2010), and infant characteristics (Beurkens, Hobson, & Hobson, 2013) have all been found to have an impact on infant attachment classifications.

21.2.1.4 Adaptations

In recent years, the SSP has been adapted for use with preschool children aged 24–60 months (Hoffman, Marvin, Cooper, & Powell, 2006). The adapted version differs slightly from the original SSP in that modifications were made to fit with the more advanced locomotor, socio-cognitive, communication, and emotional-regulation skills of older children (Hoffman et al., 2006). While the preschool-SSP has its own coding system, the classification categories remain the same as those originally outlined by Ainsworth et al. (1978) and Main and Solomon (1990).

21.2.2 Attachment Q-Sort

Before the adaption of the SSP for preschool-aged children was developed, a major criticism of the SSP was that it could only be used with a limited age range. This limitation prompted Waters and Deane (1985) to develop the Attachment Q-Sort as an alternative measure for assessing attachment in infants. The Attachment Q-Sort involves a parent or trained observer sorting a large number of cards (75, 90, or 100) which describe behavioral characteristics of children aged 12–48 months (e.g., "child greets mother with a big smile when she enters the room"; Berk, 2009; Van Ijzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). When assessing attachment behavior using the Attachment Q-Sort, infants are observed in a naturalistic environment for 2–3 h by their parent or a trained observer who is then required to sort the Attachment Q-Sort cards into piles that range from "most characteristic" to "least characteristic" of the infant (Waters & Deane, 1985, p. 7). The amount of piles and number of cards that can be placed into each pile is fixed (Van Ijzendoorn et al., 2004). The piles are then analyzed and a score ranging from "high security" to "low security" is provided (Van Ijzendoorn et al., 2004; Waters & Deane, 1985).

When compared to the SSP, the Attachment Q-Sort has several strengths: it can measure a wider array of attachment-related behaviors than the SSP, and these behaviors can be observed within the infant's natural environment (Berk, 2009; Waters & Deane, 1985). The Attachment Q-Sort, however, requires significantly more time to complete than the SSP; it does not differentiate between the different types of insecure attachments, and has not been validated for assessment of attachment disorganization (Ainsworth et al., 1978; Berk, 2009; Van Ijzendoorn et al., 2004; Waters & Deane, 1985). As a result, the SSP continues to be considered the "gold standard" measure of infant attachment and is the procedure that is most often utilized by research studies assessing infant attachment patterns (Teague, Gray, Tonge, & Newman, 2017).

21.2.2.1 Psychometrics

Like the SSP, the Attachment Q-Sort has been found to have satisfactory psychometric properties. A meta-analysis of 139 studies contacted by Van Ijzendoorn et al. (2004), which assessed the validity of the Attachment Q-Sort, found the measure to have good convergent validity with the SSP (r = 0.31; the association increased to 0.42 when more than 3 h of observations were undertaken), satisfactory discriminant validity for the trained observer version (attachment classification and temperamental reactivity were compared, r = 0.29, with more attachment security being associated with less temporal reactivity), and strong predictive validity for the trained observer version (attachment security was compared with maternal sensitivity and socioemotional development, r = 0.39 and 0.22, respectively; longer durations of observations resulted in larger effect sizes). Furthermore, the Attachment Q-Sort has been shown to have good reliability and cultural validity. Cassibba, Van Ijzendoorn, and D'Odorico (2000), for example, assessed the reliability and validity of the Attachment Q-Sort in an Italian sample of 86 children, aged 14–36 months, and their mothers/caregivers. Each child was observed at home by his/her mother/caregiver and an independent observer. To determine inter-rater reliability, some of the children were observed by a second independent observer. The measure was found to have good interrater reliability (r = 0.88 for mother–child dyads and r = 0.70 for caregiver–child dyads). To assess test-retest reliability, mothers/caregivers were asked to complete the questionnaire format of the Attachment Q-Sort 15–20 days after the initial observation. The measure was found to have satisfactory test-retest reliability (r = 0.82 for mother–child dyads and 0.83 for caregiver–child dyads).

21.2.3 Measuring Attachment Beyond Infancy

The SSP and Attachment Q-Sort have only been validated for use with children younger than 60 months of age and so alternative measures are required for the assessment of attachment in middle/late childhood, adolescence, and adulthood. This section will outline two commonly used measures for the assessment of attachment in middle/late childhood, adolescents, and adulthood: the Security Scale (childhood, adolescence) and the Adult Attachment Interview (adulthood).

21.2.3.1 The Security Scale

The Security Scale was developed by Kerns, Klepac, and Cole (1996). The 15-item scale measures a child's/adolescent's perception of his/her relationship with his/her parent. Each of the 15 questions is rated on a four-point scale by the child/adolescent with higher scores indicating more attachment security (Kerns et al., 1996). The item scores are then averaged to provide a security score (Kerns et al., 1996). The scale has been shown to have satisfactory convergent validity (when compared to the Network and Relationship Inventory, attachment security scores were correlated with child ratings of companionship, $r = 0.65$; intimacy, $r = 0.54$; affection, r = 0.46; conflict, r = −0.35; and antagonism, $r = -0.26$), sufficient discriminant validity (when compared to athletic competence, r = 0.19), and good test-retest reliability (r = 0.75; Kerns et al., 1996). There are several other measures that may be used for assessing attachment patterns in older children, such as the Doll Story Completion Task and the Attachment Interview for Childhood and Adolescence. For further information regarding these assessment tools and more, refer to Kerns, Schlegelmilch, Morgan, and Abraham (2005).

21.2.3.2 Adult Attachment Interview

The Adult Attachment Interview, developed by George et al. (1996), is the most popular measure for assessing attachment state-of-mind in adults. The Adult Attachment Interview is a structured, semi-clinical interview which focuses on having adults recall early attachment experiences and the effects of these experiences (e.g., whether they felt closer to one parent and why; whether parents had been threatening to them in any way; George et al., 1996). The Adult Attachment Interview is comprised of 15 ordered questions. Participant answers to the questions are transcribed verbatim, and the transcripts are coded to determine which one of the three adult attachment categories they fall into (autonomous/secure, dismissing, or unresolved/disorganized; Van Ijzendoorn, 1995). The Adult Attachment Interview has been shown to have good test-retest reliability ($\kappa = 0.63$; Bakermans-Kranenburg & Van Ijzendoorn, 1993), interrater reliability ($K = 0.82–1.0$; Sagi et al., 1994), and discriminant validity (when compared to autobiographical memory, $F = 0.33$; when compared to verbal intelligence, $F = 0.05$; Bakermans-Kranenburg & Van Ijzendoorn, 1993).

21.3 Autism Spectrum Disorder and Attachment Formation: Can Children with Autism Spectrum Disorder Form Secure Attachments?

ASD is a neurodevelopmental disorder which affects approximately 1% of the population (American Psychiatric Association, 2013). Interestingly, ASD was originally believed to be a rare condition that resulted in one's failure to develop normal attachment behaviors (American Psychiatric Association, 2013). The following section will provide a brief history of ASD and infant–caregiver attachment as well as evidence supporting the notion that infants with ASD can form secure attachment relationships with their caregivers.

Kanner (1943) was the first to outline the characteristic features of ASD based on his observation of 11 children (eight boys and three girls) aged between 2 years and 4 months to 6 years and 3 months who displayed unique behaviors. Kanner noted that these behavioral characteristics formed a rare syndrome now known as ASD. In his 1943 and 1949 papers, Kanner also described the observed characteristics of the children's parents (e.g., "highly intelligent families" yet "very few warm-hearted fathers and mothers"; Kanner, 1943, p. 250) and suggested that the lack of warmth, closeness, and attachment between parents and children contributed to the etiology of the disorder. As a result, the "refrigerator mother" theory of ASD etiology arose (Cohmer, 2014) in which development of ASD was attributed to lack of parental warmth. This theory was not supported by the American Psychiatric Association who, in the *Diagnostic and Statistical Manual of Mental Disorders—Third Edition* (DSM-III), rejected the view that familial interpersonal factors contributed to the syndrome (American Psychiatric Association, 1980). Rather, the DSM-III outlined ASD as a disorder that resulted in one's failure to develop normal attachment behavior, thus attributing the lack of closeness between child and caregiver as a core symptom, rather than a contributing factor to the etiology of the disorder (American Psychiatric Association, 1980; Rutgers et al., 2004).

Since the publication of the DSM-III, numerous studies have provided evidence to contradict the view that children with ASD cannot form attachment bonds with their caregivers. Over the past 17 years, there have been three reviews that have examined the literature on attachment and children with ASD (Kahane & El-Tahir, 2015; Rutgers et al., 2004; Teague et al., 2017). The results of these reviews are outlined below.

21.3.1 2004 Review

The first review was conducted by Rutgers et al. (2004) who identified 16 studies on ASD and attachment. All 16 studies (total $n = 287$) were included in a narrative review. Moreover, ten of those studies, which provided data that allowed for the calculation of effect sizes, were further analyzed using a meta-analysis approach. The chronological age of participants ranged from 40 to 69 months while the mental age ranged from 16.1 to 55 months. All ten studies included in the meta-analysis assessed attachment using the SSP, nine of which used modified versions of the SSP involving shortened or reduced separations. The meta-analysis concluded that 53% of children with ASD (total $n = 72$) displayed secure attachments towards their caregiver. Interestingly, Rutgers et al. (2004) found that the expression of attachment behaviors in children with ASD was different to that of non-ASD children, with children with ASD showing less contact-seeking and contact-maintaining behaviors. Rutgers et al. (2004) also noted that not all studies defined ASD in the same way—with some studies using a strict definition of ASD and others mixing children with ASD and pervasive developmental disorder—not otherwise specified (PDD-NOS) into the one group. Rutgers et al. (2004) found that studies that utilized the stricter definition of ASD reported larger observed effect sizes of ASD on infant–caregiver attachment than studies that mixed children with ASD and PDD-NOS, with a larger percentage of children with strictly defined ASD displaying insecure attachment patterns than children in mixed ASD and PDD-NOS specified groups.

Rutgers et al. also found that intellectual development had an impact on attachment security with children with greater intellectual disability displaying less attachment security. Interestingly, in studies examining children with ASD and a higher mental ability, the investigators were unable to find a significant difference in attachment security between children with and without ASD. These findings suggest that it is intellectual disability (which has been shown to occur more frequently in children with ASD) rather than ASD symptomatology that contributes to the lower percentage of attachment security often observed in children with ASD. The debate regarding whether ASD severity or intellectual disability contribute more to attachment insecurity will be discussed in further detail in the section on "Factors Influencing the Attachment Bond in Children with ASD."

21.3.2 2015 Review

Kahane and El-Tahir (2015) conducted a second review on attachment and ASD on ten studies. The review included studies published after 2004, studies not included in Rutgers et al.'s (2004) review, research which assessed both ASD and attachment using observational measures, and designs which had a sample comprised of toddlers and/or preschool-aged children. Nine of the studies were published after 2004 and one was published before 2004. All studies used the standardized version of the SSP to assess attachment. ASD diagnoses were confirmed using a variety of measures including the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2012; Lord, Rutter, DiLavore, & Risi, 2001) and the Autism Diagnostic Interview Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994). Study results showed that 40–48% of children with ASD and intellectual disability and 60% of children with ASD without intellectual disability displayed secure attachment patterns, providing support for Rutgers et al.'s (2004) conclusions that children with ASD can form secure attachments with their caregivers; moreover, these findings showed that intellectual disability may have a significant impact on attachment formation in children with ASD. Like Rutgers et al., Kahane and El-Tahir (2015) also noted that attachment behaviors in children with ASD differed from attachment behaviors observed in non-ASD children; however, they did not provide a description of the specific behavioral differences.

21.3.2.1 2017 Review

The most recent review was completed by Teague et al. (2017). To be included in this review, articles had to be published in a peer-reviewed journal; have at least 70% of their sample aged 12 years or younger; include children diagnosed with ASD, PDD-NOS, autistic disorder, or Asperger syndrome; and report statistical findings on child–caregiver attachment. Teague et al.

(2017) identified 40 articles, which included articles reviewed by Rutgers et al. (2004) and Kahane and El-Tahir (2015), suitable for the review ($\bar{x}_n = 83.05$; $\bar{x}_{\text{Age}} = 63\,\text{months}$). Twenty-two articles utilized the SSP to assess attachment behaviors while the remainder used a variety of assessments including the Security Scale and Attachment Q-Sort. Teague et al. (2017) found that 47% of children with ASD were classified with a secure attachment pattern when assessed using the SSP (total $n = 186$). In line with the two previous reviews, Teague et al. (2017) also found that the quality of attachment behaviors observed in securely attached children with ASD differed from those of securely attached non-ASD children (Teague et al., 2017). Specifically, when compared to securely attached non-ASD children, securely attached children with ASD sought less contact, resisted contact from their caregivers more often, engaged in less prosocial responses to caregivers, and displayed deficits in social interactions (Teague et al., 2017). Teague et al. (2017) also found that greater ASD symptom severity and intellectual disability resulted in lower rates of attachment security.

21.3.2.2 Conclusions

Taken together, results from these three reviews indicate that between 40 and 60% of children with ASD develop a secure attachment relationship with their caregiver. This stands in contrast with the earlier view of ASD as a disorder that resulted in the inability to form secure attachments.

Evidence from these three reviews also suggests, however, that the rates of attachment security among children with ASD are lower than those seen in non-ASD children (approximately 60%; Berk, 2009). There are a number of potential explanations for this finding that can be considered. First, it is possible that children with ASD are indeed less likely to form secure attachments compared to their non-ASD counterparts. As will be discussed in the next section of this chapter, there are a number of factors that can influence the formation of secure attachment patterns in young children. Of particular relevance to children with ASD is the fact that secure infant–caregiver attachment relationships develop in the context of a dynamic, transactional interplay between the caregiver and child, with positive and negative feedback loops influencing behaviors of both parties. The behaviors and social impairments displayed by children with ASD may present particular challenges for some caregivers (depending on their own parenting and attachment history and current social context) and this may lead to reduced levels of sensitive caregiving (Howe, 2006). Second, given the evidence from all three reviews that children with ASD display different types of attachment behaviors compared to non-ASD children, it may be that current attachment measurement tools do not allow for the unique secure attachment behaviors displayed by children with ASD. Third, many of the studies included in these reviews used modified versions of the SSP in order to cater to the needs of their ASD samples. The majority of studies, for example, used comorbid intellectual disability and/or the challenging behaviors that children with ASD often present with as justification for the utilization of modified versions of measures. The modifications made were often reasonable (e.g., not leaving a child with a history of self-injurious behaviors alone in a room during the SSP); however, it is possible that these modifications may have impacted the validity of the ratings. Future research should focus on testing the validity of modified versions of established attachment tools to determine whether they can be reliably used to assess attachment behaviors in children with ASD.

In sum, the balance of evidence suggests that children with ASD can certainly form secure attachment relationships with their caregivers, and that many (40–60%) indeed do. To better understand the reasons for the slightly lower rates of attachment security in ASD samples compared to non-ASD samples, future research should assess qualitative differences between the attachment behaviors displayed by children with and children without ASD and explore relations between ASD behaviors, caregiver sensitivity, and the development of attachment patterns in children with ASD. Better understanding of the impact of modification of standardized attachment protocols will also be an important contribution to understanding in this area.

21.4 Factors Influencing Infant-Caregiver Attachment in Children with Autism Spectrum Disorder

Factors influencing the development of a secure or insecure infant–caregiver attachment bond are important to consider, especially when developing interventions targeted at improving the infant–caregiver relationship. Given that parental factors are often easier to target through interventions than child factors, there has been a large focus in the literature on parental factors that impact infant–caregiver attachment. Nonetheless, there have also been a number of articles exploring the impact of child factors on the infant–caregiver relationship. Child factors in children with ASD have been of particular interest to researchers because as alluded to above, parenting a child with ASD presents with its own unique challenges; these challenges may have a significant impact on parental well-being, caregiving capacity, and, in turn, the infant–caregiver bond (Howe, 2006). This section will explore both caregiver and child factors that have been shown to be associated with attachment security in children with ASD and argue that it is the interplay of child and caregiver factors, rather than any individual factor, that has the greatest impact on the child–caregiver attachment formation.

21.4.1 Caregiver Factors

Caregiver factors that have been shown to be associated with attachment security in children with ASD include caregiver insightfulness/sensitivity (Capps, Sigman, & Mundy, 1994; Oppenheim, Koren-Karie, Dolev, & Yirmiya, 2012; Van Ijzendoorn et al., 2007), caregiver attachment style/attachment representations (Goodman & Glenwick, 2012; Seskin et al., 2010), and culture (Bauminger, Solomon, & Rogers, 2010a; Sotgiu et al., 2011).

21.4.1.1 Caregiver Insightfulness and Sensitivity

Caregiver insightfulness refers to a caregiver’s ability to see things from a child’s point of view and is believed to be basis for caregiver sensitivity (Dolev, Oppenheim, Koren-Karie, & Yirmiya, 2014). Seeing things from a child’s perspective is posited as playing an important role in attachment formation because it allows the caregiver to respond to the child’s needs appropriately (caregiver sensitivity). Having needs met reduces the child’s frustration and, in turn, the parents frustration/stress associated with being unsure of what the child’s needs are and how to meet these needs (Howe, 2006). To date, there have been two papers which have looked at the impact of caregiver insightfulness on attachment formation and five which have explored the impact of caregiver sensitivity on attachment formation. The majority of these studies suggest that caregiver insightfulness and sensitivity are associated with attachment security; however, there have been some inconsistencies in results between studies.

21.4.1.2 Caregiver Insightfulness

Oppenheim, Koren-Karie, Dolev, and Yirmiya (2009) and Oppenheim et al. (2012) published two papers on the link between maternal insightfulness, parents’ resolution regarding their child’s diagnosis, and attachment security in children with ASD. Both papers utilized the same data set. The sample was comprised of boys ($n = 45$), aged between 32 and 69 months with a mental age greater than 13 months, diagnosed with autistic disorder ($n = 37$) or PDD-NOS ($n = 8$), and their mothers. Participants were recruited from the northern part of Israel. All participants had a diagnosis of ASD prior to participating in the study, and their diagnoses were confirmed using the ADOS (Lord et al., 2001, 2012) and ADI-R (Lord et al., 1994). Attachment patterns were assessed using the standard SSP. The 2009 paper concluded that mothers who were insightful and resolved (i.e., recognized a change in their own thoughts and feelings regarding the child’s diagnosis since the time the diagnosis was presented) were more likely to have securely attached children than mothers who were either insightful but not resolved, resolved but not insightful, or neither resolved nor insightful. In 2012, the authors assessed whether the link between caregiver insightfulness/resolution and attachment security was mediated by caregiver sensitivity. Results revealed that when caregiver sensitivity had been controlled for, the effect of insightfulness/resolution on children's attachment patterns was no longer significant, suggesting that it is through caregivers' sensitive interactions that insightfulness and resolution have an effect on attachment security.

21.4.1.3 Caregiver sensitivity

Capps et al. (1994) was the first to assess the impact of caregiver sensitivity on attachment security in a sample of children with ASD (*n* = 19, 16 boys, three girls), aged 3–6 years ($\bar{x}_{\text{Mental age}} = 24.1\,\text{months}$, SD = 9.9; $\bar{x}_{\text{Developmental level}} = 45.5$, SD = 10.22 [assessed with Cattell Scales of Infant Intelligence; Cattell, 1940]). Participants were recruited from the Clinical Research Centre for the Study of Childhood Psychosis at the University of California, Los Angeles. ASD diagnoses were given to all children by two independent psychiatrists based on the DSM-III ASD criteria. Attachment patterns were assessed using a modified version of the SSP. Maternal sensitivity was assessed by coding a 12-min parent–infant free-play session using a coding system created by Crawley and Spiker in the 1980s (Capps et al., 1994). Capps et al.'s (1994) results showed that mothers of securely attached children were more sensitive than mothers of insecurely attached children. Moreover, the sample was comprised entirely of children with ASD and intellectual disability. Given that ASD is a spectrum disorder, it is difficult to ascertain whether the same results would be observed in children with different degrees of ASD severity.

Van Ijzendoorn et al. (2007) conducted the second study exploring the impact of caregiver sensitivity on attachment formation in children with ASD. Van Ijzendoorn and team (Van Ijzendoorn et al., 2007) aimed to replicate and extend Capps et al.'s (1994) study by including children with ASD and intellectual disability as well as children with high-functioning ASD in their participant sample. The sample was comprised of toddlers with and without ASD (*n* = 55, 35 boys and 20 girls), aged between 16.1 and 41.6 months, and their parents. The children's developmental level was assessed with Mullen Scales of Early Learning (MSEL; Mullen, 1995); 24 children were classified as low functioning (MSEL scores below 70), and 31 children were classified as high functioning (MSEL scores above 70). All children were recruited from a population-based sample that was participating in a large study screening for social developmental delays in children from Utrecht, Netherlands. Thirteen children were diagnosed with autistic disorder, eight with PDD-NOS, ten with intellectual disability (prior to 2010, intellectual disability was referred to as 'mental retardation,' this paper will use the term 'intellectual disability' to reflect the changes in terminology) without ASD, and nine with language delay. The nonclinical comparison group was comprised of 15 age-matched children. Attachment patterns were assessed using the standard SSP while maternal sensitivity was assessed by coding a 10-min parent–toddler free-play session using the Emotional Availability Scales (Biringen, Robinson, & Emde, 1998). Parents of children with ASD (low and high functioning) were found to be as sensitive as parents of children without ASD; however, caregiver sensitivity was only significantly associated with attachment security in children without ASD. Van Ijzendoorn et al. (2007) proposed that the inconsistency between their findings and Capps et al.'s (1994) findings might be due to the social deficits of children with ASD. They suggested that the deficits of children with ASD may have made it difficult for the parents in their sample to interpret their children's needs and thus impacted the association between maternal sensitivity and attachment security. A further possibility is that the interplay between the children's deficits and age may have led to the observed inconsistencies. The children in Van Ijzendoorn et al. (2007) sample were younger than those in Capps et al.'s (1994) studies. Parents of older children with ASD would have had more time to learn to interpret their children's needs and, as a result, the social deficits of children with ASD may not have played as significant a role on the association between attachment patterns and sensitivity.

The inconsistency between the studies (Capps et al., 1994; Van Ijzendoorn et al., 2007) and their relatively small sample sizes prompted Koren-Karie, Oppenheim, Dolev, and Yirmiya (2009) to conduct further investigations. Koren-Karie et al.'s (2009) sample was comprised of boys ($n = 45$), with autistic disorder ($n = 37$) or PDD-NOS ($n = 8$), aged 32–69 months with a mental age greater than 13 months, and their mothers. All children were recruited through agencies and early intervention programs for children with ASD in Israel. Diagnoses were provided by two senior researchers/clinicians based on the results of the ADOS (Lord et al., 2001, 2012) and the ADI-R (Le Couteur et al., 1989). Attachment patterns were assessed using the standard SSP. Caregiver sensitivity was assessed by coding mother–child interactions in free play (8 min), structured play (5 min), and social play (5 min) situations using the Emotional Availability Scales (Biringen, Robinson, & Emde, 1993). Mothers of children with ASD that had a secure attachment pattern were found to be significantly more sensitive than mothers of children with ASD who had insecure or disorganized attachment patterns. These findings held up even when ASD severity, children's level of functioning, and children's level of responsiveness were controlled. However, the study failed to find a significant difference between maternal sensitivity in children with insecure attachment versus children with disorganized attachments. The authors concluded that this result was likely due to their failure to assess for behaviors that have previously been associated with disorganized attachment such as frightening maternal behaviors or disruptive affective communication.

The most recent study to date to explore the association between maternal sensitivity and attachment patterns of children with ASD was by Rozga et al. (2018). Rozga et al. (2018) aimed to expand the literature on caregiver sensitivity and infant–caregiver attachment in children with ASD by exploring the relation between attachment security and caregiver sensitivity. Importantly, the researchers explored the effects of this outcome when disorganized attachment was and was not factored into the relation. The study was comprised of 30 ASD infant–caregiver dyads (23 boys, 7 girls; $\bar{x}_{\text{Chronological age}} = 47\,\text{months}$, SD = 9; $\bar{x}_{\text{Nonverbal mental age}} = 31\,\text{months}$, SD = 14 [assessed with MSEL and nonverbal subtest of the Stanford-Binet Intelligence Scale; Thorndike, 1972]; $\bar{x}_{\text{Language age}} = 21\,\text{months}$, SD = 13 [assessed with MSEL, Reynell Developmental Language Scales—Revised (Reynell, 1983), and Childhood Evaluation of Language Fundamentals- Revised; (Semel, Wiig, & Secord, 1987)]) who were recruited through the University of California, Los Angeles Autism Evaluation Clinic between 1997 and 2000. ASD was assessed using the ADOS (Lord, Rutter, & DiLavore, 1998) and ADI (Lord et al., 1994), attachment was measured using the standard SSP, and caregiver sensitivity was assessed by coding a 30-min parent–child play interaction using Ainsworth's original sensitivity-insensitivity scale (Ainsworth et al., 1978). Rozga et al.'s (2018) results revealed that the caregivers of securely attached children with ASD were more sensitive than those of insecurely attached children with ASD. When the disorganization categorization was taken into account and children who were classified as secure were compared to children classified as organized-insecure or disorganized, caregiver sensitivity no longer impacted attachment classification. Rozga et al. (2018) proposed that this finding might account for some of the inconsistency between Capps et al. (1994) and Van Ijzendoorn et al. (2007) findings, given that Van Ijzendoorn et al.'s (2007) study had a considerably higher number of children with disorganized attachment patterns than the Capps et al.'s (1994) study.

Taken together, these studies indicated that caregiver insightfulness and sensitivity may be associated with attachment security, but this association is likely to be mediated by child factors such as ASD severity and child age. More research exploring the association between caregiver sensitivity/insightfulness and attachment formation in children with ASD is needed. This is especially true in samples comprising younger children as only one study to date (i.e., Van Ijzendoorn et al., 2007) has utilized a sample of children below the age of 2; moreover, that study found no association between caregiver insightfulness/sensitivity and attachment formation.

21.4.1.4 Caregiver Attachment Style/Representation

To date, only one study has assessed the impact of parental attachment representations on the parent–child attachment relationship in children with ASD. Seskin et al. (2010) explored the association between parents' internal working models of attachment relationships and the parents' and children's functional and relational behaviors in a sample of ASD parent–child dyads (*n* = 40). Participating children, aged 4–16 years, were recruited from a therapeutic school for youth with neurodevelopmental disorders in the USA. Eighteen children had pervasive developmental disorder, 16 had ASD, three had autistic disorder, two had a learning disorder, and one had Asperger's disorder. Parents ranged in age from 32 to 63 years; 85% were married or partnered, 7.5% were separated, and the rest were single or divorced. Parental attachment patterns were assessed using the Adult Attachment Interview. Results showed that parental internal working models of primary attachment relationships were associated with children's functional and relational behaviors. Children of parents who had a secure state-of-mind regarding attachment engaged in significantly more developmentally appropriate social interactions (e.g., reciprocal smiles, turn-taking vocalizations, symbolic play, imaginative thinking) than children of parents with an insecure state-of-mind regarding attachment.

21.4.1.5 Culture

Two studies have been conducted on the association between culture and attachment patterns in children with ASD; both studies included participants who were older than 4 years of age. Bauminger et al. (2010a) were the first to assess the impact of culture on attachment patterns in children, aged 8–12 years, with and without high-functioning ASD (*n* = 164) from the USA and Israel. The Israeli sample comprised of nine children (eight males, one female) with autistic disorder, 15 children (all male) with Asperger's syndrome, and 23 age-matched typically developing children (22 male, one female). The US sample comprised of seven children (all male) with autistic disorder, 13 children (12 male, one female) with Asperger's syndrome, and 15 age-matched typically developing children (14 male, one female). All diagnoses were based on the DSM-IV. Attachment patterns were assessed using the Security Scale. The results revealed that the quality of the mother–child attachment pattern was higher for typically developing children than children with ASD and for children from the USA than for children from Israel. That is, children with and without ASD from the USA had significantly higher rates of attachment security compared to children with and without ASD from Israel.

Sotgiu et al. (2011) also assessed the impact of culture on infant–caregiver attachment patterns. Their sample was comprised of children with and without ASD (*n* = 52), aged 4–11 years, recruited from Cuba or Italy. The Italian sample was comprised of nine children with autistic disorder, six children with PDD-NOS, and 15 controls (26 males, four females). The Cuban sample was comprised of seven children with autistic disorder, four children with PDD-NOS, and 11 controls (16 males, six females). All diagnoses were based on the DSM-IV-TR. ASD severity was assessed using the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1986) with all children classified as either moderately (40%) or severely (60%) autistic. Attachment patterns were measured using the Parent-Child Reunion Inventory (Marcus, 1988). Sotgiu et al. (2011) findings showed that typically developing children displayed higher levels of attachment security than children with ASD in both Italy and Cuba; however, no differences were observed between cultures.

As only two studies have been conducted on the impact of culture on attachment security among children with ASD and their results have been inconsistent, more research needs to be undertaken to better understand the role that culture plays in attachment formation among children with ASD. Both studies used a sample of children aged 4 years or older; therefore, further exploration is also needed in younger samples to explore associations between culture and early infant–caregiver attachment in children with ASD. Finally, neither study discussed whether the attachment measures used were validated for use with Israeli, Cuban, or Italian populations or with ASD samples from these populations, bringing into question their ability to detect differences in attachment patterns in children with ASD from these populations.

21.4.2 Child Factors

The strong focus in the ASD and attachment literature on parental factors influencing the infant–caregiver attachment bond has meant that child factors affecting infant–caregiver attachment formation are less understood. However, the most recent systematic review identified 17 articles reporting on child factors associated with infant–caregiver attachment formation in children with ASD (Teague et al., 2017). The review indicated that the two child factors that have the largest impact on infant–caregiver attachment formation in children with ASD are severity of child intellectual disability and severity of child ASD symptoms. As mentioned earlier, the first systematic review examining the literature on attachment and children with ASD by Rutgers et al. (2004) revealed that intellectual disability was a significant moderator of the infant–caregiver attachment in children with ASD, while ASD severity was not. Thirteen years later, the review by Teague et al. (2017) indicated that researchers continued to examine the impact of ASD severity on attachment formation; in addition, numerous studies have explored the degree to which ASD severity or intellectual disability (in children with ASD) impacted attachment formation.

A 2007 study conducted by Naber et al. (2007) stands out from the rest of the literature as it found that both factors (ASD severity, intellectual disability in children with ASD) uniquely impact infant–caregiver attachment formation. Naber et al.'s (2007) sample was comprised of children with and without ASD, aged 20.7–30.6 months (n = 78, 53 males and 25 females). All children were recruited from a sample screened for social developmental delays in children from Utrecht, Netherlands. Children were diagnosed by experienced child psychiatrists from information gathered through a battery of tests (e.g., ADOS ADI-R). Children were diagnosed with autistic disorder (n = 11; $\bar{x}_{\text{Developmental level}} = 51.18$, SD = 4.26 [assessed with MSEL]), PDD-NOS ($n = 9$; $\bar{x}_{\text{Developmental level}} = 73.44$, SD = 16.99), intellectual disability (n = 8; $\bar{x}_{\text{Developmental level}} = 54.00$, SD = 3.78), or learning disorder (n = 10; $\bar{x}_{\text{Developmental level}} = 81.00$, SD = 9.09). Two control groups were also included in the study: group one consisted of children referred from hospitals due to concerns regarding their development ($n = 25$; $\bar{x}_{\text{Developmental level}} = 84.72$, SD = 14.75), and group two was comprised of typically developing children (n = 15; $\bar{x}_{\text{Developmental level}} = 101.93$, SD = 13.57). Attachment patterns were assessed using the standard SSP. A hierarchical regression analysis was used to disentangle the influences of ASD symptoms and developmental level. The study's results showed that disorganized attachment was mainly predicted by the developmental level of children with ASD whereas ASD severity predicted attachment security. Simply, the severity of ASD symptoms was a significant predictor for the development of an insecure attachment relationship while developmental delay was a significant predictor for the development of disorganized attachment.

Interestingly, some researchers have suggested that it is not developmental disability or ASD severity alone which impact attachment formation but the interplay between the two factors which results in the observed effect on infant–caregiver relationships in children with ASD (Howe, 2006; Rogers, Ozonoff, & Maslin-Cole, 1991). Rogers et al.'s (1991) study found that developmental level was associated with attachment formation in children with ASD but not in non-ASD children with developmental delays. Their sample was comprised of 34 children with and without ASD (non-ASD group: $\bar{x}_{\text{Chronological age}} = 50.8\,\text{months}$, SD = 11; $\bar{x}_{\text{Mental age}} = 43.4\,\text{months}$, SD = 14.3; $\bar{x}_{\text{IQ}} = 84.8$, SD = 20.1; 16 males, one female; ASD group: $\bar{x}_{\text{Chronological age}} = 47.6\,\text{months}$, SD = 10; $\bar{x}_{\text{Mental age}} = 39.1\,\text{months}$, SD = 10; $\bar{x}_{\text{IQ}} = 82.7$, SD = 18.1; 14 males, three females). Diagnoses were provided by two independent psychologists/psychiatrists, based on the DSM-III and DSM-III-R, with eleven children diagnosed with infantile autism and six diagnosed with PDD. A comparison group consisted of age-matched peers with other psychiatric diagnoses including reactive attachment disorder, oppositional defiant disorder, intellectual disability, or adjustment disorder. The authors suggested that the differences observed between children with and without ASD may be the result of children with ASD experiencing difficulties constructing internal working models of their caregiver due to their deficits in emotional perception, expression, and intersubjectivity. As a result of these deficits, the authors argued that children with ASD may not initially have all the available data required for the construction of an internal working model of their caregiver. As children with ASD develop, their cognitive abilities also improve and, as a result, a working model of their caregiver is developed and attachment formation occurs. In children with severe ASD, the development of the internal working model of the caregiver requires more time (than in children who have lower levels of ASD) as their emotional perception/expression and intersubjectivity are more impaired. When children also have comorbid intellectual disability, the development of emotional and intersubjective skills in children with ASD is further delayed, therefore further delaying the child–caregiver attachment formation. In contrast, non-ASD children with developmental delays do not have difficulties with processing affective or intersubjective experiences, thus their attachment formation is not impaired.

In sum, research indicates that both caregiver and child factors play a role in attachment development in children with ASD. The debate regarding which factors play the greatest role appears to be the focus of much of the literature on attachment formation in children with ASD. Nonetheless, the interplay between caregiver and child factors is likely to have the greatest impact on infant–caregiver attachment. As noted by Howe (2006), ASD severity and developmental disability have been shown to increase parental stress due to the extra demands associated with caring for a child with a disability. The increase in parental stress may lead to the activation of the caregivers' attachment-based defenses and yield reduced caregiver sensitivity. Reduced caregiver sensitivity may reduce the likelihood that the child's needs are met. Moreover, children with unmet needs may have increased frustration which could increase the stress caregivers feel (Howe, 2006). Thus, in the area of attachment, the field may benefit from future research focusing on the development and/or evaluation of treatments that take into account the abovementioned factors when attempting to improve infant–caregiver attachment relationships. Improving these attachment relationships is an important goal given research evidence suggesting that attachment patterns formed during infancy can have on a lifelong impact. The next section will explore the benefits associated with having a secure infant–caregiver attachment across the life span in children with ASD.

21.5 Importance of Attachment Across the Life Span in Children with Autism Spectrum Disorder

Numerous studies have highlighted the association between infant–caregiver attachment and social and emotional development in children and adolescents. Children with secure attachment patterns have been found to have better social skills, more friendships, and lower levels of behavioral problems throughout childhood when compared to children with insecure attachment patterns (Elicker, Englund, & Sroufe, 1992; Erickson, Sroufe, & Egeland, 1985). Erickson et al. (1985) looked at the impact of infant attachment patterns on behavioral problems in a group of 96 typically developing children and found that children with insecure attachment patterns during infancy (assessed by SSP at 12–18 months of age) were more likely to have behavioral problems (e.g., noncompliant, poor social skills) at preschool (aged 4.5–5 years) than children with secure attachment patterns. Furthermore, when Elicker et al. (1992) looked at the association between infant attachment patterns and social development in a group of 47 typically developing children (aged between 9 years, 7 months–11 years, 8 months), they also found that infants with secure attachment patterns during infancy (as assessed by the SSP at 12–18 months of age) had better social skills and were more likely to form friendships during middle/late childhood than children with insecure attachment patterns. Similar findings have been observed in children with ASD. The focus of this section will be on reviewing the relevant literature exploring the association between early attachment patterns and social and emotional development in children and adolescents with ASD. The section has been divided into two subsections: "Early Childhood" and " Late Childhood and Adolescence. "

21.5.1 Early Childhood

During early childhood (2–7 years), securely attached children with ASD have been found to display more prosocial behavior (i.e., behaviors that encourage social interaction; Bauminger-Zviely & Kugelmass, 2013; Capps et al., 1994; Rozga et al., 2018) and to engage in more developed play behavior than insecurely attached children with ASD. To date, four studies have explored the link between attachment security and prosocial behaviors (e.g., joint attention, jealousy, empathy) in children with ASD (Bauminger-Zviely & Kugelmass, 2013; Capps et al., 1994; Naber et al., 2007; Rozga et al., 2018) while only two have looked at the association between attachment security and play behaviors (Marcu, Oppenheim, Koren-Karie, Dolev, & Yirmiya, 2009; Naber et al., 2008).

21.5.1.1 Prosocial Behaviors

Prosocial behaviors are behaviors that encourage social interaction. Examples of prosocial behavior in young children include displays of joint attention, sharing, and showing empathy.

Two studies have explored the relationship between attachment security and joint attention behaviors (behaviors that help facilitate engagement between the caregiver and infant during the early years of life) in children with ASD. The first study was undertaken by Capps et al. (1994) who examined the relationship between attachment patterns, joint attachment behaviors (e.g., pointing out objects to others, responding to name), and language abilities in a sample of children with ASD (aged 3–6 years). Capps et al. (1994) found that although there were no differences in joint attention between children with and without a secure attachment pattern, children with a secure attachment pattern demonstrated greater receptive language ability, made more frequent requests, and were more likely to respond to bids for joint attention from their caregivers than insecurely attached children. Capps et al. (1994) concluded that it is possible a significant difference wasn't observed between groups in regard to joint attention as the behaviors rarely occurred in either group.

Naber et al. (2007) expanded the research into joint attention and attachment in children with ASD by looking at both "basic joint attachment" and "associated joint attachment" in a sample of very young children with ASD (20.7–30.6 months of age). Basic joint attachment refers to behaviors developed during the first year of life which are related to language development (e.g., pointing out objects to others) while associated joint attachment behaviors are behaviors not directly related to language development (e.g., child responding to his/her name). Naber et al.'s (2007) results showed that after controlling for cognitive delay and ASD severity, there was no association between attachment security and joint attention in children with ASD. That is, only cognitive delay and ASD symptom severity were significantly negatively related to joint attention in children with ASD. In contrast, attachment security was found to be positively related to joint attention in typically developing children. Naber et al. (2007) argued that children with ASD might receive less reinforcement from joint attention behaviors than children without ASD and thus feel less stimulated to show more of those behaviors.

A core characteristic of children with ASD is their minimal social interaction. Factors that may lead to increases in social interest in children with ASD are important to explore. For example, jealousy is a marker of affective bonding, social interest, and intersubjective sharing. The relationship between attachment patterns and jealousy in children with high-functioning ASD (i.e., children with ASD without intellectual disability) was explored by Bauminger-Zviely and Kugelmass (2013). The participant sample (*n* = 60, 52 males, eight females) was comprised of children with high-functioning ASD (*n* = 30) and typically developing children (*n* = 30), aged 3–6 years (ASD group: $\bar{x}_{\text{Mental age}} = 57.66\,\text{months}$, SD = 8.31 (based on MSEL and Wechsler Preschool and Primary Scale of Intelligence; Waters & Deane, 1985; Wechsler, 1995); non-ASD group: $\bar{x}_{\text{Mental age}} = 57.30\,\text{months}$, SD = 10.79), recruited from schools in central Israel. All children with ASD received their diagnosis based on the DSM-IV-TR criteria by psychologists unassociated with the study prior to study enrollment. Two children had PDD-NOS, 10 children had autistic disorder, and 18 children had Asperger's syndrome. Attachment patterns were assessed using the Attachment Q-Sort. The results showed that both children with and without ASD who were classified as securely attached displayed lower levels of jealousy (assessed through verbalizations and gaze towards mother/stranger) compared to insecurely attached children with and without ASD, suggesting that securely attached children with and without ASD are less fearful that their relationship with their mother might be impaired by sharing their mother with others than insecurely attached children with and without ASD.

Another example of a factor that may impact social interest in children with ASD is affective content. The ability to interpret and express affective content is reduced in children with ASD. Importantly, this impacts the children's ability to express empathy (Johnson, Filliter, & Murphy, 2009) which plays an important role in future developmental attainments (e.g., relationship development). Thus, exploring factors that can contribute to the development of empathy in children with ASD is of high importance. There has been only one study to date exploring the association between empathy and the infant–caregiver attachment in children with ASD (Rozga et al., 2018). Results of this study showed that toddlers with ASD who were securely attached to their caregivers displayed higher levels of empathy than toddlers with ASD who were insecurely attached. This finding was sustained even when language abilities of the children were taken into consideration.

Taken together, these studies suggest that increasing attachment security in young children with ASD may have a positive impact on their social and affect development (Bauminger-Zviely & Kugelmass, 2013; Rozga et al., 2018). However, the behaviors may need to be reinforcing/stimulating for the children to display them frequently (Naber et al., 2007).

21.5.1.2 Play Behavior

Play behavior during childhood has also been associated with later developmental attainments (e.g., social skill development; Bodrova & Leong, 2005; Casby, 2003). Researchers have thus focused on identifying factors that enhance play behavior—especially in children with ASD who may experience delays in engaging in developmentally appropriate play. Two studies have explored the impact of the infant–caregiver attachment in play behaviors in children with ASD. The first study was conducted by Naber et al. (2008) with a toddler sample (*n* = 73; $\bar{x}_{\text{Age}} = 26.45\,\text{months}$, SD = 5.63; 51 males, 22 females). Children were diagnosed by experienced child psychiatrists using information gathered from a battery of tests (e.g., ADOS, ADI-R) with autistic disorder (*n* = 12; $\bar{x}_{\text{Developmental level}} = 51.17$, SD = 4.06 [assessed with MSEL]), PDD-NOS (*n* = 11; $\bar{x}_{\text{Developmental level}} = 27.73$, SD = 7.42), intellectual disability (*n* = 10; $\bar{x}_{\text{Developmental level}} = 55.10$, SD = 4.09), or learning disorder (*n* = 8; $\bar{x}_{\text{Developmental level}} = 83.63$, SD = 8.48). All participating children were recruited from Utrecht, Netherlands, after undergoing a screening for social developmental delays. Two control groups were also included in the study: the first group included children referred from a hospital due to concerns regarding their development ($n = 16$; $\bar{x}_{\text{Developmental level}} = 85.00$, SD = 10.46) and the second group included typically developing children recruited through community-based centers for infants ($n = 16$; $\bar{x}_{\text{Developmental level}} = 98.44$, SD = 12.18). Attachment patterns were assessed using the standard SSP. Results showed that children with secure attachment patterns spent more time playing and engaging in symbolic play (e.g., pretend play) than insecurely attached children. Furthermore, children with ASD and disorganized attachment patterns spent less time playing and engaged in lower levels of play than children with ASD with organized attachment patterns.

Marcu et al. (2009) aimed to expand on Naber et al.'s (2008) findings by assessing the frequency, diversity, complexity, and duration of symbolic play through a larger sized sample. Marcu et al.'s (2009) sample was comprised of boys with ASD ($n = 45$), aged between 2.6 and 5.75 years with a mental age greater than 13 months. All children were recruited through agencies and early intervention programs for children with ASD in Israel and thus had a diagnosis prior to taking part in the research. Attachment patterns were assessed using the SSP. Study results found no differences in symbolic play between securely and insecurely attached children with ASD. However, children with a disorganized attachment pattern spent less time engaging in symbolic play as well as had less complex symbolic play than children with organized attachment patterns. This finding was sustained even after controlling for the children's level of functioning.

The differences in findings between studies may be accounted for by the differences in the participants ages, with children in Naber et al.'s (2008) sample being younger than Marcu et al.'s (2009) sample. Marcu et al. (2009) argued that young children with secure attachment patterns may develop symbolic play skills earlier than children with insecure/disorganized attachment patters; therefore, the only differences to be observed are between children with secure attachments with symbolic play skills and children with insecure/disorganized attachments whose symbolic play skills may still be developing. However, as children with insecure attachment patterns age, their symbolic play skills may equalize with those of securely attached children; therefore, the only comparisons to be made are between children with an organized versus disorganized attachment pattern.

21.5.2 Late Childhood and Adolescence

During late childhood (7–12 years) and adolescence (12–18 years), social and educational development are of high importance. Although one would not be surprised that research has explored the association between these developmental stages and infant–caregiver attachment, it is surprising that only one study has been undertaken on each topic with children with ASD (Bauminger et al., 2010a; Dolev et al., 2014). Furthermore, an additional study has explored links between attachment security and behavioral problems in children with ASD (Bauminger, Solomon, & Rogers, 2010b). Interestingly, these findings directly contrasted previous research exploring attachment patterns and behavioral difficulties for typically developing peers.

21.5.2.1 Social Development

Bauminger et al. (2010a) investigated the association between attachment security, mother–child relationship qualities, and theory of mind on the development of friendship quality in a sample of children, aged 8–12 years, with and without high-functioning ASD. The study's results showed that children with and without ASD did not differ in their attachment classification; higher security attachment scores were positively associated with open communication, trust, and lower degrees of alienation in mother–child relationships; mother–child relationship quality was associated with a sense of closeness, intimacy, and companionship in friendships; and higher verbal capabilities was the most important predictor of friendship quality. The fact that mother–

child relationship quality was the second biggest predictor of friendship quality indicates that the relationships that children with ASD form with caregivers can have a significant impact on future relationship development.

21.5.2.2 Educational Development

Dolev et al. (2014) explored the association between educational placement and infant–caregiver attachment. Their sample was comprised of 45 children (all male), diagnosed with either autistic disorder or PDD-NOS, and their mothers recruited from the northern part of Israel. Diagnoses were provided by two senior researchers/clinicians and were based on results from the ADOS (Lord et al., 2001) and ADI-R (Lord et al., 1994). Attachment patterns were assessed when the children were aged between 2.5 and 5.6 years using the standard SSP (Time 1). The families were then contacted when the children were aged between 7.6 and 11.1 years (Time 2) and followed up with when the children were aged 10.1 and 15.0 years (Time 3). Educational data was only obtained from 39 families due to the relocation of four families. Findings showed that securely attached children and children of mothers classified as insightful were likely be placed in more inclusive educational settings during late childhood and adolescence than insecurely attached children and children of mothers classified as non-insightful. Children's attachment style and maternal insightfulness together explained 34% and 16% of the variance in the children's inclusion placement during late childhood and adolescence, respectively. The children's IQ level and interactive competence were also found to be predictive of their educational placement, explaining 20% and 34%, respectively, of the variance of children's inclusion placements.

21.5.2.3 Challenging Behavior

Literature on typically developing children has found that during late childhood and adolescence, securely attached children are at a reduced risk of developing internalizing and externalizing problems (Fearon, Bakermans-Kranenburg, Van Ijzendoorn, Lapsley, & Roisman, 2010; O'Connor, Collins, & Supplee, 2012). Surprisingly, only one study to date has looked at the relation between attachment patterns and externalizing and internalizing behavioral problems in children with ASD (Bauminger et al., 2010b; Teague et al., 2017). This is concerning given that up to 68% of children with ASD experience behavioral problems (Hartley, Sikora, & McCoy, 2008; Kanne & Mazurek, 2011). Bauminger et al. (2010b) explored the relation between internalizing and externalizing behaviors, attachment quality, parenting stress, and parent–child relationship quality in children, aged 8–12 years, with and without ASD from the USA and Israel ($n = 77$). The Israeli sample consisted of eight children (seven males, one female) with autistic disorder, 15 children (all male) with Asperger's syndrome, and 22 age-matched peers (21 males, one female). The US sample consisted of seven children (all male) with autistic disorder, 13 children (12 male, one female) with Asperger's syndrome, and 12 age-matched peers (11 males, one female). Attachment patterns were assessed using the Security Scale. Results revealed that parenting stress was associated with internalizing and externalizing behavior problems in all children; however, neither attachment security nor quality of the parent–child relationship contributed significantly to behavioral and emotional problems in children with or without ASD. The failure to find an association between attachment security and behavioral problems in children with ASD may be due to the use of subjective measures rather than objective measures of attachment. More research regarding this matter is thus needed before any definitive conclusions can be drawn. Furthermore, research looking at the association between problem behaviors in children with ASD and attachment during the younger years is needed as early intervention has been shown to be the best form of treatment for challenging behaviors (Hartley et al., 2008).

Taken together, the literature suggests that there are significant benefits associated with attachment security throughout early childhood, late childhood, and adolescence for children with ASD. Given that there have been some inconsistencies between findings and that only a small number of studies have been published, it is important that these results are interpreted with caution. Nonetheless, there is enough evidence to suggest that interventions targeted at improving the infant–caregiver bond would be of benefit to children with ASD and their families.

21.6 Parent-Child Interaction Therapy: Building Stronger Caregiver-Child Relationships

Attachment patterns in infancy and early childhood have been shown to be associated with many long-term developmental outcomes in both typically developing children and children with ASD. As reviewed in this chapter, children with ASD and a secure attachment pattern demonstrate more prosocial behavior; less jealousy; more symbolic play; more empathy; more open communication and trust; and lower degrees of alienation in mother–child relationships. Furthermore, literature on typically developing children has found that children with higher attachment security display lower levels of externalizing and internalizing behavior problems (Fearon et al., 2010). Given that secure attachment constitutes a protective-factor for children with ASD, providers may benefit from identifying children who are at greater risk (with an insecure or disorganized attachment) and providing them with an evidence-based treatment that targets the infant–caregiver bond. Furthermore, given that more than two out of three children with ASD also present with challenging behaviors (Hartley et al., 2008; Kanne & Mazurek, 2011), interventions targeting both behavior and attachment relationships are likely to be ideal. One intervention that is able to address challenging behaviors and improve parent–child relationships is Parent-Child Interaction Therapy (PCIT; McNeil & Hembree-Kigin, 2010). The following section aims to (1) demonstrate that PCIT is an attachment-based intervention that has been shown to significantly improve parent–child interactions and significantly reduce internalizing and externalizing problems, and (2) discuss the application of PCIT, an evidence-based treatment integrating attachment theory and social learning theory, with children with ASD.

21.6.1 PCIT: An Attachment-Based Intervention

PCIT is an evidence-based parent training program for children with externalizing behaviors that integrates components of attachment theory and social learning theory to improve the quality of the caregiver–child relationship (Eyberg, 1988; McNeil & Hembree-Kigin, 2010). Several specific features of PCIT work to achieve this goal, namely working with the caregiver and child together; direct coaching of caregiver–child interactions; intervening early; targeting a range of behavior problems; and targeting patterns of interaction rather than discrete behaviors (McNeil & Hembree-Kigin, 2010).

Most of the core attachment theory components occur in the first phase of PCIT, Child-Directed Interaction (CDI). The main goal of CDI is to strengthen the caregiver–child relationship. According to Campbell (1997), the most proximal parental influence on a child's behavioral development is the early parent–child interaction. CDI works to enhance the caregiver–child relationship by fostering a secure attachment for the child (Herschell, Calsada, Eyberg, & McNeil, 2002). This is achieved by creating a positive pattern of caregiver–child interactions through increased positive caregiver skill use (e.g., PRIDE skills) and the reduction of negative parenting behaviors (e.g., commands, criticism). Since young children are highly responsive to parental attention, CDI works by teaching caregivers to consistently attend to children's positive behaviors and eliminate attention during child inappropriate behaviors. Reinforcing positive behaviors increases children's self-esteem (as they become more aware of the behaviors to engage in) and feelings of safety and security when they learn that parents are there for them despite negative behavior. When children feel safe and secure in a relationship with their caregiver, they are more likely to accept the limit setting and discipline offered by parents during second phase of treatment, Parent-Directed Interaction (PDI).

To understand why PCIT might be an effective intervention for improving attachment relationships in children with ASD, it is necessary to explain why PCIT ought to be understood as an attachment-based intervention. Allen, Timmer, and Urquiza (2014) clarify PCIT as an attachment-based intervention for children by (1) explicating treatment principles derived from a framework grounded in attachment theory and research and (2) comparing how PCIT targets each of these primary treatment goals of an attachment-based approach. Allen (2011) presents four guiding principles for the development of an attachment-based intervention for school-aged children:

1. **Establish an adequate relationship with an attachment figure.** This is needed to modify a child's maladaptive internal working model, which contributes to problematic behaviors and emotions.
2. **Establish an adequate caregiver–child relationship.** The caregiver achieves this by examining his or her own representations of self and learning to respond to the child in a consistent, nurturing, and non-coercive manner. This will improve the caregiver's ability to respond to the child's emotions and behaviors.
3. **Ground the intervention in the current context and focus on the present.** The treatment should take into account individual client strengths and limitations and not be focused on remediating former developmental periods.
4. **Consider important child factors such as cognitive and development ability.** A major component of improving the child's internal working model includes increasing the child's competence, respect, and worth.

PCIT has been shown to be effective in treating children with behavior problems through the improvement of the child–caregiver relationship. Allen et al. (2014) piloted PCIT as an attachment-based intervention in a sample of adopted children and their adoptive caregivers ($n = 85$, aged 2–8 years), referred to a university hospital-based outpatient clinic for disruptive behavior problems. Their results revealed significant improvements in positive parenting techniques, reductions in parenting stress, and reductions in externalizing and internalizing concerns among children. In a subset of the participants ($n = 38$), an analysis of covariance of the coded Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014) demonstrated significant increases in positive interactions (e.g., praises, reflections; $p < 0.001$) and significant decreases in negative interactions (e.g., commands, questions; $p < 0.001$). These outcomes indicated that strong changes in parenting behavior occurred with this brief intervention (Allen et al., 2014). By conducting repeated measures analysis of covariance of scores across the Child Behavior Checklist (CBCL; parent-report measure of child internalizing, externalizing, and overall problem behaviors; Achenbach & Roscorla, 2000a, 2000b) and Eyberg Child Behavior Inventory (ECBI; parent-report of the intensity and problematic nature of child problem behaviors; Eyberg & Pincus, 1999), Allen et al. (2014) found both significant improvements in internalizing, externalizing, and total problems from the CBCL ($p < 0.001$); and intensity and number of behavior problems from the ECBI ($p < 0.001$). Similarly, the application of PCIT with children with ASD has produced promising results in reducing disruptive behaviors (see Chap. 16 in this handbook for more details).

21.6.2 Applying PCIT with ASD Children

As previously outlined, PCIT is an attachment-based intervention which improves parent–child interactions, reduces child internalizing and externalizing problems, and reduces overall child problem behaviors (Allen et al., 2014). With current prevalence estimates indicating that between 1 in 88 to 1 in 110 children have ASD (Centers for Disease and Control, 2012; Lord & Bishop, 2010), and as many as 68% of these children present with disruptive behaviors (Hartley et al., 2008; Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005), there is a strong need to provide families of children on the autism spectrum with effective and timely early intervention focused on reducing disruptive behaviors. The diverse and heterogeneous symptomatology of ASD, however, continues to present treatment issues for clinicians (e.g., variability in functioning across the spectrum, comorbidities). Providers may benefit by identifying ASD children with insecure attachments presenting with disruptive behaviors. These at-risk children would benefit the most from an evidence-based treatment that focuses not only on reducing disruptive behaviors, but also on improving the parent–child relationship.

As previously discussed in this chapter, attachment research has looked at both the impact of caregiver- and child-factors (e.g., ASD severity, developmental delay) on attachment in ASD children. While the debate continues regarding whether ASD severity or developmental delay plays a greater role in attachment categorization, future research should look at the interplay between caregiver and child factors on attachment patterns. As Howe (2006) noted, the additional demands placed on parents due to ASD severity and developmental disability can increase parental stress. Often caregivers of children with disabilities must shoulder additional burdens (e.g., chronic stress, financial strain, navigating complicated healthcare systems) that may negatively impact family functioning and corrode the caregiver–child relationship. With this in mind, interventions focused solely on reducing a single presenting problem (e.g., disruptive behaviors) fall short for families that may have experienced a breakdown in positive parent–child interactions. These families may instead benefit from an evidence-based treatment that focuses on enhancing the parent–child relationship as well as reducing disruptive behaviors. Due to increased strain on the caregiver–child relationship, PCIT may constitute an optimal attachment-based intervention for children with ASD and comorbid disruptive behavior.

21.7 Summary

In sum, research exploring ASD and infant–caregiver attachment has come a long way since Kanner's original papers. Research over the years has provided support for the notion that children with ASD can form attachments and that there are significant lifelong benefits associated with attaining a secure infant–caregiver attachment as well as significant lifelong consequences associated with insecure and disorganized infant–caregiver attachments. Thus, interventions aimed at improving the infant–caregiver bond are necessary. PCIT has shown promise as an intervention for children with ASD in regard to improving infant–caregiver attachments by enhancing the dyadic relationship and reducing disruptive behaviors (often observed in children with insecure and disorganized attachment patterns).

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22

Helping Parents Generalize PCIT Skills to Manage ASD-Related Behaviors: Handouts and Clinical Applications

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Abstract

This chapter will provide several handouts for parents to help tailor Parent-Child Interaction Therapy (PCIT) skills to manage autism spectrum disorder (ASD)-related behaviors (e.g., repetitive play, sensory dysregulation, insistence on sameness, poor social skills). Handouts cover how to manage ASD-related behaviors within the context of PCIT's two phases: Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI). The chapter will additionally provide strategies for clinicians to help parents generalize skill acquisition to the home (e.g., additional considerations for setting up Special Time practice) and community environments (e.g., using CDI skills throughout the day). This chapter and the accompanying parent handouts aim to provide information for clinicians to best support families of children with ASD in generalizing these skills to manage ASD-related behaviors.

Over the past decade, Parent-Child Interaction Therapy (PCIT) has received increased research and clinical attention as studies have expanded to include children with autism spectrum disorder (ASD) and their families. To date, findings examining PCIT with children with ASD have been highly encouraging, and suggest standard (non-modified) PCIT can be an effective treatment in reducing disruptive behaviors in children with ASD (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2015; Hatamzadeh, Pouretemad, & Hassanabadi, 2010; Rowley et al., 2015; Solomon, Ono, Timmer, & Goodlin-Jones, 2008; Zlomke, Jeter, & Murphy, 2017). In turn, PCIT has been shown to be associated with improvements in domains highly relevant to ASD, including adaptive functioning, atypical behaviors, prosocial verbalizations, parent–child shared positive affect, and social awareness (Ginn et al., 2015; Masse, McNeil, Wagner, & Quetsch, 2016; Solomon et al., 2008; Zlomke et al., 2017). Further, studies have found that this population also may benefit from adaptations to the standard PCIT protocol to address the breadth of symptom presentation (e.g., Armstrong, DeLoatche, Preece, & Agazzi, 2015; Hansen & Shillingsburg, 2016; Lesak, Bearss, Celano, & Sharp, 2014). The heterogeneity in functioning in individuals affected by ASD often warrants thoughtful considerations and varying resources to guide parents to tailor PCIT skills to the specific needs of their children with ASD.

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In this chapter, we introduce handouts designed to help parents understand how to target behaviors that stem from ASD. These handouts strive to maximize parents' ability to personalize and generalize PCIT skills to their own families in both home and community environments. While many clinicians reading this chapter may be well versed in PCIT, clinical training and experience with children with ASD can vary greatly from clinician to clinician. This chapter and the accompanying parent resources (i.e., handouts) also aim to provide information for PCIT clinicians to best support families of children with ASD in using these skills. Importantly, we suggest optimal timeframes for introducing and utilizing each handout. Finally, we provide guidelines for practicing these strategies in session. It is our hope in writing this chapter that PCIT clinicians will become more familiar with the symptoms of ASD and how they may present within PCIT. We anticipate this added knowledge will build clinicians' confidence, and in turn increase access to quality care for children with ASD within community agencies.

While these handouts were developed for children with ASD in mind, we recognize that many types of children may exhibit similar difficulties. Some of these children may have undiagnosed ASD, while others may simply present with elevated behaviors in certain domains (e.g., sensory processing difficulties, behavioral rigidity, reduced social engagement, difficulties with social skills). Nonetheless, many of the strategies described here can be helpful in tailoring treatment to the needs of a given child and family regardless of whether the child has an official ASD diagnosis. However, to ensure that strategies are appropriate for the given child and family, functional assessments should be conducted to determine strategy effectiveness over time.

22.1 Overview of Handouts

Given the breadth of challenges associated with ASD, as well as heterogeneity in symptom presentation and parental understanding and acceptance, the parent handouts included in this chapter are designed to provide parents with information on how to utilize PCIT skills during both phases of treatment (i.e., Child-Directed Interaction [CDI], Parent-Directed Interaction [PDI]) to target various symptoms of ASD. While these ASD resources have not been formally evaluated to determine if they provide benefit above and beyond the traditional PCIT protocol handouts (Eyberg & Funderburk, 2011), they were all developed in accordance with PCIT behavioral principles.

The handouts to be discussed in more detail below (see Appendix) include the following:

1. The "*What Is Autism Spectrum Disorder?*" handout presents information related to understanding the behavioral challenges associated with ASD and how those symptoms may negatively impact the parent–child relationship.
2. The "*Special Time: Additional Tips for Parents of Children with ASD*" handout includes in-depth considerations of specific challenges that parents and children with ASD may experience when beginning Special Time at home.
3. The "*Managing ASD-Related Behaviors with CDI Skills*" handout supports parents in identifying ASD-specific positive opposites and gradually shaping more appropriate social and play behaviors over time. The handout also notes the potential for a slower rate of learning in this population and encourages parents to notice and appreciate the small victories in skill development.
4. The "*Having PRIDE Throughout the Day*" handout and accompanying "*Alternative CDI Homework Sheets (Using CDI at Home Throughout the Day* and *Using CDI at Home and in Typical Life Situations*)" handout are provided to support the clinician and parent in systematically working towards the goal of skill generalization—first in Special Time, then at home throughout the day, and finally in social situations outside of the home. Clinicians are encouraged to explicitly help parents apply CDI skills (<u>P</u>raise, <u>R</u>eflection, <u>I</u>mitation, <u>D</u>escription, <u>E</u>njoyment; PRIDE)

during teaching opportunities throughout the day and across different settings and people.

5. The "*Managing ASD-Related Problem Behavior with PDI: Hierarchy of Commands*" handout may help parents target difficulties associated with ASD as they move into PDI by using commands within Special Time, at home throughout the day, and in typical life situations outside the home.
6. Finally, the "*Putting It All Together: Addressing ASD-Related Problem Behavior with CDI and PDI*" handout provides parents with suggestions for combining PRIDE skills with different types of commands to address ASD-related behaviors.

As per the PCIT International Protocol (2011), it is not recommended that these handouts be distributed before CDI Coach 2, with the exception of the "*What Is Autism Spectrum Disorder*" handout, as parents are just becoming oriented to the PCIT skills and structure of the coaching sessions. However, the PCIT clinician is strongly encouraged to become familiar with all of the handouts prior to starting treatment (e.g., during intake), so that the broader concepts and rationale can be woven into early discussions about the appropriateness and fit of PCIT in early treatment sessions (e.g., CDI Teach, CDI Coach 1). Following CDI Coach 1, the timing for introducing the handouts will likely vary by family needs, PRIDE skills acquisition, and knowledge and acceptance of ASD symptoms. Below we provide detailed descriptions of each handout, including their purpose and rationale, as well as suggested guidelines for when to introduce each handout to families.

22.1.1 Handout: What Is Autism Spectrum Disorder?

22.1.1.1 Purpose and Rationale

This handout is designed to help normalize the difficulty of parenting a child with ASD, while encouraging acceptance of the child's symptoms of ASD. Further, the handout presents information about the behavioral challenges associated with ASD and how they may impact the parent–child relationship. Developing increased understanding and acceptance of an ASD diagnosis may help parents identify ways to target symptoms of ASD using PCIT skills and make the world more predictable and reinforcing for their child, which in turn can reduce challenging behaviors.

22.1.1.2 Introducing the Handout

Parents will likely vary in their level of understanding and acceptance of their child's symptoms. For families who indicate limited understanding of symptoms of ASD, this handout should be introduced as early in treatment as time allows, as it may facilitate open discussion between the clinician and parents regarding the child's symptoms. Clinicians may want to consider spending time during the CDI Teach reviewing symptoms of ASD. Further, they should provide additional justification for the importance of Special Time in children with reduced play skills to increase readiness to engage in Special Time. Other families may demonstrate clear understanding of their child's symptoms of ASD and may not need to spend as much time discussing the material in this handout with the clinician. However, clinicians may still find it helpful to introduce and reference this handout as treatment progresses and as they begin to target certain ASD-related symptoms within the context of PCIT. During later treatment sessions, clinicians are encouraged to tie symptoms of ASD listed on the handout to similar elevated behaviors on the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) as part of the "ECBI Talk" discussion of continued elevated behavioral problems. This strategy can help parents understand why children exhibit certain challenging behaviors (e.g., a child who "refuses to eat food presented" may do so because of sensory aversions to certain food textures), and what behaviors may not be as malleable in response to treatment.

22.1.1.3 Material Covered in the Handout

ASD is a complex neurodevelopmental disorder characterized by impaired social communication and interaction as well as restricted or repetitive patterns of behavior and interests (American Psychiatric Association, 2013). Many symptoms of ASD have the potential to significantly impact social skills, communication, and behavior across the lifetime. Thus, it is important for clinicians to help parents better understand that many of the challenges children with ASD experience are due to difficulties with learning skills that come naturally to most people, as opposed to purposely trying to misbehave or act inappropriately. ASD affects the way the brain processes information, particularly social information, which by nature is highly complex and abstract. Therefore, social rules and situations can be very confusing and overwhelming to a child with ASD, and can often lead to anxiety, acting out, or avoiding new situations (e.g., Bellini, 2006). Additionally, the heightened need for control, insistence on sameness, repetition, and predictability associated with ASD may result in behaviors that could seem unusual and/or rejecting. The handout describes common ASD symptoms and challenges, while acknowledging the heterogeneity in symptom presentation. It is also important to acknowledge the unique strengths that are often associated with ASD such as attention to detail, memory skills, logical thinking, and a rule-oriented nature (Baron-Cohen, Ashwin, Ashwin, Tavassoli, & Chakrabarti, 2009). In fact, many of these strengths suggest a positive response to PCIT given its emphasis on structure and consistency.

22.1.1.4 Clinical Strategies

Each child with ASD has a unique set of strengths and weaknesses. Having a clear conceptualization of the behavioral challenges that likely stem from ASD symptoms and appropriateness of PCIT in targeting these symptoms can assist parents and clinicians in setting appropriate goals for treatment. For example, PCIT alone may not fully address certain symptoms that fall within the restricted or repetitive behavior symptom domain, such as complex motor movements (e.g., hand flapping) or sensory-seeking behaviors (e.g., visual inspection). Understanding symptoms of ASD early in treatment and helping parents identify their child's strengths and areas for growth can help increase parent engagement and motivation.

22.1.2 Handout: Special Time—Additional Tips for Parents of Children with ASD

22.1.2.1 Purpose and Rationale

The play setting in which PCIT is delivered can present challenges given the limitations many children with ASD have with functional and symbolic play, verbal and nonverbal communication, and restricted interests (Baron-Cohen, 1987; Chaudry & Dissanayake, 2015; Stone et al., 1990). At times, social interactions may be overwhelming, stressful, and/or confusing for the child, which may lead parents to believe that the child is not "motivated" to interact. As a result, parents often encounter difficulties setting up Special Time and generalizing gains from the clinic to the home environment. This handout is designed to normalize this experience for parents (particularly for parents of children with low initial play abilities), provide them with information on how to troubleshoot common difficulties encountered in early Special Time practice at home, and increase the likelihood that both the parent and child can successfully practice their new skills.

22.1.2.2 Introducing the Handout

The PCIT International Protocol (2011) offers guidelines for clinicians to discuss issues related to Special Time and the completion of homework during session check-ins. We encourage the PCIT clinician to review the types of common homework-related issues included in the manual (e.g., frequency of practice, comments written in homework sheets, child response to Special Time, skills parents find most difficult) with parents. Through these discussions, clinicians may find that parents of children with ASD encounter challenges that are somewhat specific to ASD (e.g., repetitive play with toys, overstimulation or disengagement, trouble transitioning in and out of Special Time). If these ASD-related difficulties arise, this handout should be introduced early in treatment (e.g., CDI Coach 2), as it provides suggestions for adjustments to reduce difficulties in practicing Special Time.

22.1.2.3 Material Covered in the Handout

The strategies discussed in the handout can support successful parent homework completion. Parents and clinicians have liberty to choose toys that will motivate the child within the recommendations for appropriate toys. Given that children with ASD thrive on predictability, we recommend identifying at least one high-interest toy to keep consistent across Special Time sessions (consistency across home and clinic settings can be helpful but may not always be feasible). We also recommend incorporating other toys that are likely to engage the child and encourage parents to attend to any flexible play (e.g., playing with a non-preferred toy, combining different types of toys). If a child becomes stuck in a certain way of playing, encourage parents to reduce attention to that behavior and provide ample praise for any other type of play. Parents can then support expansion of the child's capacity to engage with different toys. Eventually, it may be possible to remove the preferred toy altogether.

Some children can exhibit aggressive or destructive play, which may not necessarily be intentional or directed towards the parent. If this is the case, it may be helpful to communicate expectations (e.g., gentle hands, inside voice) for appropriate play at a neutral time. For example, at the beginning of a session, parents can remind their children of behavioral expectations (e.g., "In this room, we use gentle hands and inside voices"). Encourage parents to state rules at a time when the child is calm, and state the expectation in a neutral tone, avoiding commands. Using a visual schedule with a reminder of these expectations can increase the likelihood of children behaving appropriately without the use of parental commands. If children maintain rough or destructive play with toys, parents can remove the toy, and/or clinicians can omit that toy from the next session. These toys can be reintroduced in PDI where parents issue commands related to problematic play behaviors. Having clear expectations and consistent consequences for unacceptable behavior can set families up for success.

The environment in which parents conduct Special Time can influence the child's motivation and engagement. Children with ASD often have unique sensory needs and aversions (e.g., bright colors, harsh lighting, unusual textures); if these are overstimulated, children can "shut down" even in otherwise fun situations. Pay special attention to where parents conduct Special Time. Encourage settings with low visual and auditory stimulation. Parents may also need to be flexible by following the child's lead to play on the floor, in a walk-in closet, or even in the bathroom. As long as they are following expectations for Special Time, encourage this type of adaptability. Over time, families can work up to Special Time in more public and common areas in the home.

Predictability in schedule can also help children with ASD be more likely to enjoy and engage during Special Time. In the handout, we provide suggestions for how to keep a consistent schedule and provide visual reminders for children. In our experience, when parents set up a visual schedule that includes Special Time, it can help keep everyone in the family accountable and more likely to complete Special Time homework regularly (see example visual schedule in the handout).

Play can be work for children with ASD. Some children may have a slow progression in engaging during Special Time. These families can spend days or weeks building up to children sustaining play for the full 5 min of Special Time at home. In the beginning of CDI, the clinician can encourage parents to attempt 5 min of Special Time (as per protocol), while acknowledging that it is possible that their child may disengage (e.g., walk away, prefer isolated play) after a few minutes. A "warm-up" period before Special Time, both at home and in session (e.g., between check-in and coding/coaching) can be helpful for some children. During this time, children have the opportunity to engage with the toys on their own terms while parents slowly increase the frequency of the PRIDE skills. This may extend overall time with toys, but it typically helps children tolerate longer periods of Special Time (e.g., in-session coaching periods) than they would without a warm-up. In particular, this method may aid children with high levels of rigidity who have difficulty transitioning between activities or children who are highly sensitive to auditory stimulation and may need to warm up to the rate of PRIDE skills warranted for mastery.

Commonly, children with ASD can be resistant to parental attention at first—which often leads parents to try harder to engage the child. This may cause the child to withdraw or lash out, furthering the negative interaction cycle. It is particularly important to help parents learn to recognize their child's cues (e.g., wandering, playing on his/her own, stating ownership over toys) so they can successfully ignore inappropriate behavior and attend to positive behavior. While it may be frustrating for parents to encounter this barrier, investing the time early in treatment to support the child's acclimation to Special Time will help their child learn skills to connect with others through play.

22.1.2.4 Clinical Strategies

Children with ASD continually have to sort through, process, and integrate what is expected of them in often complex and unpredictable social situations. Therefore, any in-session changes, and in particular unexpected changes—no matter how small they may seem to others—can increase anxiety. If a child has difficulty transitioning between activities, clinicians may need to be prepared initially with high-interest toys; this can help children have something to look forward to once they get past a transition in session. For example, providing children with a special toy (a toy that you have available in the clinic, or one parents have brought from home) that they only get during check in/out can incentivize calm behavior during transition periods. Frequent reminders of what is coming next, and/or visual schedules can help ease transitions for children with ASD. Providing warning statements 1 or 2 min before each transition can also prepare the child for a change that is coming (e.g., "In 1 min our Special Time will be over, but Daddy will be coming in to play with you"). *First, then* statements can also provide structure to a session and increase a child's understanding of what is to come (e.g., "First I need to talk to your parents for a few minutes, then you will get to have Special Time with Mommy"). Clinicians may also want to build in extra time for transitions. If transitioning is a challenge for the child, end Special Time coaching a little early to allow time during check out for naturalistic coaching to occur if the child tantrums. Over time, we expect this behavior to improve, particularly with clinicians coaching parents through praising successive approximations of calm behavior during transitions. Encourage parents to take a similar approach to transitions in their everyday life.

Another common challenge in implementing Special Time can stem from parent frustration with repetitive or less socially rewarding play. In these instances, parents may need additional support in increasing their levels of enjoyment during practice. Discuss what parents enjoy most about their child and brainstorm how they can incorporate that into the play. Enhancing parental enjoyment of play can increase buy-in and maintain motivation to practice CDI even during times when the play is less rewarding.

22.1.3 Handout: Managing ASD-Related Behaviors with CDI Skills

22.1.3.1 Purpose and Rationale

PCIT provides a model that can help parents understand how to manage disruptive behaviors (e.g., tantrums, aggression, noncompliance) and reduce some of the core symptoms of ASD (Ginn et al., 2015; Masse et al., 2016; Solomon et al., 2008; Zlomke et al., 2017). This handout extends principles from the standard PCIT protocol to help parents target behaviors related to ASD with CDI strategies. Parental attention is a powerful teaching tool, and therefore helping parents notice subtle prosocial behaviors (e.g., eye contact) in natural environments can reinforce the development of appropriate social skills.

22.1.3.2 Introducing the Handout

This handout will be most useful for parents demonstrating some flexibility in PRIDE skill use (e.g., at least 5-5-5 of behavior descriptions, reflections, and labeled praises within the 5-min coding period). Thus, we recommend introducing this handout following CDI Coach 2 or 3. This handout may be particularly helpful for parents who have started praising play behaviors but need help recognizing subtle social behaviors relevant to their child's symptom presentation (e.g., eye contact). This handout may further aid parents who set high expectations for their child, or those who may be frustrated with lack of change in challenging behaviors stemming from a child's ASD diagnosis.

22.1.3.3 Material Covered in the Handout

The parent handout discusses common behavioral challenges in ASD, their positive opposites, and how to notice those positive behaviors when they occur during play. Importantly, we suggest that clinicians work with parents to identify positive opposites that are specific to their child. Clinicians can use the information provided in this chapter along with the "*Managing ASD-Related Behaviors with CDI Skills*" handout in the Appendix to create an individually tailored "*Labeled Praise for Positive Opposites*" handout for families (which is already available in the Supplemental Parent Handouts section of the PCIT International Protocol). See also the "*Expanded Positive Opposites*" chart (Table 22.1) filled in with detailed suggestions for addressing ASD-related behaviors. This table is not meant to be shared in its entirety with parents as the specific symptoms of ASD, and the way in which those symptoms impact parent–child interactions, vary widely from family to family. Instead, it is meant to guide the clinician in discussing positive opposites (and small steps towards those positive opposites) tailored to each child's need.

In the handout, we provide suggestions for increasing the salience of PRIDE skills and enhancing the opportunity for teaching new prosocial behaviors. For example, in addition to providing the child with a labeled praise for positive social behaviors associated with ASD (e.g., sharing, staying calm, making eye contact, trying things in new or different ways), parents can add rationale (i.e., an explanation) to help children understand the reason these skills are important. This can help children make the connection between their actions and the effect they have on others. This type of perspective-taking can be hard for children with ASD, so having parents make the connection clearly, across multiple settings, and with numerous examples can serve as a valuable learning experience.

As PCIT clinicians, we understand that behavior change does not happen overnight; it requires slow growth through successive approximations of a desired behavior. This is particularly true for children with ASD who tend to have more difficulty than neurotypical children in the acquisition and generalization of new skills (Schopler & Mesibov, 2013). In this handout, we provide an overview of shaping a positive behavior. It may be helpful to go through an example with the parents (see example of shaping shared positive affect in the handout) and encourage them to identify 1–2 "active" target behaviors (i.e., positive opposites) that they focus on at a time.

Parents can help shape behavior through modeling and praising when children imitate or approximate these skills. Clinicians may want to help parents identify ways to model appropriate behavior and come up with a plan for how parents can respond that maximizes "Do" and minimizes "Don't" skills. For example, if a child has difficulty staying calm when play deviates from their expectations (e.g., building a tower all of one color), the parent can describe the situation, narrate his/her own reaction (e.g., "I get upset when things don't go my way too"), and describe and demonstrate adaptive ways to respond (e.g., "When I get upset, I take deep breaths." [Parent takes an exaggerated breath to demonstrate]). When children imitate these cues, parents should praise successive approximations of desired

Table 22.1 Expanded positive opposites chart

ASD-related problem behavior	Positive opposite	Possible responses to shape and reinforce positive opposites
Limited eye contact	- Looking you in the eye	"Thanks for turning towards me!" "You're facing me, that helps me know you're listening." "Thanks for coming closer to me. I like when we sit together!" "I love when you look me in the eye." "I am happy to see you smile when you look at me."
Delayed language	- Using new words, sounds or pictures to make wants known - Pointing and gestures (nonverbal communication)	Inferring meaning in sounds Child: "Cacaca." Parent: "Car! You're playing with the car." Child: "Want car." Parent (reflects with expansion): "Yes, you want to play with a car." Reflecting all new words "Nice pointing. That helps me know what you want."
Trouble understanding emotions	- Expressing emotions on face - Describing emotions in characters - Expressing frustration with words - Showing empathy when you or a character is hurt	"You're smiling, I love seeing you happy." "Thanks for telling me when you're upset." "That was sweet of you to give me a hug when I was sad."
Rigidity	- Using more than one type of toy - Using toys in new and different ways - Combining types of toys in play	Parent introduces new toy: "Thanks for playing with this new toy with me." "It's fun to play with lots of toys together." "Great job doing something new with the toys! You are so creative to think of that."
Difficulty sharing	- Taking turns - Waiting - Playing with same toy as you	"Thank you for staying calm when I took a turn." "I love when we play together!" "Nice job taking turns with me."
Preference for playing alone	- Looking at you while playing - Playing near you - Playing with your toys - Sharing/showing objects to you	"It's fun to play *with* you." "Thanks for handing me that toy, I love when you share!" "Thanks for showing me what you were playing with."
Gets upset easily	- Staying calm when frustrated - Using words or gestures to say "no" - Sticking with a hard task	"Great job taking a big deep breath. Breathing helps you stay calm." "Thanks for letting me know with your words that you don't want my help."
Aggression/hitting	- Using words when upset - Keeping hands to himself/herself	"Nice gentle hands!" "You stayed calm even though you were upset when your tower fell over." "I love your hugs!"

behaviors. Additional examples of modeling a new play behavior and then praising an approximation of that behavior are provided in the handout. Frequent practice of these skills over multiple sessions (both in session and at home) can help children develop new play, social, and coping skills that will increase engagement with others as they develop.

Parents often come into therapy expecting a "quick fix" to the behavior problems they have been dealing with for years. It may be necessary to remind parents (sometimes frequently) that behavior change does not happen overnight—for both children and parents! The beauty of PCIT is that clinicians are able to help coach parents towards increasingly more adaptive ways to shape their child's behavior, promote positive parent–child interactions, and recognize those changes every week. Additionally, it is important to remind parents to reflect on the "big picture"—notice qualitative and overarching improvements in both the parent, the child, and their relationship. Because there are often so many behaviors to target at once, the small improvements in one or two behaviors can go unnoticed. Try to catch the "little victories" and point these out to parents through higher-order process comments during coaching (e.g., "I know it's frustrating when she tries to take control over the play, but I also notice that she's much calmer when things don't go her way. All the time you spend praising her for staying calm this past week is paying off"). Helping parents enjoy these small victories promotes effective coaching while maintaining parents' motivation and commitment to treatment, even when tough situations arise in session.

22.1.3.4 Clinical Strategies

PCIT coaching sessions provide ample opportunity to practice generalization of CDI skills to manage ASD-related behaviors outside of a play context. In a typical PCIT session in an outpatient clinic, families often sit in a waiting room with other children and families before transitioning to the therapy room. Once there, children must occupy themselves while clinicians check in with parents. Within the play session, there are transitions between play activities and sometimes between parents. Then, the session moves to a check-out period where the child experiences a drop in parental attention (while likely being tired from "working" at play in Special Time). All of these are wonderful opportunities to coach parents in more naturalistic settings. Applying the strategies discussed in the handout of attending to positive opposites, shaping positive behaviors, and modeling in these situations can help promote the generalization of parent skills.

Clinicians can incorporate opportunities to work on shaping a desired behavior within CDI coaching as well. For example, if a target behavior for the child is to use words to express frustration, a clinician might coach the parents to "accidentally" knock over their own tower one week, then model staying calm and praise their child for staying calm as well. The following week, the parent could "accidentally" knock over their child's toys and immediately praise staying calm, or using their words to express their frustration if this happens. Encourage parents to notice natural opportunities to praise the child for these desired behaviors at home throughout the week as well. "Catching the positive" and reinforcing those skills with high levels of parent attention can help children make meaningful gains as quickly as possible while also promoting generalization.

22.1.4 Handout: Having PRIDE Throughout the Day

22.1.4.1 Purpose and Rationale

In order for children to maintain improvements in behavior changes over time and in different situations, efforts must be made to generalize PCIT skills outside of the clinic to increasingly naturalistic settings throughout the day. Parents often need support in making this jump, and it can be particularly challenging for parents of a child with ASD given the child's inherent difficulties with generalization. CDI techniques can also be applied to practice social skills. In this handout, we provide guidelines to help parents generalize CDI skills to social settings.

22.1.4.2 Introducing the Handout

The PCIT International protocol offers a high degree of structure and support in rolling out PDI in a gradient manner. We are proposing a similar procedure be utilized with parents of ASD children (or any parents struggling with generalization of CDI skills) to use natural teaching opportunities to reinforce skills. This handout should be introduced after discussing positive opposites of ASD-related behaviors as well as the importance of shaping and modeling (discussed in the "*Managing ASD-Related Behaviors with CDI Skills*" handout). The following strategies provide suggestions for applying these skills across a range of settings to promote treatment gains. We recommend waiting until parents reach CDI mastery to discuss these strategies, as they require highly flexible and targeted use of PRIDE skills. If a parent expresses social skills as a top problem behavior, spending extra time in CDI could help meet their desired clinical goals.

22.1.4.3 Material Covered in the Handout

The parent handout discusses the importance of looking for natural opportunities during day-to-day activities to reinforce prosocial behaviors. Parents start by praising social skills throughout Special Time (as described in the previous handouts), then slowly increase their use of these strategies throughout the day. There are many opportunities that occur in families' daily lives that, because they are so habitual, may not appear to be ideal teaching moments (e.g., getting ready for bed or school, bath time, at the dinner table, having a conversation about the day, playing near or with siblings). As parents begin expanding the settings in which they apply PRIDE skills, it can be helpful to track their efforts more systematically. The alternative homework sheet, "*Using CDI at Home Throughout the Day,*" can help parents identify positive opposites to target and monitor if attending to them is effective.

As parents become more comfortable noticing and using these natural opportunities to provide reinforcement for their child's efforts, deliberate efforts can be made to reinforce social skills in public places (e.g., eating at a restaurant, on the playground, at a religious service, in the grocery store). Setting up "low pressure" play dates can provide valuable learning opportunities. In this handout, we also discuss how to help coach social skills in PCIT sessions outside of the parent–child play situation (i.e., typical life situations). The alternative homework sheet, "*Using CDI at Home and in Typical Life Situations,*" may be a helpful reminder of the goals related to generalization.

22.1.4.4 Clinical Strategies

There are ample opportunities to help parents attend to social behaviors during a typical CDI session. Check-ins are a perfect time to reinforce appropriate social behavior. First, children have the opportunity to greet the clinician in the waiting room. Many parents of children with ASD naturally demonstrate "Don't" skills during greeting and farewell situations (e.g., "Say hi." "Can you wave bye?"). Greetings can be particularly stressful for children with ASD given their challenges with social skills. Placing demands on children during these periods can trigger additional levels of anxiety and result in tantrums or other undesirable behaviors. Once parents have become more familiar and comfortable with the PRIDE skills (typically around CDI Coach 3 or 4), be prepared to coach them through these social practice opportunities, to gently point out parents' use of "Don't" skills (e.g., "Oops, that was a question/command"), and to recognize their use of PRIDE skills for appropriate social behavior (e.g., "I like how you praised Susy's use of eye contact when we entered the room"). It may be helpful for you to model praising appropriate behavior first as some of these social behaviors (e.g., eye contact) are subtle and can be taken for granted. Notice how the child greets you over the course of treatment. You can model praising appropriate behavior (e.g., "Susy, thank you for looking at me when I said hello"), and slowly increase your expectations so that you praise higher-quality social behaviors over the course of treatment (e.g., "Wow! Today you waved and said 'hi' to me at the same time. Thank you for being so friendly"). This simple exercise may resonate with parents and help them generalize their PRIDE skills to other settings where their child greets others.

Families often need to wait for their session in crowded waiting rooms full of other children. This can provide a low-risk situation for parents to practice attending to social skills in their child. Clinicians can naturalistically coach parents to praise prosocial skills and provide brief rationale for their importance. For example, if a child with ASD offers a toy to another child, parents could respond by saying, "Thanks for sharing your toys [labeled praise]. Sharing helps you make friends [rationale].” Parents can extend social skill practice to teach their children how to relate to and play with others (discussed in the “*Having PRIDE Throughout the Day*” handout). Setting up opportunities to reinforce social skills in a monitored environment can help children generalize improvements in these skills.

22.1.5 Handout: Managing ASD-Related Behaviors with PDI Skills—Hierarchy of Commands

22.1.5.1 Purpose and Rationale

Foundational strategies for managing disruptive behavior with CDI are still paramount as families enter the PDI phase of treatment. Some families may initially have concerns surrounding PDI and the use of strategies such as commands and time out from positive reinforcement (e.g., “What if it takes a really long time for my child to calm down?” “What if my child doesn’t actually know how to do what I am telling him to do?”). In our experience, many children with ASD respond very well to the structured and consistent approach to discipline in PCIT. Use of the same wording and grammatical structure in the procedure makes the expectations very clear and predictable. Further, our research suggests that there are no significant differences between children with ASD and neurotypical children in the frequency or duration of time out (though the data suggests a trend for *shorter* time out duration and *fewer* time outs in children with ASD; Rowley et al., 2015). In addition to external regulation provided by increasing structure and predictability of discipline techniques, the process of calming oneself down during a time out will teach emotion regulation skills (Lenze, Pautsch, & Luby, 2011) that can be underdeveloped in children with ASD (Mazefsky et al., 2013).

The “*Managing ASD-Related Problem Behavior with PDI: Hierarchy of Commands*” handout provides suggestions of commands to target challenging behaviors typically observed in children with ASD in a hierarchical fashion. Similar to CDI, the beginning of PDI with a child with ASD will likely look similar to standard PDI procedures; parents need to gain familiarity with providing effective commands, and children need to comply with simple commands and accept time out prior to targeting symptoms of ASD more directly. A child’s ability to respond to daily instructions or commands can be shaped much in the same way that all positive behaviors are shaped—in small, specific, successive approximations towards a goal.

22.1.5.2 Introducing the Handout

We provide this handout to help parents generalize PDI skills to manage ASD-related difficulties in Special Time at home, in more naturalistic settings throughout the day, and then outside the home in public settings. After gaining practice with simple commands in public (e.g., PDI Coach 5), clinicians should decide whether either of the PDI handouts may be helpful to enhance application of discipline procedures to manage ASD-related behaviors. This handout provides a sample menu of commands that could accompany behavioral goals during play, at home, and in public situations related to difficulties commonly seen in (though not specific to) ASD. Following the child’s compliance with a command, parents should always praise compliance as well as the skill being targeted (e.g., “Nice listening. Great job *sharing* the toy with me”).

22.1.5.3 Material Covered in the Handout

PDI can target social communication and play difficulties through commands. Play commands provide a natural venue to learn new forms of social communication and play skills. Parents can provide commands for the child to use toys in new and creative ways (e.g., “Make the block fly like an airplane, like this”), to exhibit prosocial behaviors (e.g., “Put your hands on your lap while mom takes a turn”), and to learn manners (e.g., “You interrupted me. Please say *sorry*”). As with every new skill, it is important to set the child up for success by starting with commands with a high probability of compliance (e.g., “It’s your turn now. Take the train") and using short, concrete, specific language appropriate to the child's developmental level (see also McDiarmid & Bagner, 2005).

Play commands can target inflexibility and increase a child's capacity to tolerate unexpected events, which can be challenging for children with ASD. For example, if a child must always build a completely blue tower, parents can provide a command to "Put a red Lego on the tower." In addition to praising compliance, parents should also reinforce the child's flexibility in these situations. It is not uncommon for children with ASD to learn the command-compliance sequence so well that they revert or correct the action immediately after receiving a labeled praise for listening. In these situations, a follow-up command to "Please put the red Lego back on the tower," or "Please keep the red Lego here," may address this issue. Alternatively, if children become distressed playing with a specific toy, parents can act as external regulators by providing commands to switch to a different activity. With targeted flexibility practice, children can significantly expand their zone of tolerance of uncertainty and feel more confident in difficult situations.

Parents can also instruct children to develop social skills and behavioral flexibility at home in everyday activities (e.g., at the dinner table, when getting ready for bed) and social situations (e.g., playing with siblings, having conversations). Daily living and coping skills are also targeted in this way. Depending on the cognitive and adaptive capabilities of the child, parents and clinicians can develop specific and realistic goals that can be addressed through commands. For example, if a child has not yet learned how to brush his teeth independently due to fine motor delays, then the task could be broken down into multiple steps; the parent can provide a command for each step the child is capable of completing (e.g., "Pick up your toothbrush. Open your mouth, like this").

Lastly, we provide ideas for commands to help parents instruct children to display safe and appropriate behavior in public settings. While many of the commands listed apply to children with and without ASD, these are areas in which children with ASD have particular difficulties (e.g., recognizing social cues, greetings, being polite, behavioral inhibition, safety awareness). As is the case with all families in PDI, parents will first want to consider their willingness to put their child in time out for a particular task prior to issuing a command. Some children with ASD also experience extreme social anxiety; therefore requesting that a child "say hello" to an unfamiliar adult may be an unfair expectation. However, if the child is capable of greeting others appropriately but tends to forget that this is an expectation when encountering new people, this type of command can help reinforce these social concepts. Discussing optimal settings to practice (e.g., with familiar people, in low-stakes environments, when calm) can help families maximize learning opportunities.

22.1.5.4 Clinical Strategies

Clinicians can work with parents to practice commands of varying difficulty through additional "a la carte" sessions in PDI Coach 7 (and beyond). If a child continues to have trouble regulating his or her behaviors or applying social skills across settings, additional "on the go" sessions may be warranted to increase parental attention to or commands for desired prosocial behaviors. Other children may have trouble with adaptive behavior and functional communication (e.g., dressing, using words to communicate). If indicated, clinicians can also provide opportunities to practice these skills in session. Parents may bring in specific materials related to the adaptive behavior challenges, and clinicians can coach parents on breaking tasks into smaller steps (e.g., getting dressed involves getting appropriate clothes out, putting shirt over head, pulling arms through sleeves, buttoning shirt), attending to the skills the child can accomplish independently, and providing commands for more challenging behaviors.

22.1.6 Handout: Putting It All Together—Addressing ASD-Related Problem Behavior with CDI and PDI

22.1.6.1 Purpose and Rationale

The goal at graduation is for parents to achieve confidence and flexibility in using all of the PCIT skills to manage challenging child behaviors in any setting. This handout offers a useful framework for parents to continue to plan their approach to address their child's unique challenges both within treatment and beyond graduation.

22.1.6.2 Introducing the Handout

This handout should be introduced as parents are nearing graduation. Once parents have mastered the basic CDI and PDI skills, parents should start to apply a combination of PCIT principles to any child behavior problems that may remain. This handout can provide a way for clinicians to summarize and reiterate the variety of options parents now have to target problem behaviors with PCIT strategies. Ideas for managing challenging behaviors include attending to the positive opposites (e.g., labeled praise [LP] for positive opposite), and explicit instructions to the child (e.g., direct command [DC] for positive opposite, DC for incompatible behavior).

22.1.6.3 Material Covered in the Handout

In this handout, we present a few examples of how parents might use both CDI and PDI skills to decrease challenging behaviors. At this point, many parents more fluidly combine CDI and PDI skills to target remaining problem behaviors. Importantly, there is typically more than one correct strategy to use in a given situation. For example, if a child with ASD engages in repetitive motor movements such as walking in circles around the room, the parent has a choice on how to address this behavior with PCIT strategies. First, the parent could choose to ignore this behavior as it may not clearly be disruptive to that particular setting. The parent could then look for opportunities to praise the positive opposite of wandering (e.g., "I like how nice and still you are sitting while you read your book"). Alternatively, if the child's wandering is disruptive or potentially dangerous given the setting and/or situation (e.g., in the doctor's office, in a crowded shopping mall), the parent can issue a direct command. The effective command can directly address the positive opposite of the behavior (e.g., "Please stand still") or the parent can issue a command that is incompatible with that behavior (e.g., "Please sit down in the chair next to me"). An incompatible behavior is one that the child cannot do if engaged in another behavior or that will result in the removal of the child from the negative situation. Helping parents brainstorm various ways to respond to remaining behavioral challenges can ensure generalization of skills across settings beyond treatment completion.

22.1.6.4 Clinical Strategies

It can be helpful for clinicians to practice this type of problem solving during PCIT sessions. If a certain PCIT strategy was not particularly effective in stopping a problem behavior, remind the parent that they have other options to fall back on. The types of PCIT strategies selected may also depend on the child's behavioral goals and/or immediacy of the situation. If a particular negative behavior arises during session, ask parents how they could address this behavior with CDI skills; then ask what types of PDI skills could be used for the same behavior. Encourage parents to weigh the pros and cons of each strategy, pick one, and try it out. Have parents consider the effectiveness of the strategy they selected and modify their response, if necessary. By engaging parents in this type of in-the-moment problem solving in various situations over multiple sessions, they can become more skilled, independent, and confident in the flexible implementation of PCIT skills.

22.1.6.5 Case Example

A child was referred to PCIT who frequently struggled with emotion regulation and expressing negative emotions appropriately. At her follow-up session following PCIT treatment, “Nicole,” a 6-year-old with ASD and attention-deficit/hyperactivity disorder, was given a choice between two toy prizes at the end of the session. She matter-of-factly exclaimed, “I don’t want either of these.” Her mother immediately praised her for staying calm and using her words to express herself. Her mother then explained that these were the only two choices available and then issued a direct command for Nicole to pick one toy. With a very brief hesitation (less than 5 s), she was able to select one calmly. Although she was not completely satisfied with the toy she picked, as she walked down the hall with her parents, we overheard her exclaim excitedly, “Mommy, I was flexible!” In this situation, Nicole’s mother seamlessly combined positive attention to target behaviors (e.g., emotion regulation, using her words when frustrated), rationale for the situation, and calm issuing of a command to support her daughter through a difficult situation. Both parent and child left feeling PRIDE in their accomplishments.

22.2 Conclusion

The current chapter aims to expand recent efforts to optimize PCIT outcomes for children with ASD and their families through the development of innovative parent handouts. The unique strengths and difficulties associated with ASD can make PCIT with this population both challenging and highly rewarding. To begin addressing some of these challenges, continued efforts are needed to not only expand the scope of PCIT to include children with ASD but to develop creative approaches to tailor PCIT skills to manage ASD-related behaviors. The information covered in this chapter is also meant to support clinicians in successfully tailoring standard PCIT treatment to the unique needs of each individual child with ASD, focusing on the style of treatment delivery to meet the individual needs of the family (Eyberg, 2005). We hope that PCIT clinicians will feel more prepared now in addressing the needs of these families, but we also strongly encourage clinicians to explore and take advantage of available professional development, consultation, and training opportunities on ASD and delivery of PCIT with children with ASD.

Initial research on PCIT in ASD populations demonstrates its promise in reducing behavioral challenges, as well as improving common presenting concerns in children with ASD (e.g., adaptive functioning, atypical behaviors, prosocial verbalizations, parent–child shared positive affect, social awareness). The handouts discussed in the current chapter provide direct ways to support parents in tailoring PCIT to difficulties common to ASD. Future research endeavors should examine whether PCIT can improve core symptoms of ASD, and whether the handouts developed here provide additional benefit in reducing difficulties faced by families of children with ASD. Furthermore, future research studies may benefit from applying PCIT strategies to other treatment modalities designed for children with ASD (e.g., social skills group therapy).

Becoming familiar with the strategies discussed here, and how to use the handouts to help parents generalize skills outside of session can optimize treatment outcomes for children and families. A combination of positive attention to appropriate behaviors, ignoring difficult behaviors commonly associated with ASD, and providing clear instructions and consistent follow through can dramatically reduce challenges faced by many families of children with ASD. The opportunity to feel confidence in their ability to connect with their parents, interact successfully, and self-regulate can change the way children with ASD understand themselves and promote positive development for years to come.

Appendix: Parent Handouts for Managing ASD-Related Behaviors

What Is Autism Spectrum Disorder?

Autism Spectrum Disorder, or ASD, can affect your child's ability to interact and play. Children with ASD aren't trying to be difficult, their brain works differently which means they see and understand the world in a different way than most people. This can be hard for many parents to understand because children with ASD have trouble with things that may come naturally to you. They may have problems communicating, being social, and playing with other people, especially other kids. They may also show certain behaviors that can seem "odd," off-putting, or disruptive. Some parents find it helpful to learn more about their child's ASD-related behaviors so they can respond with more patience, understanding, and compassion. While ASD tends to look pretty different from one child to the next, here is a list of behaviors you might notice.

ASD Symptoms and Challenges

Social Communication and Interaction Challenges

- Trouble with verbal (talking) and nonverbal (eye contact, gestures) communication.
- Not noticing social cues/rules, like interrupting when you are talking with someone else.
- Not offering to share or take turns in play or when talking.
- Trouble noticing how other people feel, or telling people about their own emotions.
- Not knowing how to play with toys, or may play with them the same way each time.
- Would rather play alone than with other people.

Restricted and Repetitive Behaviors

- Making unusual noises or saying the same thing over and over.
- Moving hands or body in unusual or repetitive ways.
- Becoming upset when moving from one activity to the next.
- Trouble with sudden changes in routines or schedule.
- Strong or "obsessive" interest in certain toys or topics.
- Getting easily overwhelmed by loud, new, or crowded situations (like shopping malls).
- Having strong, sometimes sudden emotional outbursts and trouble calming down.

Children with ASD live in a social world that may be confusing and overwhelming. This can lead to anxiety, acting out, or avoiding new situations. This may also make it difficult to engage, play with, and enjoy your child during Special Time and throughout the day. Even with these challenges, children with ASD often have unique strengths—attention to detail, excellent memory, logical and rule-oriented personality—all of which make PCIT a great treatment choice for you and your child! The strategies you learn in PCIT can help you make the world a little bit more predictable for your child and make it easier for you to feel connected to one another.

Special Time: Additional Tips for Parents of Children with ASD

Play is hard work for children with ASD. These “on the job” tips may help answer some of your questions and make it easier for your child to play and enjoy being together during Special Time.

Toy Selection

Finding the right toys to engage your child is very important. You will want to follow the guidelines explained by your PCIT therapist during the CDI Teach, but it is also helpful to give some extra thought about the specific toys you put out during Special Time. Picking toys that will catch your child’s attention can help make the play more fun for everyone. Put out one toy you know your child will really like, and then choose 1–2 more toys that might be interesting to him or her. It some cases, it might be a good idea to have the same toys every session so your child knows what to expect. Once your child gets used to playing with other types of toys, you can remove or replace his/her “preferred” toys with different ones. Sometimes children get “stuck” on a specific toy. While playing with this toy, he/she may show more problem behaviors that make it harder to get his/her attention or interact. In this case, you may need to put this toy away during Special Time. Try to have other, similar toys available. For example, if your child really likes cars and enjoys watching the wheels spin, choose a different set of vehicles with similar features like a helicopter. Try to avoid toys with set instructions (like a Lego manual), or remove the instruction booklet, as children with ASD can become really focused on following the instructions.

Structuring the Environment

Putting in a little extra effort in setting up the area in your home used for Special Time can go a long way. Children with ASD can be more sensitive to specific “sensory” parts of their world. If your child gets upset by bright lights, choose a room with dim lighting. If he/she is distracted or startled by noise from the room next-door, set up a fan or white noise machine to soften those sounds. A smaller room with less clutter or distractions may also make it easier for your child to focus and sit still. It may help your child feel calmer to always use the same room for Special Time.

Children with ASD like to know what to expect. Practicing Special Time every day can give them something to look forward to in their schedule, which can help lower anxiety and outbursts. Build Special Time into your daily schedule. Choose the same time each day. It can even help to make a “visual schedule” to use with your child so it is even clearer when your child can expect to have Special Time. For example, write down a list of activities that your child does each day before or after school. Write in Special Time as one of the activities. Draw pictures or use clip art along with words in your schedule to make it very clear. Put your schedule up on the refrigerator or wall where your child can see it. Here is a sample visual schedule:

OUR AFTERSCHOOL ROUTINE

Come home

Play with tablet

Have a snack

Eat dinner

Do homework

Special time with dad

Special time with mom

Get ready for bed

During transitions, such as starting school, during trips, or on holidays, it is even more important to keep Special Time as part of your daily routine. Children with ASD can become even more stressed by these changes in schedule. They may be more irritable or have more outbursts. The more regularly you have Special Time, the less stressed your child will be. Also, if you expect a change in your routine, be sure to give your child a warning first, and to show your child how the day will be different by making changes to your "visual schedule."

Let's Warm Up

For children with ASD, play is work—it might not come as naturally to them. Try to pay attention to how your child is acting during Special Time. Sometimes children with ASD need some "warm up" time or may take longer to enjoy play. Just an extra 1–2 minutes in the beginning of Special Time where you play alone, or side by side, with your child may help give him/her time to settle in and be more open to play time with you.

Notice how your child reacts when you try to use the PRIDE skills. Does he or she look up at you, smile, start to talk more, move closer to you?—Great! It's working! Sometimes, though, children with ASD may not be used to getting so much attention and may be resistant at first. It's normal for some children to turn away, get upset, or tell you to "stop talking!" Remember that children with ASD can get overstimulated more easily than other kids and all this parent attention may just be "too much" right now. That doesn't mean you should stop though. If you seem to be getting some push back, take a breath, say something like, "Okay, it seems like you're not ready yet," and play on your own next to your child for a while. If your child uses words to tell you he/she doesn't want to play (instead of hitting or crying), that's a great opportunity to praise those communication skills! You could respond by saying something like, "Thank you for using your words to tell me you want to use the trains by yourself. I'll play with these blocks for a while."

During the "warm up," keep an eye on your child and look out for signals or "clues" that he/she is ready for some of your attention again. If he/she starts using some of the toys you have in front of you, or says something to you about the toys, that might be a good clue that your child is ready to accept some PRIDE skills. It might be a good idea to keep your statements short at first (for example, “Nice sharing,” “Good building,” or “Thanks for telling me”).

When children react poorly to your efforts to interact, you might be tempted to try harder to get your child’s attention. It is important to resist this urge. Your child is trying to tell you that it is too much right now—that his/her brain needs time to process. Even though it is hard to hold back, it might help to wait quietly and patiently for your child to be ready. Taking deep breaths, telling yourself “he’ll play with me when he’s able,” and focusing on what you are doing can help you stay calm and resist the urge to jump in. Taking the time to warm up helps show your child that you are listening to their signals, and accepting how he/she is able to play right now.

As your child warms up to Special Time, you may notice more talking, sharing of toys, sitting more calmly, and interacting more with you. It may take some time to get to that point though. For some children, it could take only 1–2 minutes, for others, it may take a few weeks. By taking the time at the beginning—listening to your child’s cues, using a few PRIDE skills here and there, and being very consistent with Special Time practice—you will get there and it will be well worth the time and effort you put in!

Managing ASD-Related Behaviors with CDI Skills

How you respond to your child's ASD-related behaviors can help him/her learn new ways of playing and talking with other people. Just because a skill is difficult for your child right now does not mean it has to stay that way! It just means we may need to work a little harder to help him/her learn things that may come more easily to other kids.

As you are learning in PCIT, your attention helps teach your child new skills! When you reward a behavior with your attention, you will see more of that behavior. So, we want to notice "positive opposites" of challenging behaviors. The positive opposites we want to pay extra special attention to are ones we may all "take for granted," or expect to see. Little things like looking at you, talking with you, playing with you, using greetings, and saying "please" and "thank you" may come naturally to you, but chances are they are really hard for your child to do consistently. That is why they need a little extra encouragement and help from you to learn them.

Positive Opposites of ASD-Related Behaviors

• Using more than one type of toy (flexibility)	• Sharing
• Staying calm when things change	• Making eye contact
• Using words to make needs known	• Taking turns
• Trying something new	• Including you in play
• Pointing or showing toys	• Being gentle with the toys
• Using gestures or other ways to communicate	• Expressing frustration with words

Sometimes adding an explanation to the end of a Labeled Praise can be a powerful teaching moment for your child. Tell your child **WHY** you like what he/she did, and why it is important. *For example:* "Thank you for looking at me [Labeled Praise]. That lets me know you are listening to me [Explanation]!" Or, "Great job for sharing the toy with me [Labeled Praise], it's much more fun when we play *together* [Explanation]."

Meeting Your Child Where He/She Is at, and Slowly Expanding

Sometimes it can be hard to find something positive to praise, especially when it seems like your child does not really want to play with you. On the other hand, it can be pretty frustrating when he/she only likes doing the same thing over and over again. We can slowly help your child learn to play differently by meeting your child where he/she is at right now, and raising our expectations little by little, over time. This may take a while, but if you stick with it, your child will be able to learn these skills.

First, figure out the specific behaviors you want to work on. Start with just 1–2 behaviors at a time. So, if you want your child to notice and play with you instead of by him/herself, first you have to ask yourself, where is my child at now? What do I see my child doing on his/her own? Next, figure out what you are working towards. What do you want to see your child do? Finally, write down every single step in between. Give your child **A LOT** of attention when you see each little step (even if it was very quick or seemed accidental)—use Behavior Descriptions, Labeled Praises, and Enjoyment together! Here is how this might work:

Steps to a new behavior	How to respond with PRIDE skills
• Turning towards you	• "Thank you for turning around! I am happy I can see your face now"
• Moving closer to you	• "You are sitting near me, thank you for coming closer!"
• Looking in your direction	• "You're looking over at me. Great noticing me"
• Looking at the toy you are using	• "Thanks for showing interest in what I'm doing"
• Looking up at you (even briefly!)	• "Thanks for looking at me. I like that we are playing here together"
• Looking you in the eye	• "You're looking right at my face! Nice job looking!"
• Smiling at you	• "You're so sweet to smile at me! When you smile it lets me know that you're happy. I love playing with you too!"

What if your child doesn't seem to know what to do? Well, then you might have to **SHOW** him/her first. We call this "modeling." You can demonstrate the positive behavior you want to see. This can work really well when trying to teach new skills like imaginative play and coping with strong emotions.

For example: Your child only likes playing with cars, and during Special Time repeatedly rolls the car down the ramp. You roll a car down the ramp in imitation once or twice. Then, you pick up a miniature person and push it down the ramp saying, "The man is going down the slide! Wheee!" Do this again a few times, then hand the man to your child, or place it at the top of the ramp. When your child pushes the man down the ramp, even if by accident, comment enthusiastically, "Now you are making the man go down the slide [Behavior Description]. I love that you are doing something new [Labeled Praise]! Great job playing with the people too [Labeled Praise]!"

Be Patient!

Behavior does not change overnight. It takes a lot of planning on your part to help your child learn new skills. Children with ASD often learn new skills at a slower pace and may take a while to show those skills consistently in different environments. Be patient. Try and take a step back and look at the "big picture." It can be easy to focus on behavior from just one day, but try to think about what Special Time practice was like a week ago, or two weeks ago instead. Notice the "little victories." Maybe today your child seemed pretty "stuck" on a certain way of playing, but he/she was so much calmer when things did not go his/her way. Sometimes it can be hard to catch positive changes in one behavior when your attention is focused on another.

Your child is so lucky to have you on his/her team, committed to a treatment that will help him/her learn. It may take your family some time but PCIT will help your child develop new play and social skills, and the rewards will be well worth the wait. Stick with it!

Having PRIDE Throughout the Day

Children with ASD need extra practice and reinforcement to learn social skills. As you get more practice with the PRIDE skills during Special Time, you may find that you start to use them naturally throughout the day. Using PRIDE skills (especially Labeled Praises for Positive Opposites) during different times of the day can help your child carry over the good behaviors you are starting to see during Special Time to other social situations. Unfortunately, though, generalization, or the "spreading" or "expansion" of skills is not automatic. And children with ASD tend to have an especially difficult time with generalization. Deliberately setting up opportunities for your child to practice social skills *outside of* Special Time can help your child generalize the good behaviors he/she learns with you in Special Time. This will help him/her better relate to and play with other people beyond parents.

Look for natural opportunities throughout the day to use PRIDE skills. Start by making a point to notice Positive Opposites in your child at home throughout the day. It may be easier to just pick one or two "target behaviors" to look out for during the day. If your child has a really hard time staying calm and using words to communicate needs or frustrations, you might try to notice these types of behaviors in situations that are especially challenging.

For example, when your child is struggling with homework and says, "This is too hard!" You could respond, "Thank you for telling me that this problem is hard for you [Labeled Praise]. I can help. Great staying calm [Labeled Praise]." Other real-life activities where you can catch your child using Positive Opposite behaviors at home throughout the day might include:

- Getting ready for school or bed
- Dinner time
- Homework
- Transitioning to a new activity or place
- Bath time
- Playing near or with siblings
- Waiting for a turn
- Conversations with family members
- Stopping a preferred activity
- Daily chores (washing dishes, laundry)

After you've become more comfortable noticing and praising Positive Opposites during Special Time *and* at home throughout the day, now try to "catch your child being good" outside of the house, in the community. There are many opportunities to practice. Start by choosing one or two specific situations to practice. Challenge yourself by praising Positive Opposites in more and more typical life situations. Here are a few ideas to get you started:

- Eating at a restaurant
- At the playground
- At a friend's house
- On a car trip
- When greeting others
- At a religious service
- At the library
- In the grocery store
- Walking down the street
- At school pickup

It also can be helpful to deliberately plan "low-pressure" situations where you can point out and praise positive behaviors you see in your child. These are settings where he/she is *most* likely to show good social skills because they are the most familiar or the child has enough adult support. Maybe invite an older cousin or nice classmate over for a playdate, or go to a favorite park. Set up play activities you know will be fun for your child. Stay with or near your child so you can catch him/her using good social behaviors.

The most reliable way to generalize skills is to teach your child (through your praise and positive attention) with as many different examples as possible across people, settings, and behaviors. The more you notice and praise these good behaviors throughout your child's daily life, the more meaningful and long lasting these positive changes will be for him/her and your family.

See Alternative CDI Homework Sheets: "*Using CDI at Home Throughout the Day*" and "*At Home and in Typical Life Situations*" to help guide your practice and keep track of your progress with using PRIDE skills throughout the day.

CDI Homework Sheet (Using CDI at Home Throughout the Day)

Child's Name ____________________ Parent's Name ____________________

Date __________	**SPECIAL TIME PRACTICE** Did you spend 5 min in Special Time today?		**CDI DURING HOME ACTIVITIES** Did you practice using PRIDE skills at home outside of Special Time?		**TARGET POSITIVE OPPOSITES** LIST HERE: _____________ _____________ List examples of Labeled Praises.	What types of home activities? Any questions or problems?
	Yes	No	Yes	No		
Monday __________						
Tuesday __________						
Wednesday __________						
Thursday __________						
Friday __________						
Saturday __________						
Sunday __________						

Modified from 2011 PCIT International Protocol (Eyberg & Funderburk, 2011)

CDI Homework Sheet (Using CDI at Home and in Typical Life Situations)

Child’s Name ____________________ Parent’s Name ____________________

Date __________	**SPECIAL TIME PRACTICE** Did you spend 5 min in Special Time today?		**CDI DURING HOME ACTIVITIES** Did you practice using PRIDE skills during other activities at home?		**OTHER CDI PRACTICE** Did you practice using PRIDE skills in typical life situations outside of the home?		What types of situations? List examples. Any questions or problems?
	Yes	No	Yes	No	Yes	No	
Monday __________							
Tuesday __________							
Wednesday __________							
Thursday __________							
Friday __________							
Saturday __________							
Sunday __________							

Modified from 2011 PCIT International Protocol (Eyberg & Funderburk, 2011)

Managing ASD-Related Problem Behavior with PDI: Hierarchy of Commands

Play Commands to Use During Special Time *These types of commands can encourage prosocial behaviors in the context of play*		
“It’s your turn, please take the train” (child loves playing with trains)	“Please put the red car down the ramp.” (child enjoys this activity)	“It’s my turn to build. Please put the blue Lego in my hand”
“Now it’s my turn, please put both hands on your lap, like this”	“I want to play with you, please sit next to me, here [point]”	“Oh no, the tower fell down. I want to build it again. Please put the blue piece here [point]”
“I like the dinosaur you made (child’s special interest is dinosaurs). Now draw a tree”	(Child is lining up the cars) “Now put this animal next to the car”	“Please put the toy away gently, like this [demonstrate]”
Real Life Commands to Use at Home Throughout the Day *Real life commands can be used to teach daily living skills, encourage independence, and improve coping skills. It is important to know what your child is capable of doing already so you do not unfairly give a command for something he/she has not yet learned how to do*		
“You are finished eating, please put your plate in the sink”	“Please use a quiet voice”	“It’s time to start your math homework, please write your first name here”
“It’s time to leave now, please put on your shoes”	“It’s time to practice staying calm [parent takes a deep breath to demonstrate]. Take one deep breath”	“You have two choices [present options]. Please use your words to tell me what you want”
“Please give your brother a turn at the game”	“Please share the toy train with your sister”	“It’s dinner time. Please turn off the tablet” (child has trouble transitioning)
Public Behavior Commands to Use Outside the Home and in Social Situations *Commands can also be used to promote safety and encourage polite, prosocial, and adaptive behavior in new, unfamiliar, or social settings*		
“Please walk on the sidewalk”	“We need to cross the street now. Please hold my hand”	“We are walking in the office now. Please use your indoor voice”
“Please tell the waiter what you want to drink”	“Please wave goodbye/say hello”	“You interrupted me while I was talking. Please say ‘sorry’”
“Share the car with your friend”	“Please sit next to your sister”	“Please wait in line for your turn on the slide”

Putting It All Together: Addressing ASD-Related Problem Behavior with CDI and PDI

Problem behavior	**LP for positive opposite**	**DC for positive opposite**	**DC for incompatible behavior**
Wandering around the room	"Thank you for standing next to me while we talk"	"Please stand still"	"Please sit down in the chair/next to me"
Putting toys in mouth	"Great job keeping your hands and mouth to yourself"	"Please take the car out of your mouth"	"Please put the car down the ramp"
Waving hands repetitively	"Nice quiet hands you have"	"Please put both hands on your lap, like this"	"Please put the crayons back in their box"
Takes toys away from others	"Thank you so much sharing your crayons with me!"	"Please put the crayon back in my hand"	"Please sit in the chair over there to color"
Add your own:			
Add your own:			
Add your own:			

Note: *LP* labeled praise, *DC* direct command

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23

PCIT and Language Facilitation for Children with Autism Spectrum Disorders

Brenda L. Beverly and Kimberly Zlomke

Abstract

This chapter outlines the significance of Parent-Child Interaction Therapy (PCIT) in facilitating language growth in young children. PCIT's first phase of treatment, Child Directed Interaction (CDI), is described in relation to literature from child language disorders. Parent-mediated methods, such as responsiveness, engagement, and directive strategies, are linked to the skills taught in CDI (i.e., PRIDE skills). Authors review scientific evidence for the effectiveness of language facilitation strategies, including their three pilot projects investigating PCIT and language growth for children with autism spectrum disorders (ASD). Factors impacting implementation are considered, such as treatment fidelity and dosage, and clinical applications and potential adaptations of PCIT for ASD are discussed.

Language impairment is a well-established area of deficit for persons with autism spectrum disorders (ASD). The language and communication profiles for children with (ASD) vary widely, but the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013) defines ASD as including at least a mild impairment of social communication. For some individuals, the impairment may be restricted to difficulty in social interactions or inappropriate contextualized language use. As now defined in the *DSM-5*, significant limitations in social interaction and the social use of language are present even when specific speech or language skills are developed at age-appropriate levels. Around 2 years of age, children with ASD tend to neither seek other's attention nor consistently respond to other's voices (Ellis Weismer, Lord, & Esler, 2010). Pragmatic language deficits may be noted for initiating conversation, responding to conversational partners and topics, and engaging in situationally appropriate communication (Paul & Norbury, 2012).

Although many individuals with ASD do develop adequate language skills while still maintaining deficits in social or pragmatic language, approximately 25–30% of individuals with ASD remain minimally verbal or nonverbal into adulthood despite extensive treatment (Rose, Trembath, Keen, & Paynter, 2016). Children who are minimally verbal may present with no functional spoken language or intentional communication, even lacking effective use of gestures or alternative communication methods (Luyster, Kadlec, Carter, & Tager-Flusberg, 2008). For children with ASD who are verbal, parents typically report that the

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child's first words were late to emerge, similar to children with a primary developmental language disorder (impairment not associated with ASD or other developmental disabilities). Almost half of verbal children with ASD display profound grammatical deficits and moderately impaired vocabulary much like children with a primary developmental language disorder (Kjelgaard & Tager-Flusberg, 2001; Paul & Norbury, 2012; Roberts, Rice, & Tager-Flusberg, 2004). There are also unique language and communication characteristics associated with ASD (Ellawadia & Ellis Weismer, 2015; Ellis Weismer et al., 2010; Paul & Norbury, 2012), including atypical impairment in receptive language compared to expressive language, monotonous or extremely varied pitch, echolalia, stereotyped learned utterances, and pronoun reversals. Children with ASD produce rote repetitions of the language of other children or adults in the environment and they often use catchphrases and dialogue from preferred television shows. These children may immediately copy the teacher's comment (e.g., "you did a great job") or they may produce learned words from a different environment (e.g., television program).

Research has also demonstrated a relationship between early disruptive behaviors and language impairment for children with ASD (Benner, Nelson, Sanders, & Ralston, 2012; Bopp, Mirenda, & Zumbo, 2009). Communication impairment can be the source of challenging behaviors, and children's challenging behaviors may serve communicative functions (Carr & Durand, 1985; Chaing, 2008). For example, children with ASD might bite others or themselves because they cannot express frustration or ask for assistance. When working to devise interventions that replace socially inappropriate behaviors with appropriate communicative responses, there is important overlap in the roles of speech-language pathologists, psychologists, and behavior analysts.

23.1 PCIT Outcomes for Children with ASD

There are various intervention approaches available addressing the behavior, language, and social skills of children with ASD. However, the empirical support varies across treatments implemented within schools, clinics, and homes. Applied behavior analysis, incidental teaching, errorless compliance training, and parent training are a few of the most widely known and implemented programs, which also have the strongest levels of empirical support (McDiarmid & Bagner, 2005). Parent-Child Interaction Therapy (PCIT), an evidence-based parent training program, is unique in that the original protocol contains a number of techniques that are traditionally seen in therapies addressing behavioral difficulties in children with ASD. For example, PCIT highlights the importance of consistent and high-quality parent-child interactions that are also components of the evidence-based ASD-focused treatments, Floortime and TEACCH (Masse, McNeil, Wagner, & Chorney, 2007; Petrenko, 2013). Additionally, PCIT uses components of pivotal response training (another ASD-focused treatment) including the incorporation of familiar play objects within the therapy session, the implementation of the intervention in environments similar to the home, and the focus on skill generalization (Masse et al., 2007). Smith and Iadarola (2015) suggest that one element of "best practice" in the treatment of ASD is the utilization of a comprehensive approach that includes parents as an integral part of the therapy. The common theme of increasing parental involvement inherent in many evidence-based interventions for children with ASD optimizes the opportunity for generalization of skills outside of the clinic setting (e.g., home, public environments).

There are a number of clinical case series, single-subject design studies, or uncontrolled studies utilizing PCIT to address disruptive behavior in ASD present in the literature (Agazzi, Tan, & Tan, 2013; Armstrong, DeLoatche, Preece, & Agazzi, 2015; Armstrong & Kimonis, 2013; Budd, Hella, Bae, Meyerson, & Watkin, 2011; Lesack, Bearss, Celano, & Sharp, 2014; Masse, McNeil, Wagner, & Quetsch, 2016). Although these studies provide helpful clinical descriptions of participant outcomes, studies with strong empirical analyses are more limited within samples of children with ASD.

Solomon, Ono, Timmer, and Goodlin-Jones (2008) found that in a sample of five 12-year-old males with high functioning autism, PCIT was effective in reducing parental perceptions of child behavior problems and atypicality, as well as increasing parental perceptions of child adaptability. In a single-subject design (non-sequential multiple baseline), Hatamzadeh, Pouretemad, and Hassanabadi (2010) examined the use of PCIT for three males with high functioning autism, and, similar to Solomon and colleagues, found decreases in parent-reported child problem behaviors. In a randomized controlled trial, Ginn, Clionsky, Eyberg, Warner-Metzger, and Abner (2017) conducted eight-sessions of Child Directed Interaction (CDI) for young children with ASD. Statistically significant improvements were seen in child disruptive behavior and child social awareness along with decreases in the mothers' reported levels of parenting stress. Additionally, Zlomke, Jeter, and Murphy (2017) reported on an open trial of unmodified PCIT for 17 young children with ASD. They demonstrated effectiveness for reducing disruptive behavior as well as improving functional communication and prosocial behavior. On average, dyads required 19 sessions of PCIT to graduate from the protocol. Parents reported a high degree of satisfaction with both the intervention and changes in children's behavior (Zlomke et al., 2017). Such contemporary research along with a substantial number of published case reports suggests that PCIT may be an effective way to treat disruptive behavior in children with ASD.

23.2 PRIDE Skills as Language Facilitation Strategies

Although a primary therapeutic goal of PCIT is the reduction of problem behaviors, the first phase of PCIT emphasizes increasing parental use of positive interaction behaviors with their children. Specific parental interaction and language behaviors (e.g., child-oriented strategies of verbal responsiveness and joint focus as well as language modeling with diverse vocabulary) are predictive of language growth (e.g., Furrow, Nelson, & Benedict, 1979; Hoff-Ginsberg, 1986; Huttenlocher, Waterfall, Vasilyeva, Vevea, & Hedges, 2010; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Moreover, these parental behaviors plus complementary interactive language behaviors (e.g., parallel talk, expansions and recasts, see Table 23.1) are considered effective parental interventions for children with primary language impairments (Camarata, Nelson, & Camarata, 1994; Girolametto, 1988; Roberts & Kaiser, 2011; Warren, Brady, Sterling, Fleming, & Marquis, 2010). Research has revealed language and communication benefits of parent-directed interventions to improve parental communication skills with their children with ASD (Aldred, Green, & Adams, 2004; Drew et al., 2002; Kasari, Gulsrud, Wong, Kwon, & Locke, 2010; Siller & Sigman, 2008).

During the CDI phase of PCIT, parents are coached to shift their interactions based on five "Do" skills and three "Don't" behaviors. The "Do" skills consist of interaction and language facilitation techniques including: Praise of prosocial behaviors; Reflect (repeating and expanding upon) children's appropriate verbalizations; Imitate children's appropriate play; provide Descriptions of children's play behaviors; and create Enthusiasm during the play time. These skills are referred to as the PRIDE skills. Descriptions, reflections, and imitations are all responsive strategies (Roberts, Hensle, & Brooks, 2016) characterized by parental responsiveness to the child's interests and actions. This is done by creating direct links between parental language input, communicative contexts, and social contexts that can reduce a child's processing demands for learning language. In Table 23.1, we connect the PRIDE behaviors with terms used in speech-language interventions and provide examples and references for the evidence base.

Descriptions within PCIT are equivalent to language facilitation strategies of parallel talk, follow-in comments, parent self-talk, and linguistic mapping. Table 23.1 describes the language facilitation strategies in more detail and provides examples. These responsive strategies are synchronized to the child's activity, and theoretically, descriptions enhance the parent-child interactions during child-led play situations and in everyday life. Descriptions show adult interest and attention; model speech, vocabulary

Table 23.1 PRIDE "do" skills compared with other language facilitation methods

	Language facilitation strategies	Definitions	Examples
Responsive strategies			
Descriptions	1. Parallel Talk or Follow-In Comments	1. The adult talking about what the child is doing	Child: [stirs spoon in a bowl] Adult: *You're stirring*
	2. Self-Talk or Parent Description of Own Behavior	2. The adult talking about what the adult is doing. To fit PCIT Do behaviors, the adult needs to be engaged in the same activity as the child so that the language matches the child's action as well as the adult's action (*See Imitation below*)	Child: [pushes a car] Adult: [pushes a car] Adult: *I'm pushing the car*
	3. Linguistic Mapping	3. The adult talking about what the child could be saying following the child's use of intentional communication or gestures	Child: [holds up a toy cow] Adult: *A cow*
Reflections	1. Expansions	1. The adult restates the child's utterance adding grammatical complexity. Key content is retained but the modification adds more adult-like grammar or syntactic complexity	Child: *Here bottle* Adult: *Here's a bottle*
	2. Extensions or Expatiations	2. The adult builds on the child's meaning by adding another idea or meaning unit. This adds semantic complexity. *Rule of thumb:* *Restate child's utterance adding 1–2 words or ideas*	Child: *My blocks* Adult: *Your blocks are stacked up*
	3. Recasts	3. The adult repeats the child's utterance with modifications. The narrowest definition of recasts is revising the child's utterance from a statement to a question or from an affirmative one to a negative one	Child: *Baby eat* Adult: *Is the baby eating?* Child: *Baby eat* Adult: *The baby's not drinking*
Imitation	1. Imitation/ Mirroring	1. The adult imitates behaviors or verbalizations produced by the child	Child: [pushes a car] Adult: [pushes a car]
	2. Synchronicity	2. Imitation or responsiveness by an adult that happens in a short time after observing the child's behavior or words, usually within 3 s	[Child and A put together a puzzle of individual letters] Child: *B* Adult: *B*
Engagement strategies			
Praise Enthusiasm	1. Reinforcement/ Feedback	1. The adult's verbal praise may function to increase the likelihood of the same behavior in the future. It can also provide information to the child about his/her success	Child: *My juice.* Adult: *Good job asking for your juice!*
	2. Active Engagement	2. The adult selects activities that are known to appeal to the child and engages in the desired activities with the child	Child: [lines up blocks] Adult: [lines up blocks] We can line the blocks up. [counting] 1! 2! 3!
	3. Positive Affect	3. Smiling, laughing, physical touch	Adult: This is fun!

and advanced concepts; organize the child's thoughts about the play activity; and hold the child's attention (Tempel, Wagner, & McNeil, 2013). Support for these responsive strategies that resemble the descriptions within the PCIT PRIDE skills is noted for infants (about 9–15 months old) and children who are in the earliest stages of language development. Tamis-LeMonda et al. (2001) reported a positive predictive relationship between maternal descriptions produced with the mothers' 9-month-old infants and the timing of their children's first words. Haebig, McDuffie, and Weismer (2013) found benefits for follow-in comments, but only for children with ASD who were minimally verbal.

Verbal reflections, like descriptions, also present beneficial effects for language facilitation and growth. Reflections, as described in PCIT, are similar to expansions, extensions/expatiations, and recasts within the speech-language literature. Reflections specifically focus on the language output of the child. Researchers and clinicians posit that reflections are a mechanism for teaching language by reinforcing the child's use of developmentally appropriate vocabulary, grammar, pronunciation, and expression of thoughts (Tempel et al., 2013). Reflections also demonstrate that the parent is attending to the child's experience and can convey acceptance and understanding (Eyberg, 1988; Herschell, Calzada, Eyberg, & McNeil, 2002). Beyond early language learning stages, added complexity in the input benefits child language development (Huttenlocher et al., 2010). It was maternal expansions produced with 13-month-olds, not descriptions, that predicted the toddlers' timing several months later for achieving a key language milestone—the first 50-word expressive vocabulary (Tamis-LeMonda et al., 2001). Sandbank and Yoder (2016) reported a positive effect of longer parental utterances for children with ASD and concluded that input from parents with some increased complexity may be optimal. Cleave, Becker, Curran, Owen Van Horne, and Fey (2015) determined there is an evidence base for recasts (i.e., adult repeating child utterance with modification) supporting grammatical development for children with language disorders.

Imitation by the parent of the child's actions establishes joint attention as a foundation for meaningful, contingent language and social communication through imitation, mirroring, and synchronicity. By imitating the child, parents are active participants in the child's play, demonstrating that they are paying attention to the child's activities, and reinforcing the activity in which the child is engaged. Imitation by the adult is especially important to create joint engagement with children with ASD, because children with ASD are less likely to focus on others' interests. Imitation of the child may enhance the child's imitation of the parent and can encourage the social skill of turn taking. Ideally, this leads to an iterative process of turn taking and copying one another's actions that would start with behaviors within the child's repertoire and then shift to include the child's imitation of new behaviors. Ingersoll and Schreibman (2006) reported increased object imitation skills and corresponding language growth for children with ASD following treatment focused on teaching imitation. Imitation plus expansions predicted language growth at the end of the second year (Tamis-LeMonda et al., 2001).

Descriptions, reflections, and imitation are parental responsive strategies that parallel language facilitation strategies. These responsive skills are beneficial for language growth and improvement in children with ASD. Praise and enthusiasm, as well as imitation, are engagement-based strategies (Roberts et al., 2016). Engagement-based strategies include positive affect, play, and environmental arrangement. Parents and children attain long-lasting benefits from interactions that are centered around mutual play and enjoyment, which includes joint attention. Joint attention, a primary concern for children with ASD, is a precursor to receptive and expressive language success. Kasari et al. (2010) found that when caregivers were taught to follow the interests of the child, maintain the topic of interest, and then expand upon their children's actions, toddlers with ASD demonstrated increased joint attention over time. In addition to the significant gains made by the treatment group compared to the waitlist group in joint attention, higher quality of parental involvement moderated the treatment outcomes. A subset of parents who exhibited confidence, comfort, and enthusiasm facilitated better treatment outcomes than parents who demonstrated a lower quality of parent involvement (Kasari et al., 2010). Positive engagement supporting social interaction and opportunities for learning as well as the use of labeled praise (such as the enthusiasm promoted during CDI) can convey a parent's positive affect and promote positive child outcomes.

As described above, the CDI phase of PCIT focuses on increasing the parental PRIDE behaviors that facilitate language development. Additionally, clinicians teach parents to decrease three specific behaviors, often termed the "Don't" behaviors. The PRIDE "Don't" behaviors include: don't give commands, don't ask questions, and don't use negative talk (e.g., criticisms, sarcasm). While language interventions or parent-implemented treatments for language delay often include commands and questions as directive strategies (Roberts et al., 2016), this presents a problem in PCIT. Specifically, the CDI phase of PCIT aims to reduce these directive strategies as they may take the lead away from the child, limit the child's expressive speech, and prevent opportunities for contributing within the parent-child interaction. Directive strategies such as commands and questions attempt to shift the child's focus; the message that may be communicated by the adult is that the child's interest is not shared or approved by the caregiver. Additionally, questions limit children's opportunities to initiate communication, and they often require only one- to two-word responses because much of the information is established in the question.

In summary, PCIT teaches behaviors to parents that are consistent with stimulating young children's language development. Moreover, this type of parent-implemented language intervention has been shown to be effective for children with ASD (Meadan, Ostrosky, Zaghlawan, & Yu, 2009). Although PCIT was not designed as a language intervention, parental language models provided within the joint engagement of PCIT's CDI phase likely support language development, particularly given the language and social interaction deficits presented by children with ASD. The PCIT PRIDE skills are closely aligned with interaction strategies and language facilitation methods used by parents, early interventionists, and speech-language pathologists to support and increase language development for typically developing children, children at-risk, or children known to have language impairment and developmental delays.

23.3 Parent-Mediated Interventions for Language Development for Children with ASD

Within the speech-pathology literature, several investigators have documented the benefit of parent-mediated intervention in targeting language development in children with ASD. They have found that parent-implemented treatment for children with ASD has resulted in significant vocabulary growth, with children doubling the number of words understood in relatively short time frames (e.g., Drew et al., 2002). Drew et al. (2002) did not target direct vocabulary growth, but targeted joint attention and play behaviors; outcomes indicated a significant increase in receptive language for children with ASD. Parental responsive behaviors have been found to be a moderator of child outcomes within parent-mediated language interventions. Roberts and Kaiser (2011) conducted a meta-analysis and found positive effects of parent training for children with primary and secondary developmental language disorders. Specifically, responsiveness, use of language facilitation strategies during play, rate of communication (quantity), and use of language models (quality) were the most effective parenting strategies. Positive child language outcomes were measured as increases in receptive and expressive vocabulary, expressive grammatical skills, and overall rate of communication. Differences in effectiveness of parent-implemented intervention and therapist-implemented intervention varied depending on the language construct, with a moderate positive effect of parent-implemented language interventions for children's production of grammatical markers (e.g., plural –s or possessive –s markers; past tense –ed; and function words such as "the" and "is").

Clearly, parent-mediated intervention for children with language impairment, including those with ASD, can be effective in promoting joint attention and play behaviors, as well as improving expressive and receptive language skills. A factor in the effectiveness of parent-mediated intervention is the quality of involvement of the parent. This ranges from levels of comfort and enthusiasm to adherence to the treatment protocol. Investigations of parent-implemented treatment for children with ASD bring to light additional challenges including problems assessing language change when children are difficult to test, are minimally verbal, or when their progress is expected to be slow.

23.4 Status of Research on Language Improvement Through PCIT

The empirical evidence of PCIT to address disruptive behavior and non-compliance within ASD is strong (Ginn et al., 2017; Hatamzadeh et al., 2010; Masse et al., 2007; Solomon et al., 2008; Zlomke et al., 2017). Evidence for the facilitation of language through PCIT in children with and without ASD is growing. Bagner, Garcia, and Hill (2016) reported the language production effects of a PCIT-modeled, behavioral parent-training program with infants at-risk for early behavior problems (entitled the Infant Behavior Program). Sixty infant-parent dyads were enrolled in the study and randomized to either the intervention or standard care groups. The Infant Behavior Program is an adaptation of the CDI phase of PCIT conducted in the homes of families with infants. On average, families completed six intervention sessions. To measure any changes in language, language sampling was used to count infants' total utterances and number of different utterances. At the posttreatment and 3-month follow-up assessment points, there were no significant language differences between groups. At the 6-month follow-up assessment, however, infants in the intervention group displayed significantly more total utterances than those in the standard care group. Additionally, children's disruptive behavior was a significant mediator for this language growth at this time point. Authors also found that infants whose mothers reported greater improvement in externalizing behavior following the intervention displayed greater increases for number of different utterances from baseline to assessment and at both 3- and 6-month follow-up assessments. These results suggested that the reduction of infant externalizing behavior, through a behavioral parenting intervention modeled upon the CDI phase of PCIT, is a potential mechanism facilitating language growth.

Findings from Bagner et al. (2016) are promising for PCIT and language growth, but the study sample included only typically developing infants, not children with developmental delays or ASD. Hansen and Shillingsburg (2016) reported on two case studies to determine whether a modified version of PCIT would improve the production of vocalizations of children with ASD. Two male participants diagnosed with ASD and language delay, ages 45 months and 32 months, participated in a modified course of PCIT with their caregivers. PCIT was changed to include empirically supported behavioral strategies for increasing requests for preferred items during CDI. Additionally, parents were coached to use instructional fading techniques and three-step guided compliance during the second phase of PCIT, Parent-Directed Interaction (PDI). In addition to standard DPICS coding for parental labeled praises, behavioral descriptions, and verbal reflections, observations were coded for children's imitative and spontaneous vocalizations and requests. Following PCIT, parents increased their number of positive PRIDE skills and both children increased their total number of vocalizations.

In a randomized controlled trial of the CDI phase of PCIT for children with ASD, Ginn et al. (2017) examined whether a child-led phase of PCIT would lead to improvements in child behavior and an increased number of total words spoken by young children with a diagnosis of ASD. At pretreatment, children were required to have a minimum of three words or three word approximations as well as cognitive functioning equivalent to age 2 years or higher. Parent-child dyads participated in eight sessions of CDI. Unfortunately, neither the total number of intelligible words spoken during a 5-min observation nor receptive language differed significantly between groups 10 weeks later at the Time 2 assessment. One factor that may have limited growth outcomes was that 86% of the children displayed average or advanced receptive language skills and good word use (e.g., 132 words in a 5-min observation) at pretreatment.

23.5 Investigations to Measure Language Change for Children with ASD Following CDI

The authors of this chapter have conducted a series of three pilot investigations addressing particular research limitations of parent-implemented treatments for children with ASD (specifically focusing on the potential of CDI; Fig. 23.1). As a first step, a case study was conducted incorporating PCIT skills and procedures into an intervention provided by a speech-language pathology graduate student (Keyes, Beverly, & Zlomke, 2012).

The primary goal for our first project (Keyes et al., 2012) was to pilot a short-term treatment provided by a speech-language professional to measure language gains using direct language and communication assessments. The targeted language facilitation strategies were ones that overlapped with CDI PRIDE skills. In addition, the clinician used a bug-in-the-ear coaching model reflecting the method utilized in PCIT. Prior to this project, investigators (e.g., Drew et al., 2002) often based child language gains on parent-report measures following parent-implemented treatment (an arguably biased assessment). In contrast, we utilized direct language sampling measurements and assessments of communicative behaviors in maternal-child interactions which incorporated innovative technology. The Language Environmental Analysis (LENA™; LENA Foundation, 2011), a recording device that the child wore daily in the front pocket of a t-shirt (Warren et al., 2010; Weil & Middleton, 2010), was utilized to assess direct language production by the child and parent both within and outside of the clinic setting.

One 3-year-old boy with ASD and his mother participated in maternal responsiveness training focused on: (a) following the child's lead (avoid questions, commands), (b) expansions (verbal reflections), and (c) parallel talk (descriptions). Using a modified multiple-baseline design, initial data on maternal and child behavior was collected over nine baseline assessment sessions. These assessments included a maternal report measure, the *MacArthur-Bates Communicative Development Inventory* (MBCDI; Fenson et al., 2007) and 15-min mother-child language samples. A second phase included nine weeks of intervention, wherein each of the three maternal behaviors was targeted and coached by the therapist for three consecutive sessions. A final phase consisted of post-intervention assessment with retesting of pretreatment measures. Language samples resulted in several outcomes including the LENA™ automated measures for number of adult words, child vocalizations, and conversational turns. Language samples also were transcribed

Fig. 23.1 A father plays with his preschool-age child with autism spectrum disorder and language impairment during PCIT child-led play

from the LENA™ recordings and coded using the conventions of *Systematic Analysis of Language Transcripts* (SALT; Miller & Nockerts, 2002). The SALT measures of interest were the child's mean length utterance in morphemes (MLU), a general measure of utterance length and grammatical complexity; the number of different words (NDW), a measure of lexical diversity; and the number of total words, a measure of overall language and verbal fluency.

The mother demonstrated a substantive decrease in her questions produced with the start of treatment, but this decrease continued even when the treatment focused on other behaviors. Her command production also dropped with treatment and returned to baseline when the treatment focus shifted. Criticisms, however, were variable with little evidence of a treatment effect. The mother demonstrated an increase in use of parallel talk in response to targeting parallel talk in treatment. Similar to commands, her use of parallel talk returned to baseline when the treatment emphasis shifted. Her use of expansions was variable with no clear treatment effect. The mother's decrease in adult words measured with LENA™ was commensurate with her decreased questioning.

As with earlier studies, the MBCDI, which was the maternal report measure, revealed large gains for productive vocabulary, from 212 to 496 words pre- to posttreatment. This change indicated a jump from the 10–15th percentile to the 45–50th percentile. The mother also reported that the child demonstrated 25 grammatical markers at the end of the treatment, but only six at the time of pretesting. Visual inspection of the graphed changes in the child's language production over the course of the 9-week intervention also found evidence for a beneficial effect. The child demonstrated a trend for increasing NDW and MLU over the course of the parent-mediated intervention (see Figs. 23.2 and 23.3).

Lastly, change in child language was assessed with automated measures via LENA™ both within and outside of the clinic. One limitation to the methodology was that the child primarily wore the LENA™ device in his school setting and not at home during interactions with his mother. While no differences were observed across the intervention for the number of conversational turns between the child and his mother or the number of child vocalizations outside of the clinic, a trend for an increase in child vocalizations was observed during in-clinic

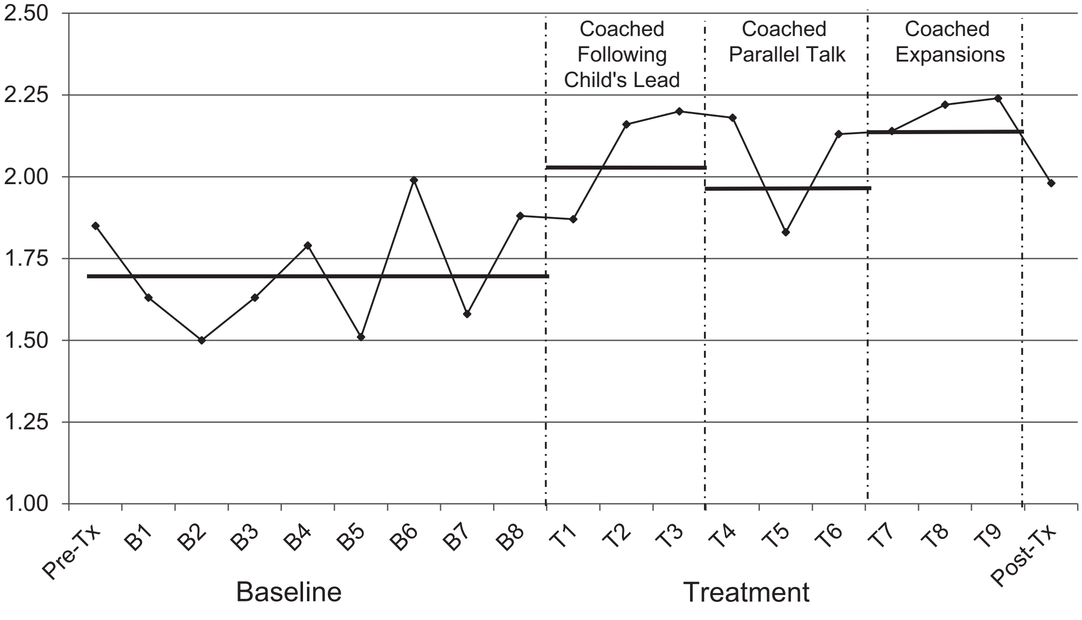

Fig. 23.2 Child mean length of utterance (MLU) in morphemes produced across phases (Keyes et al., 2012)

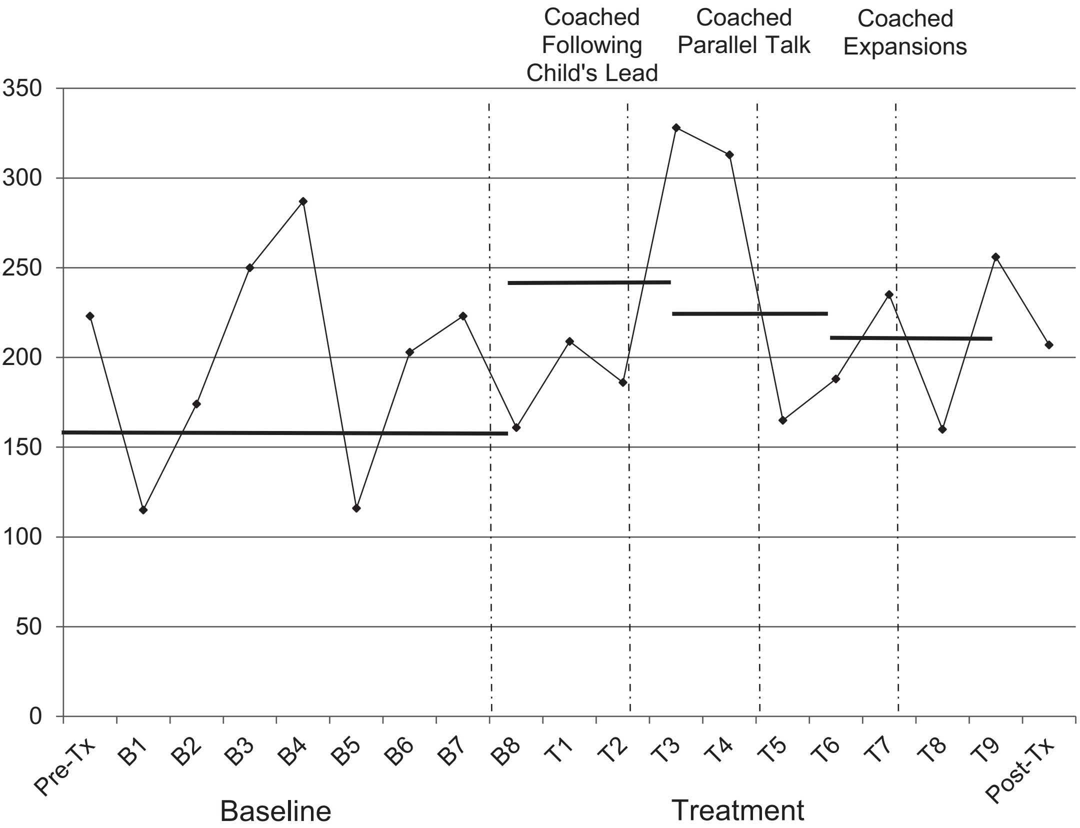

Fig. 23.3 Number of different words (NDW) produced by the child across phases (Keyes et al., 2012)

observations. LENA™ measurements for the number of words spoken by the mother revealed a decrease in total words spoken, most likely as a result of her decreased questioning. We viewed this change positively; although, it was contrary to the standard LENA™ recommendation that increased daily adult input is best for children's language development. For the clinic samples, the increase in the number of vocalizations produced by the child may be attributed to the mother's decrease in words produced. Perhaps her decreased questioning allowed the child time to produce more utterances. Additionally, her use of expansions may have supported the child's increased MLU, a measure of length and complexity.

While this study had multiple limitations, significantly due to its single subject nature with a corresponding lack of control for maturity or external factors, it illuminated possible benefits of PCIT for facilitating language growth in children with ASD and the feasibility of measuring language development in an objective manner through language transcription and coding as well as LENA™. The LENA™ technology offers many exciting opportunities for furthering the research on beneficial language effects of PCIT and the generalization of effects outside of the clinic.

In our second pilot study (Wagner, Beverly, Zlomke, & Murphy, 2014), we again implemented direct language assessments based on language sample analysis to examine the effects of PCIT on language growth for children with ASD. Improving upon our initial case study, this second study examined parental responsive verbal behavior and child language output in a non-randomized open trial of PCIT for children with ASD. Our primary

Table 23.2 Means (standard deviations) for number of total words (NTW), number of different words (NDW), and mean length of utterance (MLU) at Time 1 and Time 2

	Immediate treatment group		Wait list group	
	Time 1	Time 2	Time 1	Time 2
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*M* (*SD*)
NTW	134 (128)	223 (90)*	244 (99)	237 (101)
NDW	63 (49)	86 (30)	113 (36)	91 (20)
MLU	2.12 (0.82)	3.26 (0.70)*	3.24 (0.22)	3.14 (0.62)

Note. *$p < 0.05$. Differences from Time 1 to Time 2 were statistically significant for two measures, NTW and MLU, for the Immediate Treatment Group (Mei et al., 2017)

purpose was to determine if the CDI phase of PCIT could impact language performance for this child population. Three young boys and their parents completed an unmodified, but individualized program of PCIT provided by a PCIT-trained mental health professional. Two of the three children showed clinically relevant gains for utterance length as measured by MLU, and all three children had substantial increases for NDW. One participant first completed a control/waitlist condition before starting CDI. He had no observable changes in language production during this no treatment phase, but demonstrated substantial increases for MLU, NDW, and NTW after CDI treatment. His MLU increased from 1.71 to 2.27 morphemes per utterances. He doubled the NTW per minute from 10 to 22 and dramatically increased NDW per minute from 2 to 7. Again, our findings were limited by the single-subject design, but every indication was that we could successfully assess language outcomes using language sampling analysis during the CDI parent-child probes. Likewise, we could expect that children with ASD would show language gains associated with positive shifts in parental use of responsive behaviors.

In our most recent project (Mei, Beverly, & Zlomke, 2017), we furthered our line of research by assessing language change for a subset of children with ASD participating in a randomized controlled trial of PCIT. Participants were eight parent-child dyads randomly assigned to either the treatment or waitlist group. Child participants included six male children and two female children (mean age = 54 months) with a diagnosis of ASD and language impairment. Parent-child play for the language sampling analysis was videotaped at pretreatment/baseline (Time 1) and 6 weeks after study initiation (either 6 weeks of CDI or 6 weeks of no intervention; Time 2). Transcripts from parent-child 10-min interactions were transcribed and then analyzed using SALT. Language samples for the treatment group means showed growth from Time 1 to Time 2 for each language variable analyzed: NTW, NDW, and MLU. Statistically significant increases were found for NTW and MLU for the treatment group (see Table 23.2).

Children in the immediate treatment group showed gains that averaged an increase of 90 words during the 10-min parent-child interaction observation and an increase of 1.11 morphemes per utterance. The oldest participant, a 6-year-old girl, had the smallest gains with increases of 33 words and 0.22 morphemes, whereas the greatest increases were for the youngest participant, a 3-year-old boy, who added 182 words and increased by 2.04 morphemes. Language usage declined between Time 1 and Time 2 for the children in the waitlist group, but group differences did not reach statistical significance. This important preliminary work suggests that PCIT does indeed have a beneficial effect on child language. Although Ginn and colleagues (2017) did not find an effect for the number of total words displayed during a 5-min observation, our work examined a longer interaction sample (10 min) and documented a significant increase in both the total number of words spoken and the complexity of utterances. Future work will replicate these analyses with a larger sample to further this line of research.

23.6 Clinical Factors: Treatment Dosage, Fidelity, and Generalization

One important question regarding the use of parent-implemented strategies in interventions targeting language is, "What is the optimal treatment dose, or parent responsiveness necessary, to facilitate language change?" Overall, the literature is clear that parental responsivity does not cause ASD or language impairment, and simply being a highly responsive parent does not prevent ASD or language impairment. Thus, the challenge is to define a therapeutic dosage or effective amount of input to kick-start growth in a child's language ability.

In our first study, we did not employ coaching PRIDE skills in the manner and rate promoted in PCIT. Outcomes therefore yielded minimal change from pre- to posttreatment. In our most recent project (Mei et al., 2017), however, the intervention was implemented by PCIT therapists and there was a relatively large treatment effect for the intervention group after just 6 weeks in the CDI phase. Proctor-Williams, Fey, and Loeb (2001) calculated that the natural rate of parental recasting, or a type of expansion like reflections, was generally less than 0.2 per min. Camarata et al. (1994) reported that a rate at least four times greater, 0.8 recasts per min, was effective in an intervention study. In PCIT, parental mastery of PRIDE behaviors is defined as ten behavior descriptions and ten reflections within 5 min, in addition to ten labeled praise statements. This criterion for mastery results in an average rate of four responsive parental utterances per minute, or six positive parental statements per minute, a rate that is much higher than natural parent-child interactions. PCIT parents are coached to attain levels of parental responsive utterances that are 5–7 times higher than what was found effective in Camarata et al. (1994). The key to real success is defined by growth in language which may be increased by high rate of quality and responsive input.

Increasingly, parent-implemented therapy is recognized as an effective treatment for children with primary and secondary developmental language disorders, including ASD. A review conducted by Roberts and Kaiser (2011) on the positive impact of parent-implemented therapy, however, found that only 50% of the reviewed studies adequately described procedures used in the parent training model. Moreover, the researchers found only limited information about the professionals conducting the training or the professionals' instructional strategies. Disappointingly, the majority of studies (72%) did not address the important construct of treatment fidelity to determine the parents' use of the language facilitation strategies. Kasari et al. (2010) reported that the child gains in their study could not be predicted by parents' self-report of adherence to the protocol. Karasi and colleagues (Kasari et al., 2010) did find, however, that children's progress could be predicted by the researchers' ratings of the parents' adherence to the treatment protocol. PCIT can address these limitations as PCIT is a manualized intervention protocol that provides specific definitions of skills to be taught to parents and treatment mastery is determined by the trained clinician. Parent adherence to homework, or special play time at home, is prioritized, monitored, and addressed during each session.

The true test of parent-implemented intervention is identifying ongoing impact beyond the clinic setting or the duration of the parent coaching. After all, the advantage of parent-implemented treatment exists in its potential to be utilized in everyday contexts and at times outside of the average school day or clinic treatment hour. Yet, generalization of the parent behaviors with children with ASD outside of the clinic setting remains an unknown. Kaiser and Roberts (2013) identified parental use of language strategies up to a year after parent training, but only for trained activities at home and not in untrained activities. Girolametto, Weitzman, and Bornstein (2002) found that the responsiveness of caregivers was highly influenced by the communicative context. Clearly, continued investigation to show generalization is warranted. As piloted in our first study, tools such as LENA™ can enable researchers and clinicians to assess changes in parental responsiveness in nonclinical settings—home, school, and daycare. Previous research on generalization of behavior change outside of the clinic or intervention setting has been positive. McNeil, Eyberg, Eisenstadt, Newcomb, and Funderburk (1991) found that improvements in conduct problem behavior had greater generalization than hyperactivity or social behavior. Due to the reciprocal social reinforcement that follows improvements in language production, generalization of language gains may be large and sustained, although further work in this area is greatly needed.

23.7 PCIT Adaptations for Populations with ASD and/or Language Impairment

When implementing PCIT with children of varying ages and skill levels, clinicians might consider individualizing the child skills, the targeted parental behaviors, or the elements of the intervention to best serve the needs of the involved child and family. Based on our own clinical experiences working with parent-mediated intervention for young children with ASD and the empirical literature on language facilitation strategies, we can comment on possible future modifications. Our suggestions should be interpreted with caution, however, as these modifications or adaptations are untested and could result in varying outcomes for families in PCIT.

We first suggest that the implementation of PRIDE skills could be tailored to fit the age or language capabilities of the child (see Table 23.1). Roberts et al. (2016) emphasized two factors when considering language facilitation strategies—the child's age and his/her language developmental level. For children who are not yet talking or who are minimally verbal (e.g., using first words but not producing spontaneous one- to two-word utterances to comment or request), clinicians may consider using engagement-based strategies. Parents can implement imitation, praise, and enthusiasm during play activities to establish joint attention and lay a foundation for learning in parent-child interactions. In this manner, children can become responsive to their parents, a critical factor in the success of preschoolers with ASD (Kasari et al., 2010). We sought to assess changes in one child's nonverbal communicative behaviors in our first pilot study, but this proved to be a time-intensive task. In addition, our reliability was relatively poor for coding the child's communicative functions from the videotaped play. We think, however, that assessing improvements in joint attention and communicative skills by children with ASD who are minimally verbal is worthwhile based on anecdotal change observed in our research. We continue to seek and pilot objective, efficient measures to evaluate outcomes.

Moving beyond these initial stages for joint engagement and mutual enjoyment during interactions, responsive strategies become the tools of choice. First, descriptions (i.e., parallel talk, linguistic mapping) might be emphasized with parents because they have been shown to support language development for children displaying nonverbal intentional communication. Haebig et al. (2013) reported that the children with ASD who were minimally expressive benefitted from follow-in comments (descriptions), but the more verbally fluent children did not. As children attempt to communicate and control their environment, parents can shift to utilizing reflections (i.e., expansions, extensions, recasts) to model multi-word utterances when their children produce single-word or telegraphic phrases. Reflections, more so than descriptions, follow from a child's initiation, which means that responsive talking by the adult will occur in joint engagement and be maximally facilitative. Extensions support children's development of new ideas and vocabulary linked meaningfully to the child's attention and language attempts. For preschool children who display increasing utterance length and who are expected to demonstrate more grammatically correct sentences and adult-like speech sounds, a focus on recasts (i.e., repetition of the child's utterance with modifications to structure) is recommended.

Although directive strategies (e.g., questions, commands) are considered "Don't" behaviors during the CDI phase in PCIT, some investigators have supported the use of directives in language interventions (see Roberts et al., 2016). More specifically, one form of directives, those that "follow-in" and thereby relate to the child's focus, were found to have a positive effect with both minimally verbal and verbally fluent children with ASD (Haebig et al., 2013). Perhaps directive strategies support children's language use by providing adult scaffolding for language learners, particularly those with language delays. Parents, clinicians, and educators often use directive language strategies to elicit new language forms that are not yet a regular part of the child's spoken repertoire or to elicit talking for children capable of verbally interacting or responding. One consideration when asking questions is the type of response the question will prompt. "Wh-" questions often only require one- to two-word responses (e.g., "What color is the truck?") as compared to open-ended questions (e.g., "What's happening?") that require a more spontaneous, independent utterance formulation. Similar to this strategy, as part of Teacher-Child Interaction Training (Tiano, 2010), teachers are encouraged to minimize unnecessary questioning and to make questions that are necessary and meaningful in the classroom environment. Teachers are also encouraged to avoid rapid-fire questions that do not allow children time to process the question and respond. Clinicians could carefully consider the use of directives within CDI sessions or sessions aiming to increase language. Depending on the goal for the child's talking and interaction, intentional use of some questions may be supportive. Ideally, follow-in directives would be implemented to encourage child interaction and responsiveness; this would then be followed by an adult using PRIDE skills and building on the child's contribution. For example:

Child: [manipulates a cow; plays and doesn't talk or engage].
Adult: *What does the cow say?*
Child: *Moo.*
Adult: *Moo*. [**Reflection**] *The cow says moo-moo.* **[Neutral Talk].**
[Child and Adult play with Mr. Potato Head].
Adult: *Where's Mr. Potato Head's nose*?
Child: [points].
Adult: *You pointed to his nose!* **[Behavioral Description]** *Great job pointing to his nose.* **[Labeled Praise].**

These adaptations, although consistent with other supported, parent-implemented treatments for children with ASD and with the Teacher-Child Interaction Training model, have not been tested in the standard PCIT model. It's conceivable that parents would overuse directives and lose the more important positive interactive aspects of PCIT's CDI.

When considering directives, PCIT's second phase (PDI) might warrant some investigation for how to use simple, clear commands and consistent follow-through with children with ASD. In PDI, parents are taught to continue using their skills to encourage child-directed interactions and play while interspersing this with language aimed at positively directing their children's actions. Parents are taught to present age-appropriate and developmentally appropriate commands in direct but neutral language and tone (e.g., "Draw a circle," "Put the red cars in the big box," or "Please hand me the doll"). Given the frequent language deficits of children with ASD, these directives could support children's receptive language development and serve to provide prompts for joint engagement and verbalizations, like follow-in directives, needed for parents to use PRIDE skills.

Lastly, there are considerations of language quantity and language quality when coaching parents. There is an initiative, known as the 30 Million Words Initiative™ (http://thirtymillionwords.org/), which incorporates LENA™ technology to support a "word pedometer" to allow parents to track the number of words they or other caregivers use in the child's environment each day. Our first case study, which focused on reducing the number of questions parents asked, resulted in decreased adult words as measured by LENA™, the opposite of the stated goal for The

30 Million Words Initiative™. Yet, the child showed language gains in coached sessions when the mother decreased her talking. Roberts et al. (2016) concluded that broad support for quantity-only strategies (that emphasize the total number of words spoken) is lacking. Instead, support for quantity is evident when strategies are responsive and increase complexity in the input. Responsiveness and engagement aspects appear to be critical.

The future of PCIT for children with ASD is vast, and there is great potential for PCIT to serve an adjunctive role for language development in addition to its core purpose of addressing disruptive behavior. To maximize effects for language growth, clinicians should be familiar not only with the overarching theory and protocol of PCIT but also of the specific communication impairments often seen within ASD. This would support clinicians' decisions to implement PRIDE skills to target communication and language. Clinicians and researchers alike can consult and collaborate with professionals within the field of speech-language pathology to further the empirical literature on the "bonus" effects of PCIT for increases in total words, different words, and utterance length and complexity, as well as to investigate improvement in joint attention and conversational turns. Collaborations between professionals build on the expertise of differing fields to maximize benefits for affected children and families.

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24

Summary of Lessons Learned from Two Studies: An Open Clinical Trial and a Randomized Controlled Trial of PCIT and Young Children with Autism Spectrum Disorders

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Abstract

Recently, there has been a growing interest in the use of Parent-Child Interaction Therapy (PCIT) among preschoolers and school-age children with autism spectrum disorder (ASD). In this chapter, we describe two studies of PCIT and ASD: an open clinical trial and a randomized controlled trial. In both evaluations, we used the standard PCIT protocol to examine treatment efficacy with children 3–7 years of age and tested the traditional PCIT model without adaptations. However, tailoring the model to meet the unique needs of individual children was necessary. In a few cases, adapting the model was required to address persistent aggression in CDI and difficulty sitting for a length of 3 min during the discipline sequence. We discuss the considerable promise of PCIT as a treatment for children with ASD to reduce disruptive behavior severity and we highlight particular lessons learned through our clinical work with children with ASD and their families.

The research summarized in this chapter was completed during two studies in which we examined the standard Parent-Child Interaction Therapy (PCIT) protocol with families of children with autism spectrum disorder (ASD) and disruptive behavior disorders. The initial study was an open clinical trial completed with our first ASD/PCIT cases with children ages 3–7 years. This served as a pilot for our subsequent randomized controlled trial (RCT) of PCIT with young children with ASD. Our RCT then randomized a total of 23 children ages 3–7 years to immediately receive 16 PCIT sessions or stay on a waiting list for 16 weeks prior to starting PCIT (Hoffman, Wong, & Handen, 2017; Scudder, Wong, & Handen, in press). This chapter will describe the clinic and clinical team, summarize initial study design and key findings, highlight lessons learned from both projects, and provide recommendations for future directions based on our work.

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24.1 Description of Clinic and Team

The Merck Child Outpatient Clinic, Center for Autism and Developmental Disorders at the University of Pittsburgh Medical Center serves families with children ages preschool through young adulthood for diagnostic and treatment services. Families seen in the clinic come from across a wide region: western Pennsylvania as well as parts of West Virginia and Ohio. While families attend the Merck Clinic with a number of presenting concerns related to ASD and other developmental disorders, many families report problems associated with child disruptive behaviors. In 2012, the Merck Clinic first began offering PCIT to explore the utility of the intervention for children with ASD displaying early childhood disruptive and oppositional behaviors, as PCIT is well established as an evidence-based treatment for typically developing children. Since then, the clinic has continued to provide PCIT services over the last 5 years.

To establish and maintain strong clinical skills, the PCIT clinical team underwent a strict set of training and supervision guidelines. First, the team was trained and supervised by PCIT International-Certified trainers. Second, all PCIT clinicians received weekly clinical and research supervision which included case discussion, review of clinical assessments, and in-person and video-recorded supervision. The initial clinical team was composed of four doctoral-level licensed psychologists and one master's level social worker. Following the initial cohort of clinicians, the program grew; to meet this demand, four master's level clinicians were also trained according to the same standards as the previous cohort.

The work at the Merck Clinic is uniquely positioned as one of the first programs to provide PCIT with a clinical team who has primary expertise in neurodevelopmental disorders. For this reason, the clinic was a perfect setting to conduct one of the first RCTs of full-protocol PCIT (i.e., both Child-Direction Interaction [CDI] and Parent-Directed Interaction [PDI]) with ASD in preschool-aged children (Study 2). We describe our study designs, initial study findings, and lessons learned in the sections that follow.

24.2 Study 1: Open Clinical Trial

24.2.1 Study Design

Study 1 was an open clinical trial of PCIT with children with developmental disorders and disruptive behaviors ($n = 8$). Families of children enrolled in the program received services at the Merck Outpatient Clinic between 2012 and 2014. This examination of PCIT in our clinic was conducted retrospectively as program evaluation to assess outcomes of our first families in PCIT.

24.2.1.1 Measures

The following measures were obtained at baseline, mid-, and post-assessments.

Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999)
A 36-item, parent-completed rating questionnaire used to assess disruptive behavior for children and adolescents ages 2–16 years. The ECBI comprises both an Intensity Scale and a Problem Scale. The Intensity Scale consists of a seven-point Likert scale to assess the frequency of behavior. Raw scores of 131 or higher are suggestive of clinically significant disruptive behavior. The tool has adequate internal consistency and test-retest reliability (Funderburk, Eyberg, Rich, & Behar, 2003; Robinson, Eyberg, & Ross, 1980) and good construct and discriminative validity (Baden & Howe, 1992; Boggs, Eyberg, & Reynolds, 1990). The ECBI was completed at baseline, mid-, and posttreatment assessments as well as at each treatment session.

Dyadic Parent-Child Interaction Coding System-IV (DPICS Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013)
A behavioral observation system designed to assess parent-child social interactions. Extensive

normative data, reliability studies, and validity studies have shown the measure's strong psychometric properties (Eyberg et al., 2013). During structured DPICS observations, "Do skills" (Labeled Praises, Reflections, Imitation, Behavioral Descriptions, Enjoyment; PRIDE skills) and "Don't skills" (Negative Talk/ Criticism, Commands, Questions) as well as child compliance are coded. The DPICS-IV was used to code a 5-min Child-Led Play observation, 5-min Parent-Led Play observation, and 5-min Clean-Up observation at baseline, mid-, and posttreatment. In addition, the DPICS was used for 5-min live coding of parent-child interactions prior to coaching during treatment sessions. This information was also used to provide feedback to the family and to tailor treatment. Mastery for CDI was reached for a parent who used 10 behavioral descriptions, 10 reflections, and 10 labeled praises and three or fewer "Don't skills."

24.2.1.2 Participants

As summarized in Table 24.1, participating children included 6 males (75%) and 2 females (25%), between the ages of 3 and 7 years ($M = 5.13$ years, $SD = 1.55$). The majority of children were White, Non-Hispanic ($n = 5$, 62.5%), while others were Asian ($n = 1$, 12.5%), Hispanic ($n = 1$, 12.5%), and multiracial ($n = 1$, 12.5%). All 8 children had been previously diagnosed with a pervasive developmental disorder: pervasive developmental disorder, not otherwise specified (PDD-NOS; $n = 6$, 75%), Asperger's disorder ($n = 1$, 12.5%), or autistic disorder ($n = 1$, 12.5%). In addition, many of the children were given a comorbid disruptive behavior disorder diagnosis: attention-deficit/hyperactivity disorder (ADHD; $n = 5$, 55.6%) and disruptive behavior disorder, not otherwise specified (DBD-NOS; $n = 2$, 22.2%). Some children also had additional diagnoses such as anxiety disorder, not otherwise specified ($n = 1$, 11.1%) and generalized anxiety disorder ($n = 1$, 11.1%). Seven mothers and one father served as the primary parent participating in treatment, but both parents were trained in PCIT for half of the participating families.

24.2.1.3 PCIT sessions

All families were seen as part of standard clinical practice. PCIT was conducted in weekly one-hour sessions. Across sessions, as indicated in the PCIT protocol (Eyberg & Funderburk, 2011), an ECBI and a 5-min DPICS observation were administered. Treatment progression was based on parental skill mastery.

24.2.2 Results

24.2.2.1 Number of Sessions

As is shown in Table 24.1, the total number of sessions (i.e., CDI plus PDI) ranged from a low of 14 to as many as 31. Three mothers were able to meet PRIDE skills criteria in six or fewer CDI sessions; the remaining parents ranged from 10 to 16 sessions. One parent was unable to fully meet criteria before PDI sessions were initiated.

24.2.2.2 ECBI Scores

As shown in Table 24.2, the mean raw ECBI Intensity score across the eight families decreased from 139.4 to 123.8. Based upon a $\geq 20\%$ decrease between the baseline and posttreatment ECBI Intensity score, four participants were found to be responders to PCIT. The remaining four families evidenced little change in ECBI Intensity scores. Mean raw ECBI Problem scores also decreased from 17.4 to 14.6 from baseline to posttreatment. Figure 24.1 depicts the session-by-session ECBI Intensity scores for Participant #3. The ECBI scores actually increased slightly during the course of the CDI sessions and did not start to decrease until after the PDI Coach 2 session. At that point, there was a 50-point decrease, which stayed stable for the remainder of treatment.

24.2.2.3 PRIDE skills

Table 24.3 summarizes the primary parent change in PRIDE skill use from baseline to mid- and posttreatment. As can be seen, all participating parents were able to significantly increase their use of "Do skills" and decrease their use of "Don't skills" by the mid-treatment assessment.

Table 24.1 Subject demographics

Participant #	Age	Gender	Race	Dx at Baseline	Comorbid Dx	# of CDI Sessions	# of PDI Sessions	Primary Parent	Two parents?
01	6	Female	Caucasian	Autistic disorder	ADHD, disruptive behavior disorder NOS	10	17	Mother	No
02	7	Male	Caucasian	PDD NOS	Anxiety disorder NOS	11	13	Father	Yes
03	4	Male	Asian Indian	PDD NOS	None	4	10	Mother	No
04	4	Female	Hispanic	PDD NOS	GAD	6	9	Mother	No
05	4	Male	Biracial	PDD NOS	ADHD, disruptive behavior disorder NOS	15	13	Mother	Yes
06	3	Male	Caucasian	Asperger's	None	4	17	Mother	No
07	7	Male	Caucasian	PDD NOS	ADHD	16	10	Mother	Yes
08	6	Male	Caucasian	PDD NOS	ADHD	13	18	Mother	Yes
Average	5.13					9.88	13.38		
Std dev	1.55					4.76	3.58		

Notes. ADHD attention-deficit/hyperactivity disorder, *GAD* generalized anxiety disorder, *PDD-NOS* pervasive developmental disorder – not otherwise specified, *Std Dev* standard deviation

Table 24.2 Individual and Average ECBI Intensity and Problem Scores at Baseline, Mid-, and Post treatment

	ECBI Intensity			ECBI Problem		
Participant #	Baseline	Mid	Post	Baseline	Mid	Post
01	131	128	140	12	23	27
02	129	118	101	12	11	5
03	144	166	90	23	27	19
04	156	146	123	18	14	9
05	153	146	155	18	14	23
06	124	134	139	13	12	12
07	144	129	145	23	22	19
08	134	128	97	20	23	3
Average	139.38	136.88	123.75	17.38	18.25	14.63
Std Dev	11.64	15.11	24.78	4.60	6.14	8.68

Notes. ECBI Eyberg Child Behavior Inventory, *Std Dev* standard deviation

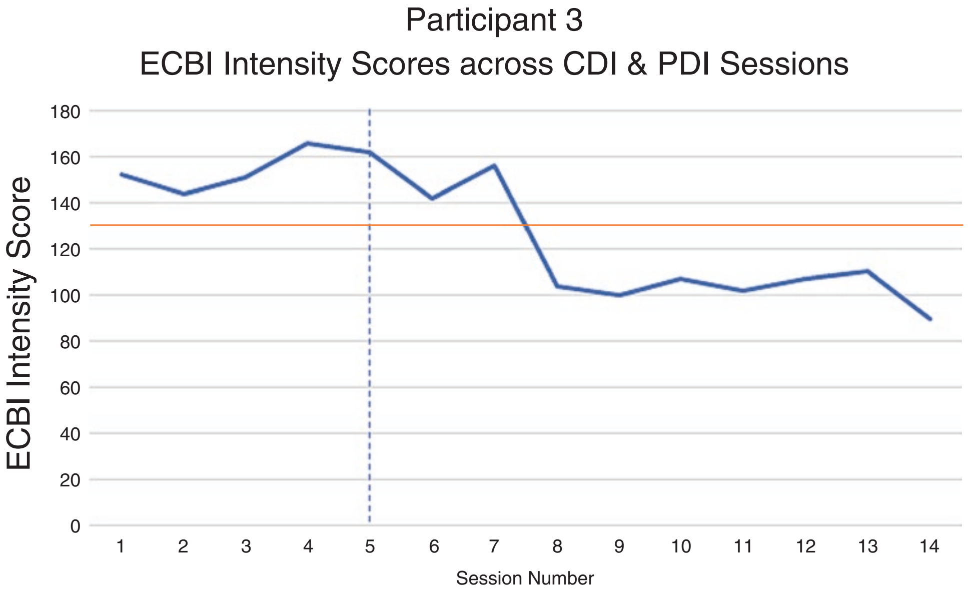

Fig. 24.1 ECBI Intensity scores across CDI and PDI sessions. The dotted line represents the PDI Teach Session

Table 24.3 DPICS Observation Scores

DPICS Skills		Baseline M(SD)	Mid-treatment M(SD)	Posttreatment M(SD)
Positive skills	Behavior descriptions	2.88 (3.83)	15.75 (7.01)	14.25 (6.25)
	Reflections	3.50 (7.01)	10.25 (3.99)	12.00 (7.19)
	Labeled praises	1.38 (2.33)	12.38 (3.96)	8.75 (4.17)
Negative skills	Questions	12.00 (12.20)	1.88 (3.36)	0.50 (0.76)
	Commands	5.88 (8.74)	1.50 (2.51)	0.13 (0.35)
	Negative talk	1.00 (1.77)	0.75 (0.89)	0.00 (0.00)

Notes. n = 8

In addition, these skills were maintained (and in some cases continued to improve) at posttreatment. Only the mean rate of labeled praise dropped slightly at the end of treatment.

24.2.3 Discussion

This study captures outcomes of the clinicians' very first PCIT cases. Clinically, we accepted families into the program who were reporting high levels of difficulty in managing their children's disruptive behavior; in two cases the reported behavioral intensity on the ECBI was slightly below the clinical cutoff (124 and 129 points). Four of eight participants were determined to be "PCIT responders." Yet, even parents whose children's ECBI Intensity scores failed to change appreciably were able to demonstrate consistent use of PRIDE skills across the course of treatment. Consequently, increased parental use of PRIDE skills alone may not always be associated with improved behavior for children with ASD. In fact, even in cases in which the children evidenced significant gains, it was not until a number of PDI sessions were completed before improvement on the ECBI Intensity score was noted.

A number of parents were able to demonstrate acquisition of PRIDE skills within a reasonably short number of sessions. However, the overall number of sessions required for treatment was rather long. It is possible that this was due to the fact that both parents were involved in four of the eight cases. It is also possible that children with ASD may require a greater number of sessions before gains are noted than among neurotypical children. Finally, there were many external factors that may have impacted outcome. For example, one family was undergoing a significant amount of interpersonal stress during the course of treatment, which likely affected their child's behavior.

24.3 Study 2: A Randomized, Wait-List Control Trial

Our second study was a randomized, wait-list control trial of PCIT with children with ASD, ages 2.5–7 years (ClinicialTrial.gov identifier: NCT02088905). To our knowledge, this was one of the first randomized, controlled trials of PCIT among young children with ASD that included both CDI and PDI sessions. The study was conducted at two sites: The Merck Child Outpatient Clinic, Center for Autism and Developmental Disorders at the University of Pittsburgh Medical Center and Wesley Family Services. Data were collected between April 2014 and June 2016. A total of 25 families were enrolled and 23 randomized to either immediate treatment or a wait-list control.

All participants met criteria for a diagnosis of ASD, based upon the *Diagnostic and Statistical Manual of Mental Disorders, fifth edition* (DSM-5) criteria (American Psychiatric Association [APA], 2013) and the Autism Diagnostic Observation Schedule-2 (Lord, Rutter, DeLavore, & Risi, 2012), a semi-structured assessment of communication, social interaction, and play (or imaginative use of materials) which can be used to diagnose and differentiate individuals with and without autism or other pervasive developmental disorders. A minimum mental age of 30 months was required, based upon the Stanford-Binet V (Roid, 2003) or Mullen Scales of Early Learning (Mullen, 1995), which are each cognitive ability and intelligence tests used to diagnose developmental or intellectual deficiencies in young children. These criteria were established to ensure that children possessed enough expressive language to offer opportunities for the parents to learn "verbal reflection" skills. In addition, receptive language skills of 30 months or greater were required, based upon performance on the Peabody Picture Vocabulary Test (PPVT, Dunn & Dunn, 2007). The receptive language criteria were established to ensure children could understand simple parental verbalizations.

Study participants continued to receive ongoing services, including preschool, individual therapies (e.g., speech, occupational therapy), and medication management throughout the course of participation. Treatment involved 8 CDI and 8 PDI sessions (including CDI and PDI Teach sessions). For all participants, study assessment visits occurred at baseline, mid-, and posttreatment; wait-list participants completed three additional assessment visits prior to beginning PCIT which occurred at the same time as the treatment group: an initial screen, 9-week visit, and 18-week visit. Outcome measures included the ECBI, the Parenting Stress Index (measuring parental stress levels; Abidin, 2012), the Social Responsiveness Scale-2 (identifying the presence or extent of social impairment in ASD; Constantino & Gruber, 2012), DPICS-IV, and the Therapy Attitude Inventory (assessing parental perspectives on therapy and their clinician; Brestan, Jacobs, Rayfield, & Eyberg, 1999). The results of that study were recently presented (Hoffman et al., 2017) and have been submitted for publication (Scudder et al., in press). Important lessons learned and future directions from the present study are described in detail below.

24.4 Lessons Learned and Future Directions

24.4.1 Differences in Parenting and Parent-Child Interactions in Families with ASD Compared to Typical Developing Children

Our experiences to date have strengthened our belief that parent-child interactions of families with children on the autism spectrum differ in some days from families of typically developing children. Furthermore, our work has reinforced the need to consider factors such as receptive language, behavioral severity, the function of challenging behaviors, and the influence of specific parent interaction strategies on child behavior in PCIT treatment of children with ASD, as they likely contribute to some of these differences. Reflecting on previously published findings, parents of young children with ASD tend to initiate play more frequently, give more suggestions and commands in the context of play, and more often respond at a level of play above the child's abilities in comparison to parents of typically developing children (Freeman & Kasari, 2013). In our families, we found parents to frequently use verbal (e.g., suggestions and commands) and nonverbal strategies (e.g., gestures and physical touch) to engage their children in parent-child play. Often, parents in families of children with ASD are required to work harder to assess and match child play behaviors and abilities as children's cognitive and adaptive levels are not the same as their chronological age and may vary from one type of activity to another. These differences and variations in the child's cognitive and adaptive levels likely contribute to increases in child disruptive behavior (e.g., Simonoff et al., 2008), decreases in synchronized and cohesive parent-child behavior (e.g., Strid, Heimann, & Tjus, 2013), shorter duration of parent-child joint engagement (e.g., Freeman & Kasari, 2013; Maljaars, Boonen, Lambrechts, Van Leeuwen, & Noens, 2013), and decreases in parental consequences following child disruptive behaviors (e.g., Reese, Richman, & Belmont, 2005).

Behavior problems of children with ASD are also often perceived differently by their caregivers (e.g., Reese et al., 2005). For example, parents of children with ASD may more frequently look to antecedents of their child's behavior or show and explain to the child how to behave, rather than implement consequences for their difficult behavior. We have found that at baseline, parents in our clinic commonly modify their communication towards their children using both strategies in line with PCIT (e.g., simplifying verbal instructions) as well as strategies that may maintain disruptive behaviors: modifying the child's environment in ways that remove demands on the child or avoiding settings that seem to trigger problem behaviors (e.g., no longer taking the child to public places). As we have seen more families with ASD through PCIT, we take careful note of the interactional strategies used during our initial intake assessment and CDI sessions to optimize our coaching to individual family strengths.

Finally, the trajectory of which parenting skills are used across the age span may vary for parents of children with ASD compared to parents of typically developing children. For example, while mothers of younger, typically developing children report that they more often stimulate the development of their child than with older children, mothers of older children with ASD stimulate the development of their child even more compared to younger children with ASD (Maljaars et al., 2013). Consistent with this finding, parent-child interactions have been shown to more significantly influence social skills in children with ASD as they age than typically developing peers (Haven, Manangan, Sparrow, & Wilson, 2014; Meek, Robinson, & Jahromi, 2012). This may, in part, be due to increased difficulties for children and adolescents with ASD in developing other facilitative relationships. Regardless of some differences, an increase in behavior problems is directly related to increased negative, controlling parenting behaviors for families of both children with and without ASD (e.g., Maljaars et al., 2013).

24.4.2 Differences in Challenging Behaviors of Children with Autism

The challenging behaviors of children on the autism spectrum are substantial (Mayes et al., 2012) and although some behaviors may be accounted for solely by child noncompliance, some disruptive behaviors may in part be due to core features of ASD (e.g., restrictive and repetitive behaviors). Consistently, we found that behaviors such as stereotyped speech or movements, restricted interests or unusual sensory interests often influenced child behavior during play. For example, children in our clinic demonstrated a variety of stereotypic behaviors such as using repetitive verbalizations and rigid or repetitive play behaviors (e.g., lining up toys, sorting toys, verbalizing rigid rules during parent-child play interactions). This type of disruptive behavior is distinct from behaviors occurring due to noncompliance or defiance in typically developing children, and it has been hypothesized to, at times, serve as a self-regulatory coping strategy that helps regulate arousal levels or anxiety (Joosten, Bundy, & Einfeld, 2009). Some of the children we saw displayed frequent emotion dysregulation, which appeared to result in less persistence to continue tasks and less utilization of constructive coping strategies. Our clinical conceptualizations were that increasing alternative coping behaviors may be needed to fully address emotion dysregulation and the associated restrictive and repetitive behavior (e.g., Samson et al., 2014). We believe that additional empirical studies related to the process of developing alternative coping behaviors and emotion regulation skills in young children with ASD during evidence-based practices (e.g., PCIT) may be key to enhancing clinical practices.

24.4.3 Clinical Utility of PCIT with Children with Autism Spectrum Disorders: Tailoring, Adapting, and Modifying

Standard PCIT may not be effective for all children with ASD. Autism is a diagnosis which has great variability in clinical presentation and requires clinicians to have specialized knowledge and skill as well as be more expedient and flexible in repeatedly assessing and evaluating behavior during parent-child interactions. In addition, the clinician must be keenly aware of the influence of specific parenting strategies on child behavior, the function of challenging behaviors, and change in behavior over time. Anecdotally, this may be even more essential with a population with ASD and disruptive behaviors, because redirecting negative behavior patterns once they have started can be particularly demanding and time intensive. We also agree that children with ASD may more frequently have difficulty generalizing skills to other settings. Consequently, home (e.g., personal hygiene, completing household tasks, homework) and public (e.g., attending birthday parties, going to the grocery store) practice of skills is particularly important (Krasny, Williams, Provencal, & Ozonoff, 2003). In our opinion, additional clinician training is warranted to provide education and support in effectively tailoring specific aspects of the intervention to families of children with ASD.

When we first implemented PCIT for children with ASD, we utilized the standard protocol to determine the effectiveness of this strategy without adaptations. We found that for the majority of families, tailoring treatment in ways similar to that used in PCIT treatment with typically developing children was effective in the reduction of challenging behaviors. However, adaptations would likely benefit some children and families. Using Eyberg (2005) as a guide of tailoring, adapting, and modifying treatment, we are beginning to understand common ways the protocol may be tailored or adapted to families of children with ASD with specific clinical presentations (e.g., additional areas of emphasis in coaching, mastery criteria in CDI for children using few verbalizations [reflection criteria]). With this, we are also finding common presentations which may warrant further considerations of tailoring and adapting treatment, such as a child whose baseline assessment indicates significant language deficits; a large percentage of parent-child interactions characterized with persistent stimulation seeking, physicality, and aggression; frequent perseverative echolalia, repetitive play, or limited social responsivity; or any combination of these. Further examination of the adaptations to PCIT made by other authors studying PCIT and ASD (e.g., Masse, McNeil, Wagner, & Chorney, 2007; Solomon, Ono, Timmer, & Goodlin-Jones, 2008; see Chap. 16 from this handbook) as well as those made by others working in related areas, such as children with intellectual disabilities (Bagner & Eyberg, 2007) and toddlers (Dombrowski, Timmer, Blacker, & Urquiza, 2005), may also inform our approach.

24.4.4 Common Adjustments

24.4.4.1 Adjustment to the session environment and setup

Adjustments to the PCIT session environment are recommended as the first strategies to improving the effectiveness of PCIT for children with ASD. Careful consideration must be given to the types of toys used during treatment sessions, as many children with ASD have certain toys that are of extremely high interest to them. For example, iPads and electronics, cars, and superhero figurines were preferred play options for children in our studies. While including such toys may increase the child's interest in coming to PCIT sessions, they also can make it very difficult for the parent to effectively interact with the child. In addition, a child's preferred toy may not be conducive for a CDI session, as it may invoke increased aggressive behavior (e.g., light saber), the implementation of rules or structure (e.g., pogs or Harry Potter board game), or the increased likelihood of isolated play (e.g., iPad). Proactively addressing challenges (e.g., children arriving at the clinic with one of these favorite toys or activities) can prevent early difficulties. It may be helpful to discuss whether these items will be used in early sessions to engage children in play or left in the car or at home because they would likely require limit setting. In addition, if a child has a history of aggressive behavior, PCIT clinicians may need to have access to a number of soft, safe toy options, as aggressive behavior may persist longer and be more difficult to redirect initially than with typically developing children. Incorporating a child's interests can also be helpful when first trying to engage children on the autism spectrum. If a child has an interest in a particular iPad game, rather than letting the child bring the iPad to session, we might coach the parent to try working the characters into play or have drawing paper with the characters on it. Since engaging children with ASD can be difficult, being creative in the ways to engage their interests may help reduce resistance stemming from removing their favorite activities entirely.

Small modifications to the physical session room and setup can also prevent unnecessary challenges. For example, children with ASD often have an interest in lights and switches. Having sat in the dark with more than one family when trying to conduct therapy, we quickly replaced our PCIT session room light switches with a key switch that cannot be operated by a child. Securing other doors, cabinets, and access to other areas in the clinic was also necessary to reduce elopement. In some cases, we found it necessary to remove all furniture in the session room. Similarly, a number of our children have pulled at the bug-in-the-ear wire or attempted to grab the device itself. We shifted to a wireless Bluetooth-like option, which is worth exploring. Prior to this, a few parents wore vests or other outer clothing to hide the device and associated wires. Lastly, the one-way mirror often intrigues both neurotypical and atypical young children; however, for several children with ASD, their interest in the mirror persisted for a longer duration (e.g., repeated saliva and mucus swirling on mirror). In these cases, we moved the dyad's play interaction away from the mirror. Considering these slight adjustments prior to working with children with ASD may reduce the number of barriers to overcome while trying to regularly implement PCIT with this population. That being said, unique challenges will likely arise with individual clients and will require consistent patience, regular flexibility, and some ingenuity.

We commonly found that children in our studies had difficulty waiting and needed support and preparation for transitions. Minimizing the number of unnecessary or abrupt transitions for children, providing verbal transition statements, and positively attending to increases in flexibility throughout sessions can be ways to practice and model appropriate transitions with families, which will likely add ease during sessions. At times, clinicians may need to reconsider or adjust the regularly scheduled 5–10-min check-in with the parent used to obtain an update of the prior week's activities and review of homework. During long check-ins, the child may engage in increased stereotypies or stimulation-seeking behaviors and, in turn, have difficulty transitioning into play. In particular, checking in with the parent by phone prior to the session, in-person while the child is playing in the waiting area, at the start of the session over the bug-in-the-ear, or at the end of the session may minimize preventable challenges early in treatment. As many of our participants required supervision at all times, clinicians may also need to interact with the child while providing the parent homework; in ideal circumstances, a second clinician might join to engage with the child while the primary clinician checks in with the parent and provides the homework assignment for the following week.

24.4.4.2 Adjustments in CDI

While "typical PCIT coaching" usually emphasizes child prosocial behaviors and parent support through the use of differential reinforcement, some additional education surrounding ASD behaviors was necessary to tailor the standardized protocol to the child and family's specific needs (as would be done with typically developing children). For example, one child demonstrated repetitive behaviors and rigidity in allowing toys to mix. Coaching was tailored to include information about flexibility and rigidity in his play. Specifically, the use of selective attention principles during CDI to address rigid play behaviors and praising the child's flexibility over time was a coaching focus. With his parents' increased awareness of flexible play behavior, they were able to promote sharing, letting others have a turn or engage in the play, as well as creative child play behaviors.

In our work, we have been able to use the standard CDI mastery criteria for most parents of children with ASD. However, our most consistent challenge has been meeting mastery criteria for reflections. We have purposely limited PCIT enrollment to children with receptive/expressive language skills at or above 30 months to reduce this challenge. Regardless, we are finding that this does not necessarily mean that a given child will verbalize enough during a 5-min interaction period for parental mastery criteria for reflections (i.e., of child verbalizations) to be met. At times, we have adjusted the CDI parental mastery criteria from 10 or more reflections during a DPICS observation to reflecting >75% of the child's verbalizations during the 5 min. This change capitalizes on opportunities for reflections rather than a direct frequency count. In cases that children have limited words, we would also encourage parents to reflect vocalizations. Therefore, in the case that a child only says five things during a given five-minute CDI observation, as long as the parent has reflected at least four verbalizations/vocalizations, he or she will have met the adapted reflection criteria.

Some of our children have displayed a range of sensory behaviors at various times during the sessions. These may include pacing, spinning, hand-waving, trailing their hands on the wall, and high-pitched screams. These types of behaviors are not typically socially mediated, so ignoring these behaviors does not always result in the child returning to the targeted activity. Occasionally, children with ASD simply engage in these behaviors for a brief period of time and will then begin interacting with their parent again. In cases that children are engaging in these behaviors for longer periods of time (e.g., child spinning a Lego over and over again saying "Woo!", seemingly unaware of parent behavior or verbalizations), we may coach the parents to imitate or reflect and then redirect (e.g., say "Woo!" as they rotate the Lego. Then, once the child becomes engaged, we coach the parents to continue their own play by using the Lego in another way) as a way to engage attention back to the parent-child interaction in a manner that is interactive enough to disrupt the sensory self-stimulating behavior. Essentially, we coach the parent to briefly engage with the child and then expand the play. In most cases, this approach appeared to reduce the time spent in restrictive play, self-stimulation, and perseverative behavior across sessions.

Perseverative behaviors are also frequently observed among children with ASD in which a child seems to become "stuck" on a certain topic or appears overly focused on an item. For example, one participant wanted a particular toy to be in the session room. When he did not find it there, he repeatedly asked for it throughout the session (continued to focus on it, even when the parent did not respond to the questions and discussion). In our clinical discussions, we have focused on several potential parent responses. The clinician can either (a) continue to coach the parent to ignore the child's perseverative behavior (which may limit what can be accomplished during the rest of the session), (b) provide a one-time answer and then move on (ignoring any further perseverative questioning), (c) immediately provide the child what he or she has been requesting (thereby, reinforcing initial requesting but prevent parents from reinforcing persistent and escalated requests), or (d) ignore and redirect such requests, but place the item in the session room at the next session so as to avoid continued perseveration across sessions. We have not created a specific response to this type of behavior as we have observed that the quality of the perseveration has varied across individual children. For example, one child who would unsafely climb on the table in the playroom continued to request the table at each appointment after it was removed. In another example, one child continuously requested a toy that was not in the room during one session. In this case, we chose to answer once, then ignore the repeated questions and redirect play throughout the session. When the toy was included in the session room during the next visit, the child did not engage with it.

Aggression was also an ongoing concern for some of our participants, particularly in CDI. In part, we found this to be due to deficits or delays in developmentally appropriate play, differences in functional and creative play, or ongoing parent-child interactions characterized by high levels of physical stimulation (e.g., parent and child initiated "rough housing," such as child climbing on parent or parent frequently lifting the child). For example, a child may not easily be redirected or may even engage in increased disruptive behavior when the parent attempts to play in a manner different from the way the child was accustomed. In these cases, mild aggression could simply be ignored and redirected as outlined in the PCIT manual (Eyberg & Funderburk, 2011). However, we also observed more severe aggression and tantrums which were clearly unsafe, and in a few cases, persisted over multiple sessions.

We felt it was necessary to establish a clear discriminant of severe and persistent aggressive behavior in CDI. After attempting other recommended management strategies (see McNeil & Hembree-Kigin, 2010 for description), if aggression persisted, we moved to a "Swoop-and-Go" technique during CDI. This was introduced only in cases when the child displayed persistent aggression consisting of direct intentional harm towards the parent (e.g., repeatedly striking the parent, throwing toys with force at the parent's head, pulling roughly at parent clothing). The parent simply told the child that he or she had to leave the room when the child hit (taking the toys as well). The parent remained out of the room (although still visible to the child) for 60 s, followed by 5 s of quiet. Once PDI sessions began with this group of aggressive children, the time-out sequence was used as a consequence for noncompliance just as it is in the standard protocol, beginning with an effective command. For these families, we taught the parent to give a quick incompatible command with any aggression, and, if needed, follow with a warning and use of timeout.

As a clinical team, we felt that this change in CDI was warranted for several reasons. In CDI, the children were primarily engaging with their parents in more physical ways than seen with same-aged typically developing kids. In many cases, a baseline assessment of behavior indicated that physical stimulation and communication were often functions of this physicality. Frequently, the parent was responding to the physical engagement (e.g., rough housing, allowing the child to climb on the parent's back). For many reasons, these interactions were ineffective for dyads; however, they were central to how these dyads were interacting. In observing these interactions, an important focus of CDI treatment was helping the parents differentiate between positive and negative communication or stimulation behaviors. This distinction bolstered the parents' use of more appropriate physical touch and alternative communication strategies (e.g., PRIDE skills), as well as supported effective selective attention. For these children, they were either (1) completely unresponsive to subtle redirection (e.g., the parent turning away and continuing to play) or (2) they became increasingly physical while the parent ignored and redirected the problem behaviors—extinction of the behavior did not occur in a period of time that appeared safe.

Examples

In Study 1, we had two children who fell in this category. For the first, we began with lower-level strategies (see McNeil & Hembree-Kigin, 2010), moving only to Swoop-and-Go after persistent aggression occurred (to adhere to the standard protocol). Although we eventually moved to our described Swoop-and-Go procedure, one child had already displayed in-session aggression for a number of CDI sessions; ultimately, this child demonstrated sporadic bouts of aggression throughout CDI. After this case, if child aggression persisted for more than one session, we moved to the Swoop-and-Go strategy to manage high levels of physicality and aggression. Importantly, we enforced a no tolerance rule for *any* physical aggression with these children. In these cases, aggression was managed much more quickly. We conceptualized this strategy as preventing the session room from becoming a discriminant stimulus for aggressive patterns of behavior. Ultimately, we found that we needed extremely clear consequences for aggressive behaviors with this group of children.

24.4.4.3 Adjustments in PDI

Similarly, to CDI, we found some changes were necessary when implementing PDI with children with ASD. Specifically, two primary challenges were included: child processing of a command and child ability to sit on the timeout chair for 3 min. These examples are detailed below.

One issue we continually faced while working in PDI with children on the autism spectrum was ensuring that parental commands were heard. For example, we have had a number of instances in which the child was engaging in sensory-seeking behaviors that distracted the child from processing the issued command. If it seemed that the child did not "hear" the command, we coached the parent to improve their location by moving closer, improve their positioning to be within the child's view, and then restart the process by restating the command. Keeping to the standard PCIT protocol, we coached parents to avoid using an orienting command (e.g., calling the child's name). However, many parents with a child with ASD have been taught (by other professionals) to engage the child by first using his/her child name prior to giving a directive. Therefore, additional rationale or focus was needed to adjust this behavior for families of children with ASD; for some, this was a particularly difficult behavior to change. We encouraged the parent to stand close to the child when commands were initially given and to point to enhance the clarity and saliency of what was said. The goal of this procedure was to increase the distance from the child at later sessions. As with typical children, parents may also be coached to remove or set aside items that may distract the child prior to giving the command. One study evaluating specific strategies to increase compliance in children with autism (Fischetti et al., 2012) highlights our clinical impression that effort reduction alone (providing less demanding instructions) may not be effective for increasing compliance. Further examination of gradually increasing task demands as well as the specific application of components of the discipline sequence may be useful when considering PDI coaching with families of children on the autism spectrum.

Some of our younger children or children with more severe ASD symptoms had difficulty fulfilling the three-minute timeout chair criteria. While the child may be able to remain seated and quiet for 1–2 min, by the second minute, some children began to engage in sensory behaviors or got out of the chair. In a few cases, it appeared that the child forgot that he or she was in timeout. As a result, we shortened the timeout period length for such children to 1–2 min plus quiet. We drew from our timed observations of how long the child was able to be seated during play in CDI and our baseline data of each child's developmental level. In such cases, the shortened timeout period assisted in increasing compliance in a developmentally appropriate manner; this seemed to decrease frustration for both the parent and the child. Moreover, this change allowed the clinician to manage the session more effectively as well as more efficiently shape compliance across sessions.

24.5 Summary

Children with ASD often display high rates of disruptive behavior. We have found that utilizing PCIT to address these concerns has been successful. Across our two studies of PCIT and young children with ASD, we were able to follow the standard PCIT protocol with only slight adjustments. Our research suggests that parents of children with ASD can rapidly develop and consistently use PRIDE skills. Importantly, this does not necessarily mean that the clinician will observe a corresponding change in the rate of child's disruptive behaviors; in fact, there may be a lag between parent acquisition of skills and decreases on ECBI scores. At times, some adaptations to the PCIT protocol will need to be considered when working with the ASD population. Specifically, there may be higher rates of aggression persisting across early sessions, as well as disruptive behaviors that relate to core features of ASD (e.g., stereotyped or repetitive motor movement, inflexible adherence to routines or ritualized behavior, restricted interests that interfere with parent-child interactions). Such behaviors may lower rates of child social reciprocity and verbalizations during parent-child interactions and lead to difficulty for some children in complying with parental instructions or sitting for the 3-min timeout required in the PDI sequence. In this chapter, we have provided some options for addressing such concerns and conclude that PCIT can be an appropriate treatment option for families of young children with ASD.

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Melding of Two Worlds: Lessons Learned about PCIT and Autism Spectrum Disorders

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Abstract

Externalizing behaviors are a common co-occurring issue in young children with autism spectrum disorder (ASD). One evidence-based treatment for disruptive behaviors that has shown empirical and clinical success with a range of specialized populations is Parent-Child Interaction Therapy (PCIT). While the accumulating research for implementing PCIT with the ASD population is promising, clinical parameters for PCIT practice with ASD are dynamically evolving. The chapter presents lessons learned from the authors' research and clinical experiences when implementing PCIT with the ASD population. The organization of the chapter overlays PCIT concepts onto the ASD diagnostic framework of the DSM-5, including severity and functional level of impairment. Although PCIT is a robust intervention which typically requires minimal changes in implementation for a variety of populations, having a basic understanding of ASD symptomatology and using level of functioning to inform when and how to tailor PCIT to ASD populations is crucial in obtaining positive clinical outcomes.

25.1 A Tale of Two Perspectives

25.1.1 PCIT Meets Autism

In 2004, during my (Masse) graduate training at West Virginia University, a 4-year-old boy named "Charlie" and his mother, "Charlotte," presented to the university clinic due to concerns about Charlie's behavior at both home and school. Given his age, Charlie was referred to Dr. Cheryl McNeil's Parent-Child Interaction Therapy (PCIT) team for mental health services. While observing Charlie during the pretreatment structured behavioral observations (Dyadic Parent-child Interaction Coding System; DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014), it was quickly noted that Charlie's speech was scripted and out of context, his prosody was even, and much of his behavior was picking up markers or crayons and moving them back and forth across his field of vision. It was clear to the clinical team that Charlie had behaviors consistent with autism spectrum disorder (ASD) and more specialized services were needed immediately.

The clinical team spoke at length about how to carefully and gently provide our impressions to Charlotte and began to gather referral sources for

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autism-specific therapies in the community. After informing Charlotte that Charlie may be on the autism spectrum, she replied, “I know he is. He has already been diagnosed with autism at the Kennedy Krieger Institute in Maryland. I’m here because I can’t control his behavior. He doesn’t listen to anyone and he’s getting into trouble a lot at school. I have read Dr. McNeil’s book and want to try PCIT with him. I know it’s not used with children with autism, but I have tried almost everything and I am not sure what else to do.”

Charlotte did her homework and she was right about PCIT and ASD. In 2004, ASD was almost always an exclusionary rule-out in PCIT research and treatment. Based on the therapy’s dependence on social contingencies, it seemed contraindicated for children on the autism spectrum given that one of the hallmark features of the disorder was a lack of social connectedness. The clinical team again had lengthy discussions and decided that we would move forward treating Charlie with PCIT while being clear with Charlotte that we were empirically in “unchartered waters.” She insisted she wanted to proceed, so off we went!

In the initial PCIT sessions (phase 1 = Child-Directed Interaction; CDI), Charlie demonstrated repetitive “scanning” behaviors with markers and crayons, concurrent scripted vocalizations, and hyperlexia (with the reading capability of a young adolescent). As such, his scripted language was advanced, often reciting signs or billboards he had read around the community. These behaviors comprised a majority of the session time. As treatment goals focused on increasing more prosocial behavior and reducing self-stimulatory behavior and echolalic vocalizations, the clinical team decided to ignore Charlie’s nonsocial behaviors and coached Charlotte in redirection techniques (e.g., describe her own play while attending to any positive or neutral behavior). By taking this approach, much of the coaching consisted of prolonged ignore sequences (which continued over the course of 3 weeks). For example, Charlie looked in the one-way mirror or stood on one side of the room while scripting, and Charlotte tried to engage him through redirection. It became clear that Charlie’s behavior was not responding to parental ignore. Therefore, after much consideration, a clinical decision was made to first engage Charlie by reflecting and describing his behavior and then attempting to redirect his behavior by playing with other toys or activities. This was an effort to join “his world” and then attempt to have him join his mother’s “world.” At first, Charlie’s nonsocial behaviors persisted with little indication of interest to join with his mother’s play. However, with repeated cycles of joining and redirecting with Charlie’s more preferred toys, Charlie began to demonstrate (albeit slight) interest in Charlotte’s play. He initiated social play by looking at the toys and moving closer to his mother’s play area. In shaping Charlie’s behavior, he eventually joined Charlotte in play, and with coaching, their interaction began to look qualitatively different. Importantly, after PCIT, Charlie’s disruptive behaviors also decreased, thereby improving his functioning and participatory capabilities across contexts (e.g., school speech therapy, social skills groups).

Although more specific details of Charlie’s case are beyond the scope of this chapter, it is recounted as a clinically transformative experience to observe the effects of PCIT with a child on the autism spectrum. Armed with clinical success and optimism, a theoretical paper exploring the feasibility of PCIT with ASD was published (Masse, McNeil, Wagner, & Chorney, 2007) and served as a foundational background for a doctoral dissertation and eventual publication examining the efficacy of PCIT with the ASD population (Masse, 2010; Masse, McNeil, Wagner, & Quetsch, 2016). Since 2004, PCIT for children with autism and co-occurring behavioral difficulties has gained a great deal of momentum both clinically and empirically with increasing evidence suggesting that the treatment is effective for ameliorating those challenging behaviors. Although initially proposed solely as a “gateway” treatment to increase the likelihood of participation in more ASD-focused interventions, research has also shown that PCIT impacts core symptoms of the disorder as well (covered in the proceeding section), an unsurprising result given the robust versatility of the intervention. It is exciting to anticipate what breakthroughs will continue to occur as PCIT expands across the ASD landscape.

25.1.2 Autism Meets PCIT

During my (Warner-Metzger) early career at the University of Tennessee (UT) Boling Center for Developmental Disabilities in Memphis, Tennessee, I was introduced to 5-year-old "Tyler." Similar to other children referred to the Center for ASD, Tyler received an interdisciplinary evaluation from a team representing several professions (psychology, speech/language pathology, developmental pediatrics, child and adolescent psychiatry, audiology, and social work). Although the referral flow to the Center at the time (2010–2011) was for a primary rule-out of ASD (38%), developmental/intellectual disability (25%), attention-deficit/hyperactivity disorder (20%), or learning disability and speech/language (less than 10% each), a resulting post-evaluation primary diagnosis of ASD was indicated for 12% (117 of 965 clients) of our population served. Tyler was one of the 12%.

Tyler's cognitive testing revealed a pattern of significant deficits in verbal skills, working memory skills, and fluid reasoning skills, despite personal strengths in visual spatial abilities. His processing speed skills were considerably impacted by his tendency to perseverate on items and become overly engaged in the tactile aspects of the stimulus items. His caregivers reported significant delays in adaptive skills, indicating Tyler experienced difficulties independently completing daily living skills, communicating with others, engaging others in the community, and navigating social relationships. He demonstrated delays in his overall school readiness skills, although his performance varied greatly across domains of identifying letters, shapes, numbers, and colors. Tyler also showed significant deficits on a test of self- and social-awareness related to school preparedness. Similarly, speech/language testing showed significant receptive and expressive language delays, as Tyler mostly spoke using single words and often engaged in immediate echolalic speech. Developmental pediatric screenings concurred with the cognitive and speech/language testing findings, as well as revealed tight calf muscles and toe walking upon assessment of Tyler's gait, range of motion, and muscle tone. Autism-specific assessments (including the Autism Diagnostic Observation Schedule; Lord et al., 2012) highlighted Tyler's limitations in spheres of social affect and reciprocal communication, in addition to the presence of repeated and restricted behaviors.

During the team feedback meeting with Tyler's caregivers, a dual diagnosis was rendered: ASD with comorbid intellectual disability, mild severity. While discussing the importance of implementing speech/language therapy (ST), as well as occupational and physical therapy (OT/PT) services with the family, Tyler's mother described failed previous attempts to initiate ST and OT/PT due to Tyler's significant disruptive behaviors during the sessions. Moreover, Tyler's erratic temper tantrums extended beyond therapeutic sessions and precluded the family from engaging in community or church events. Although preliminary recommendations often included behavioral treatment to address primary or secondary disruptive issues for children diagnosed with ASD, accessibility to evidence-based ASD services was limited throughout Western Tennessee. Additionally, despite a handful of local providers using the Lovaas Model of applied behavioral analysis, families anecdotally found traditional applied behavioral analysis too time consuming, too expensive, or not covered by insurance. Although Memphis is an urban city, no Medicaid providers in the area were trained in other ASD treatments, such as Pivotal Response Therapy (PRT; Koegel, Koegel, & Brookman, 2003) or Developmental Individual-difference Relationship-based Model (DIR/Floortime; Wieder & Greenspan, 2006).

The PCIT Clinic at the UT Boling Center routinely used PCIT with the developmental disability population with clinical procedures guided by available research (McDiarmid & Bagner, 2005) suggesting PCIT was appropriate with minimal to no modifications necessary. Appropriateness for treatment for children with developmental disabilities was based on an assessed language development of 2 years old or higher. However, a diagnosis of ASD was considered an exclusionary criterion, much as it was considered exclusionary for many of the PCIT research studies at the time. So, rather than starting PCIT with Tyler, he initially received Discrete Trial Training (DTT; Lovaas & Smith, 2003) supplemented with free play activities in which the therapist used PCIT skills (Praise, Reflection, Imitation, Description, Enjoyment; PRIDE) to build Tyler's play repertoire, to generalize pronoun and gender use, and to assist with emotion identification. It quickly became apparent Tyler's disruptive behaviors subsided during free play activities, and he more readily engaged in DTT following short periods of therapist interaction using the PRIDE skills.

Because other ASD treatments were geographically and financially not available to the family, and due to Tyler's incremental behavioral improvements, he (along with an additional select few comorbid ASD and intellectual disability cases) received services through the UT PCIT Clinic. Thus, born of necessity, but initiated with clinical hesitance and professional reluctance, a foundation in ASD assessment highly influenced how PCIT was tailored to ASD clients at UT. The interdisciplinary evaluation allowed a qualitative item analysis of assessment data to identify target behaviors for PCIT, while also prioritizing caregiver concerns (to decrease parenting stress). A plan for targeting disruptive and ASD behaviors, such as difficulties with reciprocal interaction, was developed consistent with PCIT protocol and theory. Originally, as noted, it was posited PCIT would serve as a "gateway" treatment for children with ASD to alleviate their disruptive behaviors and prepare them for ASD-specific therapies, such as OT/PT and ST. However, improvements in core ASD symptomatology were clinically noticeable and reported by caregivers, including improvements in functional and imaginative play skills, social reciprocity, frequency and quality of speech/language, and cognitive flexibility. Tyler's tearful mother once explained, "My son asked me for Special Time yesterday. You have to understand, my son has never asked me to play with him before."

With Tyler's and his cohort's successes and gains in PCIT, it was timely to tackle the gap in the scientific literature for using PCIT with ASD. This led to a collaboration with Shelia Eyberg, Ph.D., ABPP, and her protégés to systematically answer questions about PCIT effectiveness (in particular, CDI) with the ASD population (refer to Chap. 32 by Abner, Clionsky, & Dreiling in this handbook). Simultaneous to the ongoing research with CDI and ASD, UT continued with clinical applications of PCIT using both phases of treatment (CDI and Parent-Directed Interaction; PDI) for children with ASD who exhibited various levels of functioning. While clinically following the adage, "if you've treated one child with autism, you've treated *one* child with autism" (meaning children with ASD often present with a true spectrum of symptomatology and require frequent treatment tailoring), PCIT proved a viable, socially-mediated and family-oriented treatment for the often complex and varying symptoms of ASD.

25.1.3 Melding of Two Worlds

When considering the use of PCIT with the ASD population, it behooves the clinician to contemplate the intersectionality of two perspectives: (1) using a PCIT framework with the theories underlying oppositional behavior as the foundation for intervention with ASD symptomatology superimposed, and, inversely, (2) using an ASD diagnosis with its inadvertently disruptive behaviors as the foundational framework colored by a PCIT lens. When contrasting these approaches, a clear distinction to traditional PCIT work becomes apparent: using PCIT with the ASD population addresses the behavioral difficulties traditional to PCIT work, while it also approaches PCIT in a manner that does not operationalize *all* disruptive behaviors as "oppositional" or "defiant" (e.g., minor annoying misbehaviors may be self-stimulatory rather than attention-seeking). As we combine these frameworks, it is necessary to consider how PCIT with the ASD population addresses core symptoms of ASD in addition to the more traditional "oppositional" and "defiant" behaviors treated by PCIT.

Behavioral difficulties, such as chronic noncompliance and aggressiveness, are widely cited as co-occurring issues for children with ASD. Indeed, a large number of children with ASD present to clinics with behavioral difficulties as the primary focus of treatment (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005). As noted, it was originally posited that PCIT could serve as a first-line treatment to prepare children and families for more traditional autism-focused therapy. However, research has shown that, in addition to targeting the traditional PCIT outcomes (i.e., increasing positive parenting and reducing disruptive and aggressive behaviors), PCIT has also impacted core symptoms of ASD. Masse et al. (2016) revealed a general reduction in some ASD behaviors following PCIT. For example, the study demonstrated an improvement on the Relating subscale of the Autism Behavior Checklist (Krug, Arick, & Almond, 1980), a construct composed of behaviors related to connectedness (e.g., attending to social cues, eye contact, relationship-enhancement, imitation). Further, the same study demonstrated fewer symptoms of ASD on the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1988) across participants. Moreover, the data summarized in Ginn, Clionsky, Eyberg, Warner-Metzger, and Abner (2015) regarding an 8-week course of CDI indicated 40% of children in the study who received PCIT showed decreased disruptive behaviors, almost one-third of children also experienced a shift from clinical to nonclinical ranges in terms of pre- to posttreatment levels of social awareness, and an additional 27% exhibited a change from severe to mild-to-moderate levels of social awareness in pre−/posttreatment comparisons. Overall, the findings demonstrating the impact on relationship and social-based variables are promising, namely given the potential deleterious effects associated with difficulties in these domains. Future research would be an essential next step in determining qualitative and quantitative extent of the change.

While the pioneering research for implementing PCIT with the ASD population is promising, clinical parameters for PCIT practice with ASD are dynamically evolving. The content of this chapter is based on lessons learned from the authors' research and clinical experiences conducting PCIT with children on the autism spectrum. The organization of the chapter overlays PCIT concepts onto the ASD diagnostic framework of the *Diagnostic and Statistical Manual of Mental Disorders—fifth edition* (DSM-5; American Psychiatric Association, 2013), including severity and functional level of impairment. What follows are ways in which PCIT impacts ASD symptoms and clinical techniques found to enhance skill performance in each diagnostic domain.

25.2 Addressing Core ASD Symptoms with PCIT

25.2.1 Criterion A: Persistent Deficits in Social Communication and Social Interaction

As detailed in Chap. 1 of this handbook, deficits in social communication and social interaction are cornerstone symptoms of ASD, including difficulties in social-emotional reciprocity, delays in verbal and nonverbal communication, and impairments in understanding relationships through social contexts and play.

25.2.1.1 Social-emotional Reciprocity

An overlying consideration when determining the effectiveness of PCIT with the ASD population is whether social attention has a compelling, reinforcing value to a child to enhance the caregiver-child relationship and manage disruptive behavior. After all, social and communicative attention is the standard currency of PCIT.

Several questions are raised including:

Do prosocial or neutral behaviors increase following labeled praise?

Does reflection increase expressive language?

Does differential attention serve the same function with children on the spectrum as it does with oppositional children without co-occurring ASD?

Do some children consider time-out a place of retreat and one not requiring social demands?

Do some children with ASD find social praise slightly aversive and seek to avoid or escape caregiver attention?

Do some children with ASD respond differently to PCIT than others?

To answer these questions, PCIT should be viewed through a functional lens. One of the strengths of PCIT is its commitment to ongoing assessment and tailoring treatment goals based on such assessment. In addition to coding data, important information is also gathered during coaching. To determine the function of behavior, coaching is ultimately an informal functional assessment in which a therapist may systematically observe and modify antecedents and consequences in real time. For example, as noted in Masse et al. (2007), "clinicians should assess the effectiveness of differential attention and timeout. Systematically ignoring (e.g., the caregiver turning his/her back to the child while the child engages in undesired behavior) during CDI sometimes does not result in behavior change in children with ASD. In some cases, children did not seek attention when parents turned their backs, but instead used the "break" in play to engage in self-stimulatory behavior" (p. 727). For example, as described with Charlie, it is essential to functionally determine what happens when therapists instruct caregivers to ignore a child's stereotyped behaviors versus reinforce them with PRIDE skills. In addition, some children with autism may experience time-out as an escape from social demands or a place of less stimulation. As an example, if a child does not comply with a command to draw a red circle, she receives a time-out where she can "escape" the command for a certain time period and may engage in other behaviors (e.g., rocking, flapping) that are less functional but largely self-stimulating. Although compliance is eventual per the sequence, the time-out chair may serve as a form of retreat/avoidance. In this way, noncompliance is negatively reinforced as the behavior allows for escape from social demands and increases the likelihood of further noncompliance.

Given the positive clinical and research outcomes of PCIT, it is increasingly evident many children on the spectrum indeed desire social connection, and the skills taught in PCIT serve as a conduit to further develop and enhance positive reciprocal interaction. Clinically, our experience has shown that despite some children immediately responding to social attention, there is a subset of children who do not spontaneously respond to the PCIT skills. In these situations, employ clinical judgment to allow adequate exposure to the skills before considering other treatment options. At this time, no standardized practice parameters exist outlining the number of sessions one should conduct to determine whether children respond to the skills. Overall, clinicians should assess for intermediate goals or approximate bids for attention (e.g., looking toward a caregiver, playing proximally to the caregiver, orienting a toy in front of the caregiver) that may be shaped toward a terminal goal (e.g., interactional play).

Another consideration for social reciprocity is shared enjoyment, which may also prove challenging for children with ASD, as they often lack the skills required to share interests, express emotions, and attend to affect within the dyad. Although increasing enjoyment within the parent-child dyad is inherent to the PRIDE skills and PCIT, children with ASD may have a particularly difficult time exhibiting these social cues. Specifically, while a child with ASD may become engrossed with a toy or smile while he plays with a toy, he may not direct a social smile or joy toward another person. It becomes imperative for coaches to serve as master observers, quickly guiding caregivers to reinforce and shape the child's basic social overtures (e.g., eye contact, showing an object to a caregiver, giving a toy to a caregiver, initiating attention from a caregiver). For example, if a child encounters a new toy and vaguely holds the toy in orientation to the caregiver but does not make eye contact with the caregiver, the coach should quickly encourage the caregiver to draw attention to the approximation of the appropriate, socially interactive behavior by stating, "Oh, he's showing you a toy. That's a great prosocial skill. Praise him for showing you the toy." Over time, continued reinforcement of social overtures (e.g., showing, giving, requesting, directing facial expressions toward others) will lead to a greater likelihood of the child integrating eye contact, gestures, and verbalizations to both initiate and maintain reciprocal social interactions. Refer to Table 25.1 regarding ways to target specific ASD core symptoms with praises for positive opposite behaviors.

25.2.1.2 Verbal and Nonverbal Communication Deficits

Impairment in communication may be significant or subtle for children with ASD. While not all children experience the level of language delay discussed later in this chapter to qualify for ASD "with accompanying language impairment," many children with ASD lack an integration or coordination of verbal and nonverbal methods of communication, as well as the ability to chat, comment, and make remarks in a conversation. In essence, children with ASD often lack the social nuances that pave the road for a natural, reciprocal dialog.

Although an integral component of natural reciprocal and social communication, neutral talk is often an overlooked PRIDE skill, likely as a result of its exclusion from the CDI mastery criteria. Some clinicians view the skill as a "catch all" or a "throwaway" skill. When working with children on the spectrum, neutral talk may serve an important function to increase or teach conversational skills. This is especially important for children with low verbal abilities or apprehension to speak during the session. For example, a child with well-developed language abilities is very quiet in session, making reflections and general interactive play more difficult. A clinician, knowing this child's preferred topic, involves dinosaurs and coaches the caregiver to include commentary around this topic (e.g., "The tinker toy reminds me of a dinosaur bone"). The caregiver is not expected to ask questions around the topic but rather "lob" these type of social bids to the child in hopes she will "take a swing" at one of them. The caregiver can be coached to repeat similar statements until the child responds, which is then followed by a reflection ("I *do* remember that funny dinosaur movie") or labeled praise ("Thanks for sharing your thoughts with me"), increasing back-and-forth interaction. This technique may also be implemented with a child whose language deficits negatively affect spontaneous speech.

Another vital characteristic of neutral talk is pacing. Some caregivers have the tendency to use the technique with a rapid-fire type of delivery ("This tinker toy reminds me of a dinosaur bone. I remember the time we saw dinosaur bones at the museum. That's the trip Uncle John took with us"). By slowing the pacing of comments and allowing for *verbal spacing*, the child has more time to process the neutral statement, generate a response, and deliver the response. Rapidly commenting or switching between topics may overstimulate a child on the spectrum, leading to less interaction.

One area where both verbal and nonverbal communication is combined is during the explanation of PDI for the child. Consequently, taking a thoughtful approach to integrating visuals, gestures, and verbalizations when introducing a child with ASD to the PDI procedure is essential. This explanation involves both articulating the PDI sequence and demonstrating the physical movements and proximity contained within the sequence. As such, many children on the spectrum have difficulty learning and understanding PDI via this format. Given that some children on the spectrum have difficulty integrating verbal and nonverbal communication (such as during demonstration), clinicians should consider whether Mr. Bear is the most optimal way to teach the time-out sequence to children on the spectrum. As this approach involves a good deal of language, perspective-taking, and pronouns, a more visually laden approach may be prudent. As such, teaching by way of social narratives or Social Stories © (Gray, 2000; Gray et al., 1993; Gray & Garand, 1993) or a visual flipbook (Masse & Girard, n.d.; available on www.pcit.org) could be a helpful adjunct when teaching the PDI sequence.

In addition to live-modeling the procedure with or without the use of Mr. Bear, a visual representation of the procedure may aid the child to

Table 25.1 Praising Positive Opposites of DSM-5 ASD Symptoms

ASD Symptoms: DSM-5	Praising Positive Opposite Behaviors
Deficits in social-emotional reciprocity	"I really enjoy our special time together."
Failure of back-and-forth conversation	"It's nice to talk to you when you give me a turn to speak." "Good job waiting until I finished talking before you told me your idea."
Reduced sharing of interests, emotions, or affect	"I'm so glad you gave me a car to drive." "I appreciate you used your words to tell me how you felt."
Failure to initiate or respond to social interactions	"It was nice how you picked a toy to start special time." "That is a nice way to look at what I'm showing you."
Poorly integrated verbal and nonverbal communication	"Thank you for showing me and telling me you need another block." "I love how you used your words and your pointer finger to show me the farmer."
Deficits in nonverbal communicative behaviors (e.g., eye contact, facial expression, gestures)	"Thank you for looking at me when I called your name." "It makes me happy to see you smile while we play." "I like how you pointed to the car you wanted."
Deficits in developing, maintaining, and understanding relationships	"Good job playing with your brother." "Thank you for giving me a horse to play with."
Difficulties adjusting behavior to various social contexts	"It's great how you're using your inside voice while we play."
Difficulties in imaginative play	"That's a fantastic idea to use the block as food for the animals."
Absences of interest in peers or in making friends	"You're sharing your toys so nicely with me today. I bet your friends at school love it when you share with them, too."
Stereotyped use of objects (lining up toys)	"Good driving the car on the road."
Insistence on sameness, inflexible adherence to routines, or ritualized patterns of behavior	"What a great idea to add the ponies to the car race." "I know you prefer to go first, so I appreciate you letting me go first." "You did a good job listening when I said special time was over."
Fixated interests	"I like how you are playing with a new toy today."
Unusual sensory interests or responses	"I'm proud of you for touching the PlayDoh."

Note. C. M. Warner-Metzger, 2015. Reprinted with permission
ASD autism spectrum disorder, *DSM-5* Diagnostics and Statistical Manual of Mental Disorders (5th ed)

better understand the sequential and conditional nature of PDI. One example is to use a social narrative to depict PDI, incorporating a series of tailored printed words and pictures that explain the important social cues, perspectives, and behavioral responses. A recommended social narrative specific to PDI begins with an introduction of the child playing and the positive emotions shared within the parent-child dyad, familiarizes the child with listening practice and direct commands, provides a brief explanation of the outcome for listening, explains the outcome for not listening, and emphasizes the importance of receiving a second chance to listen—which then allows the return to playing and fun. The social narrative should end with a positive focus on listening and the enjoyment that comes from playing with the child's caregivers. Depending on the child's developmental level, the social narrative may be 8–10 pages, with each page consisting of (a) a picture for the specific step in the sequence and (b) a short sentence read aloud to the child. General social narrative guidance and templates are widely available online.

Alternatively, specific visual cards to pair with each step of the PDI sequence may be used. As noted, Masse and Girard (n.d.) developed a "flipbook" specifically for the PDI sequence. The flipbook is devised of 18 cards and visually depicts each component of the PDI sequence with the appropriate corresponding verbal statement next to the picture. For example, one card depicts a small child sitting on a chair and above the picture reads, "After placing the child on the chair, back away and say: Stay on the chair until I say you can get off." The flipbook also contains cards designed to teach a child the PDI sequence emphasizing the importance of listening "quick as a bunny" and remaining quietly seated on the time-out chair. In addition to utilizing visual representations for children, the flipbook is helpful to assist parents in learning the PDI sequence, given the prescribed PDI sequence verbiage is paired on the same card the child is viewing. Typically, the flipbook is used to introduce the PDI sequence, and then is regularly revisited throughout the first several weeks during listening exercises.

During PDI, caregivers also integrate verbal and nonverbal communication as they are taught to use gestures in combination with verbal instructions. For example, a caregiver may be told by a PCIT coach, "Point to the elephant and point to your hand while saying, 'Please put the elephant in my hand.' OK, stay quiet. Keep pointing. Stay quiet. Keep pointing to the elephant and pointing to your hand." This illustrates the critical use of gesturing during the command sequence. For some children with ASD, but not all, it may be important to first model the command-compliance sequence several times so the child observes the gesture before it becomes contingent upon a warning or potential time-out. Children on the spectrum may also benefit from prompting or cueing gestures as a means to gain attention and signal an impending command. Specifically, caregivers could be encouraged to position themselves closer to a child so they are in direct view of the child, extend a soft physical touch on the child's shoulder or hand, or deliberately place an object within child's direct eyesight to help orient the child to the command stimulus before administering the verbal command.

Another component of nonverbal communication often forgotten is facial expression. Some children on the spectrum have a constricted range of expression. They may have difficulty understanding or interpreting another's emotion based on their facial expression or other nonverbal means of communication (e.g., tearfulness). Therefore, to develop and increase this skill, caregivers could be coached to model a range of expressions while concurrently narrating their emotion. Often, we coach caregivers to "embrace silliness" while saying, "That makes me laugh," or to display a frown if, for instance, a tower unexpectedly falls over, and say, "That's frustrating the tower fell over." If a child displays an emotion via facial expression, a caregiver is taught to point it out either with a behavior description or a labeled praise. For example, when a child recalls an episode of Thomas the Tank Engine with a noted smile, a caregiver may say, "Thanks for sharing that story with me. I love to see you smile. It shows me that you are happy."

25.2.1.3 Deficits in Developing, Maintaining, and Understanding Relationships

For children between the ages of 2 and 6 years, play skills are the primary agent for initiating social interactions and maintaining them. As aptly summarized by Fred Rogers, the American children's television personality behind *Mister Rogers' Neighborhood*, "Play is often talked about as if it were a relief from serious learning. But for children, play is serious learning. Play is really the work of childhood." Unfortunately, without competent play skills, children with ASD miss the important work of social interactions and learning with their peers and family members. In PCIT, play is not only a mechanism for improving the relationship between children and caregivers, but also a means for learning prosocial skills and testing social hypotheses. Therefore, as PCIT therapists, it is critical to recognize the different types of play and understand the developmental trajectory of play skills. While there are many theories regarding the development of play in young children, the following types of play examples are derived from common developmental and autism-specific assessment batteries consistent with the population age served by PCIT.

Young children often engage in nonfunctional play, such as banging or chewing on toys, as a means to explore their senses, test cause and effect, and develop motoric movements. As children advance, they more often engage in functional play, or using items in the manner they are intended; for example, children may use a play fork as an eating utensil or stack blocks to form a tower. When children become aware of the social routines around them, they develop more sophisticated representational play, first with themselves (either spontaneously or in parallel play) and then extended to others. Representational play may include basic themes such as feeding or bathing, starting with the theme centered on themselves (e.g., feeding oneself), but progressing to more complex play in which the child incorporates others into the theme, such as feeding a caregiver or a stuffed animal.

As imaginative play is discovered, it may take many forms. A child may demonstrate imaginative play by using an item in a manner other than it is intended, such as pretending a box is a car or a house, or a block is an ice cream sandwich. Children also conjure make-believe items during play, such as feeding a baby cow an imaginary bottle or placing a pretend band aid on a zookeeper who cut her finger on a pitchfork. Children with a breadth of play skills may also engage in multischematic play, which incorporates various play elements, including multiple themes, within play scenarios. As an example, children may engage themselves or others in a play scenario in which they clean the kitchen after a meal and then prepare for bath time. Across the developmental trajectory of play, children veer from the literal in play to increasing symbolic play. With proper scaffolding from caregivers during CDI, children with play deficits learn to expand their play repertoire as a way to engage others.

A caregiver's use of modeling and imitation are prime building blocks for play skills; however, children with autism exhibit significant impairment in imitation skills. These deficits have been exhibited across a range of tasks including symbolic and nonsymbolic body movements, symbolic and functional object use, vocalizations, and facial expressions (Ingersoll, 2008).

To examine the effects of PCIT on imitation of a range of play forms, Masse (2010) adapted an assessment method employed by Ingersoll and colleagues (see Ingersoll, Schreibman, & Tran, 2003, for overall procedure) and applied the measure with three children (Kenneth, Adam, Christopher) at pretreatment, posttreatment, and 2-month follow-up. To administer the measure, a caregiver first modeled a particular action three times while overtly describing the behavior (i.e., "I am feeding the baby"). Before initiation of each act, the child was verbally encouraged to watch the parent (i.e., "Watch me"). The child had an identical toy placed in front of him/her prior to the first trial. If the child did not respond within the first 10 s following the parent's third trial, the child was asked, "What can you do with this?" The child then had 10 s to respond followed by the presentation of the next action.

Scoring for the imitation task was based on guidelines suggested by Stone, Ousley, and Littleford (1997). Raters scored the task on a 0–2 scale with “0” representing a failure to imitate, “1” representing an emerging but inaccurate response (i.e., the child made an effort to engage in imitation but failed to reproduce the exact action), and “2” indicating an exact imitation. To standardize test administration, caregivers were given specific wording for each imitation activity and practiced assessment administration with the therapist prior to the session. Therapists were given the wording via a single note card until all imitation activities were completed. Therapists manipulated the play area between imitation activities to ensure that the assessment had minimal interruptions. Each prompt was given in the same order for every administration across parent-child dyads. In addition, therapists tracked the time between trials and indicated to the caregiver via note card when a prompt (i.e., “What can you do with this?”) may be necessary. Imitation of play was measured by examining individual differences in total score across ten items at each phase of the study (e.g., 0–20 scoring range).

Fig. 25.1 shows the results of the imitation assessment. For each of the children, there was an increase in imitative behavior from pretreatment to posttreatment, with 2 of the 3 children exhibiting increases in imitative behavior from pretreatment to follow-up. One child immediately imitated his caregiver on each assessment item at both posttreatment and follow-up (Masse, 2010). The results of this small study are encouraging for the impact of PCIT given that imitation is a core feature of autism and warrants further analysis. First, it is possible that an increase in overall compliance influenced this task, as part of the administration required the caregiver to ask the child what he could do with the object directly after demonstrating the action several times. In this way, the question carries an indirect intent for action stated to the child (with the imitation serving as compliance with the indirect caregiver suggestion). A second hypothesis is that the CDI skills enhanced the parent-child relationship resulting in the likelihood that each child became more attuned to and interested in the caregiver’s actions. Next, as parents were coached to imitate a child’s behavior, recognize child imitation, and praise child approximations, it is possible that this social reinforcement led to increased behavior. Prior research employing a similar imitation task (from which the task in this study was derived) used contingent reinforcement and behavioral descriptions for imitation and showed a similar increase in imitation of gestures (Ingersoll, Lewis, & Kroman, 2006). Also, as parents engaged in Special Time on a consistent basis, it is possible that the greater time on task with toys combined with increased caregiver interaction resulted in enhanced constructive play skills of the child following treatment. Last,

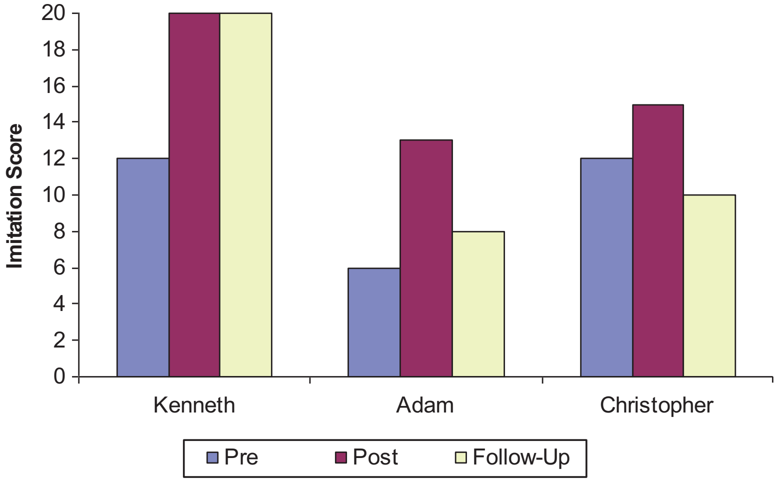

Fig. 25.1 Imitation Task score across participants

given the young ages of the participants, change via natural developmental maturation cannot be ruled out. Given the implication of these findings, further research (e.g., more large-scale studies) is warranted to examine the effects of PCIT on imitation and to assess whether skill generalization to other individuals and settings maintain over time.

Clinically, imitation could be considered an "entry skill" toward interactive play with a child on the autism spectrum. Specifically, for a child who may be closed off, showing more isolative behaviors, or engaging in repetitive behaviors during play, a caregiver could be coached to imitate and verbally narrate (neutral talk) as a way to join alongside the child (e.g., "I am going to spin the cup just like you"). Over time, the caregiver could expand the commentary to include other behaviors in an effort to increase a child's play repertoire (e.g., "I am going to spin the cup and drink from it").

Although imitation is a precursor to interactive play, clinicians should also consider more complex "theory of mind" concepts which often impact social interactions for children with ASD. Autism Speaks (2017) defines theory of mind as the "ability to perceive how others think and feel, and how that relates to oneself." While theory of mind issues pertain to both phases of PCIT treatment, neglecting a child's deficits in perspective-taking may be most problematic in PDI. As an exemplar, "hand me" or "give me" commands (i.e., "Please give me the red block") are commonly coached to introduce the child to the PDI process. However, a subset of children with ASD may experience difficulties with "releasing" or "removing" items from their perspective. Instead, when encountering a child with ASD who apparently and repeatedly ignores such commands, or who is repeatedly incited to bouts of dysregulation without noticeable progress toward compliance when prompted with such commands, clinicians may consider rotating the social perspective to encourage the child to "take" an item from the outside context. For example, a child with ASD may more readily comply with a command to "take a red block" to add to their own collection of blocks rather than release or "give" a red block in their possession to someone else. While not all children with ASD are initially inflexible to commands requiring perspective-taking, it will behoove clinicians to consider theory of mind as a contributing factor to otherwise perceived "oppositional" behavior. Certainly, clinicians should consider the unique challenges children with ASD face when predicting the behavior and emotions of others, initiating and responding to bids for joint attention, and perceiving intentions of others, as it will better inform clinical judgments when defining increasing demands within PDI.

The advanced stages of PDI are the opportune time to assist children with ASD in adjusting their behavior to suit various social contexts. After all, PDI not only serves as a means to systematically increase child compliance, it also serves as a mechanism for modeling appropriate request behaviors. Indeed, many children with ASD quickly learn and emulate the highly structured approach to PDI's use of direct commands as a mechanism for making appropriate social requests. While it is common for children with primary disruptive behaviors to also imitate direct command verbiage from a caregiver (e.g., after complying with a caregiver's directive to "Hand me the bus," the child states to his caregiver, "Please hand me the blue car"), the child with ASD may more readily adhere to this social request scripting. Clinicians should remain vigilant for opportunities to praise the child's appropriate requests, as well as for opportunities to aid the caregiver in modeling a variety of social requests.

To further expand relationships, sibling sessions present a unique opportunity to practice prosocial and reciprocal relationship skills. For the child with ASD, this not only means emphasizing the typical sibling session focus of sharing and cooperating, but also showing an interest in others, expanding the play repertoire, and initiating social interactions with others. During sibling sessions, consider situations in which the target child must engage in less preferred activities, incorporate multiple types of toys in the play scenario that may not typically go together (e.g., cars with ponies), tolerate completing tasks in sequence with their sibling (e.g., the sibling stacks a block then the target child stacks a block), or initiate requests for materials (such as requesting the glue or scissors from the caregiver for a craft project).

25.2.2 Criterion B: Restricted, Repetitive Patterns of Behavior, Interests, or Activities

Children with ASD also exhibit circumscribed and repetitive patterns of behavior, interests, and activities (see Chap. 1 of this handbook). Thus, they often engage in repetitive motor movements, inflexibility with and over-reliance on routines, fixated interests, and sensory sensitivities.

25.2.2.1 Stereotyped or Repetitive Motor Movements, Use of Objects, or Speech

As one type of stereotyped behavior, children with ASD often exhibit echolalic speech, either immediate to the context (i.e., replicated words or phrases almost immediately after they are heard) or delayed to the context (i.e., "scripting" words or phrases that were previously heard and repeated after a delay in time). In theory, echolalia may serve various purposes for a child with ASD as it may be classified as interactive or non-interactive, and may serve as a coping strategy to decrease anxiety in verbally-laden situations, a mechanism for learning language, or a means to sustain social interactions (McEvoy, Loveland, & Landry, 1988; Prizant & Duchan, 1981), especially when children attempt to reduce the cognitive strain while remaining engaged in demanding social situations (Sterponi, de Kirby, & Shankey, 2015). While echolalia is a form of stereotyped language and may be considered a minor, annoying behavior that is undesirable in the long term for appropriately initiating and maintaining reciprocal communication, it likely serves as a functional bridge for children with ASD as they increase their receptive and expressive language. Therefore, PCIT coaches should not view echolalia as an ignorable offense, but rather, a skilled coach will use a child's echolalia as an opportunity to *meet and expand* the child's vernacular. As such, the caregiver is first coached to *meet* the child at the level of their functional communication and attend to the echolalia with PRIDE skills. Following an initial acknowledgement of the child's verbalization, the caregiver may then *expand* the child's vocabulary or comprehension of a concept through verbal extrapolation and scaffolding. The following exchange exemplifies the *meet and expand* approach:

Child: The elevator goes up! *(scripting from previously heard phrasing)*

Caregiver: The elevator does go up! <Reflection> *(meeting the child's level of functional language)*

Child: The elevator goes up!

Caregiver: I like how you're playing with the elevator. <Labeled Praise> *(expanding and attending to child's appropriate play behaviors)*

Child: The elevator goes up!

Caregiver: You're putting a car on the elevator. <Behavior Description> *(expanding the child's vocabulary by describing and introducing action words related to child's behavior)*

Child: The elevator goes up!

Caregiver: I'll put a car on the elevator, too. <Neutral Talk> *(modeling extension of play behaviors and scaffolding perspective of other and conversational speech)*

I like playing with you. <Labeled Praise> *(encouraging child's continued prosocial skills in light of strereotyped speech)*

Similarly, caregivers should be encouraged to *meet and expand* their child's repetitive play and motor stereotypies, such as twisting Lincoln Logs in their hand rather than engaging in more functional play by building with Lincoln Logs. Children may also line up toys or become preoccupied with parts of objects (such as the wheels of cars). While PCIT therapists should certainly keep toys available that the child prefers, they should also consider introducing other less preferred or novel toys into play. For example, maybe the child has a prescribed interest in playing with giraffes. The therapist will have giraffes available while coaching the caregiver to incorporate other toys into play (e.g., Legos to build the giraffe a home, cars for the giraffe to drive). The caregiver verbalizations may be represented as follows:

Caregiver: You're walking the giraffe. <Behavior Description> *(parent picks up Legos)*

I'm going to make a tree for the giraffe to eat. <Neutral Talk> *(places the tree in the path where the child is walking the giraffe; child bumps the tree with the giraffe)*

Oh, you're helping the giraffe eat! <Behavior Description>

The child may first reject the additional toys; if the child does so with appropriate words or gestures, the caregivers should praise the appropriate communication: "Thanks for letting me know with your words <Labeled Praise>. You don't want the Legos <Neutral Talk>." If the child tends to reject notions of increased flexibility in play materials during CDI, the caregiver should continue to follow the child's lead without insisting on incorporating additional toys. However, increased flexibility in play themes and integration of play materials will likely be a strategic focus of PDI sessions. Shaping play, social skills, and language skills by *meeting and expanding* is a powerful learning tool across the course of PCIT. Yet, the degree to which a caregiver should be coached to *meet and expand* stereotyped or repetitive movements and speech is dependent upon the level of the child's overall intellectual and adaptive functioning, and is further discussed in the *Functional Considerations* section of this chapter.

Because children who become overstimulated by closeness in their environment may engage in increased stereotyped behavior, clinicians should also examine physical spacing (proximity) during sessions. Although comfort levels for physical proximity and touch vary by child, physicality plays a role in how comfortable a child with ASD is during a session, namely during initial sessions when they are acclimating to the new clinical environment. Over time, a caregiver may be coached to gradually share more space with their child while acknowledging it (e.g., "Thanks for letting me sit right next you when we play"). Similarly, a caregiver's enthusiasm or physical touch may overstimulate a child on the spectrum, leading to less interaction and potentially more stereotyped behavior. Whereas, a well-timed touch may serve as positive sensory input for other children. As such, it is important for caregivers to match (or be within range of) their child's energy level and to remain watchful of any nonverbal communicative behaviors signifying discomfort (e.g., turning away from caregiver, tensing up).

25.2.2.2 Insistence on Sameness, Inflexible Adherence to Routines, or Ritualized Patterns of Verbal/Nonverbal Behavior

Many children on the spectrum tend to engage in ritualized and repetitive behaviors, especially in play routines, and often become upset if interrupted. They may also react to adjustments in schedule and new environments with inflexibility. As such, PCIT clinicians should thoroughly assess a child's propensity for rituals and routines throughout treatment.

When preparing for each session, carefully consider the choice of toys used with regard for the child's age and developmental level. Although expansion of play repertoire through exposure to new toy types may be a long-term goal, beginning with toys that cater to the child's interests may increase the likelihood the child will engage in play while adjusting to the newness of the clinical environment. Within reason, a child may be allowed to bring a toy from home to integrate in play, as long as it coincides with general guidelines for appropriate PCIT toys (i.e., it does not encourage aggressive play, require rules, or result in messiness). While consideration for soft toys or toys that are not likely to cause destruction if thrown are similarly desirable for children with ASD and children with primary disruptive behaviors who become aggressive, children with ASD may also be particularly sensitive to damaged toys that are inoperable or play sets with missing pieces due to their heightened need for sameness. For this reason, clinician's should take great care in toy selection and recognize how a child's demandingness for particular toys may be a symptom of inflexibility rather than oppositionality.

Clinicians should ascertain how the child's activities during check-in may impact subsequent Special Time, as some children with ASD become consumed in self-directed play or a ritual, which may be difficult to interrupt to begin Special Time. The check-in may need to remain brief or occur at the end of session for highly inflexible children, or the child may require a transitional sensory activity to prepare them for Special Time. For instance, Tyler often played with a squooshy ball during the check-in, and the caregiver presented the toys to Tyler as they transitioned to Special Time.

As play occurs, a child with ASD may insist the play unfolds in a specific sequence. In general, the caregiver should follow the child's lead, as long as the child's ritualized play is not aggressive or detrimental to the parent-child interaction. On the contrary, should inflexible adherence to a particular routine negatively impact the interaction, coaches may choose to employ strategic attention for positive opposites (e.g., allowing the caregiver to add a block to the castle) or use labeled praise to shape the child's approximations of flexible play. For example, if the child stipulates the caregiver may only use the blue car to go down the ramp, the caregiver may also nonchalantly choose the green car to drive down the ramp, saying, "I like green <Neutal Talk>. I'm driving the green car down the ramp <Neutral Talk>. *(before the child protests)* Thank you for letting me to choose a different car <Labeled Praise>. Sometimes it's okay when people use different cars <Neutral Talk>." Following this slight challenge to the child's ritual, the coach may guide the caregiver to follow the child's lead without diversion. If the child presses the caregiver to return to using the "blue car," the caregiver may purposely say, "Oh, the blue car <Reflection>. It's nice of you to give me the blue car to use this time <Labeled Praise>, and I may use the green car later <Neutral Talk>."

Children with ritualistic tendencies tend to engage in the same behavior repetitively, proving challenging to their caregivers in terms of varied language for behavioral descriptions. After all, there are only so many times a caregiver can state, "You're driving *another* car down the ramp." An astute coach may assist the caregiver in devising a list of "action words" that may be used to describe the child's positive behaviors; for a child who repetitively propels cars down a ramp, possible action words may be: pushing, driving, racing, rolling, speeding, sending, dropping, or sliding. This expands the caregiver's descriptive vocabulary while accommodating the child's developmental needs.

During PDI, clinicians should anticipate children with ASD to experience difficulties with transitions and exhibit extreme distress at small changes. The evolution of the PDI session progression sequentially advances from (1) orienting the caregiver and child to the PDI process within play tasks, (2) generalizing PDI to clean-up and throughout the day, to (3) applying PDI to overarching family rules and public situations over a series of sessions; in this sequence, children are gradually exposed to increasing social demands and flexibility to environments.

For children with ASD, there are additional core ASD symptom factors to consider while undergoing PDI (compared to PDI with a child with primary disruptive behavior problems). In particular, when embarking on house rules, clinicians should aim to be clear on two aspects: the definition of the house rule and the intent of the behavior. First, highly oppositional children as well as highly rigid children may question the term "house" rule, taking a literal interpretation that house rules only pertain to the household or within the physical structure of the home. However, as the family advances to using PDI in public, "house" rules will also be enforced in public. For this reason, the term "family rules" may be most appropriate for highly oppositional children seeking a loophole and highly perseverative children, alike. By definition, the child is always part of the "family," so whether they are at home, in public, or at school, the family rule always applies (and is enforced once the public outing stage is reached). Additionally, when considering the appropriateness of targeting certain behaviors for family rules, it is imperative to not only indicate clear operational definitions of behaviors within one of the primary family rules categories (i.e., aggressive, destructive, or never acceptable under any circumstances), but also to rule-out any targeted behaviors as self-stimulatory or coping mechanisms for managing sensory overload. As one example, "yelling" may be an appropriate disruptive behavior to target for a house rule by definition of the 2011 PCIT Protocol (Eyberg & Funderburk, 2011), as it is verbally aggressive. However, for a child with ASD, they may tend to have difficulties with loudness during times of both excitement and duress, or may self-stimulate with periodic, out-of-the-blue squeals or screams. Indeed, the underlying mechanism and intent of "yelling" is difficult to distinguish in these circumstances. Likewise, administering a time-out for a broken family rule of "no yelling in the house" to a child with ASD who yells in excitement for another family member winning a game (a highly socially reciprocal behavior) seems counterintuitive. Rather than using the behavioral principle of punishment via a family rule to extinguish these stimulatory and impulsive behaviors, focusing on a positive opposite replacement behavior (e.g., giving a "high five" when excited rather than screeching) may be more effective and fair to the child with ASD. Without a doubt, children with ASD do not receive a blanket exemption from family rules; merely, the additional layer of ASD symptomatology should be given consideration when creating effective family rules.

As PDI proceeds to preparation for public outings, a child with a primary disruptive behavior presentation is likely to respond with little incident to a public outing if they both meet the prerequisite of a positive response to a careful, progressive PDI intervention and meet the criterion of a child reliably remaining on the chair during a time-out at home or in the clinic. On the contrary, a child with ASD may effectively meet the prerequisites to a public outing, but may experience greater difficulties with the transition of PDI from the clinic and home settings to the public setting, due to insufficient means to adapt to changing environments. Hence, a child with ASD may require additional shaping in preparation for a public outing, which may include, but is not limited to: (1) *micro-outings* within the clinic environment, such as taking a tour within the clinic or taking the elevator to a different floor in the clinic building; (2) micro-outings within or near the home environment, such as applying PDI principles when other adults and children visit the home, when the child has a playdate with a neighbor, or when visiting family members; or (3) pairing or visibly placing the public outing time-out placeholder (i.e., towel, placemat, cloth napkin, or handkerchief) with the time-out chair at home and in clinic for a few weeks before using the placeholder as the time-out marker in public. When embarking on a full-scale public outing to a location such as a store or a neighborhood park, therapists should consider how a child is likely to respond to the sights, sounds, and social interactions within the public environment (similar to managing the stimulatory nature of the clinic environment). Other PDI generalizations may include purposely varying the route taken to familiar locations, practicing the process of greeting others in a varied (rather than ritualistic) manner, and tolerating additional activities or the incorporation of new objects in daily routines.

During PDI, some children with ASD who experience significant difficulty with rigid thinking patterns may perseverate following an extended time-out or show significant difficulty downregulating following a time-out. As an example, in initial sessions of PDI, Tyler often returned from the time-out chair, and complied with the original command and follow-up command, exhibiting an understanding and motivation for compliance. Despite his caregiver providing a labeled praise for listening, Tyler refused his caregiver's bids to return to CDI, instead frantically repeating, "Time-out," as he climbed on and clung to his caregiver. After two sessions ending with this perseverative behavior, the traditional labeled praise for listening was changed to, "Thank you for listening <Labeled Praise>. Now there is *no* time-out <Neutral Talk>," with the caregiver briefly but tightly hugging Tyler (for sensory input) before placing Tyler in his own space on the floor next to her. Notably, the caregiver was coached to pair the sensory input of positive touch with praises or other PRIDE skills for appropriate play or social behavior, and to use strategic attention or direct commands to redirect Tyler for other perseverative behaviors. Effectively, in this scenario, the use of the extended rationale following the labeled praise for compliance paired with brief, positive sensory input was used to "close the loop" for Tyler and prevent further perseverative spiraling.

25.2.2.3 Highly Restricted, Fixated Interests that Are Abnormal in Intensity Or Focus

At times, children with ASD may become engrossed in excessively circumscribed or perseverative interests. This may manifest in a behavior similar to the oppositional child who repeatedly requests access to a particular toy despite it being inaccessible or demands to play with a particular caregiver while denying interaction with another caregiver. In general, a *one-and-done* approach is most theoretically sound in acknowledging the child's verbal request in a developmentally appropriate manner and strategically ignoring repeated requests. The initial acknowledgement may be paired with a brief positive touch for sensory input, but future requests are verbally and physically ignored. Thus, the *one-and-done* interaction may unfold as follows:

Child: Mom, I want the dinosaurs.

Caregiver: Thank you for using your words to tell me what you want. <Labeled Praise> *(she gently pats child back)*

I'm afraid the dinosaurs are being used by another kid right now. <Neutral Talk>

Child: *(loudly)* But I want the dinosaurs!

Caregiver: *(removing eye contact and ignoring child's repeated request)* Hmmm. <Neutral Talk> I see some dishes here. <Neutral Talk> I think I'll start making dinner. <Neutral Talk>

Child: *(crawls under table)* No! Give me dinosaurs!

Caregiver: *(continues to ignore repeated requests)* There is so much food here. <Neutral Talk> I'm not sure what to make. <Neutral Talk> I know! <Neutral Talk> A chocolate cake! <Neutral Talk>

Child: *(remains under table, playing with shoe laces, growling)* Dinosaurs.

Caregiver: *(continues to ignore repeated requests)* Oh, I need an oven. <Neutral Talk> *(pushes her chair away from the table, brings some dishes to the floor, sits within eyesight of the child, and orients toys within reach of child, but does not intrude in child's space)*

I'm putting the cake in the oven. <Neutral Talk> *(placing a cake pan under the chair)*

Child: *(takes the remaining dishes and nonaggressively pushes them under the chair)*

Caregiver: *(rubbing the child's back)* Thank you for playing with me and helping me cook! <Labeled Praise, Labeled Praise>

Although many children with ASD present as disengaged with caregivers, other children may show strong attachment to or preoccupation with a particular caregiver and become overly clingy with them. During the initial ASD assessment, Tyler's mother explained he became upset when separated from her. Indeed, during the DPICS pretreatment assessment, Tyler generally interacted with his mother by tossing blocks around the room. When his father entered the room and his mother left the room, Tyler screamed, cried, and banged on the door (which his father sat against) for the entirety of the 20-min DPICS assessment. During the CDI Teach, a mutual plan was devised with the caregivers to initially allow Tyler's mother to remain in the room during the father's prescribed Special Time. However, during the father's Special Time, the mother was coached to act as an inanimate object, such as a piece of furniture; Tyler was allowed to sit on his mother's lap or near her, but she was coached to avert eye contact, refrain from verbalizations, and withhold positive touch. As Tyler acclimated to the clinical environment, the nature of his mother's presence was slowly faded. Across successive CDI sessions, she sat on the floor, sat in a chair, stood away from the toys, stood near the door, and finally discretely left the room as the father engaged Tyler in Special Time.

A similar shaping process may be used to first allow a child access to an item of preoccupied interest during Special Time; this may be done if it is deemed absolutely necessary to accommodate the child as she adapts to the clinical environment and if it is not contradictory to Special Time activities. One mechanism to assist children in relinquishing a preferred, non-PCIT object is for Mr. Bear to "watch" the item during the session. The child gives the item to Mr. Bear at the beginning of the session, Mr. Bear watches the item in the observation room, and then Mr. Bear returns the item at the end of session. Some children may allow the item of interest to be slowly faded away from Special Time across the course of CDI. For other children with ASD, removal of the item of interest may be a focus PDI intervention.

25.2.2.4 Hyper- or Hypo-reactivity to Sensory Input Or Unusual Interest in Sensory Aspects of the Environment

General environmental awareness and planning is important to ensure children are readied for success throughout PCIT. While this axiom is true for traditional PCIT, it should receive special attention when PCIT is used for children with ASD. As many children on the spectrum experience a level of sensitivity to certain aspects of their environment (e.g., sounds, lighting), some cognizance of environmental stimuli may be appropriate. A simple preparedness activity for the PCIT clinician is to conduct a basic "sensory walk-through" of their clinical space, including the trek into the building. Take note of the sights, sounds, and textures encountered. Questions to ask during this logistics assessment are: What am I seeing? What am I hearing? What am I feeling in my body? These questions may be asked simultaneously during a single walk-through, or they may be asked in a singular fashion during separate walk-throughs.

As common sensory stimuli, clinicians should assess lighting in agencies and be aware of any sounds that may cause children to be hyperreactive. For instance, some settings (e.g., medical center) have intercom systems where an announcement is preceded by a certain tone that could bother a child on the spectrum. Other experiences of note include the need for elevators or stairs, logistics of the furniture in the waiting room or therapy room, music or television in the waiting room, and access to light switches, power outlets, cords, blinds, windows, and artwork hung on walls. Consideration should also be given to the particular toys used in the clinic. Some children are adverse to toys with unpredictable noises or certain textures, while others may become overly engrossed in noisy toys.

Sensory sensitivities may be notable in PDI if a child refuses to comply with a command due to sensory aversiveness rather than strong-willed defiance. In this case, when it is quickly apparent that the function of noncompliance is more sensory-related, it is recommended that clinicians "eject" from the sequence as quickly as possible and administer a more appropriate command. As PDI moves outside the clinic, caregivers should be thoughtful to the location of public outings, especially in the first several practice sessions. Of concern, some children with ASD may be particularly sensitive to fluorescent lighting or feel overstimulated in crowded or noisy stores. In many instances, clinicians have developed a list of certain stores or areas (e.g., contained parks, safe playgrounds) in their locale that are more public-outing friendly than others and recommend these places to families.

Another component to consider is how natural aspects of therapy can impact a child's senses. For example, some children with ASD become overstimulated during transitions, and children often experience a series of four to five transitions prior to starting in-clinic Special Time (e.g., transition from school to driving, from driving to clinic waiting room, from clinic waiting room to PCIT therapy room, from PCIT check-in to Special Time). If necessary to aid a child who is overwhelmed or fatigued by transition, it may be beneficial to arrange for the family to be immediately escorted from the check-in desk to the therapy room (skipping the waiting room) or to begin the session with coding and coaching Special Time, reserving check-in time for the end of the session. Similarly, during coaching, when a child with ASD shows early signs of sensory overload or sensory-seeking (e.g., hyperkinesis), the child may be assisted through brief sensory input via positive touch (e.g., a hand on the child's shoulder, a tight squeeze for a hug, a quick rub on the child's leg or arm). For example, Tyler often rolled on the floor as a precursor to becoming dysregulated. His mother sat next to him on the floor and gently rubbed his back as she modeled appropriate play with cars. Within 30 s of the positive touch, Tyler typically engaged in functional play with the toys.

25.3 Functional Considerations

It is important for therapists treating children with ASD to have a solid understanding of each child's symptom severity level. As referenced in Chap. 1 and defined by the DSM-5 (2013), there are three levels of functioning indicated for children with ASD: (1) Level 1—"Requiring support," (2) Level 2—"Requiring substantial support," and (3) Level 3—"Requiring very substantial support." The various levels depend on the child's combined social communication deficits (ranging from [1] noticeable impairments to [2] marked deficits to [3] severe deficits) and restricted, repetitive behaviors (ranging from [1] inflexible behavior in one or two contexts to [2] inflexible behavior with significant distress in a variety of contexts to [3] inflexible behavior with extreme difficulty in all contexts). A child's functional level must also account for the cognitive and adaptive deficits inherent in the highly comorbid intellectual disability, as well as the level of language impairment relative to the child's cognitive functioning. A thorough assessment and conceptualization of the child's functional level will inform PCIT implementation for a child with ASD.

25.3.1 ASD Levels of Functioning

A course of CDI is beneficial to build play skills and basic interaction skills for children with the most severe symptoms of ASD. Indeed, Harrington, Allen, Cooke, and Paulson (2015) conducted a randomized controlled trial comparing 25 children with ASD receiving both phases of PCIT to 19 waitlist controls. Researchers found increases in positive parenting behavior and child compliance rates, and decreases in level of child disruptive behavior. Importantly, the study also revealed children with a more severe level of autism (as rated by a Child Autism Rating Scale score greater than 50; Schopler et al., 1988) showed much larger improvements on the Eyberg Childhood Behavior Inventory (ECBI; Eyberg & Ross, 1978) following the CDI phase of therapy (with scores falling considerably below the clinical cutoff). In contrast, children with lower levels of autism severity (i.e., Child Autism Rating Scale score less than 50; Schopler et al., 1988) showed the greatest improvement on the ECBI following PDI. Although further research is needed to better understand the impact of each PCIT phase in relation to ASD severity, the study authors posit that children with formerly termed "higher functioning" ASD, or currently termed Level I ASD functioning, responded similarly to neurotypical children (i.e., had greater changes in behaviors following the successful implementation of a structured discipline procedure); however, the caregivers of children with more severe ASD seemed to benefit from learning how to appropriately respond to their child and engage in specialized play. Once the interactions improved and more prosocial skills were cultivated, the disruptive behaviors improved as well.

To further illustrate the functional level in a child and the associated clinical considerations, the case of a participant with ASD included in the Masse et al. (2016) study will be highlighted. This child had a 65 overall IQ and severe expressive and receptive language impairments. Following PCIT, this participant showed positive improvements with behavior as well as language capabilities. Modifications were consistent with those proposed in a study examining PCIT for children with intellectual deficits (Bagner & Eyberg, 2007; McDiarmid & Bagner, 2005). Parents were instructed to use more discrete commands, coached to consistently "undershoot" his developmental level when giving commands, and guided to deliver shorter parenting phrases (e.g., "Rabbit. White rabbit. You are drawing a white rabbit," "Lego. Give Mom Lego").

Some modifications to the PDI procedure may also be warranted based on a child's functional level. Specifically, some children may benefit from an additional teaching phase preceding the implementation of time-out. As outlined in Lesack, Bearss, Celano, and Sharp (2014), one method is a three-step prompting sequence that begins with a caregiver combining a command with a gesture (e.g., "Nora, please hand me the block," while the caregiver points to a block and their own hand). After allowing 5 s for compliance, the caregiver then models compliance while repeating the command (e.g., "Nora, please me hand the block," while the caregiver places a block in her own hand). After allowing for an additional 5 s to comply, a caregiver then physically guides the child to comply with the command (e.g., "Nora, please hand me the block like this," while guiding Nora's hand to place the block in the caregiver's hand). Through this process of "errorless learning," a labeled praise is offered for compliance only for the verbal and model prompt. Mastery of child understanding is defined as compliance with three consecutive commands needing only a verbal or model prompt. Once mastery is attained, the time-out sequence is taught to the child.

Last, shaping time-out in shorter increments during the initial learning phase may be a mechanism for children who do not remain on a chair for 3 min. Gathering information during the PDI Teach regarding the child's ability to remain seated in various contexts (e.g., at school, at mealtimes, while engaged in a challenging activity, during previous time-out attempts) will assist the clinician in determining the specific shaping intervals. The initial length of time-out should be long enough so the removal of positive attention is obvious and meaningful but short enough so it is developmentally appropriate. As a general guideline, 1 min (plus 5 s of quiet) is an ideal starting point to begin the shaping process toward 3 min (plus 5 s of quiet). As noted above, these adaptations should be considered in the context of functional ability and should not be applied universally with all ASD cases.

Another clinical consideration related to functional level is ECBI interpretation, which serves as an ongoing functional assessment of home behavior throughout PCIT. As some ECBI items capture behaviors related to language (e.g., lies, sasses adults) and adaptive functioning (e.g., dawdles when getting dressed), scores should be interpreted cautiously and in the context of capability versus oppositionality. This is especially true for a child with Level 2 or Level 3 functioning. When interpreting the ECBI, one should ask, "Is this score reflective of a disruptive behavior or a skill deficit?" As such, graduation criteria should be inspected on an individual, item-by-item basis to ensure developmentally appropriate treatment decisions, and should be guided by current research.

Interestingly, given the recent proliferation of PCIT studies using the ECBI with the ASD population, researchers have begun to examine the psychometric properties of the measure with the ASD population (Jeter, Zlomke, Shawler, & Sullivan, 2017). Jeter and colleagues studied 335 children with ASD ages 2–12 years. Using the same method as the original ECBI standardization study (Eyberg & Ross, 1978) and its revisions (Colvin, Eyberg, & Adams, 1999), the researchers determined that the "ASD cutoff" was more accurately an intensity score of 169 and a problem score of 15, thus representing a useful gauge for clinicians interpreting the ECBI. Although the authors make clear they do not seek to recalculate the ECBI cutoff for ASD children, the finding further supports previous research indicating that comorbidities in children with ASD tend to manifest with more intensity and severity. It is worth noting the sample in this study involved children up to 12 years of age. In addition, the children's level of functioning was not specified, so caution should be taken in generalizing the findings across all children with ASD.

Most often occurring for children who have Level 2 or Level 3 ASD functioning, self-injurious behavior may be a common problem. Therefore, a thorough assessment of the frequency, intensity, severity, level of impairment, and function of the behavior is warranted. This information should be gathered at the initial intake and DPICS pretreatment assessment, and revisited during both the CDI and PDI Teach sessions. Additionally, environmental modifications such as adding foam floor mats, putting a pillow between a child and hard surfaces, or placing mittens or gloves on a child's hands may be warranted. Gauging level of parental concern about self-injurious behavior, namely before moving into the PDI phase, is also recommended.

Correlated with child level of functioning is parental level of stress. Indeed, some families with a child on the autism spectrum tend to rate high levels of stress despite improvements in behavior, whereas families with children with challenging behaviors, but not autism, rate lower stress levels once the externalizing behaviors subside. Further, Hayes and Watson (2013) conducted a meta-analysis examining parenting stress of caregivers with children on the autism spectrum and found a significant difference between parents of children with ASD in comparison to those with children not on the spectrum on comprehensive measures of parenting stress (effect size (*d*) = 1.58). Interestingly, the study also revealed higher stress levels for parents of children with ASD in comparison to those with children diagnosed with other chronic disabilities (e.g., Down syndrome, intellectual disability; effect size (*d*) = 0.64). Several PCIT studies have included stress as an outcome variable with mixed findings. Ginn et al. (2015) found a positive trend on the Difficult Child subscale of the Parenting Stress Index; Solomon, Ono, Timmer, and Goodlin-Jones (2008) found total stress remained at clinical levels on the Parenting Stress Index at posttreatment; and Agazzi, Yin Tan, Ong, Armstrong, and Kirby (2017) found reductions in total stress on the Parenting Stress Index at posttreatment across three caregivers. Masse (2010) also measured stress levels across three caregivers and found total stress for two caregivers remained at clinically significant levels at posttreatment. In addition, the Parent-Child Dysfunctional Interaction scale dropped to below significant levels for two dyads at posttreatment, while the other dyad reported a low level at pretreatment. This particular result is promising as the subscale measures relationship-based constructs such as emotional and social reciprocity.

Clinically, given the chronicity and variety of behavioral difficulties associated with ASD, caregiver stress is an important variable to continually assess and address throughout PCIT. For example, a clinician may consider allowing several more minutes at check-in or at the end of the session (to protect coaching time) to allow parents the opportunity to discuss stressors (both related and unrelated to the child's behavior), or request caregivers to write additional concerns or stressors as they arise on their Special Time homework for the therapist to review at a strategic point in the session. Alternatively, a phone or email check-in during the week may be appropriate. Perhaps, due to more intense behavioral challenges and subsequent stress levels, some families may need more sessions, particularly during PDI (Masse et al., 2016). As such, caregiver stress should be on the forefront when working with the ASD population.

As a final, but common, concern for applying PCIT to various severity levels of ASD, Masse et al. (2007) hypothesized that PCIT may not be appropriate for all children with ASD. For example, it was thought that children with poor receptive language (< 24 months) who do not understand simple instructions or children with severe self-stimulatory and repetitive behavior may not benefit from PCIT. It was also hypothesized that intellectual level and general language may preclude some children on the spectrum from benefitting from PCIT. Certainly, additional research is needed to more fully understand ways to discern how to best implement PCIT to accommodate a child's functional level; however, current research and clinical information suggests the standard model of treatment may be effective in reducing behavioral challenges for children with various degrees of functional impairment, though some clinical adjustments may be needed.

25.3.2 ASD with Accompanying Language Impairment

In addition to overall severity level, children with ASD present with various degrees of language functioning. While the revised fourth edition of the DSM (DSM-IV-TR; American Psychiatric

Association, 2000) conceptualized communication deficits separately from social deficits (what was then "autistic disorder"), the DSM-5 (American Psychiatric Association, 2013) theorizes a combined social communication criterion for what is now termed autism spectrum disorder, with an overall diagnostic qualifier of "with or without accompanying language impairment." For those children who present with the additional qualifier (i.e., "with accompanying language impairment"), a few clinical considerations for PCIT are suggested. First, when determining if a child with ASD is appropriate for PCIT services, it is recommended the clinician screen the child's basic expressive and receptive skills. While a nationally normed, standardized language measure, such as the Preschool Language Scales, fifth Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011), is most preferable, minimally assessing the child's ability to complete the following language tasks is suggested (phrased as questions presented to the caregivers):

1. Can your child follow a 1-step direction such as, "Get your shoes," "Throw the ball," or "Give it to me"?
2. Does your child recognize his/her own name? If your child is playing and you call his/her name, will he/she look your way?
3. Can your child identify at least 10–15 common objects and/or pictures of common objects, such as pointing correctly when you say, "Show me the ball?"
4. Does your child use two-word phrases?
5. Can your child imitate words spoken by someone else?

If the child successfully demonstrates the ability to complete the tasks (meaning the caregiver answers "yes") on 4 of 5 questions, then the child may be a suitable PCIT candidate. If the child fails two or more of the above questions (meaning the caregiver answers "no"), then careful consideration should be given to the child's appropriateness for PCIT. In particular, it is unfair and inappropriate to administer a PDI sequence to a child who cannot identify 10 common objects or follow single-step instructions. Indeed, while many PCIT trainers and clinicians find CDI generally beneficial with various populations, PDI may be deemed inappropriate for some children with ASD.

Second, although clinical parameters regarding minimum language requirements have not been determined, recent research (Ginn et al., 2015) identified the inclusion criterion for language production to be at least three words spoken in a 5-min period. If implementing PCIT with a child who has a low frequency of verbalizations (i.e., spoken words), this may impact the caregiver's ability to achieve CDI Mastery. Specifically, meeting the traditional reflection criterion for CDI Mastery requires the child to verbalize at least 10 words. However, for children who do not use 10 words within a 5-min period, the criterion may be tailored so the caregiver reflects 75% of the child's verbalizations, at a minimum (Eyberg & Funderburk, 2015, personal communication). To accurately calculate this percentage, the clinician must tally the number of words or word approximations the child speaks during the 5-min coding observation, in addition to the number of reflections the caregiver provides. Thus, the number of caregiver reflections divided by the number of child word verbalizations equals the percentage of caregiver reflections, given the opportunity. Of importance, these tallies are of spoken words or word approximations (e.g., child says, "Ca," while holding up a cat, and caregiver repeats the utterance and then reflects, "Ca. Cat."). By the DPICS definition, a reflection is "a declarative phrase or statement that has the same meaning as the child's verbalizations" (fourth edition; Eyberg et al., 2014), whereas repeating vocalized noises or sounds made by the child (e.g., child vocalizes, "Grrrrrr," while playing with a tiger) are considered positive imitative skills, not reflections. When in doubt, clinicians are encouraged to use Dr. Warner-Metzger's "pig rule" to distinguish verbalizations (words that may be reflected) from vocalizations (sounds that may be imitated). Expressly, if the child is playing with a pig and snorts, and the caregiver snorts, this is a principal example of imitation. However, if the child is playing with a pig and says, "Oink," and the caregiver says, "Oink," this is a reflection because "oink" is a word that can be spelled and found in the dictionary (defined in the *English Oxford Living Dictionaries Online*, n.d., as "the characteristic grunting sound of a pig"). Lastly, in terms of discerning which sounds or words to reflect for children with ASD, Lesack et al. (2014) offered sound clinical guidelines which may be most appropriate for children with Level 1 severity and without accompanying language impairment. Specifically, the researchers suggested that vocalizations with communicative intent should be reflected to engage caregivers while also ignoring stereotypic utterances and words. However, as previously noted in this chapter, using the *meet* and *expand* approach to stereotyped language may be more appropriate for children with Level 2 or Level 3 functioning, and children with accompanying language impairment.

Third, special consideration should be given during PDI for children who exhibit ASD with accompanying language impairment. As previously mentioned, simplifying commands to as few words as possible is the most desirable option. Additionally, children with language impairment may benefit from a rationale explicitly attaching the reason "for listening" to the subsequent command. For example, common rationales preceding a direct command may be "Now it's time to practice listening," or the simpler "It's time to listen." Furthermore, in extremely rare cases—a child with language impairments, significant cognitive deficits, and Level 2 or 3 severity level—adaptations to the language used within the PDI sequence may be necessary. Specifically, children with significant deficits may not comprehend the conditional statement: "If you don't…" In such cases, while the PDI sequence is maintained, the wording may be simplified to "Hand me *X* or sit in time-out." Such an adaptation is a functional consideration and should not be applied in a generic manner; rather, careful assessment of the child's receptive language comprehension should occur before implementing PDI.

25.4 Conclusions and Future Directions

In summary, although official coaching guidelines for implementing PCIT with the ASD population do not exist, a breadth of clinical experience and research trends provide several coaching insights. Namely, it is crucial that ASD symptom presentation and functional level guide clinical decision making. As such, PCIT with the ASD population may require some clinical adjustments and theoretical flexibility regarding the traditional view of disruptive behaviors. ASD symptomatology (e.g., deficits in social communication, restricted/repetitive patterns of behavior) serves as the basic conceptual framework for tailoring the intervention to each child. Therefore, working with a child with ASD and Level 1 functioning likely would not require the same amount of tailoring as a child with more pervasive symptoms. Whereas, in instances of severe functional impairment, additional behavioral methods, such as errorless learning, may be necessary to ensure PCIT is delivered in a developmentally appropriate manner. Moreover, treatment requires ongoing assessment of language, ASD functioning, and imitation through formal and informal methods of evaluation, as well as ongoing attention to parenting stress. To provide treatment that remains consistent with overarching PCIT theory, it is suggested clinicians use an amalgamation of *meeting and expand*ing, *one and done*, praising positive opposites, building play skills through imitation, and developing conversation through neutral talk and strategic use of reflections. Additionally, altering PDI expectations to initially accommodate and eventually challenge a child's cognitive flexibility, stereotyped behaviors, and sensory sensitivities may be necessary. Overall, PCIT is a dynamic therapy that provides caregivers a socially-mediated approach to effectively treat ASD behaviors.

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Clinical Application of Parent-Child Interaction Therapy to Promote Play and Vocalizations in Young Children with Autism Spectrum Disorder: A Case Study and Recommendations

26

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Abstract

Parent-Child Interaction Therapy (PCIT) is an empirically supported, manualized intervention for addressing disruptive behaviors in young children (Eyberg. Child and Family Behavior Therapy 10:33–46, 1988; Neary and Eyberg. Infants and Young Children 14:53–67, 2002). Recently, researchers have expanded the use of PCIT with diverse populations to include children with autism spectrum disorder (ASD; Hansen & Shillingsburg. Child and Family Behavior Therapy 38:318–330, 2016). Adaptations to the original PCIT protocol may be needed to address core characteristics of ASD that otherwise may limit treatment effectiveness with this population. Characteristics of ASD that should be considered include deficits in social communication and interactions, high levels of rigidity and stereotypic behavior, and circumscribed interests and preferences. This chapter will discuss how the characteristics of ASD may pose challenges to the standard PCIT approach and provide detailed recommendations for several adaptations including altering the mastery criteria and adding preference assessments, stimulus-stimulus pairing, mand training, instructional fading, errorless prompting, and three-step prompting. To provide guidance and suggestions to PCIT clinicians, the authors' experiences working with parents of children with ASD in PCIT are discussed in addition to a case study (Hansen and Shillingsburg. Child and Family Behavior Therapy 38:318–330, 2016).

26.1 Overview of Parent-Child Interaction Therapy

Parent-Child Interaction Therapy (PCIT) is an empirically supported intervention for young children experiencing behavioral or emotional challenges (Eyberg, 1988; Neary & Eyberg, 2002). The goal of PCIT is to change negative parent-child interactions into warm, affectionate interactions using components of several therapeutic approaches (Eyberg, 1988). PCIT is divided into two phases: Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI; McNeil & Hembree-Kigin, 2011). During the CDI phase, parents are trained to provide their child with near continuous attention in the

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form of labeled praises, reflections of vocalizations, and descriptions of their child's desirable behaviors. Once mastery criteria for CDI are met, families move on to the PDI phase of treatment. PDI focuses on reducing child noncompliance through utilizing effective commands and a structured discipline procedure.

26.1.1 Strategies for Reducing Problem Behavior in CDI

Many families are referred to PCIT due to the high incidence of problematic child behavior such as negative attention seeking. Often, parents may be unaware that their responses to a child's negative behaviors can worsen the incidence and severity of the behavior in question. Therefore, PCIT teaches caregivers to use positive attention for child desirable behaviors, limit periods of attention deprivation, and reduce the likelihood that children will engage in problem behavior maintained by attention (Shillingsburg, 2004). In CDI, parental attention is removed following a child's problem behavior therefore placing the attention-seeking behavior on extinction. The combination of increased attention during play and withheld attention during problematic behavior is a powerful strategy in improving parent-child interactions.

Not all problematic behavior is evoked by attention deprivation however. During CDI, parents are also taught to refrain from presenting demands and questions to their child. When parents place rapid-fire, developmentally inappropriate, challenging, or vague demands upon a child, it is more likely the child will fail at the request or misbehave, thus preventing a positive parent-child interaction from occurring. The child's inability or disinterest to comply with a demand (to escape a nonpreferred activity) can significantly hinder the development of a positive parent-child relationship. Likely, in these cases, the child has previously been successful in avoiding or delaying a parent's demand. In some cases, the problematic behavior may also lead to parents asking less and less of their children, further reinforcing the child's likelihood to engage in that problematic behavior. In extreme cases, the parent's mere presence may become a signal to the child that demands are coming and that playtime is about to be over. By eliminating demands and questions and replacing them with preferred activities and parent engagement that the child enjoys, parental interaction becomes increasingly associated with positive reinforcement. The child comes to value interactions with the parent over time, therefore creating motivation to access parental interaction through desirable behaviors (Shillingsburg, 2004). Improving the child's response to demands is subsequently addressed in the PDI phase.

26.1.2 Strategies for Reducing Problem Behavior in PDI

In the PDI phase of PCIT, parents are taught to simplify the commands they issue to their children while still utilizing CDI skills. Further, parents are taught to provide consistent consequences for child compliance (i.e., positive reinforcement) and for problem behavior (e.g., planned ignoring, structured discipline strategy). By reducing the complexity of demands, parents increase the likelihood of child compliance, which creates more opportunities to provide reinforcement for their child's behavior. Providing positive reinforcement for compliance and appropriate behaviors increases the likelihood of future child compliance and instances of desirable behavior. Over time, the initiation of a demand comes to signal the availability of reinforcement, which promotes appropriate behaviors rather than evoking problematic behaviors (Shillingsburg, 2004).

26.1.3 Behavior Analytic Interpretation of PCIT

We suspect that the success of PCIT is due to the intervention's focus on addressing underlying motivation-behavior-reinforcement relations (Shillingsburg, 2004). If problem behavior is evoked because the child wants to avoid interacting with his/her parent, PCIT makes interaction with the parent valuable through pairing it with reinforcement. In addition, PCIT teaches parents to provide higher frequency and higher quality attention when the child is not engaging in problem behaviors; it also teaches parents to minimize attention when problem behavior does occur. Understanding the behavior change mechanisms responsible for the success of PCIT is particularly critical when considering the expansion of PCIT to different populations (e.g., families of children with autism spectrum disorder [ASD]).

26.2 Considerations for Children with ASD in PCIT

PCIT is an effective intervention for young children with disruptive behavior disorders and has preliminary support with children with ASD (e.g., Hansen & Shillingsburg, 2016; Lesack, Bearss, Celano, & Sharp, 2014; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). However, as clinicians consider utilizing PCIT with families of children with ASD, there are some important factors related to the children's diagnoses they should consider.

26.2.1 Foundations of Autism Spectrum Disorder

It is widely known that ASD is associated with less frequent initiation of social interactions, less social interaction in general, and atypical turn-taking patterns (American Psychiatric Association, 2013; Anderson et al., 2007; Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998; Paul, Orlovski, Marcinko, & Volkmar, 2009; Sheinkopf, Mundy, Oller, & Steffens, 2000; Warren et al., 2010; Zwaigenbaum et al., 2005). These children are also at an increased risk of producing fewer speech-related vocalizations (Patten et al., 2014; Paul, Fuers, Ramsay, Chawarska, & Klin, 2011; Warren et al., 2010), which in turn limits opportunities for caregivers to provide contingent responses. For example, when a baby says, "Ba," a parent might respond, "Yes! That's a sheep," and point to a sheep picture in a storybook. In the absence of that initial vocalization, the parent would not have an explicit occasion to respond and model additional speech.

Warlaumont, Richards, Gilkerson, and Oller (2014) analyzed the microstructure of child-adult interactions for children with and without a diagnosis of ASD. Outcomes indicated that adult responses occur more when a child emits a speech-related vocalization; in turn, a child is more likely to emit a speech-related vocalization if a previous speech-related vocalization resulted in an immediate response from an adult. In other words, caregivers are more likely to talk to children who have attempted to speak, and children are more likely to continue to speak when their vocalizations are repeated by caregivers. A reduction in vocalization rate leads to fewer iterations of the social feedback loop, reducing the number of child opportunities to learn from contingent social feedback (see also Leezenbaum, Campbell, Butler, & Iverson, 2014; Tamis-LeMonda, Bornstein, & Baumwell, 2001; Yoder & Warren, 1999). This can inadvertently result in a cascading negative effect on language development in the child.

Importantly, studies have also found that greater vocal coordination between infants and adults predicts later language, cognitive, and perceptual ability (Greenwood, Thiemann-Bourque, Walker, Buzhardt, & Gilkerson, 2010; Jaffe, Beebe, Feldstein, Crown, & Jasnow, 2001). This holds true for those individuals with language emerging later in development. For children with developmental disabilities, a mother's responsiveness to her child's communicative behaviors has also been shown to predict later language performance (Girolametto, 1988; Yoder & Warren, 1999). These findings suggest that teaching parents to persist in initiating and responding to their child's attempts at interaction is warranted.

26.2.1.1 Expressive Language

ASD is characterized by deficits in social communication and social interactions (American Psychiatric Association, 2013). A PCIT clinician may work with a child who has limited expressive language characterized by very few, if any, vocalizations (e.g., words, sounds). Little functional expressive language can make it difficult for parents to understand what a child is communicating, and can make both the child and the parent frustrated. Additionally, opportunities for caregivers to reflect back child vocalizations can be significantly reduced and may prevent standard PCIT CDI mastery criteria from being reached.

26.2.1.2 Receptive Language

A child's difficulty with receptive language may also create unique challenges when implementing PCIT for children with ASD. Children with ASD may not comply with demands presented by caregivers because they do not understand the instructions. If this distinction is not recognized, inappropriate procedures may be applied that do not address the underlying deficit. For example, if the child does not understand when the parent says, "clean up," time-out will not have the desired effect of increasing "compliance" on the next teaching opportunity. The child will still not know how to respond to the instruction, "clean up," leading to continued faulty interactions between the parent and child.

26.2.1.3 Restricted Interests

The number or potency of preferred activities and reinforcers may be limited for children with ASD. This can create challenges with the child's willingness to engage with items that the caregiver provides during a play activity—especially given the limited toys suggested for use during PCIT. For example, a child with ASD may only be interested in playing with clocks. This child's parents might initially find it difficult to build meaningful interactions around the topic of clocks in play situations. However, if other activities are presented that are more appropriate but not of interest to the child, it will be difficult to establish a connection through naturalistic, positive play interactions for the dyad.

26.2.1.4 Stereotypic Behavior

ASD is also characterized by high rates of stereotyped behavior (which has its own specific challenges). If the child has low rates of appropriate play and high rates of stereotypy with toys, parental imitation of the child's behavior, behavioral descriptions, and labeled praise can all be significantly impacted. Specifically, it might be contraindicated to draw attention to the stereotypy (e.g., "Nice job spinning the wheel"). Thus, the parents may hesitate to engage in play when they are unsure if the behaviors exhibited by their child are appropriate for fear of inadvertently reinforcing the play with attention. The child's play skills (or lack thereof) may be influencing the parent's confidence in joining in and modeling appropriate play skills.

26.2.1.5 Caregivers of Children with ASD

Clinicians using PCIT should expect to experience or witness unique challenges in their sessions. For example, the child may rarely initiate with caregivers, preferring to play alone. The child may even become upset when the caregiver attempts to insert him or herself into the activity by narrating, imitating, or joining in the play. Caregivers may ask their child too many questions or give a high number of commands that are outside of the child's repertoire of skills; this may be in effort to fill the silence during a time the child is not engaging or communicating.

Many caregivers may feel worn or saddened by their child's lack of engagement. Common questions from families of children with ASD include, "Why won't my child play with me? I try and it just irritates him/her, so I have stopped," or "Why would I play with my child when he/she doesn't seem to like it?" A clinician may hear additional comments like, "I don't know how to talk to my child because he/she doesn't respond or doesn't seem interested in what I am saying." Often due to a lack of social reciprocity indicative of the ASD diagnosis, it may be common to observe caregivers looking uncomfortable with their children during play or for the play to look somewhat forced or unnatural. It is important for a clinician to remember that this does not indicate a lack of motivation or effort by the caregivers. Instead, these observations are likely due to a history of failed attempts at getting a reciprocated response from the child and a lack of resources to help the parent persist and/or adjust strategies under these circumstances.

26.2.2 Rationale for Use of PCIT with ASD

Although these unique issues may exist, educating and coaching caregivers on effective methods to enhance their child's play, increase communication and compliance, and reduce disruptive behaviors can easily be incorporated into a standard PCIT approach. Further, these parent-child interaction skills may be critical to long-term development. Research has shown that interventions targeting adult responding can positively affect the social feedback loop (Yoder & Stone, 2006). PCIT focuses on teaching caregivers to attend to and respond positively to their children's communicative attempts by providing praise, reflections, and behavior descriptions. In addition, the treatment emphasizes giving clear directions and following up consistently. These standard elements of PCIT are similar to interventions found to be useful when working with children with ASD. However, PCIT in its standard form may have limited utility for addressing the unique barriers of working with children with ASD, requiring some thoughtful adaptations.

26.3 Case Study Example

Two case studies on adapting PCIT for children with ASD will be discussed in this section. Findings are based off of our manuscript (Hansen & Shillingsburg, 2016). In the study, two children diagnosed with ASD (i.e., "Devon," a 3.5-year-old male, and "Cameron," a 2.5-year-old male) participated in weekly sessions with their caregivers at a language clinic. Both participants presented with language and social skill deficits and were evaluated by a licensed psychologist at the center. Following a face-to-face intake with a clinician in the skill acquisition clinic and caregivers expressing concerns about noncompliance and/or challenges with playing or interacting with their child, it was determined that these children and caregivers would benefit from PCIT.

26.3.1 Pretreatment

Caregivers expressed to the therapist that they were experiencing challenges engaging in play with their children; this was congruent with direct observations. During the pre-assessment, Devon's caregiver primarily asked questions and delivered demands that Devon either did not comply with or did not have the prerequisite receptive language skills to follow. Devon did not reciprocate when his caregiver made attempts to engage with him through play or conversation.

During the pre-assessment, Cameron's caregiver was generally quiet. However, when she spoke, her interactions with Cameron consisted of commands and questions. Cameron's caregiver rarely provided labeled praises, reflections, or behavior descriptions. She was observed to have difficulties engaging with him during the play session, and he did not reciprocate her attempts.

26.3.2 CDI

The CDI phase of PCIT focused on building positive parental behaviors in the context of play with the child. Some adaptations were made to typical CDI procedures (mentioned briefly here and in-depth in the next section) to address the family's unique needs. The caregivers were taught to specifically assess their child's preferences for items and activities and to incorporate these items in the sessions. Caregivers used several strategies to promote vocalizations and eventually taught their children to make requests. Mastery criteria for the CDI phase was altered, as it was noted that the children were not always vocalizing at a high enough rate for the caregivers to reflect 10 times per during the five-minute coding period. Thus, parents were required to meet two of the three criteria for positive caregiver behaviors: 10 reflections, 10 statements of labeled praise, or 10 behavior descriptions.

26.3.3 PDI

The PDI phase of PCIT focused on teaching parents to provide effective commands and implement a structured discipline procedure when met with child noncompliance. Again, some adaptations were necessary in this phase to increase the effectiveness of the procedure and ensure child understanding. The caregivers were taught to wait until the child displayed an indicating response for an item or activity before presenting the demand. Once interest in an item or activity was exhibited, the caregivers were trained to give one, clear instruction to their child. If compliance was observed, the parent provided a labeled praise and access to the desired item or activity. If their child did not comply within 5 s of the demand, rather than issue a warning statement or time-out, the caregivers were taught to use a three-step compliance procedure. Within and across PDI sessions, parents learned how to gradually increase their demands; for example, caregivers worked with their children on picking up just one toy to eventually cleaning up all toys in the room over the course of a session. Mastery criteria for the PDI phase was to give at least four commands (75% of which were single, direct, and positively stated) and provide the child an opportunity to comply. In addition, they had to have 100% follow through with the three-step guided compliance procedure.

26.3.4 Outcomes

Devon and Cameron participated for 13 and 14 weeks in treatment, respectively. Results showed that for both caregivers and their children, the intervention led to increases in desired behaviors during a five-minute coded behavioral observation. For Devon's caregiver, parent positive behaviors, including labeled praise statements, behavior descriptions, and reflections, increased from the pre- (n = 9) to the posttreatment (n = 54) session. Similarly, for Cameron's caregiver, parent positive behaviors increased from the pre- (n = 3) to the posttreatment (n = 45) session.

For Devon's caregiver, parent negative behaviors, including questions, commands, and criticisms, also reduced from pre- (n = 65) to posttreatment (n = 7). For Cameron's caregiver, parental negative behaviors continued to occur, but only at moderate levels (n = 18). In our study, we included measures of child vocalizations during pre- and posttreatment (Hansen & Shillingsburg, 2016). Results showed a substantial increase in these behaviors (Devon: Pre = 18, Post = 48; Cameron: Pre = 5, Post = 30), suggesting that PCIT may be a viable approach to target vocalizations for children with ASD (Figs. 26.1 and 26.2). Below, all adaptations to the PCIT protocol are described in greater detail.

26.4 Adaptations to the PCIT Protocol for Children with ASD

In this section, the modifications made to standard PCIT will be described in greater depth. Additionally, step-by-step instructions are provided in Table 26.1.

26.4.1 Recommended Procedures: Environment

26.4.1.1 Preference Assessments

It has been hypothesized that deficits related to social motivation can account for many of the challenges that individuals with ASD face over their lifetimes (Chevallier, Kohls, Troiani, Brodkin, & Schultz, 2012). Expecting children to be motivated by social attention or interaction may not work if social interaction is not currently functioning as a reinforcer for desired behavior. Thus, positive parent behaviors alone may not be reliably counted upon as reinforcers for children with ASD during PCIT. Instead, parents may need to identify what items and activities are currently preferred by their children, and then use

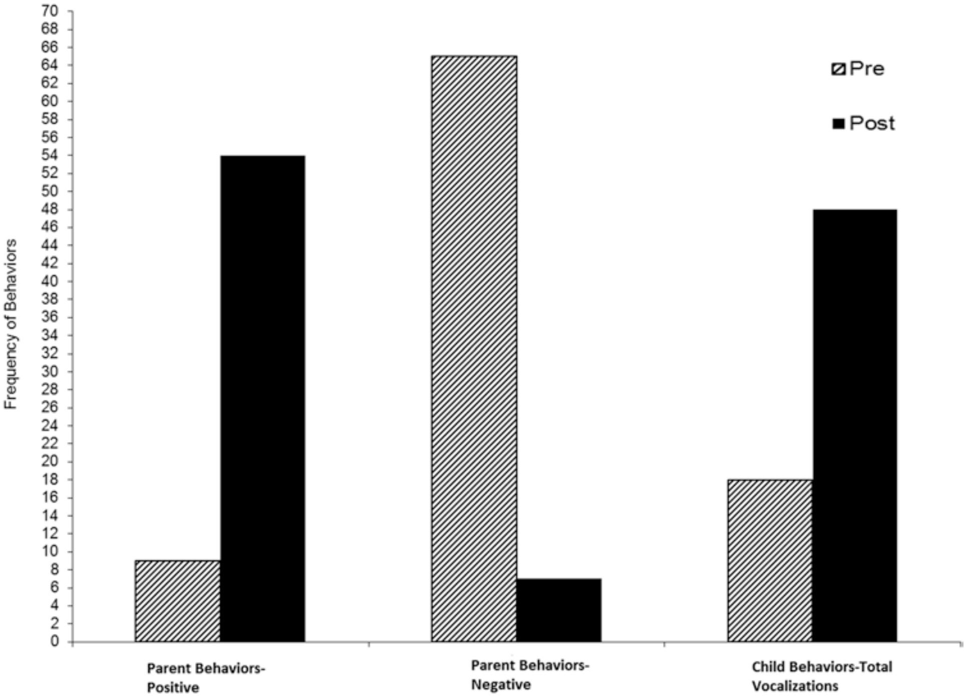

Fig. 26.1 Pre- and posttreatment observations for Devon

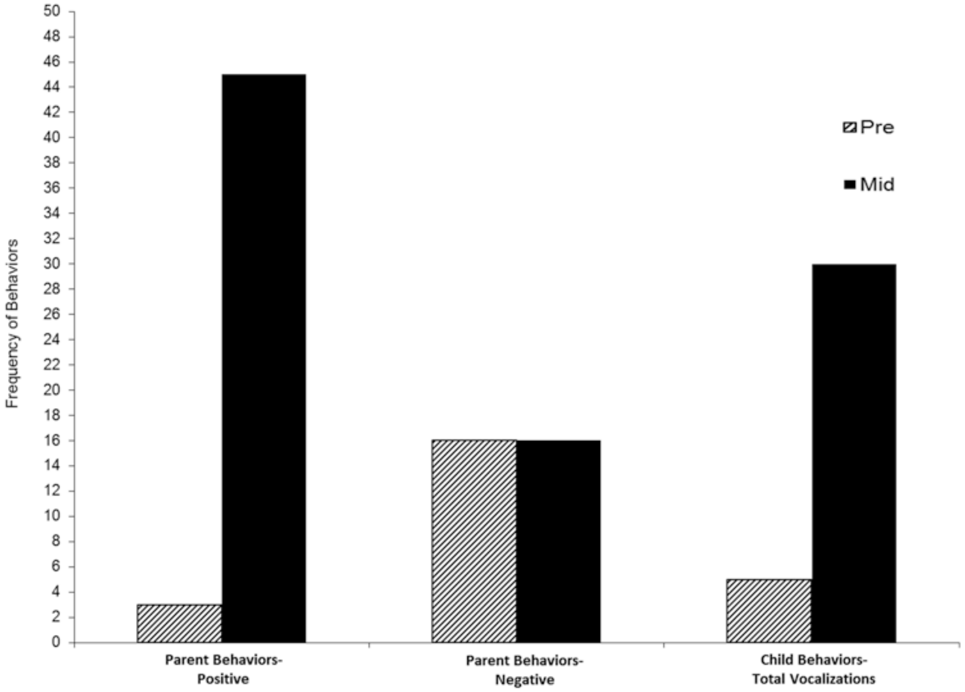

Fig. 26.2 Pre- and posttreatment observation for Cameron

Table 26.1 Adaptations to Standard PCIT for Children with ASD

	Adaptation	Steps
Environment	Preference assessment	1. Develop list of items/activities with the caregiver that the child typically enjoys. 2. Practice assessing preference using multiple stimuli without replacement (Carr et al., 2000) and free operant procedures (Roane et al., 1998) during a role-play. 3. Coach caregivers through use strategies with child. 4. Record results of these formal/informal assessments and make these items available during sessions.
CDI	Indicating responses to assess motivation	1. Discuss with caregivers what form indicating responses typically take for different items and activities. (a) Use the preference assessment list and ask caregivers, "how do you know when your child wants [item]?" (b) Develop a list of common indicating responses (e.g., hand-leading, reaching, pointing). 2. Coach caregivers to recognize these behaviors in real time. If the behaviors are not occurring, caregiver is coached to use strategies to contrive motivation.
	Stimulus-stimulus pairing	1. Review procedures related to indicating responses. 2. Direct caregivers to practice pairing words with preferred items during role-play sessions. 3. Practice delayed trials with the caregivers during role-play sessions. (a) Clinicians should sometimes respond by vocalizing and sometimes by remaining silent. (b) Start with noncontingent reinforcement (i.e., the child gets the item whether he/she echoes or not) then move to contingent reinforcement (i.e., the child gets the item only if he/she echoes). 4. Coach parents through use of these skills with their child.
	Mand training	1. Review procedures related to indicating responses. 2. Direct caregivers to withhold access to desired items and prompt mands using echoic prompts in role-plays. (a) Clinicians should sometimes vocalize and sometimes wait for prompts. 3. Practice shaping responses during role-play. (a) Clinicians should vary their verbal approximations to allow caregiver to practice in reserving reinforcement for best responses. 4. Coach parents to implement these procedures with their child.
	Reflecting vocalizations plus pairing	1. Discuss the child's typical vocalizations with the caregiver. 2. Discuss appropriate vs. inappropriate speech for the child (if applicable). 3. Role-play reflecting and reinforcers with the caregiver. (a) Clinicians should exhibit both appropriate and inappropriate vocalizations for the parent to practice. 4. Coach parents to use the strategies with their child.
PDI	Demand fading	1. Start at a low level of command frequency and difficulty. The first command should occur only after an indicating response is presented. (a) If indicating responses occur frequently, the caregiver should give the item to the child rather than requiring a demand every time. 2. Discuss using errorless prompting if the demand is not known (i.e., skill deficit) or three-step prompting if the demand is known (i.e., noncompliance). 3. Coach caregivers to praise and provide reinforcement following compliance. 4. Monitor the frequency of noncompliant behavior and instruct the caregiver to slowly increase demand frequency when problem behaviors are low.

(continued)

Table 26.1 (continued)

	Adaptation	Steps
	Errorless prompting	1. Create a list with caregivers of demands they want their child to do. Separate lists should be made for known and unknown skills. 2. Role-play different prompt types with caregivers. 3. Coach parents on use of errorless prompting with their child.
	Three-step compliance	1. Review the list of unknown and known demands with parents. 2. Practice the three-step prompting procedure with parents in role-play. Practice both compliance and noncompliance after each step until parents demonstrate the procedure with fluency for each outcome. 3. Coach parents on use of three-step compliance with their child.

Note. ASD autism spectrum disorder, *CDI* child-directed interaction, *PDI* parent-directed interaction, *PCIT* parent-child interaction therapy.

these items to reinforce their child's desired behaviors. While this can be an effortful exercise, failure to identify potent reinforcers for child behavior can impede meaningful treatment improvement, thus putting the parents' behaviors effectively on extinction. In other words, the parents may lose steam during CDI because little to no change is happening with their child. Thus, use of preference assessments (whether formal or informal) is a critical component of PCIT success for children with ASD and their caregivers.

In our study with Devon and Cameron (Hansen & Shillingsburg, 2016), we drew upon a rich body of literature related to intervention with individuals with disabilities. We explored which toys and items were preferred by the children before initiating treatment. Adjustments in available activities or items were also made based on child preference throughout the course of treatment sessions. Decades of research support the contention that an individual's preferred items are likely to function as reinforcers during skill teaching programs (Carr, Nicolson, & Higbee, 2000; Roane, Vollmer, Ringdahl, & Marcus, 1998). Preference for items can be evaluated in a number of ways, varying in complexity depending on the needs of the individual.

These procedures generally start by developing a list of items and activities that are likely to be of interest to the child. In the cases of Devon and Cameron (Hansen & Shillingsburg, 2016), we used a parent interview based on the Reinforcer Assessment for Individuals with Severe Disabilities (Fisher, Piazza, Bowman, & Amari, 1996). In this interview, Devon and Cameron's parents were asked a series of questions about potential preferred items; this allowed us to have a foundation of potentially reinforcing items to increase the likelihood of immediate child interest.

Next, the individual's actual preference for these items was evaluated in a systematic manner. Roane et al. (1998) assessed preference by presenting individuals with disabilities with an array of eight items on a table and simply measuring the duration of engagement with each item during a five-minute observation session. Entitled the *free operant preference assessment*, this assessment is a reliable method in identifying reinforcers during subsequent evaluation periods. In the Carr and colleagues study (2000), children with ASD were also presented with an array of eight items and instructed to pick one. Once an item was selected, the child was allowed 10 s to interact with the item. When that time was up, the item was removed from the array, and the child was then instructed to select another item to interact with from the remaining seven objects. This process was repeated until all the items had been selected, and the order in which the items were selected was recorded. This very brief preference assessment, referred to as a *multiple stimulus without replacement*, aids in the identification of items that are the most likely to be effective reinforcers during skills training exercises. While these are just two examples of strategies to assess preference, clinicians may find these approaches easy to integrate into PCIT sessions for children with ASD.

For Devon and Cameron, we used a simplified version of the preference assessments described above. After the list of preferred items was generated, the items were set up throughout the therapy room, and parents were directed to briefly observe which toys their children engaged with most frequently. Additionally, the parents were taught to offer their children choices of items and note which items were selected most regularly. The "highly desired" items were then incorporated into all the PCIT sessions. For clinicians wishing to implement this modification to PCIT, see Table 26.1.

Common Concerns

Children with ASD can have rote and restrictive interests; thus, PCIT clinicians may need to help parents strategically expand the list of possible items to present to the child over time. If a child presents with a very particular interest, say in Thomas the Train videos, the parent may be a little perplexed as to how to appropriately incorporate this video into their CDI interactions. Beginning with the known, powerful reinforcer, the clinician may want to evaluate the child's response to related items that have similar properties. For example, perhaps a Thomas the Train puzzle or book may be appealing to this child. Also, if the child likes Thomas, they may enjoy playing with a wooden train set. With the parent, the clinician can brainstorm lists of items that may also strike the child's interest; it is important for the clinician to then evaluate the child's response to the items. Again, if the child engages with the new items or picks them when offered, we can assume these items may function as reinforcers (for at least a brief period of time).

26.4.2 Recommended Procedures: CDI

26.4.2.1 Indicating Responses

While preference assessment procedures are useful to generally identify possible reinforcing items for the child during PCIT sessions, the determination of which exact item or activity is most desired from moment to moment requires an additional assessment procedure. In our sessions with Devon and Cameron (Hansen & Shillingsburg, 2016), we taught parents to look for specific behaviors that suggested their child was interested in a particular item or activity at that moment. These behaviors varied for each child but could take the form of: reaching for an item, pointing at an item, gazing at an item, attempting to independently manipulate an item, or standing near an item. The occurrence of these behaviors, collectively referred to as *indicating responses,* highlighted the child's motivation for that item/activity within that moment. Parents were taught to identify what types of indicating responses their child used and when an indicating response occurred; the parent used this as an opportunity to teach their child to vocalize or request.

If no indicating responses were observed, parents were instructed to hold off from teaching communication and focus on contriving motivating situations for their child. The parents could contrive motivation by (a) modeling use of a toy (e.g., pushing the buttons of a toy piano so their child could see the lights and hear the sounds), (b) providing some parts of a toy to their child but withholding the rest (e.g., give two puzzle pieces but keep the other three), or (c) offering a small piece of a snack (e.g., a tiny piece of cookie while keeping the rest of the cookie). When an indicating response occurred, the parents would teach communication, provide reinforcement, and start the process over again. For specific implementation instructions, see Table 26.1.

Common Concerns

Children with ASD may demonstrate odd or unusual behaviors that are not as easily recognized as indicating responses. For example, a child may return to a location where a desired activity was provided on the day before. The indicating responses may be difficult to discern. For example, a child may wave at a pile of objects rather than specifically pointing at items. Or, challenging behaviors may be the only indication a child desires an item or activity. For example, a child may cry when a parent removes an item the child desired. In these instances, it may be useful to first teach the child to use a conventional gesture (e.g., pointing, reaching) to indicate interest. The responses would be immediately followed by access to the desired item or activity initially. Once these responses were established, other forms of communication could be taught.

26.4.2.2 Stimulus-stimulus Pairing

The typical components of the CDI training phase for caregivers may not always be suitable for children with ASD, particularly when rates of child vocalization are low. Parents may find it difficult to engage in social interactions with their child when the child cannot communicate in a conventional manner.

In the examples of Devon and Cameron, we trained caregivers to implement a strategy referred to as *stimulus-stimulus pairing* (SSP) during their sessions (Hansen & Shillingsburg, 2016). SSP procedures are designed to associate the parents' vocalizations with previously established reinforcing items and activities. It is believed that this repeated pairing may help to condition the parents' vocalizations as reinforcers (Sundberg, Michael, Partington, & Sundberg, 1996), with numerous possible benefits. First, if the parents' vocalizations are conditioned reinforcers, the children will attend to their parents more often. This increase in attention to parents could lead to cascading improvements for children's overall skill development as they may begin to follow their parents' directions and cues more readily (Hart & Risley, 1995). Secondly, as the sounds of parental speech become strong conditioned reinforcers, when the children vocalize and hear their own speech sounds, the similarity between their speech and their parents' speech may also be reinforcing (Skinner, 1957; Sundberg et al., 1996). For example, a child says, "Uppa," and the child recognizes that this sounds similar to when Mom and Dad say, "Up," a sound which was previously associated with reinforcing activities such as being picked up. As the child comes to enjoy hearing her own speech (because it sounds like her parents' speech and her parents' speech has been associated with other enjoyable events) she may speak more. Additionally, if the child says, "Uppa," and the caregiver responds by picking her up, this may further reinforce the vocalization as the child was able to obtain a desired behavior from her parent. These interconnected reinforcement pathways are believed to play a major role in the development of vocal speech in typical children.

During the SSP procedure, caregivers are encouraged to pair words and engagement with preferred items and activities. In the case of Devon and Cameron, caregivers were instructed to focus on words that most directly matched the items and activities their child was indicating interest in, therefore laying a foundation for future request training (Hansen & Shillingsburg, 2016). Caregivers started by labeling the reinforcers as they gave them to their child (regardless of whether or not the child had vocalized). To increase the number of pairing opportunities between the word and the reinforcer, parents were encouraged to label the reinforcer: (1) as soon as they observed an indicating response, (2) as they delivered the reinforcer, and (3) as their child consumed or played with the reinforcer. For example, (1) as the child reached for his cup, the caregiver would say, "Drink"; (2) as the caregiver delivered the cup to the child, the caregiver will say, "Drink"; and (3) as the child took a sip from the cup, the parent would say, "Drink." After repeating this process on several occasions, caregivers were encouraged to label the reinforcer, then pause, to allow the child to echo the word. For example, (1) the parents might say, "Drink," as they saw their child reach for the cup but (2) wait a few seconds before delivering the cup to the child. If the child were to attempt an echo their parent, (3) the caregiver immediately and enthusiastically gave the cup while labeling it ("Drink! Here's your drink"). If the child did not respond, the parent would give the item and label it as he/she delivered it and as the child consumed it, as before.

We often used this method in early stages of Devon and Cameron's treatment (Hansen & Shillingsburg, 2016). As the children made more frequent attempts at echoing, the caregivers were coached to delay giving the desired item and provide a more explicit opportunity for the student to echo. Consistent echoing by children was met with parental differential reinforcement. Specifically, successfully echoed trials resulted in access to the reinforcer and praise, but failure to echo resulted in minimal or no access to the reinforcer for a brief time until a new trial was initiated. These procedures allowed the caregivers to teach Devon and Cameron new vocal skills while simultaneously maintaining the quality of the parent-child interaction during the CDI phase. Importantly, SSP procedures usually begin with noncontingent reinforcement, so there are no specific demands in place to vocalize. Additionally, the inclusion of a brief delay before delivering a reinforcer allows the child an opportunity to independently vocalize, without specifically demanding speech. Thus, these features of SSP make it a useful component of the CDI phase for parents of children with ASD. See Table 26.1 for details.

Common Concerns

Parents may be tempted to immediately use contingent reinforcement procedures when they hear their child begin to echo. They may also be tempted to do only contingent trials, ceasing to do the trials without demands. If this jump is made too quickly, this could undermine the overall effectiveness of the procedure and could result in CDI becoming aversive. If this occurs, it can be useful to give the parents specific reinforcement ratios to aim for during their sessions. In other words, clinicians should instruct and guide parents to do noncontingent trials for 75% of the vocalization attempts and only use contingent trials on the other 25%. As clinicians observe improvements in a child's responses, clinicians can choose to coach the parent to gradually shift the ratios (e.g., 50% noncontingent and 50% contingent, 25% noncontingent and 75% contingent).

26.4.2.3 Mand Training

Another important adaptation we incorporated into our work with Devon and Cameron (Hansen & Shillingsburg, 2016) was the inclusion of procedures to teach requesting, also known as *manding* in the behavior analytic literature (Skinner, 1957). While Devon already had a well-developed echoic repertoire when he began the study, Cameron was largely nonverbal and did not consistently echo his caregiver's vocalizations. With use of the SSP procedures outlined previously, Cameron began to consistently echo, making a transition to mand training an appropriate option.

As we previously discussed, caregivers were instructed to continuously assess their child's motivation throughout sessions. Once the transition to mand training began, when an indicating response occurred, the parent was instructed to withhold the item for approximately 2 s without vocalizing. This allowed the child an opportunity to independently mand for the desired item. If the child vocalized or attempted to vocalize the item's name, the caregiver immediately provided access to the item, labeled the item, and praised the child's mand. For example, when Cameron reached for his cup, his caregiver withheld the drink and waited. When Cameron said, "Drink," his parent immediately said, "Drink! Great job asking for drink," as she handed him the cup. Occasionally, Cameron would not vocalize or would emit an approximation that was less than optimal. In this case, his parent modeled the name of the item then waited another 2 s for him to echo again. If Cameron was able to echo this time, the caregiver provided access to the item, labeled the item, and praised Cameron's mand. Caregivers were directed to repeat this process as long as their child remained interested in the item without becoming visibly frustrated (e.g., engaging in precursors to problem behavior).

Parents of Devon and Cameron were instructed to use differential reinforcement procedures and monitor the degree of independence displayed by their children. For example, Cameron responded on the echo trials but did not respond on the independent trials initially; therefore, the echoed responses were considered his *best* responses and were reinforced. However, once Cameron was able to mand independently, only independent responses were reinforced because these were now considered his *best* efforts. Standards for the boys' responses continued to increase over the course of treatment. Once independent responses were reliably observed, parents were instructed to reserve reinforcement for only the highest quality independent responses. For example, Devon started out by independently approximating "drink" by vocalizing, "Drah." This statement was therefore reinforced. However, once Devon was observed to say "Drin-kah," only this response was reinforced by his parents. This process continued until the child's best approximation was the target sound/word. See Table 26.1 for detailed steps on implementing mand procedures.

Common Concerns

During early mand training, it is very important for parents to ensure that indicating responses and mands correspond with one another. If the child is observed to indicate for one item but say something else, the parent should correct this as an error by providing a model prompt of the correct word. For example, if the child reaches for chip but says "Drink," the parent should prompt the child to say, "Chip," then give the child the chip.

26.4.2.4 Reflecting Vocalizations Plus Pairing

Reflecting vocalizations is one of the key skills taught in CDI within standard PCIT procedures. Research has shown that responding to the vocalizations with either an imitation of the sound (i.e., reflection) or general motherese (i.e., speaking with an animated voice and exaggerated facial cues) increases children's vocalizations (Pelaez, Ortega, & Gewirtz, 2011). We hypothesize that these procedures are effective because social responsiveness functions as a reinforcer for the child. However, for many children with ASD, social stimuli fail to become conditioned as reinforcers early in development (Dawson et al., 1998; Dawson et al., 2004). Therefore, simply coaching parents to echo speech sounds emitted by their child may not always result in an increase in vocal speech for children with ASD.

In our case studies with Devon and Cameron, we addressed this issue by modifying the parental directions for reflecting (Hansen & Shillingsburg, 2016). Specifically, we encouraged parents to reflect the children's vocalizations and to present an established reinforcer as they did so. For example, as the child said, "Baa," the parent would also say, "Baa;" then the parent would provide their child with a yummy cracker. This process served two possible purposes: (1) to provide a reinforcer (e.g., the cracker) after a vocalization, thus increasing the future frequency of vocalizations, and (2) to increase the instances of pairing between the reinforcer and parent vocalization, a parallel strategy used in the SSP procedure. Activities such as tickles, hugs, or spins could all be quickly paired with the parent's reflection of their child's vocalization.

Common Concerns

Vocalizations of children with ASD may not always be appropriate, adding another complication to typical PCIT procedures. Children with ASD may engage in rote, repetitive vocalizations that have no bearing on the actual context. These vocalizations (often referred to as vocal stereotypy) are not desirable behaviors and should not be reinforced. Parents must be taught to discriminate between appropriate vocalizations and vocal stereotypy, and only reflect the appropriate vocalizations.

Children with ASD may also only emit approximations of words, making parents hesitant to reflect the vocal speech attempts. In these situations, parents should be educated that these vocalizations are appropriate, should be reflected, and should be reinforced when they occur. Some discussion of the phases of speech development may be helpful for these families so they can reconcile the difference between chronological and developmental norms. In other words, clinicians should be mindful in working with a family to help them understand that while the child's typically developing peers may not repeat only simple consonant-vowel-consonant blends, this is a developmentally appropriate skill for their child with ASD. Refer to Table 26.1 for the procedures to implement this approach.

26.4.3 Recommended Procedures: PDI

26.4.3.1 Demand Fading

The PDI phase of PCIT emphasizes the importance of learning how to use commands effectively (e.g., developmentally appropriate, singular, stated directly). Often, parents referred to PCIT are unaware of the demands they place on their children. PDI teaches parents to deliver appropriate commands while continuously providing CDI skills (e.g., praise, reflections, behavior descriptions), therefore reducing the frequency of delivered commands and filling the remaining time with positive attention for appropriate behaviors. To further emphasize this skill, we included an antecedent strategy in the cases of Devon and Cameron called *demand fading* (Hansen & Shillingsburg, 2016). In a demand fading procedure, the frequency of demands is significantly reduced from the outset of the session due to the disruption caused by a high level of problematic behavior (Pace, Iwata, Cowdery, Andree, & McIntyre, 1993; Shillingsburg, Hansen, & Wright, 2018). Similar to the standard PCIT procedure, the low rate of commands is hypothesized to reduce the child's feelings of aversion during the interaction time with the parent. Shillingsburg et al. (2018) found that when demands were presented at a high rate during initial skill teaching sessions, proximity to the instructor remained low and the rate of problematic behaviors was elevated. However, when demands were removed and instructors focused on pairing skills (highly similar to the CDI strategies), proximity increased and problematic behaviors decreased. In treatment sessions, the instructor gradually reintroduced demands, with close monitoring of the participant's willing engagement in the instructional activities and the instructor herself. Eventually, instructions were increased to the same levels as initially tested in baseline, but problem behaviors remained low and proximity to the instructor was high (Shillingsburg et al., 2018).

With Devon and Cameron, we chose to use this demand fading approach in the PDI phase, in the hopes that the gradual introduction of demands would not "undo" the progress made by the parent and child in the CDI phase (Hansen & Shillingsburg, 2016). Initially, the clinicians asked the parent to target clean-up of just one toy. As compliance was observed, the number of items required was increased. As the initial demands were short and relatively simple to complete, the clinicians hypothesized that they were unlikely to be aversive to the children; therefore, this reduced the likelihood of problem behavior occurring to escape the task. As the children built a history of reinforcement following compliance, demands were extended without a return to problematic escape behavior. Additionally, the caregivers were taught to wait for an indicating response prior to presenting an initial demand, thus ensuring the student was motivated to earn an item or activity (Table 26.1).

Common Concerns

Parents may be tempted to present demands more frequently. It is important to remind parents to move slowly and systematically to achieve their long-term goals.

26.4.3.2 Errorless Prompting

Important differences are present when working with children with and without ASD in PCIT during PDI. While noncompliant behavior can serve a variety of functions for all children, special considerations need to be taken into account when working with children on the spectrum. For children with ASD, it cannot always be assumed that the child is capable of performing a desired demand made by a parent; what may look like noncompliant behavior may actually be a skill deficit. Determining the difference is critical for parents and clinicians, as each requires a different approach. Thus, for clinicians conducting PDI sessions for children with ASD, the standard list of commands may not be appropriate to use. In addition, age-appropriate questions may not be developmentally appropriate for the child if developmental delays are present. Clinicians and parents should work closely together to create a list of demands that the child most frequently complies with, which can be considered mastered or known. Failure to comply with these commands would be treated as noncompliance, while other responses would be considered unknown or unmastered skills (instead addressed through *errorless prompting* strategies).

Errorless prompting strategies generally consist of using a reliably effective prompt (e.g., a gesture prompt, a model prompt) which is then followed by reinforcement. Over time, the prompts are altered to be less intrusive and slightly more challenging to the child. One of the simplest prompting strategies that parents can learn to apply in PCIT sessions is *graduated guidance*. Graduated guidance requires the parent to present an instruction and then manually guide the child to complete the task (MacDuff, Krantz, & McClannahan, 2001). As compliance with prompting is observed, the parents may lessen the amount of aid necessary to prompt the child to comply. For example, Devon's mother needed to initially guide Devon to pick up a toy using a hand-over-hand prompt; however, she was eventually able to simply nudge Devon's upper arm to prompt him to pick up the toy.

Graduated guidance strategies typically include a shadowing step where the parent does not touch their child, but their hands remain close if immediate prompting is needed. Eventually, the child may pick up the toy without any additional prompts from the parents to do so. Using these strategies, parents can teach their child to perform new skills (a critical component of interventions to support individuals with ASD). Please refer to Table 26.1 for more information on this adaptation.

Common Concerns

Skills that have not been mastered may be relatively difficult for the child. As excited as parents may be to see their child learn a new skill, repeated presentation of difficult demands may be inadvisable for PCIT sessions. Thus, clinicians may need to encourage parents to alternate between unknown and known demands to keep the child from being pushed past his/her threshold.

26.4.3.3 Three-step Prompting

While we were able to teach parents how to use errorless prompting strategies to build unknown skills, we were also able to teach parents how to address noncompliant behavior related to known skills. Typical PCIT procedures train parents to provide more effective instructions and implement a structured discipline procedure. While this is still an important step for parents of children with ASD, additional methods were utilized with Devon and Cameron's families (Hansen & Shillingsburg, 2016). Noncompliant behavior was also addressed using the *three-step prompting* method (i.e., verbal prompt, model prompt, physical guide; Miltenberger, 2001; Tarbox, Wallace, Penrod, & Tarbox, 2007). In this procedure, when noncompliance with a known skill was exhibited, the caregiver was taught to first repeat the demand verbally (e.g., "Put your toy in the bin"). After 5 s, if the child did not comply, the caregiver modeled the skill for the child (e.g., parent repeats, "Put your toy in the bin," while modeling how to put the toy in the bin, and then says, "Now you do it"). After another 5 s, if the child still did not comply, caregivers used a physical guide to help the child complete the command (e.g., parent repeats, "Put your toy in the bin," and physically guides the child to comply). In addition to the three-step prompting, differential reinforcement procedures were used in which parents reserved praise and access to the desired items/activities for when the child complied after either a verbal or model prompt only.

The three-step prompting procedure is frequently used in applied behavior analysis training programs (the gold-standard evidence-based treatment method for youth with ASD) to minimize the likelihood of a child receiving any reinforcement after noncompliance. Noncompliance can have several functions for children. First, noncompliance may function as a form of escape from instruction therefore producing reinforcement through avoidance of undesirable demands. When this is the case, three-step prompting prevents the child from escaping, effectively placing noncompliance on extinction. Second, noncompliance may also function as a means to access parental attention. In these scenarios, three-step prompting teaches parents to remain calm and avoid providing attention following instances of child problem behavior. By refraining from providing possibly reinforcing forms of interaction (e.g., reprimanding, consoling), the parent is also reducing the likelihood noncompliant behavior will occur again. Third, by using differential reinforcement strategies for compliance, the child is only receiving tangible and social reinforcement when he or she complies with verbal or model prompts. This may prevent the child from developing a history of dependence on intrusive parental intervention (e.g., manual guidance). Also, the child will understand that fun activities and praise are only accessible with independence. Function-based interventions are a common component of interventions for individuals with disabilities (Hanley, Iwata, & McCord, 2003). Three-step compliance is a simple but effective approach for parents of children with ASD in PCIT (see Table 26.1).

Common Concerns
As soon as parents observe compliance with their child, they may be tempted to rapidly increase the rate of demand presentation. Coach them to be patient and mindful of the current demand fading step.

26.5 Conclusion

There is increasing research support that PCIT can improve parent-child interactions, problematic behavior, and language skills (Eyberg, 1988; Solomon et al., 2008). Utilizing PCIT with the ASD population may help increase access and outreach of services to children and their families. While many generalist psychologists have experience and familiarity with PCIT and/or other manualized parent-training interventions, these clinicians may not have expertise in the area of behavior analysis or children with ASD, in general. Adapting a widely used evidence-based intervention to implement with children with ASD better equips professionals to adequately deliver an intervention without starting from scratch. This method is beneficial for both providers who want to address the needs of their clients with ASD and families who live in rural areas and may not otherwise have access to specialized care.

Unlike some other treatment models for children with ASD, PCIT focuses on improving a caregiver's ability to serve as a change agent; this allows a child to receive more hours of intervention outside of a clinic, and it increases the likelihood that positive gains can be generalized to the natural environment. Parent-training programs are also a less intensive form of intervention than many treatment options for children with ASD. Parent-training programs such as PCIT add to the diversity in client treatment options for families with differing abilities, time, and available resources. Lastly, intensive services can be quite expensive to deliver. A modified version of PCIT may prove to be an effective evidence-based intervention at a lower cost.

Many of the experiences that parents have described relating to the difficulties in engaging and teaching their children with ASD can be alleviated through adapted PCIT. Our clinical findings for Devon and Cameron yielded high levels of parental-reported satisfaction; acceptability of treatment; and effectiveness of the intervention for addressing child language development, behavioral functioning, and the parent-child relationship. In addition to the caregiver report, we noted several positive changes in the caregivers' behavior and in the parent-child interactions during the behavioral observations (Hansen & Shillingsburg, 2016).

Prior to starting PCIT, caregivers expressed discomfort, awkwardness, and difficulty when asked to play with their child. Over the course of treatment, there were clear changes in parental behavior and child response. In both families, their interactions appeared much more natural. Caregivers were better equipped to deliver praise and behavior descriptions, model appropriate play, provide opportunities for the child to engage in the activity, introduce novel toys and activities, and assess their child's preferences.

Overall, PCIT is a promising tool for improving parent-child interactions and decreasing child maladaptive behavior. We are some of the many clinicians and researchers who have firsthand experience in witnessing the positive impact of educating, coaching, and empowering caregivers to be change agents for their children with ASD (Hansen & Shillingsburg, 2016; Solomon et al., 2008). Investigating and refining the procedures for applying PCIT with children with ASD and their families is an ongoing endeavor. Through this work, PCIT can continue to improve community outreach and access to services for families, provide an additional service on a continuum of intensity, and improve the generalization of child outcomes.

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Reflections on the First Efficacy Study of Parent-Child Interaction Therapy with Children Diagnosed with Autism Spectrum Disorder

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Abstract

The present authors constructed a randomized controlled trial and demonstrated the efficacy of Parent-Child Interaction Therapy (PCIT) for children with higher-functioning autism spectrum disorder (ASD; Solomon, et al. Journal of Autism and Developmental Disorders, 38: 1767–1776, 2008). Our study filled a gap in the literature, promoting the use of parenting interventions designed for typically developing children in the population of higher-functioning children with ASD. The purpose of this chapter is to review and critique the choices we made, our findings, and conclusions, examining them with the benefit of current research and information about ASD interventions, PCIT, and research targeting the use of PCIT with children on the autism spectrum. We will briefly review our 2008 study, then discuss in more detail certain decisions and outcomes that we believe still have an impact on how PCIT currently is provided to children with ASD.

Approximately 10 years ago, we noted that there were a relatively large number of behavioral problems exhibited among children with autism spectrum disorders (ASD). At the time, observations of this comorbidity were present at a rate of about 1 in 150 children. This rate included children with an autism spectrum diagnosis, children previously termed "high-functioning autism," Asperger's Syndrome (AS), and Pervasive Developmental Disorder—Not Otherwise Specified (PDD-NOS; CDC Morbidity and Mortality Weekly Report, 2007). With the change in diagnostics, we now identify these clusters of symptomatology on the continuum defined by the diagnosis, ASD. Many of these children received highly effective behavioral interventions, such as applied behavioral analysis (ABA), to reduce ASD-specific symptoms (Lovaas, 1987). Despite participation in such services, additional clinically significant disruptive behavior problems were often apparent in children with ASD, but few interventions were available to help them with these difficulties.

However, there were several evidence-based parenting interventions for young children with disruptive behaviors without ASD. Among them

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was Parent-Child Interaction Therapy (PCIT), a dyadic intervention designed to reduce disruptive behaviors in 2- to 7-year-old children by teaching and coaching (via live feedback) parents in specific skills (e.g., positive parenting techniques, strategies to improve compliance) until they reached mastery criteria. PCIT had qualities that appealed to our team: (a) it was behaviorally based, so was likely to fit with families' previous experience with highly behavioral interventions (e.g., ABA); (b) therapists coached parents while they played with their children, maximizing the likelihood of skill transference and effective change in parental behaviors; and (c) it addressed the family system, which had the potential for modifying the structure of environmental reinforcers by changing how parents interacted with their children. For this reason, we constructed a randomized controlled trial and demonstrated the efficacy of PCIT for children with higher-functioning ASD. We found that parents of children participating in PCIT showed more tolerance and acceptance of their children's problem behaviors, rated children as showing greater adaptability to change and new situations, and rated children as less "atypical" (for instance, showing more reciprocity in social interactions; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). At that point in time, there were studies of interventions for school-aged children with higher-functioning ASD that focused on improving social skills (e.g., Bauminger, 2002; Solomon, Goodlin-Jones, & Anders, 2004) but no published studies of interventions focused on reducing problem behaviors in this population. Our study filled a gap in the literature, promoting the use of parenting interventions designed for typically developing children in the population of higher-functioning children with ASD.

The purpose of this chapter is to review and critique the choices we made, our findings, and conclusions, examining them with the benefit of current research and information about ASD interventions, PCIT, and research targeting the use of PCIT with children on the autism spectrum. We will briefly review our 2008 study, then discuss in more detail certain decisions and outcomes that we believe still have an impact on how PCIT currently is provided to children with ASD.

27.1 About the Study

27.1.1 Selecting a Target Population

At the time we were planning our study, there was a robust literature supporting the use of functional assessments to evaluate environmental factors that contributed to or supported problem behaviors in young children with classical autism (Horner, Carr, Strain, Todd, & Reed, 2002). "Environmental factors" was a term used to loosely describe the physical and social system within which a child functioned, including parents, siblings, caregivers, teachers, school, and neighborhood settings. Changing the environment by removing triggers and rewards for behavior was successful in promoting enduring changes in children's behavior (Horner et al., 2002). There were not, however, any interventions for higher-functioning school-aged children with ASD that addressed the significant level of behavior problems we were witnessing.

Problem behavior, including aggression (towards self or others) and noncompliance, is highly common among youth with ASD (Kaat, Levacalier, & Aman, 2014). One large-scale study suggested that over 50% of youth with ASD experience moderate to severe levels of frustration intolerance (Lecavalier, 2006). The various typologies and functions of youth with ASD remain a topic of study, though various sources demonstrate that problem behavior is communicative in nature and frequently serves specific functions: escape, sensory input, and attention (Carroll et al., 2014). Overall, core ASD symptoms and related mechanisms, such as social communication deficits and neural abnormalities (e.g., amygdala and prefrontal cortex connectivity), may inherently underlie and contribute to the experience of poor emotion regulation in these youth (Mazefsky et al., 2013). In a clinical setting, a particularly important and recurrent finding is that child problem behavior is a prominent predictor of parent stress, perhaps even above and beyond core autism symptoms (e.g., Lecavalier, Leone, & Wiltz, 2005). Together, literature demonstrates problem behavior as a crucial intervention target for youth with ASD and their families.

Despite the fact that externalizing behaviors were known to be a major concern for children with ASD, including those who were higher-functioning, research on interventions for this population primarily addressed the improvement of social skills (e.g., Bauminger, 2002; Solomon et al., 2004). The fact that this gap existed, combined with the fact that there were many evidence-based, manualized interventions designed for typically developing children with similar behavior problems led us to select higher-functioning school-aged children with ASD as our target population. The fact that these interventions were also trying to change children's "environment" by modifying the way parents interacted with their children suggested that they might eventually be more acceptable to ASD specialists.

27.1.2 Selecting an Intervention

Although there were many evidence-based treatments available, PCIT's effectiveness in reducing problem behaviors in young, school-aged children (e.g., Eyberg, Boggs, & Algina, 1995) was an important reason for selecting the intervention for a population of children with ASD. Equally as important was its demonstrated effectiveness in strengthening the quality of children's social interactions and self-esteem (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993), enhancing awareness of emotions, stimulating language development, and increasing language output (McElreath & Eisenstadt, 1994); all of these factors were essential for improving adaptive and social capabilities in higher-functioning children with ASD (Koegel & Koegel, 2006; Koegel, Koegel, & Surratt, 1992).

In addition to improvements in child behaviors, PCIT showed reductions in parenting stress and increased parental use of positive verbalizations (Eyberg et al., 2001). At the time, research showed that parents of children with ASD typically reported more parenting stress than parents of children with other developmental disorders (Eisenhower, Baker, & Blacher, 2005; Wolf, Noh, Fisman, & Speechley, 1989). High levels of parenting stress were found to predict increased levels of disruptive behaviors in children with ASD, which in turn predicted increased parental stress (Baker et al., 2003). Thus, PCIT provided a means to address this negative cycle by decreasing children's disruptive behaviors and decreasing parenting stress.

The most important reason for using PCIT over other interventions was the fact that the parent and child participated together, which increased the likelihood of improving the overall quality of the parent-child relationship—improving attunement and shared positive affect in particular. Shared positive affect (SPA) is defined as moments where the child and parent are sharing a happy moment, laughing together, smiling, or touching affectionately. SPA had been shown to relate to increased compliance, moral development, social skills, frustration tolerance, and kindergarten adjustment in typically developing children (Kochanska & Aksan, 1995; Kochanska & Murray, 2000). More significantly, it had been shown that parent-child attunement led to superior joint attention and language development in children with ASD, up to 16 years later (Siller & Sigman, 2002).

Although PCIT had not previously been studied with children with ASD, the structure of and outcomes associated with PCIT suggested that it could target the behaviors and interactions we most wanted to change. Specifically, we hoped to improve child behavior problems, adaptive and social functioning, parenting stress, and shared positive affect. Importantly, PCIT is a highly verbal intervention that involves joint play between parents and children; therefore, we needed to be thoughtful about the characteristics of our participants to ensure they could effectively participate in the intervention.

27.1.3 Identifying Participants

We chose to study higher-functioning children with ASD ostensibly because of a clear gap in suitable and effective interventions for this group in the ASD intervention research. Not stated was the fact that we did not believe that PCIT could be effectively delivered to children with lower levels of intellectual functioning, attention deficits, and the inability to sit at a table to receive instruction without therapists' diverging from the protocol.

For this study, higher-functioning children were defined as those with Full Scale IQ scores >69 on the Wechsler Abbreviated Scales of Intelligence for Children (WASI; Wechsler, 1999) and who possessed enough expressive and receptive language to participate in the intervention. These criteria ensured that participants would be able to understand their parents' verbalizations (including commands) and interact with their parents in joint play. In the final sample, IQ scores ranged from 79 to 135, with children in the intervention and wait-list groups matched on this variable. All children met criteria for autistic disorder, AS, or PDD-NOS according to the *Diagnostic and Statistical Manual of Mental Disorders, fourth Ed., Text Revision* (DSM-IV-TR; American Psychiatric Association, 2000); ASD or autism according to the Autism Diagnostic Observation Schedule- Generic (ADOS-G; Lord, Rutter, DeLavore, & Risi, 2000); and autistic disorder according to the Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994).

The symptoms of ASD were not the primary focus of this intervention, as well-established interventions for ASD already existed. Instead, our goal was to reduce disruptive behaviors that often co-occur with ASD but are less easily addressed in typical ASD treatments. Thus, in addition to meeting criteria for ASD, children had to be reported as having clinically significant externalizing behavior problems, as measured by the Behavior Assessment System for Children (BASC) Externalizing Problem Scale (Reynolds & Kamphaus, 1992) or exceed the clinical cutoff on the Intensity Scale of the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999).

Participants were recruited from local psychiatrists, neurologists, general practitioners, psychologists, speech and language pathologists, occupational therapists, advocacy groups, regional centers, and the MIND Institute's Subject Tracking System database (the MIND Institute houses scientists, psychologists, and medical doctors who conduct research on the causes of and treatments for ASD and other neurodevelopmental disorders). Children in this study ranged in age from 5 to 12 years, older than the typical age range of PCIT participants. We argued that while PCIT was empirically supported for children 2–7 years, a 2- or 3-year-old with developmental delays might not be capable of participating in the language heavy intervention. Using the same logic, we reasoned that a 12-year-old on the autism spectrum might resemble a typically developing 7- or 8-year-old in toy choice and in the child's dependence on parents. For this reason, we chose to recruit slightly older children for this study.

27.1.4 Identifying Measures of Change

27.1.4.1 Child Measures

The ECBI is a measure authored by the PCIT treatment developer to indicate treatment progress and readiness for graduation. The ECBI contains two measures: Intensity Scale, measuring the frequency of different problem behaviors, and the Problem Scale, measuring the degree to which the behaviors were problems for the parent. We also used this measure as a performance outcome.

The BASC was used to measure changes in children's behaviors. In addition to scales measuring externalizing behavior, the BASC also contained scales that measured adaptive social behaviors and well-being: Adaptability, Social Skills, Leadership, Depression, Anxiety, and Atypicality. The Adaptability scale measured rigidity, stubbornness, and being easily upset when routines were changed (Reynolds & Kamphaus, 1992), behaviors which are part of the diagnostic criteria for ASD.

The Atypicality scale was originally developed as a measure of psychoticism, with questions addressing the presence of auditory and visual hallucinations. However, the authors note that many of the items can be interpreted differently for different populations (Reynolds & Kamphaus, 1992). For instance, questions assessing the frequency of babbling to oneself, rocking back and forth, and talking excessively also had particular relevance for the population of children with ASD.

27.1.4.2 Parent Measures

We used the Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) to measure the stress the parent reported from his/her role as a parent. The PSI-SF contained three subscales (Parenting Distress, Difficult Child, and Parent-Child Dysfunctional Relationship Scale) and a Total Stress scale. We only analyzed the Total Stress scale for the purposes of this research project.

27.1.4.3 Parent-child Relationship

The relationship between PCIT participation and change in parent-child shared positive affect was of particular interest to us, as it reflected a potential for change in parents' acceptance of their children and children's potential for reciprocal social interaction. To measure change in shared positive affect, we adapted Kochanska and Aksan's (1995) Shared Positive Affect Coding (SPA; Ono, Maccoun, & Solomon, 2005) and coded 15-min behavioral observations of the parent and child together at pre-, mid-, and posttreatment; this was done using facial expressions, tone of voice, and body language to judge the presence of shared positive affect, aloofness, neutral, and negative affect in each of 60 15-s intervals.

27.1.5 PCIT Intervention Procedures

Using a traditional two-room format, therapists coached parents through an earpiece from an observation room on the other side of a two-way mirror while parents played with their children. The intervention was delivered in two phases, and each phase began with a teaching session. The first phase of treatment focused on parents' attunement to their children by teaching them how and when to give the child positive attention (Child-Directed Interaction; CDI). Initially, therapists provided considerable support through coaching. After the parents initiated the positive skills they learned, therapists began to point out and coach the parents to reinforce child behaviors that would be useful in their daily lives (e.g., playing calmly, using words). Parents continued in the first phase of treatment until they met a mastery criteria of competence, which at that time was 25 total descriptions (e.g., "You are building a house") and reflections (e.g., child: "Blue"; parent: "It *is* blue"), 15 praises (e.g., "Thank you for sharing"), and no more than three questions, commands, or negative verbalizations within a 5 min observation. All dyads completed the first phase of treatment within eight sessions.

The second phase of treatment (Parent-Directed Interaction; PDI) focused on teaching effective behavior management skills. Therapists coached parents to give effective commands (e.g., developmentally appropriate, simple, direct, positively stated) and to use time-out to enforce compliance. The standard protocol for a 3-min time-out was followed, unless the child was unable to sit that long. Adjustments were made on a case-by-case basis. When 75% of parents' commands were effective (i.e., direct, child complied), the dyad was considered to have reached mastery of this phase.

27.1.5.1 Adaptations to the Protocol

Two small adaptations were made to the PCIT protocol to increase social interaction in the session and reduce the likelihood that the child would retreat into the isolation of solo play. When children had intense, focused interests and talking about those interests interfered with reciprocal interaction (e.g., the child talked about Thomas the Tank Engine, but did not allow space for the parent to reply or attend to the parent), we set a rule for "Special Time" prohibiting mention of the special interest. When children were not talking about their special interests, they were much more likely to engage in social interaction, which made it possible to coach effectively.

Second, we noticed that the typical approach of letting the child take the lead in CDI (Phase 1) often resulted in the child either being inappropriately bossy and controlling or engaging in solo play. Since the goal of this phase of treatment was to increase joint play and improve the quality of their interaction, we coached the parent to direct the child to allow joint play (e.g., "I'd like to play with the zoo animals just like you! Please hand me the lion").

Last, while not a change to protocol, it is worth mentioning that whenever the child initiated a social interaction (e.g., asking the parent a question), parents were coached to praise that adaptive social behavior (e.g., "You asked a great question").

27.1.6 Summary of Results

The proof of the efficacy of an intervention in a randomized controlled trial is a significant group (in our case: group vs. wait-list control) by assessment point (pre- vs. posttreatment) interaction, showing a significant drop in negative behaviors for the intervention group and no significant improvement for the control group. To account for floor effects (i.e., reports of low pretreatment behavior problems), we included pretreatment scores in all analyses. However, the sample size was small (10 intervention, 9 wait-list control), making it statistically challenging. Effect sizes of analyses needed to be very large to attain statistical significance.

27.1.6.1 Behavioral Problems

Analyses of ECBI Intensity and Problem scales showed that participation in PCIT improved parents' tolerance for their children's difficult behaviors (Problem scale). However, the intensity of children's behavior problems diminished for both groups, so we could not say that participating in PCIT helped reduce children's behavior problems. Results of analyses of the BASC's Hyperactivity, Attention Problems, and Conduct Problems scales showed interaction effects that approached, but did not quite achieve statistical significance ($p < 0.10$). While it was encouraging that children's difficult behaviors were not as much of a problem for parents by the end of treatment, it was puzzling that it was not accompanied by a similar drop in the parent-reported problem behaviors themselves. It was also interesting that, in contrast to the ECBI Intensity scale, the scales measuring symptoms more characteristic of children with ASD improved at least to the level that we could reasonably attribute their nonsignificance to the small sample size and lack of statistical power.

27.1.6.2 Adaptive Behavior and Emotional Well-being

Results of analyses of the Adaptability scale on the BASC suggested that involvement in PCIT was significantly related to improved adaptability to change in children. While analyses of change in Leadership and Social Skills scales showed no significant change by group, results of analyses of the Atypical scale showed that children's atypical behaviors (e.g., repeated speech or movement) decreased with participation in PCIT. Improvements in parents' perceptions of children's adaptability and atypical behaviors from pretreatment to posttreatment was as clinically significant an outcome as improvements in externalizing behavior problems because these behaviors are part of the foundation of social relationships (Reynolds & Kamphaus, 1992) and help preserve a trajectory of healthy development in the future.

Analyses of Depression and Anxiety scales revealed no statistically significant changes by group, although the group difference in change in Depression scores approached significance ($p < 0.10$).

27.1.6.3 Parent Stress

Results of analyses of parental stress, using the Total Parenting Stress score of the PSI-SF gave no indication that PCIT improved parenting stress levels. Moreover, the pre- and posttreatment mean levels of this measure were in the clinical range, so it was not a question of parents not reporting stress in their roles as parents.

27.1.6.4 Shared Positive Affect and Parental Positive Affect

Because behavioral observation assessments were not conducted for the wait-list control group, shared positive affect and parental positive affect could only be measured in the intervention group. Results of analyses showed that both SPA and parental positive affect scores increased over the course of treatment. These findings spurred us to look sequentially at the data and examine the number of times children's positive affect followed parents' positive affect. Results showed a significant increase in the number of times children's positive affect followed parents' positive affect. These were important results, as they suggested not just improvement in the amount of time parents showed positive affect, but also that the child may have developed more emotional reciprocity and the parent-child relationship became increasingly positive, reciprocal, and synchronous over the course of PCIT.

To test the importance of the developing shared and parental positive affect for achieving positive outcomes, we calculated Pearson correlations between mid-treatment positive affect measures and posttreatment child outcomes measured by the BASC and ECBI. We found that mid-treatment *parental* positive affect, but not shared positive affect, correlated significantly with posttreatment scores on the BASC Hyperactivity, Adaptability, and Social Skills scales, as well the ECBI Problem Score. A similar analysis of the positive affect scales with the PSI-SF Total Parenting Stress scale showed that increased *shared* positive affect and decreased Parenting Stress were correlated at the level of a nonsignificant trend. These findings suggested that increasing parental warmth in CDI by coaching parents to use positive parenting skills could mediate the improvement in children's behavior problems. Additionally, the direction of effects suggested that while increasing parents' positive affect may be associated with reductions in child behaviors, increasing shared positive affect (e.g., the child's reciprocal positive response to the parent) may be associated with reductions in parents' stress levels. While highly intriguing, the sample size was so small in these analyses ($N = 10$), we could only put this forward as a promising finding that future research might follow.

27.1.7 Summary of Discussion

All in all, in spite of a deficit of statistical power, we found that PCIT participation predicted strong improvements in children's adaptability, parental positive affect and shared positive affect, and in parents' tolerance of their children's negative behaviors. Additionally, we found some support for the idea that increased parent positive affect during interactions at mid-treatment were related to later improvements in children's behaviors.

Apart from the small sample size, which constrained the power and complexity of statistical analyses, the study had several limitations. First, we noted that the assessments of the efficacy of PCIT with this population were all parent-reported measures. When we designed this study, we considered the observational assessment to be part of the intervention, and so did not include it as something that should also be administered to the wait-list control group. Future efficacy trials should include the behavioral observation for all participants, whether they are receiving PCIT, another intervention, or wait-list controls. In addition, we believed it would be helpful to have used other ecologically valid measures of children's social functioning, autism-related social behaviors, and other problem behaviors. Last, we regretted our omission of a measure of treatment fidelity, which would have improved the study design.

27.2 Reflections on Past Findings

27.2.1 Adaptations for Children with ASD

Overall, the pilot study demonstrated the feasibility and efficacy of using PCIT with higher-functioning, 5- to 12-year-old children with ASD and co-occurring disruptive behaviors. However, we felt we needed to adapt the protocol slightly to move forward expeditiously in PCIT and accomplish what we considered to be a foundational requirement for the first phase of treatment for our clients: children and parents playing together. As briefly stated earlier, we achieved this by first setting a rule for "Special Time" that limited the discussion of restricted interests when children's interests interfered with reciprocal interaction in play. Additionally, if a child became unnecessarily bossy or overly involved in his/her own play during CDI, we coached parents to give a command that was incompatible with this behavior and increased opportunities for interactive play. For example, if a child ignored the parent or became overly bossy, the parent expressed his/her desire to play just like the child and gave a command for the child to do something that forced joint attention or parental involvement (e.g., "Please hand me a giraffe like yours"). Parents then returned to avoiding commands. This slight modification allowed parents to redirect children to joint play and then praise children for positive social engagement.

We were not alone in making small adjustments to the PCIT protocol to meet the needs of children with ASD. Much of the research looking at the effectiveness of PCIT with children diagnosed with ASD includes children varying in age and cognitive functioning, making minor adjustments within the PCIT structure to address the needs of these child clients. Indeed, Masse, McNeil, Wagner, and Quetsch (2016) and Lesack, Bearss, Celano, and Sharp (2014) discussed how PCIT is flexible enough to allow therapists to tailor coaching to the needs of the family. For example, Masse et al. (2016) point out that when children have problems "using their words" to get what they want, and grab a toy, scream, yell, or tantrum, parents are typically taught to ignore the inappropriate attempt to get their way but to attend to any appropriate communication. This strategy is useful for both "typical" PCIT clients and ASD clients. Additionally, Masse et al. (2016) noted that behaviors of special interest to parents of ASD children (e.g., eye contact, imitation) can be coached, monitored, and "shaped" using positive attention the same way a PCIT therapist would for behaviors like playing with toys gently or sharing. Similarly, Bagner and Eyberg (2007) used a strategy of giving a command incompatible with an undesired behavior to stop that undesired behavior; while this is a strategy commonly used for children with only disruptive behaviors, it can be extended to undesirable behaviors in ASD children.

Despite maintaining the overall integrity of the format of PCIT, these scholars tailored the way they coached parents and set up play situations to meet their clients' special developmental needs. Bagner and Eyberg (2007) noted that to build on emerging cognitive skills, such as color identification, they might coach the parent to identify colors in the positive parenting skills they practiced. For example, the therapist would coach the parent to say, "You picked a red crayon. You're coloring the balloon red. I like your big red balloon" (Bagner & Eyberg, 2007, p. 427). Borrowing from the approaches of Lovaas' (1987) discrete trial training (DTT) procedures and the Koegels' (Koegel & Koegel, 2006) pivotal response training (PRT) approach for children with autism, parents were taught to use brief comments to describe the child's behavior and praise the child's accomplishments. Masse et al. (2016) used strategies similar to Bagner and Eyberg (2007): repeating concepts (like teaching colors) across different positive verbalizations, and coaching the parent to use short sentences with longer pauses to allow a more severely delayed client enough time to generate sentences and speak.

These studies all show caution and mindfulness of the need for treatment fidelity when using an evidence-based treatment with a novel population. They also show an understanding of strategies that have proven effective for children with ASD.

27.2.2 Children's "Special Interests" and PCIT

Traditionally, in the first phase of PCIT, children are allowed to choose whichever toy they would like and parent directions (including rules) are avoided. To enhance the likelihood of parent-child interactions, we chose to modify this component of treatment by restricting children's engagement in their special interests during treatment sessions. We observed an increased range of interests and decreased fixation on targeted special interests, which excluded others from play. This was an unexpected, but intriguing, finding. It helped to show that fixation on special interests may be malleable, likely established jointly by parents' needs to quiet their children or reward them with a toy they liked and children's preference for rigid structures and routines.

In several studies of the effectiveness of PCIT for children with ASD, children's restricted interests affected their ability to engage in play with their parents. For example, Agazzi, Tan, and Tan (2013) described a child who repeatedly resisted play with parents, which derailed the treatment session. The therapist in this case, together with the parents, identified a "preferred" toy from home to use in treatment sessions, which they thought would reduce the child's resistance to play. The preferred toy was one of his restricted interests, but nevertheless allowed the dyad more opportunity to play together and for parents to master the positive parenting skills. In the second phase of treatment, the therapist coached the parents to put away the preferred toy and pick a different toy with which to play.

While using a preferred toy was useful in Agazzi et al.'s (2013) case, Lesack et al. (2014) had to avoid using highly stimulating, battery-operated toys preferred by their child client as he perseverated on the lights and sounds, decreasing social interaction. The researchers chose instead to use more typical PCIT toys such as blocks and Mr. Potato Head, which allowed for more opportunities for parents and children to play together.

These decisions highlight an important treatment issue. Many behavioral therapists argue that, in light of their deficits in joint attention, it is very helpful to use the special interests of children with ASD to motivate them to initially participate in social interactions and make such interactions more rewarding (Baker, 2000; Kryzak, Bauer, Jones, & Sturmey, 2013; Vismara & Lyons, 2007). The experiences Agazzi et al. (2013) report support this assumption. Our findings and those of Lesack et al. (2014) suggest that reliance on special interests as a motivator for interaction can also serve to perpetuate behavioral rigidity in the child with ASD. This contention received support in a recent study, which found that greater conversational flexibility was promoted when a partner progressively reduced and/or lagged positive responding to a child with ASD who was perseverating on a specific interest in conversation (Lepper, Devine, & Petursdottir, 2017). Thus, in therapy, it may be more effective to conceptualize special interests as reinforcers to be used judiciously and then faded to promote greater child adaptability and flexibility.

27.2.3 Communication Deficits and Eligibility for PCIT

Given that communication is inherent to PCIT and that related deficits are inherent to ASD, it is worth considering whether there is a criterion level of expressive and receptive language indicating that a child may not benefit from participating in PCIT. For example, parents with young, preverbal children are coached to use reflections or imitations for any of the children's appropriate sounds and verbalizations (e.g., reflect "ah" or elaborate the child's "ba" when trying to say, "Ball"). However, it is difficult to train parents to reflect verbalizations if the child does not speak at all. Our study somewhat circumvented this issue by selecting youth with adequate expressive and receptive language skills, thereby rendering it unlikely that their language deficits would interfere with the administration of treatment. Indeed, we did not experience problems with children's language comprehension or expression in the administration of PCIT.

Other studies suggest that PCIT may be appropriate and even recommended for youth with language deficits. For instance, PCIT has garnered attention beyond the realm of behavior therapy and has been highlighted as an effective supplement to speech and language interventions for children with expressive and receptive language impairments (e.g., Allen & Marshall, 2010; Tempel, Wagner, & McNeil, 2009). Several case studies have also yielded promising results for treating young children with ASD and significant language impairments, suggesting that some adaptations such as visual supports may enhance treatment effects (e.g., Armstrong, DeLoatche, Preece, & Agazzi, 2014; Lesack et al., 2014). Thus, PCIT may be appropriate for youth with ASD with varying levels of language deficits in terms of targeting both problem behavior and language skills (e.g., Keyes, Beverly, & Zlomke, 2012; Wagner, Beverly, Zlomke, & Murphy, 2014). This may be of particular importance to this population of children given the clear association between problem behavior and language limitations (see Carr & Durand, 1985, for a seminal example of this association). However, this conclusion is largely drawn from case study examples, and further examination of how the presence of language delays and ASD symptoms warrant treatment adaptations and outcome is warranted (Mei, Beverly, & Zlomke, 2017; see also Chap. 23 of this handbook).

27.2.4 Cognitive Deficits and Eligibility for PCIT

We deliberately selected children who functioned at least in the borderline of IQ for our study of the efficacy of PCIT for children with ASD. Our team members had adequate knowledge about the capacities of children with ASD and thought it would be unfair to test a language intensive therapy on a population of children who might not understand what a command was or why they were receiving a time-out. Our hesitation to use a population more varied in cognitive functioning for our randomized controlled trial was born out in later research.

Children's cognitive functioning and level of receptive language created a need for adaptation in several of studies on the effectiveness of PCIT for children with ASD. For example, Lesack et al. (2014) and Masse et al. (2016) used a "cueing" command before giving a target command to increase the chances that the child would understand that a command was coming. Lesack et al. (2014) used the child's name as a bid for attention before giving a command. Masse et al. (2016) cued their most delayed client by first giving the child a command to "Look at me." Both studies also reported working out a system to improve the children's understanding of their parents' commands so that they would not confuse noncompliance with lack of comprehension. Masse et al. (2016) reported pairing verbal commands with physical cues to perform the command (e.g., pointing at the chair while saying, "Please sit on the chair"), similar to strategies recommended for very young children (McNeil & Hembree-Kigin, 2010).

Lesack et al. (2014) used a three-step strategy of teaching the commands and the parent's desired reactions before giving consequences for noncompliance—using verbal commands, gestural cues, and modeling the appropriate reaction. Following this, the caregiver would restate the original command, wait 5 s for the child to comply, then use "hand-over-hand" to "guide" the child in the compliant behavior. For children with severe delays, this strategy could be slow moving; though these steps may have been essential to the child's achievement of behavior management treatment goals, a large portions of a treatment session was often spent ensuring the child's comprehension with the compliance process. Possibly because of this, Lesack et al. (2014) limited the direct commands the parents gave the child to the management of only a few safety-related behaviors.

27.2.5 Time-Out for Children with ASD

PCIT uses time-out as its primary form of discipline. Time-out in PCIT lasts for 3 min plus 5 s of silence, using a "backup room" when children "escape" time-out (Eyberg & Funderburk, 2011). The time-out has been the subject of considerable controversy in recent years, mostly concerning the emotional risks and benefits (e.g., Quetsch, Wallace, Herschell, & McNeil, 2015; Siegel & Bryson, 2014). Apart from this controversy, there is the belief that the PCIT time-out should not be used with children under two because they are not likely to have the executive functions necessary to understand the cause and effect of misbehavior and negative consequences (McNeil & Hembree-Kigin, 2010). Because assessing developmental age is more complicated for children who may have ASD, one way to ensure that children are old enough for PCIT behavior management is either to provide PCIT only to high-functioning children or to assess and analyze children's functional behavior repeatedly (e.g., reactions to their parent's behavior) while they are in the first phase of treatment.

While our study avoided these potential pitfalls by including only higher-functioning children, studies of PCIT with children with ASD have reported difficulties implementing time-out (e.g., Agazzi et al., 2013; Lesack et al., 2014). Agazzi et al. (2013) reported that in the home, the study child's parents had difficulty finding a space for time-out backup where they could leave him without worrying about his safety, which decreased the effectiveness of the time-out. Lesack et al. (2014) also described needing to tailor the time-out process because of the client's low cognitive functioning. First, having noticed that the child rarely sat in a chair at the best of times for more than 2 min, the therapist initially required only 1 min with 2 s of quiet time-out, working gradually towards longer periods of sitting. This practice of gradually increasing the length of time-outs is common for therapists providing PCIT to 2-year-olds who have limited understanding of the meaning of the time-out (Dombrowski, Timmer, & Zebell, 2008). McNeil and Hembree-Kigin (2010) recommend that clinicians make the decision to coach time-out with 2- to 3-year-olds on a case-by-case basis, as there is considerable variability in cognitive development in this age group. It may be similarly advisable to give individualized consideration to how elements of PCIT are provided to children with ASD.

27.2.6 Use of PCIT in Addition to Traditional ASD Interventions

Disruptive behaviors are common among children with ASD (e.g., Gadow, DeVincent, Pomeroy, & Azizan, 2005). In an examination of an administrative database, Mandell, Novak, and Zubritsky (2005) found that approximately 40% of children with ASD were referred for mental health services in a community mental health setting because of their disruptive behaviors. For this reason, PCIT therapists are likely to continue to receive referrals for children with ASD that specifically seek treatment for disruptive behaviors. However, children with ASD diagnoses are likely to have already received other services (Payakachat, Tilford, & Kuhlthau, 2017). The caregivers' exposure to these other services may shape their expectations about their children and their parenting behavior.

For example, we noticed that PCIT seemed particularly helpful to parents and children who had participated extensively in ABA in early childhood. Some ABA approaches (e.g., DTT) depend heavily on teaching appropriate behavior by giving a series of or repeated commands, and using small (mostly edible) tangible reinforcements as rewards for compliance. Caregivers learn these skills as well as strategies for engaging and maintaining a child's attention. These engagement strategies also involve giving repeated commands (e.g., repeating the child's name to bid for attention, telling the child to look at them). Little social warmth is built into these exchanges, and the parent-child relationship is not a focus of therapy. In contrast, PCIT focuses on teaching parents and children the value of the parent's positive attention as social reinforcement, thereby fostering greater parent-child relationship quality and depth.

This mismatch in approaches between DTT and PCIT was highlighted in one of the families in our study. This case involved a very able 10-year-old boy who had participated in extensive ABA therapy with his mother throughout his childhood; the mother found it difficult to recognize, reward, and encourage the child when he spontaneously began to ask her questions about herself and her experiences during the course of PCIT. Although improving social engagement is a core goal of ASD treatments, this mother had not learned how to encourage these behaviors when they occurred naturally. In PCIT, the therapist helped the mother notice these social bids, identify them as important indicators of progress, and respond in a positive and encouraging manner.

Many parents had similar difficulties engaging in CDI. In ABA and other ASD-specific interventions, parents or therapists are consistently in control of the play situation, giving commands and rewarding appropriate behaviors. Parents become "teachers," and may resign themselves to the fact that they will not have a "normal" relationship with their children. In PCIT, the roles are reversed, and parents are asked to follow their children's lead without teaching or forcing any particular type of interaction. Many parents do not believe their children will be capable of leading play or feel uncomfortable engaging in the children's preferred play (e.g., often repetitive and non-pretend). However, with coaching, parents were able to reduce their own need to be in charge and teach, instead following along with their children and finding that they could enjoy playtime together.

27.2.7 PCIT and Parenting Stress

Parents of children with ASD are universally noted to experience high levels of stress and internalizing psychopathology (Abbeduto et al., 2004). While greater levels of ABA have been associated with reductions in depressive symptoms, they also have been associated with greater maternal strain (Schwichtenberg & Poehlmann, 2007). The mechanisms underlying these relationships remain poorly understood. Our clinical experience suggests that positive outcomes of relationship-based therapies—parents' better understanding of their children, the improvement of children's responsiveness to their positive attention, the significant decline in the frequency of child tantrums, and the children's increased compliance—should help reduce parents' stress. Of note, parenting stress did not decrease as a simple function of PCIT involvement in this study; however, intervention dyads that showed greater shared positive affect (i.e., children reciprocating and sharing in positive affect with the parent) also had lower levels of parenting stress. Thus, future studies should continue to examine whether changes in children's emotional reciprocity and ability to engage with (and serve as social reinforcers for) parents may be a mediator of reduced parental distress in parents of children with ASD.

27.3 Implications for the Future

Nearly 10 years ago, therapists in community mental health agencies estimated that approximately 21% of their caseloads consisted of children suspected of having ASD or with ASD diagnoses (Brookman-Frazee, Taylor, & Garland, 2010). Since then, the prevalence of ASD among children has increased, and therapists may see even greater numbers of children come into clinics with this symptomatology. Brookman-Frazee and colleagues (Brookman-Frazee et al., 2010) interviewed 23 parents of children on the autism spectrum and reported that one of the most common challenges parents of children with ASD mentioned (in working with community mental health providers) was the therapists' lack of knowledge about ASD and its associated challenges. Unfortunately, many community mental health clinicians do not have training in ASD-specific deficits and may feel it challenging to provide effective services to these children. However, we believe our study showed that providing PCIT to higher-functioning children on the autism spectrum did not require extra training in ASD; it was possible to deliver PCIT to this population with few adjustments and still focus on typical PCIT challenges. The primary questions for our therapists were, "How can I get the child to play with the parent," and "How can I keep this child regulated so that we can have a PCIT session?" These questions are also frequently asked about typical PCIT clients. While the solutions can be highly variable, they are often derived from a limited set of options and well within the skill set of a trained PCIT therapist. While we avoided working with low-functioning children to optimize our chances of success in using PCIT with the ASD population, other research suggests that therapists may need additional resources. When children's cognitive functioning limits their ability to understand what the parent wanted them to do or if they did not listen (to understand why they were receiving consequences), PCIT therapists may need to incorporate strategies from ABA interventions and possibly improve their understanding of the disorder (Masse, 2010).

PCIT has been implemented and is now practiced widely within community mental health centers, with trainers and funders sharing an understanding of the importance of sustaining the practice in organizations. Our study—in addition to later studies of PCIT with children with ASD—suggests that training clinicians in PCIT and helping them understand the minor adaptations available for children with ASD may improve the services these children receive.

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28

Lessons Learned from the Application of Parent-Child Interaction Therapy with Children with Autism Spectrum Disorder

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Abstract

Given the increasing prevalence of autism spectrum disorders (ASD) in children and its high rate of comorbid disruptive behavior symptoms, there has been a surging demand for evidence-based behavioral interventions with this population. While applied behavioral analysis (ABA) has been the first-line treatment for ASD, other behavioral interventions such as parent-child interaction therapy (PCIT) have gained clinical and research interest due to its promising findings and emphasis on parent involvement. This chapter describes the rationale for the application of PCIT to address challenging behaviors in children with ASD utilizing our clinical experiences and case study research conducted in a university-based PCIT clinic. The chapter also presents the clinical challenges we have encountered and treatment adaptations we have used to meet the unique needs of children with ASD and their families. Through various case examples, we discuss lessons learned, clinical considerations, and recommendations in hopes to further promote research and implementation of PCIT with children with ASD.

28.1 Autism Treatments for Disruptive Behaviors

Behaviorally based interventions have been the first line of treatment for children with autism spectrum disorder (ASD). These interventions build upon a child's interests, use a series of simple steps to teach tasks, engage a child's attention, and regularly reinforce children's pro-social skills (Horner, Carr, Strain, Todd, & Reed, 2002). Most notably, interventions like applied behavior analysis (ABA), modeling, pivotal response training, and schedules have been recognized as established interventions for individuals under age 22 (National Autism Center, 2015). Additionally, research suggests that these interventions are more effective when there is a strong caregiver component included in the treatment package, as opposed to the specialist being solely responsible for delivering the intervention in a clinical setting (Carr et al., 2002). Caregivers possess great expertise regarding the strengths and needs of their child; caregiver involvement in the problem-solving process commonly used in behavioral interventions is crucial (Bergan & Kratochwill, 1990). Children with ASD who receive evidence-based interventions in the context of their daily routines learn better and have

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fewer problems generalizing their new skills to other settings ("Teach children with autism," 2012). Furthermore, research indicates that caregivers can be trained to be effective interventionists of their child's treatment plan (Burrell & Borrego, 2012).

Recent estimates indicate that approximately one in four children with ASD meet diagnostic criteria for a disruptive behavior disorder (Kaat & Lecavalier, 2013). Disruptive behaviors are more common in children with ASD compared to typically developing children (Matson, Wilkins, & Macken, 2008; Nicholas et al., 2008), children with learning impairments (Dixon, Kurtz, & Chin, 2008), children with intellectual disabilities alone (Holden & Gitlesen, 2006), and children with psychopathology (Matson et al., 2008). The disruptive behaviors typically present in the form of externalizing behaviors like irritability, aggression towards self or others, tantrums, and noncompliance; these behaviors are associated with core deficits in social skills (Ashburner, Ziviani, & Rodger, 2010; National Research Council, 2001). The severity of these behaviors increases with age and, if left untreated, often persists into adulthood (Murphy et al., 2005). Once these disruptive behaviors are ingrained in family routines, they are unlikely to decrease without interventions. Untreated behavioral problems in children with ASD can lead to reduced educational programming, interfere with therapy progress (e.g., speech, occupational, and physical therapies), impair academic performance, increase social relationship problems, lead to psychotropic medication use, and exacerbate core ASD symptoms (Horner et al., 2002). Caregivers of children with ASD report the highest levels of caregiver stress when compared to caregivers of typically developing children and children with other disabilities including developmental delay and Down syndrome (Estes et al., 2009; Schieve et al., 2014). It comes as no surprise then that many caregivers desire to treat their child's disruptive behaviors such as noncompliance and aggression, prior to treating other atypical behaviors (Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005).

Despite high comorbidity rates for disruptive behavior disorders in children with ASD (e.g., 25% meet criteria for disruptive behavior disorder; Kaat & Lecavalier, 2013) and strong empirical support demonstrating the benefits and necessity of parent involvement in ASD treatment, limited research exists on the use of behavioral parent training (BPT) for disruptive behaviors in children with ASD (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017). To this point, the literature has focused more on parent involvement in ASD treatments targeting core ASD symptoms (National Autism Center, 2015). In BPT, parents learn how to identify and manipulate antecedents and consequences of their child's behavior; target and monitor problematic behaviors; use praise, positive attention, and tangibles to reward pro-social behavior; and use planned ignoring to decrease undesired behaviors. BPT actively involves parents in their child's intervention. As a result, parents experience increased feelings of competence and control and decreased stress levels (McConachie & Diggle, 2007; Sofronoff & Farbotko, 2002). In fact, in many BPTs, parents act as co-therapists, which increases the likelihood of skill generalization across settings (e.g., home and school) and holds importance for children with ASD because they often experience difficulties with spontaneously demonstrating learned skills across settings and situations (Burrell & Borrego, 2012). In addition, parent training increases the amount of intervention that the child receives (Burrell & Borrego, 2012; McConachie & Diggle, 2007).

28.1.1 Rationale for Parent-Child Interaction Therapy as an ASD Treatment

While Parent-Child Interaction Therapy (PCIT) is an intensive form of behavioral parent training with strong empirical support for young children ages 2–7 with disruptive behaviors (Eyberg, 1988; Eyberg et al., 2001; Eyberg, Boggs, & Algina, 1995), PCIT has not traditionally been a first-line intervention for children with ASD. Some have reasoned that PCIT may not be a good match for children with ASD, given its heavy emphasis on social contingencies such as verbal reinforcement, time-out, and planned ignoring (Masse, McNeil, Wagner, & Chorney, 2007). Questions regarding the use of PCIT for children with more significant developmental delays pertain to the prominence of social reinforcement through parental attention to motivate and reinforce children's pro-social behaviors. In addition, clinicians have been cautioned that PCIT may not be an appropriate treatment option for children with receptive language abilities below 24 months of age due to the heavy reliance PCIT places on communication between the parent and child (Masse et al., 2007).

Children with ASD are increasingly presenting to PCIT clinics nationwide, and with the previous questions in mind, clinicians and researchers alike have started to address the effectiveness of PCIT for children with ASD. Our research team has contributed to this small but growing body of literature. Initial findings provide support for the application of PCIT to treat disruptive behavior disorders among children with ASD. From a clinical and research perspective, we reasoned that children with ASD are likely to benefit from PCIT due to its similarities with many established behavioral interventions for ASD and PCIT's successful implementation with other specialized populations (e.g., children with intellectual disabilities; Bagner & Eyberg, 2007).

PCIT, like other ASD treatments, places a strong role on family involvement as caregivers are coached to use effective behavioral techniques with their children. PCIT emphasizes one-to-one interactions between the caregiver and child wherein the caregiver learns to follow the child's lead and interests during structured playtime. By teaching caregivers, skills can then be generalized from the clinic to home and community settings. PCIT also emphasizes teaching children pro-social skills through positive reinforcement and differential attention, two key components of many ASD proven treatments. PCIT, like many ASD treatments, involves structure and a predictable schedule for therapy sessions and homework practice. Finally, PCIT teaches caregivers behavioral strategies to promote child compliance, a critical skill for success in school, therapies, and other community settings. It is for these reasons we believed that PCIT could be effective in addressing the behavioral needs of children with ASD. In fact, the positive effects of PCIT may provide a portal for children with ASD to participate in and benefit from comprehensive and multicomponent treatments designed to address the core deficits of ASD. Disruptive behaviors common to children with ASD often interfere with their participation in and progression through treatment programs. PCIT specifically targets child compliance and social responsiveness, both of which are fundamental skills necessary in treatments that address the development of more adaptive behaviors (e.g., social skills, motor coordination, and speech). Given the importance of treating disruptive behaviors among children with ASD, the remainder of this chapter will focus on our experiences implementing PCIT with children with ASD and their families and on the lessons we have learned.

28.2 The University of South Florida PCIT Clinic

Our research with children on the autism spectrum has focused predominantly on treating disruptive behaviors (Agazzi, Tan, & Tan, 2013; Agazzi, Tan, Ogg, Armstrong, & Kirby, in press; Armstrong, DeLoatche, Preece, & Agazzi, 2015; Armstrong & Kimonis, 2013). Our published studies include three single-case studies (Agazzi et al., 2013; Armstrong et al., 2015; Armstrong & Kimonis, 2013) and one noncurrent multiple baseline design across three subjects (Agazzi et al., in press). Taken together, our case studies have demonstrated the effectiveness of PCIT in reducing externalizing behaviors, increasing compliance, and improving adaptability in children with ASD. Additionally, our results also found improvements in parent outcomes, which include strong gains in positive parenting skills as measured by the Dyadic Parent-child Interaction Coding System (DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014) and the reduction of maternal anxiety, depression, and stress (Agazzi et al., in press). Our findings are consistent with other studies that investigated the application of PCIT in addressing disruptive behaviors in children with ASD (Hatamzadeh, Pouretemad, & Hassanabadi, 2010; Lesack, Bearss, Celano, & Sharp, 2014; Masse, McNeil, Wagner, & Quetsch, 2016; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). Despite these preliminary but promising findings, we recognize a need for more rigorous research (e.g., randomized control trials) to provide further evidence to support the implementation of PCIT within the ASD population.

Although PCIT is a manualized treatment, it allows for some flexibility to meet the individual needs of the child and the family. When considering the use of PCIT for children with ASD, one must determine if any changes need to be made to the standard method of treatment delivery. One of PCIT's strengths is its flexibility to incorporate some degrees of tailoring within treatment. Tailoring involves changes in the delivery style or focus of fundamental elements of the treatment to meet a family's specific needs (Eyberg, 2005). For example, a PCIT therapist may tailor treatment sessions to emphasize the use of labeled praise to target a specific desired behavior, such as eye contact. However, some PCIT cases require adaptations to meet the specific needs of a child. Adaptations refer to changes in the structure and content of treatment for use with a given population or situation (Funderburk et al., 1998). Although published guidelines do not exist for PCIT adaptations to meet the needs of children with ASD, several case studies, including one of our own, describe the use of unique adaptations utilized to meet the needs of children with ASD with varying levels of developmental delays and language abilities (Agazzi et al., in press; Lesack et al., 2014; Masse et al., 2016).

Clinically, our experiences have highlighted the feasibility of PCIT for children with ASD at increasing compliance, reducing disruptive behaviors, and improving positive parenting practices. We have found that when working with children with ASD, clinicians must allow for some flexibility and/or tailor treatment to support the treatment goals of the family and ensure their successful completion of PCIT. In addition, we have found it necessary to dedicate extra time to establish and maintain rapport with caregivers over the course of treatment, especially during Parent-Directed Interaction (PDI), when they may need additional support. The remaining sections of this chapter will expand upon and address the lessons we have learned from using PCIT with children with ASD.

28.3 Lessons Learned from Child-Directed Interaction

The Child-Directed Interaction (CDI) phase of PCIT involves two main goals: (a) to improve the caregiver-child relationship using positive attention and (b) to modify the child's behavior through differential attention (i.e., ignore undesired behavior and attend to appropriate behaviors) through the context of a child-led play. Specifically, parents provide high-quality parental attention using social reinforcement to encourage and reward children's behavioral and verbal expressions. Parents remove their attention through planned ignoring of children's inappropriate and/or disruptive behaviors and through praising positive opposite behaviors.

28.3.1 Tailoring and Adapting CDI Procedures for Children with ASD

28.3.1.1 Reflecting Vocalizations with Apparent Communicative Intent

In addition to improving children's behavior problems, parents' use of CDI PRIDE skills (i.e., Praise, Reflect, Imitate, Describe, Enjoy) may help with the development of children's language and communication abilities (Masse et al., 2007). Parents learn to provide a language-rich environment by using positive parenting skills to communicate with and provide attention to their child. Therefore, parents model the appropriate use of verbalizations while simultaneously providing their child with specialized attention for appropriate behaviors. This attention helps to improve children's self-esteem, which may increase the number of appropriate vocalizations they use (Tempel, Wagner, & McNeil, 2009). Parents' use of reflections gives children immediate attention for appropriate vocalizations, increasing the likelihood that a child will use functional vocalizations during special play. This is particularly important for children with ASD, who may present with stereotyped patterns of speech that are distracting, difficult to understand, and often lack social intent. In our clinical experience, it has been beneficial to adapt parents' use of reflections such that they only reflect those child vocalizations with apparent and appropriate communicative intent (e.g., engaging in joint attention, making requests, naming toys).

Some children with ASD present with expressive language delays that make their vocalization difficult to understand. We have found that many times, a child's vocalization can be deciphered through the context of their play. For example, a child playing with a block during special time says, "Bah, bah, ah," while reaching for another block. The child vocalization may be an attempt to say the word block, and as such to tailor PCIT for children with ASD and expressive language delays we encourage caregivers to respond with, "Bah, you said block!" In this way, the parent reflects their child's vocalization then provides the corrected pronunciation of the word associated with the action or items in the form of a behavior description. Or the child may sign something such as "more" and the parent would say, "You want more blocks."

28.3.1.2 Stereotyped Vocalizations

We have observed that children with ASD and limited communication skills tend to engage in stereotyped vocalizations (e.g., repetitive or echolalic comments) as a form of self-stimulation. Of note, these behaviors are often not maintained through the use of parent attention. Therefore, we have found it difficult to modify children's stereotyped vocalizations through ignoring and redirection, as much of the session could be spent ignoring the child rather than engaging with them. Caregivers typically want to address these vocalizations because they often find them disruptive and distracting. One way to adapt the use of reflections involves coaching parents to reflect their child's repetitive or echolalic comments the first time they are made, to follow their child's lead, then to rely on the use of other PRIDE skills to reinforce their child's pro-social behaviors. For example, if a child says "Choo-choo" repeatedly while pushing a train, the parent would reflect, "Choo-choo, you are pushing the train!" Like the previous example, the parent reflects the child's words, and then uses a behavior description to expand the communication. Parents should be reminded of the rationale behind CDI: allowing their child to lead the play will improve the parent-child relationship, which will better facilitate the success of the PDI phase.

28.3.1.3 Using PRIDE skills to increase pro-social behaviors

The behaviorally based procedures utilized in CDI emphasize the importance of child-led interactions including child selection of activities and parent fading of instructions and directives. These procedures have been shown to minimize children's social avoidance during play and increase children's motivation to socially engage with others (Escalona, Field, Nadel, & Lundy, 2002; Koegel, Dyer, & Bell, 1987). As such, parents can utilize PRIDE skills to reinforce and increase their child's use of pro-social behaviors such as making eye contact, using words to communicate wants, answering questions, taking turns, using gestures, taking care of the toys, and using more than one type of toy. In turn, children learn to engage in these pro-social behaviors more frequently in order to receive positive feedback and attention from their parents. We have found that when using PRIDE skills with children with ASD and receptive language delays, it may be helpful to coach parents to limit their verbalizations (i.e., three to five necessary words). For example, instead of saying, "I really like the way you looked at me and shared your special dinosaur with me," they might say, "Thanks for looking at me!" This simplified speech, along with a brief quiet period during which the child can process the content before the parent vocalizes again, may facilitate child understanding. Although the latter statement only includes one labeled praise as opposed to two in the original statement, the parent could follow up shortly thereafter with another simple comment regarding sharing the dinosaur.

28.3.1.4 Reduced mastery criteria for reflections

Standard PCIT protocol requires parents to reach mastery on the PRIDE skills (i.e., 10 labeled praises, 10 reflections, and 10 behavioral descriptions; no more than three questions, commands, and/or criticisms; and consistent ignoring of minor inappropriate behaviors) during a 5-min DPICS observation session. Once the parents achieve mastery criteria, they progress to the PDI phase of treatment. In our clinical investigations, children with ASD exhibit fewer verbalizations, which decreases the number of opportunities for parents to use reflections. As such, an adaptation to mastery criteria for reflections may be helpful to account for the reduced opportunities. Other clinical case studies have slightly adjusted the CDI criteria from 10 of each PRIDE skill (i.e., labeled praises, reflections, and behavioral descriptions) to 10 labeled praises and a total of 20 combined reflections and behavioral descriptions (Lesack et al., 2014; Zlomke, Jeter, & Murphy, 2017). Another adjustment would be to allow the caregiver to reflect 75% of the child's functional vocalizations (e.g., word approximations or words); to do so, the PCIT therapist will need to keep track of all child functional vocalizations during the coding session.

28.3.1.5 Allowing preferred toys

It may be beneficial to allow children with ASD to use toys that they are familiar with to create a comfortable play environment and to promote the generalization of skills to the home setting. In the Agazzi et al. (2013) article,we noted that our client (e.g., 7-year-old male) had poor interest in our PCIT toys, and as such frequently engaged in unusual motor stereotypies for the first 4 weeks of PCIT. With the caregivers' input, we identified a list of preferred toys and asked them to bring one of those toys to the next session. As noted in our article, while this toy (e.g., Hex bugs) was one of the client's restricted interests, having the toy motivated him to play and extinguished motor stereotypies. The Hex bugs facilitated child-led play and parent acquisition of PRIDE skills. Over time, we were able to introduce other toys into the play with Hex bugs. Our client accepted some of the toys and rejected others. However, this provided many opportunities to praise for appropriate social behaviors (e.g., "Thank you for playing with a new toy," and "Thank you for telling me you do not like this toy").

In a recent clinical case, we worked with a 7-year-old boy who took a Winnie-the-Pooh doll with him everywhere. His mother was frustrated with this behavior but was unable to extinguish it. During CDI sessions, her son would hold the doll in one hand while building with the other hand, which often interfered with his building ability. We coached this mother to differentially reinforce her son when he put the doll down, "Thank you for building with both of your hands! Now you are making a very tall tower!" Over the course of CDI, the doll became less of an issue. During PDI, we taught her to give specific commands to put the doll down when it was interfering with play.

28.3.1.6 Coaching statements

When working with families with ASD, we have found that caregivers can become frustrated and fatigued by the extra work involved to engage their child in functional play and to use PRIDE skills. One way to maintain parent interest and involvement in treatment is to point out the dyad's progress through higher-order coaching statements. For example, statements like, "Your behavior descriptions are getting him to look up at you and make eye-contact," and "He's really making an effort to play with new toys this week!" Helping the parent acknowledge subtle changes in child social behaviors and connecting it back to their own behaviors can really impact a parent's self-confidence and satisfaction.

28.4 Lessons Learned from Parent-Directed Interaction

During the PDI phase, parents continue to reinforce their child's appropriate behaviors (e.g., labeled praise) while learning strategies to implement effective commands to increase compliance. Commands are considered effective when they are direct, positively stated, specific, and issued one at a time. Parents also learn how to implement specific consequences for noncompliance by following a structured time-out sequence that emphasizes consistency, predictability, and follow-through—which works well with children with ASD.

28.4.1 Tailoring and Adapting PDI Procedures for Children with ASD

28.4.1.1 Teaching Commands

In our clinical experience, children with high-function ASD and average language abilities are able to respond similarly to other PCIT clinical samples during the compliance training component of PCIT. Most children tend to understand direct commands and can follow them when they are simple (e.g., handing a non-preferred toy to the parent). As the commands increase in difficulty (e.g., handing a preferred toy with which they are playing), children typically require a warning or a time-out. We have found that children with ASD do not like to sit in the time-out chair and they typically will comply with direct commands to avoid the time-out chair. Some children who come to our clinic and present with ASD and comorbid attention-deficit/hyperactivity disorder tend to be a little more absorbed in their own activity/play than the average client; we have found it helpful to use the child's name to gain their attention before issuing a command (e.g., "Scott, hand me the blue block"). While the standard PCIT protocol discourages parents from saying their child's name prior to giving a direct command and classifies this as an indirect command, we have found this adaptation helpful for increasing child attention and compliance. Similarly, we have found that when working with children with ASD who like to complete things, it may be more difficult for them to comply with a direct command that prevents them from completing a goal-directed behavior (e.g., handing over the roof piece, when they are trying to complete a building). In fact, getting a child with ASD's attention when they are hyper-focused on a goal-directed behavior can be difficult. Using their name, gesture, or physical touch may be helpful in to garner their attention prior to giving a direct command.

More extensive adaptations to PDI procedures (e.g., teaching commands) may be required when working with children with ASD who exhibit significant developmental delays and/or substantial receptive language difficulties. In particular, a three-step prompting procedure with a "teaching phase" for direct commands may be used as described elsewhere (e.g., see Lesack et al., 2014 and Agazzi et al., in press). This procedure reduces the likelihood that children's noncompliance occurs because of receptive language difficulties. The sequential teaching phase for direct commands occurs prior to introducing the child to time-out for noncompliance. Specifically, the parent uses verbal, model, and physical prompting to teach a child the target response. The sequence begins with the delivery of a direct command by giving a verbal command combined with a gestural cue (e.g., "Scott, hand me the blue block," while pointing to the blue block and placing his/her hand out). If the child does not comply after 5 s, the parent models the requested action in addition to providing the verbal command (e.g., "Scott, hand me the blue block like this," while simultaneously imitating the requested action with the item). If after 5 s the child still does not comply, the parent issues a physical prompt along with the verbal command (e.g., "Scott, hand me the blue block like this," while gently guiding the child's hand to complete the requested action). Children receive a labeled praise for compliance after following the verbal or model prompts but not after the physical prompts. The teaching phase is considered mastered when a child complies with their parent's direct command on three consecutive occasions following the verbal or gestural prompts. After achieving mastery, children are introduced to the time-out procedure as a response to noncompliance.

28.4.1.2 Teaching Time-out

In addition, the time-out procedures used with children with ASD with delayed receptive and expressive language skills may need to be adapted. One possible adaptation to enhance comprehension, social communication, and interaction involves the implementation of visual supports. Visual supports might include the use of pictures, objects, and/or words. Visual supports can be used to improve parent-child communication during treatment, as PCIT heavily relies on parent verbal behaviors to improve behavioral functioning. They also provide children with a means to engage in effective communication with others. Visual supports have been used to improve task engagement, play skills, social interactions, transitions, and daily living skills for children with developmental disabilities (Dauphin, Kinney, & Stromer, 2004; Johnston, McDonnell, Nelson, & Magnavito, 2003; Pierce & Schreibman, 1994). Our research (e.g., Armstrong et al., 2015) examined the use of PCIT combined with visual supports for a 5-year-old girl with ASD, intellectual disability, and epilepsy. We utilized multiple visual supports including picture cards, a visual schedule, and a social story to ensure that the child understood her parent's expectations.

One potential adaptation that may be necessary is reducing the length of time that a child is required to sit in the time-out chair from 3 min and 5 quiet seconds to 1 min and 2 quiet seconds (Lesack et al., 2014). The purpose of this adaptation is to make the time-out procedure more developmentally appropriate while still ensuring that the time required remains long enough to constitute a meaningful consequence. In addition, another possible adaptation to time-out procedures involves the use of a time-out holding chair instead of a time-out room. This adaptation may be utilized to address concerns regarding safety, logistics, and efficacy. The use of a holding chair as a backup alternative to the time-out room has been demonstrated in previous PCIT research (Hembree-Kigin & McNeil, 1995). When utilizing the holding chair adaptation, a parent places their child in a second chair and uses physical guidance to ensure that the child remains in the holding chair for a designated period. The use of the time-out holding chair follows the flow of procedures outlined in the PCIT time-out flowchart. Specifically, if the child leaves the time-out chair prior to 1 min and 2 quiet seconds, the parent physically guides them to the holding chair and holds them there for 30 s and 2 quiet seconds, then moves the child back to the time-out chair. However, as discussed in Lesack and colleagues' work (Lesack et al., 2014), a holding chair should be used with caution and with clinical acumen. We have only used this procedure with two clients with ASD and we found this procedure to increase aggressive behavior, to the point that the caregivers gave up on the procedure. We were able to immediately convert to a time-out room procedure, which was successful with both children. The use of physical restraint may not be allowed in some clinical settings or acceptable to some families. Therefore, before using this procedure, we recommend clinicians consider all options and have a backup plan available. Another option that we have used in our clinic includes the use of a "swoop and go" procedure. This procedure involves instructing the child's parents to "swoop" up the toys and leave the room, bringing the toys with them. This is a modified version of the time-out room, is an accepted modification per the PCIT protocol, and has worked in our clinic when we did not have a separate room for time-out. For all our suggestions for clinical adaptations, see Table 28.1.

Although the procedures described above involve adapting standard PCIT procedures, all of the adaptations align with the main principals involved in the PDI phase of PCIT including: (a) motivate children to avoid time-out through the removal of social attention and desired activities, (b) identify a procedure that can be quickly applied for noncompliance, (c) create consistency by selecting a procedure that can be safely implemented multiple times per day, and (d) do not model inappropriate behaviors, such as spanking (Hembree-Kigin & McNeil, 1995; Lesack et al., 2014).

For children with ASD and severely aggressive behavior, we have found the need to slightly adapt time-out procedures in the home setting. For one child who was particularly aggressive, parents had to use his bedroom for the backup procedure and remove all items from the bedroom (e.g., ceiling fan, TV, electronics). This family had no

Table 28.1 PCIT Adaptations for Children with ASD

Adapted Procedures	Brief Description of Adaptations
CDI reflections	(a) Only reflect vocalizations with apparent and appropriate communicative intent followed by the word(s) associated with action(s) or item(s) (e.g. "bah, you said block"). (b) Ignore stereotypic vocalizations.
PDI direct commands	(a) Say the child's name as a prompting cue before giving a command. (b) Introduce target commands with three-step prompting (i.e., verbal, model, physical). (c) Use a gesture cue for commands (e.g., pointing). (d) Target commands must be complied with three consecutive times prior to introducing time-out.
PDI time-out	(a) Reduced time-out procedure from 3 min and 5 quiet seconds to 1 min and 2 quiet seconds. Time-out length increases with the child's successful sitting compliance. (b) Use of a holding chair for 30 s and 5 quiet seconds as a backup procedure instead of the time-out room.

Note. Information based on the Lesack et al. (2014) case study

other safe space in the home to utilize as a backup procedure. When the boy was in time-out room, he was destructive and risked injuring himself. For another child with severe destruction behaviors, parents were able to clear all contents from a large, well-lit walk-in closet and use this space safely for time-out. The parent held the door and remained directly outside of the door during the duration of the time-out room sequence. In severe cases like this one, extreme measures may be necessary to keep a child safe. This method proved to be the most ethical and safe option. Some alternatives include the use of a bathroom or a laundry room, which proved to be unsafe for the child and family, as the child frequently destroyed household appliances (e.g., faucets, knobs to turn water on/off, washer machine controls). In this situation, the mother was a single-mother on a limited budget and when her son broke appliances it caused her a tremendous amount of financial stress. The walk-in closet provided a safe, self-contained setting from which she was able to easily remove all breakable items. Further, the closet dimensions were comparable to those of many clinic-based time-out rooms.

28.4.1.3 Teaching House Rules

House rules should be simple, concrete, and developmentally appropriate when used with children with ASD. Our clinical experiences have taught us the importance of dedicating ample time to defining and explaining the inappropriate behavior that will land a child in an automatic time-out. For example, the parent might say, "You hurt the dog. I don't like it when you hurt the dog," each time the child uses rough hands with the dog. However, children with ASD and language delays may have trouble with understanding the concept of a house rule and remembering it over time. One adaptation that can be used to ensure that children understand the behavioral expectations is the use of visual supports such as picture cards and social stories. For example, the house rule along with a picture of the child following the house rule can be posted at the clinic and in the home environment. Social stories can also be used to teach children with ASD specific behavioral expectations. A social story uses pictures and words to describe situations that involve choices, highlight others' perspectives, suggest appropriate choices (e.g., following the house rule or not following the house rule), and illustrate positive and negative consequences for each choice. To reinforce the desired behavior, labeled praises for making good choices (i.e., following the house rule) should be embedded throughout the social story. Parents should be encouraged to read the social story to their child daily prior to implementing the house rule to ensure that the child understands the behavioral expectations.

28.4.1.4 Public Outings

In addition to the other strategies, using visual supports (e.g., social stories, visual schedules) may be helpful when preparing children for public outings during PDI. The use of a social story can portray the child on a public outing and, as described above, highlight his/her choices in the situation as well as the consequences of those choices (to be set by the parent). It is important to review the social story with the child daily prior to the public outing to ensure that the child understands the behavioral expectations. These social stories can also be helpful when attempting to generalize the behavioral expectations across other settings and public situations. We have used social stories to teach a child to participate in activities in a library setting, stay safe in a theme park, and to guide a child through the many steps involved in a visit to the doctor.

Similarly, a visual schedule that shows a sequence of events can also be helpful to teach children what they can expect of the outing and what is expected of them. These visual tools can be sized such that they are small enough to carry in hand and fit into the caregiver's purse or pocket during the outing. With this tool handy, the caregiver can easily access the visual tool during the outing, when needed, to reinforce an expectation.

28.5 Other Lessons Learned

In general, we have found that our families of children with ASD tend to have some of the highest stress levels, which is consistent with the literature on caregiver stress (Hayes & Watson, 2013). We know that in the general population, caregiver stress is related to ineffective parenting strategies coupled with challenging behavior issues. Taking some time to talk to caregivers about their stress is important in standard PCIT and especially in PCIT for children with ASD.

We have found some parents arrive at our clinic overwhelmed by the number of medical and therapy appointments their children have and confused about how to prioritize them. We dedicate some time to caregivers to explain different treatments, describe the core skills targeted by each treatment, and process what caregivers find important so caregivers can make informed decisions about how to prioritize therapies and minimize their family's time away from school, work, and other family duties. Parents may wish to postpone other therapies during PCIT treatment to have adequate time and energy to concentrate on CDI and PDI.

In our clinic setting, mothers have often been the predominant caregivers in treatment, although some fathers have participated. Mothers of children with ASD, especially those with multiple children, have chronic levels of stress that place them at high risk for internalizing problems like anxiety and depression. We have found the need to screen many mothers of children with ASD for symptoms of anxiety and depression, and refer them for their own mental-health treatment. While this is not the case for every caregiver of a child with ASD, clinicians should be mindful of caregiver stress and internalizing symptoms. Also, clinicians should be prepared to use screening tools or refer individuals out to access community resources.

In terms of treatment completion, anecdotally, we have not observed higher rates of attrition among families with children with ASD. On the contrary, we have found caregivers of children with ASD to be highly motivated to engage in treatment and compliant with homework and treatment expectations. In general, they have good attendance to weekly sessions and complete treatment at rates comparable to other clinical samples. As previously mentioned, we tend to work more with mothers, and encourage fathers or other caregivers to attend any treatment session when possible. We have also had grandparents, therapists, and teachers attend our PCIT sessions, which we found helpful for the generalization of skills to other settings.

Children with ASD often need academic and behavioral supports to function optimally in school. To support skills learned in the clinic and to increase generalization, PCIT therapists may reach out to a child's classroom teacher or school-based therapists (with parental consent of course!) in an effort to consult and collaborate. We are trained as school psychologists, and take the home-school-clinic collaboration very seriously. However, we have not encountered enthusiastic support from our local schools when trying to consult on child behaviors. Some schools have been receptive to PCIT teacher handouts but have been less interested in implementing some of the PCIT skills in the classroom. This is especially true when we discuss the implementation of the time-out procedure. For some of our clients with more severe aggression, we have found that PCIT decreases aggressive acts in the clinic and home settings, but these behaviors remain at pretreatment levels in the classroom due to operating consequences (e.g., child escapes math assignment when he throws his pencil at the teacher). Some schools have been open to having a graduate student clinician come into the classroom and conduct a functional behavioral assessment, but have not been as interested in implementing school-based behavioral plans, likely due to the time, staff, and resources needed to implement these plans. Despite this, we do believe it is critical to reach out to the school to facilitate communication and awareness about clinical treatment and goals. It is important that we find ways to work together. As we move forward in our work, we aim to improve collaboration among key caregivers, educators, and therapists to support client functioning and success across settings.

28.6 Conclusions

We are fortunate to work with many children and families with ASD in our PCIT clinic. We believe that PCIT offers these families a cost-effective and time-sensitive treatment to address noncompliance and aggression. PCIT may act as a gateway treatment for children with ASD and comorbid opposition problems to increase successful engagement in treatments that target core ASD symptoms.

Because PCIT emphasizes one-to-one interactions between the caregiver and the child by following the child's lead during play, the caregiver learns how to interact and play with the child in ways that promote attachment, increase prosocial skills, and improve communication abilities; these skills are then generalized to natural environments like the family's home and community. We have found that the core features of PCIT—positive reinforcement and differential attention—work exceptionally well for children with ASD. Finally, the consistency of expectations and consequences in PDI increases child compliance and decreases child behavior problems. PDI effectively opens the door for the child to learn more functional skills.

PCIT gives parents the tools to relate better to their child with ASD and to manage their challenging behaviors. The tools can improve parents' confidence in their parenting skills, decrease parenting stress, and allow for more positive parent-child interactions. Many families of children with ASD find it difficult to participate in activities in the community due to their child's unpredictable nature or extreme difficulty with trying something new. Activities other families may take for granted such as shopping for groceries, going to the library for story time, eating dinner in a restaurant, attending church, and even participating in extended family gatherings and holidays are frequently avoided by families of children with ASD. After completing PCIT, however, these activities become more feasible for these families due to their new skills.

Given the high prevalence of children now identified with ASD (1 in 59), evidence-based and effective interventions are essential (Centers for Disease Control and Prevention [CDC], 2018PCIT holds promise for these children as PCIT strategies increase engagement, improve social interaction and communication, address challenging behaviors, reduce parenting stress, and lead to improvements in the quality of life for children and their caregivers; PCIT strengthens families and leads to more positive outcomes for these children. Additionally, PCIT offers a structured, skills-based approach, is based upon principles of differential attention and consistent discipline methods, and has been supported by a body of scientific evidence for children with disruptive behaviors, developmental delays, and other challenging behavior issues. When necessary, PCIT can successfully be adapted to meet the unique needs of children with ASD to facilitate their understanding and communication during treatment. For example, adaptations such as prompting to teach commands, modifying the time-out procedure, or using visual supports may be necessary to ensure children with low receptive communication skills understand the procedures. However, we have found that the vast majority of children with ASD respond to the standard PCIT protocol. Therefore, the standard PCIT protocol should always be applied initially. Thus, while there is a need for further research on the effectiveness of PCIT for children with ASD, the current research points to promising results for these families. With greater findings, the present research team hopes the treatment can become more available for this population.

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29

PCIT for Children with Severe Behavior Problems and Autism Spectrum Disorder

Korrie Allen, John W. Harrington, and Cathy Cooke

Abstract

Several evidence-based therapies are available for children with disruptive behavior; however, few have been studied among children with ASD and co-occurring behavioral difficulties. The purpose of this chapter is to review the effectiveness of Parent-Child Interaction Therapy (PCIT) in reducing disruptive behaviors among school-age children (4–12 years) with ASD. Forty-four children were enrolled in the study: 19 in the control group and 25 in the PCIT treatment group. Participants in the intervention group received the manual-based PCIT treatment weekly (60–90 min) for approximately 14–16 weeks. Control group participants maintained community treatment for the duration of the study. Parent-reported and observational measures of child behavior and compliance, parental distress, and parental mental health were administered at baseline, interim treatment (10 weeks), and posttreatment (14 weeks). The results indicated that children in the treatment group demonstrated a significant reduction in disruptive behaviors and improvement in compliance compared to children in the control group. Exploratory analyses revealed a differential treatment response based on ASD severity. These results demonstrate that PCIT can be effectively translated to children with ASD and disruptive behavior.

Autism spectrum disorder (ASD) includes a continuum of neurodevelopmental disorders characterized by social deficits, communication impairments, and rigid, repetitive behaviors (American Psychiatric Association, 2000). The estimated incidence of ASD in the United States is 1 in every 88 children (1 in 54 for males and 1 in 252 for females; Centers for Disease Control and Prevention, 2012). This estimated prevalence rate represents an increase of 78% over the 2002 estimate of 1 in every 150 children (CDC, 2007), and an increase of 23% over the 2006 estimate of 1 in 110 children (CDC, 2009). Due to the steady increase over the past four decades (Newschaffer, Falb, & Gurney, 2005), ASD has become an urgent public health concern (CDC, 2009). Disruptive behaviors (e.g., aggression, tantrums, and self-injury) are commonly

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reported in children with ASD (2005; Bauminger, Solomon, & Rogers, 2010; Farmer & Aman, 2011a; Guttmann-Steinmetz, Gadow, & DeVincent, 2009; McClintock, Hall, & Oliver, 2003; Research Units of Pediatric Psychopharmacology, 2002) and represent one of the most common reasons for referral to pediatric and mental health clinics (Masse, McNeil, Wagner, & Chorney, 2007). The purpose of this chapter is to summarize the findings and practical implications of a 2 × 2 randomized clinical trial which evaluated the effectiveness of a behavioral treatment (Parent-Child Interaction Therapy; PCIT) to reduce disruptive behavior problems for school-aged children (4–12 years).

29.1 Rates of Disruptive Behavior and Autism Spectrum Disorder

The presence of clinically significant behavioral problems among children with ASD is widely acknowledged and cited; however, the exact prevalence is unknown due to the use of clinical samples in studies (Masse et al., 2007; Solomon, Ono, Timmer, & Goodlin-Jones, 2008) and inconsistent definitions of behavior problems. For example, Kanne and Mazurek (2011) reported that 68% of children and adolescents with ASD exhibited aggressive behavior to a caregiver. In contrast, studies conducted by Matson, Wilkins, and Macken (2009) and Jang, Dixon, Tarbox, and Granpeesheh (2011) concluded that 94% of study participants with ASD showed some form of challenging behavior as measured by the Autism Spectrum Disorder—Behavior Problems for Children (ASD-BPC; Jang et al., 2011). This assessment, however, includes repetitive and stereotypic behaviors, which are trademark symptoms of ASD and would apply to most individuals with ASD. Comparative community samples of children without ASD have reported that only 1.8–8.7% of these children display conduct problems, therefore making them two to ten times less likely than their ASD peers to experience difficulties (Esser, Schmidt, & Woerner, 1990; Jacobs, Becker-Weidman, Reinecke, & Jordan, 2010; Kashani et al., 1987; Kashani et al., 1987). The prevalence of disruptive problems in children with ASD is significantly higher than the general population (Brereton, Tonge, & Einfeld, 2006; Gadow, DeVincent, Pomeroy, & Azizian, 2005; Solomon et al., 2008).

29.2 Impact of Disruptive Behaviors

Behavior problems present barriers to learning and can result in reduced educational, social, and community opportunities as well as further delayed development (Horner, Carr, Strain, Todd, & Reed, 2002; Horner, Diemer, & Brazeau, 1992; Reichle, 1990; Solomon et al., 2008). Children with ASD and behavior problems often have difficulties enrolling and remaining in schools (Chalfant, Rapee, & Caroll, 2007; Kanne & Mazurek, 2011). Aggressive behaviors also cause risk for physical harm, reduce quality of life, and are the greatest predictor of parental stress (Baker, Blacher, Crnic, & Edelbrock, 2002; Kanne & Mazurek, 2011). Failure to address behavioral problems in children with ASD during early- to mid-childhood allows these behaviors to become established. Without intervention, problem behaviors are unlikely to ameliorate (Horner et al., 2002; Oliver, Murphy, & Corbett, 1987; Rojahn, 1994). The presence of behavioral problems among children with ASD impedes developmental progress and the acquisition of key skills emphasized by early intensive behavioral interventions (Jang et al., 2011). When behavioral problems are addressed and decreased, children with ASD are more likely to comply with intensive and focused therapies targeted at improving core ASD deficits (Masse et al., 2007).

29.3 Treatment for Children with ASD and Disruptive Behaviors

29.3.1 Pharmacological Treatments

Several recent studies have established the short-term efficacy of antipsychotic medications (i.e., risperidone and aripiprazole) in the treatment of the acute symptoms of aggressive behaviors among children with ASD (2005; Farmer & Aman, 2011a; 2011b; RUPP, 2002; Volkmar, 2001). In addition, two recent studies examined the effectiveness of a combined medication plus parent training approach in treating children with ASD and challenging behavior (Aman et al., 2009; Frazier et al., 2010). In both studies, the greatest reduction in aggressive behaviors was reported in the combined treatment group when compared to medication alone. However, these studies did not examine the effectiveness of a behavior intervention alone. This complicates the interpretation of the relative benefits of each treatment and the delineation of specific benefits, which may be present only when behavior management treatments are provided in the absence of medication. It is impossible to determine if the combination of treatments is synergistic or the same as one of the modalities used alone.

29.3.2 Behavioral Treatments

There are numerous established behavioral and educational therapies and treatments available for children with ASD. These include Applied Behavioral Analysis (ABA), the UCLA Young Autism Project, Pivotal Response Training (PRT), Positive Behavior Support (PBS), the TEACCH Method, and DIR/Floortime. The reader is referred to Chap. 3 for a complete review. These therapies employ a number of techniques to increase socially appropriate behaviors; decrease challenging behaviors; and improve language, social, and behavioral deficits in children with ASD. However, these therapies often require cooperative behavior from the child, which is problematic for children exhibiting oppositional behavior.

29.4 Relationship Between Oppositional Defiant Disorder and ASD

Occurring in about 1–16% of the general population, oppositional defiant disorder (ODD) is characterized by patterns of hostile and defiant behavior toward adults and other authority figures over a period of at least 6 months (American Academy of Child and Adolescent Psychiatry, 2007; Loeber, Burke, Lahey, Winters, & Zera, 2000). Studies conducted within the ASD population have found that ODD is frequently diagnosed among clinically referred samples of school-age children with Asperger syndrome and high-functioning autism (Solomon et al., 2008). Preschool-age children with ASD in outpatient settings also exhibit clinically significant oppositional behavior (Gadow, DeVincent, Pomeroy, & Azizan, 2004; Solomon et al., 2008). Furthermore, the problem behaviors described as typical for children with ASD correspond with those described for typically developing children with ODD. Both include aggression, tantrums, hostility, and defiant behavior.

29.4.1 Rationale for Utilization of ODD Treatment

Due to the similarities between the behavioral problems exhibited by children with ASD and those displayed by typically developing children with ODD, it is appropriate to identify evidence-based treatments for ODD that could be translated to an ASD population for the treatment of behavioral problems.

There are a number of evidence-based treatments already in use for the treatment of ODD among typically developing children including individual approaches with a focus on problem-solving skills and parent management training (American Academy of Child and Adolescent Psychiatry, 2007). The parent management interventions adhere to four main principles: (1) reduce positive reinforcement for negative or disruptive behaviors, (2) increase positive reinforcement for appropriate behaviors, (3) establish consequences for punishment for negative or disruptive behaviors, and (4) provide consistent, predictable responses to behaviors (American Academy of Child and Adolescent Psychiatry, 2007). Furthermore, most treatments involve a variation on Hanf's (1969) two-stage behavioral treatment model (Brestan & Eyberg, 1998; Eyberg, Boggs, & Algina, 1995; Hamilton

& MacQuiddy, 1984; McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991; Peed, Roberts, & Forehand, 1977; Wells & Egan, 1988; Zangwill, 1983). One example of an effective treatment containing the abovementioned components includes PCIT. Moreover, PCIT has been demonstrated efficacious in over 150 studies.

29.4.2 Parent-Child Interaction Therapy

PCIT has been proven effective for children with conduct problems and oppositional behaviors by demonstrating clinically significant improvements in the interactional style of parents and in the behavior problems of children in home and school (Brestan & Eyberg, 1998; Chase & Eyberg, 2008; Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg & Boggs, 1989). Although PCIT is not typically conducted with children with ASD, the treatment has been proven effective among children with disruptive behaviors and comorbid developmental and intellectual disabilities (Bagner & Eyberg, 2007; Berkovits, O'Brien, Carter, & Eyberg, 2010; Chase & Eyberg, 2008; Schuhmann, Foote, Eyberg, Boggs, & Algina, 1998; Solomon et al., 2008). In turn, researchers are starting to find that PCIT studies conducted with ASD populations are also yielding similar success rates. Solomon et al. (2008) concluded that PCIT was effective in reducing oppositional behaviors among children ages 5–12 with high-functioning ASD. Masse et al. (2007) reported that based on clinical experience, PCIT could possibly serve as a gateway therapy for more intensive treatments. PCIT may therefore serve as a first-line treatment to prepare ASD children for responding to therapies focused on building core ASD deficits (e.g., occupational therapy, speech therapy).

29.5 Purpose and Hypotheses

The purpose of this study was to evaluate the effectiveness of PCIT in reducing oppositional behaviors among school-age children (4–12 years) with ASD. This study built upon Solomon et al.'s (2008) research by including children with varying levels of ASD (rather than limiting enrollment to children with high-functioning ASD). The study included three hypotheses: (1) PCIT would result in a significant decrease in parent-reported disruptive behaviors; (2) parent and child interactions (child compliance rates and parenting skills) would significantly improve over the course of PCIT; and (3) PCIT would result in significant improvements in parental practices, parent efficacy, and parent mental health (stress). This study also assessed parental satisfaction with PCIT.

29.6 Overview of Method

29.6.1 Participants

The study sample consisted of diverse families from southeastern Virginia. Fifty-four female and eight male caregivers and their 4- to 12-year-old children ($n = 44$) participated in the study. Although eight fathers participated in treatment, the primary caregivers in all enrolled families were the mothers; therefore, the study's analyses only included information from the mother. Children who participated in the study were mostly boys (86%) with a mean age of 7.18 years (SD = 1.72). To be included in the study, children had to be diagnosed with ASD by a health professional, demonstrate at-risk or clinically significant externalizing behaviors (T-score ≥ 60), and obtain a receptive language age equivalent of 2 years or higher.

29.6.2 Research

The study design followed a stepwise model for conducting psychosocial interventions for ASD, as outlined by Smith et al. (2007) and in accordance with the guidelines adopted by the National Institute of Mental Health (NIMH). This research design adheres to the recommendation that when applying PCIT to a new population, it should first be empirically tested in its standard form to determine its efficacy before any modifications are made to the model (McCabe, Yeh, Garland, Lau, & Chavez, 2005). Thus, our study evaluated the efficacy of PCIT in its original form for school-age children with ASD and behavioral problems.

29.6.3 Procedure

Upon completing the screening assessment, children were stratified based on psychiatric medication use; matched on age, severity of autism, and externalizing behaviors; and then randomly assigned to the control or intervention group. Enrolled families then completed a pretreatment assessment (Time 1) that included parental report questionnaires and parent-child observations, which were videotaped and coded by research personnel.

Approximately 10–12 weeks after the Time 1 assessment, all treatment and control families were scheduled to complete an interim treatment assessment (Time 2). This interim assessment marked the transition from CDI to PDI for treatment families. The Time 3 assessment occurred posttreatment. The Time 2 and Time 3 assessments included the same measures of parent and child functioning as completed at Time 1. Families in the treatment group also completed the Therapy Attitude Inventory.

29.6.4 Screening and Inclusion Measures

Several measures were used to screen children for study inclusion and matching criteria. These are described below.

29.6.4.1 Peabody Picture Vocabulary Test, Fourth Edition (PPVT-IV)

The PPVT-IV (Dunn & Dunn, 2007) is an individually administered, untimed, norm-referenced, wide-range test designed for children and adults ages 2.6–90+ years that assesses receptive vocabulary and verbal ability. The PPVT-IV has measures of reliability in the 0.90s and validity studies indicate it is sensitive enough to identify language-delayed students. The PPVT-IV was used in this study to assess the receptive vocabulary of children to determine if they met participation criteria of a receptive language score equivalent to a 2-year-old or higher.

29.6.4.2 Behavior Assessment Scale for Children-Second Edition (BASC-2)

The BASC-2 (Reynolds & Kamphaus, 1992) was designed to aid in the identification and differential diagnosis of emotional/behavioral disorders in children and adolescents based on a 4-point Likert-scale ranging from “never” to “always.” The normative sample obtained internal reliabilities using alpha coefficients of 0.80–0.90. The BASC-2 Parent Rating Scale (PRS) was administered to parents to assess externalizing, internalizing, and adaptive behaviors. Potential participants had to receive an at-risk score (T-score ≥ 60) or higher on externalizing behavior problems to meet eligibility criteria.

29.6.4.3 Childhood Autism Rating Scale, Second Edition (CARS-2)

The CARS-2 (Schopler, Reichler, & DeVellis, 1980) is used to identify children with autism and distinguish them from those with developmental disabilities. It is empirically validated and provides concise, objective, and quantifiable ratings based on direct behavioral observation. The CARS-2 includes three forms: two 15-item rating scales completed by a clinician (one standard scale and one scale for high-functioning children) and one questionnaire for parents or caregivers. The standard form (SF) and high-functioning form (HF) total scores have inter-rater reliability estimates of 0.71 and 0.96, respectively. Internal consistency reliability is estimated at 0.93 for the SF and 0.96 for the HF. Each of the rating forms asks about 15 areas of behavior defined by a unique rating system developed to assist in identifying individuals with ASD and distinguishing them from individuals with other diagnoses. These measures were used to confirm ASD diagnosis and determine severity.

29.6.4.4 Clinical Intake Questionnaire

The Clinical Intake Questionnaire is a self-administered survey designed to capture basic background and sociodemographic information, affected child's developmental history, use of services/therapies, and medication status.

29.7 Outcome Measures of Child and Parent Functioning

All outcome measures of child and parent functioning were administered at each of the three assessment periods to all families in the treatment and control groups. In addition, two of the measures, as noted below, were administered weekly to TG families. Primary outcome measures included two parent-reported assessments of child problem behaviors and an observational measure of parent-child interactions. Secondary outcome measures included assessments of parenting stress, practices, locus of control, and an assessment of parent depression.

29.7.1 Eyberg Child Behavior Inventory (ECBI)

The ECBI (Eyberg & Boggs, 1989) is a 36-item parent-report measure of disruptive behavior and includes two scales: Intensity and Problem. The Intensity scale measures the frequency with which disruptive behavior occurs using a 7-point Likert-type scale (1 = never to 7 = always). The Problem scale includes "yes" or "no" responses and measures how problematic the child's behavior is for the parent. The Intensity and Problem scales yield test-retest reliability coefficients of 0.80 and 0.85 across 12 weeks, respectively, and 0.75 across 10 months. The ECBI was administered weekly to PCIT families.

29.7.2 Behavior Assessment Scale for Children-Second Edition (BASC-2)

The BASC-2, which was described as a screening measure, was also used as an outcome measure.

29.7.3 Parent Stress Index-Short Form (PSI-SF)

The PSI-SF (Abidin, 1995) is a 36-item self-report measure of stress in the parent-child dyad. It provides a Total Stress (TS) score and also has four subscales: Parental Distress (PD), Parent-Child Dysfunctional Interaction (P-CDI), Difficult Child (DC), and Defensive Responding (DR). The PSI-SF utilizes a 5 point Likert-type scale ranging from Strongly Agree to Strongly Disagree. Test-retest reliabilities are reported as 0.84 for TS, 0.85 for PD, 0.68 for P-CDI, and 0.79 for DC. Internal consistency measures (Cronbach's alpha) are 0.91 for TS, 0.87 for PD, 0.80 for P-CDI, and 0.85 for DC.

29.7.4 Alabama Parenting Questionnaire (APQ)

The APQ (Frick, 1991) is a 42-item self-report instrument designed to assess specific parenting behaviors that could be linked to child behavior problems. The items are rated on a 5-point frequency scale (1 = Never, 2 = Almost Never, 3 = Sometimes, 4 = Often, and 5 = Always), to represent the typical frequency of occurrence in the home. The internal reliability (Cronbach's alpha) for the five subscales were as follows: Involvement (0.76), Positive Parenting (0.89), Poor Monitoring/Supervision (0.21), Inconsistent Discipline (0.76), and Corporal Punishment (0.44; Shelton, Frick, & Wootton, 1996). Only the nine items for the Positive Parenting subscale were administered to parents.

29.7.5 Parenting Locus of Control—Short Form (PLOC-SF)

The PLOC-SF (Campis, Lyman, & Prentice-Dunn, 1986) is a 25-item self-report questionnaire that measures the degree to which parents feel in control of their child's behavior. For each item, respondents choose from a 5-point Likert-type scale from Strongly Disagree to Strongly Agree. Werba et al. (2000) reported a Cronbach's alpha of 0.79 and established convergent and discriminant validity for the PLOC-SF.

29.7.6 Beck Depression Inventory (BDI-II)

The BDI-II (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item self-report measure for assessing the intensity of depression in persons 13 through 80 years of age. Respondents are asked to consider how they have been feeling over the last 2 weeks and respond to specific items about depression-related symptoms on a scale from 0 to 3, with zero being no experience of the associated symptom and three representing significant experience of the associated symptom. Higher scores on the BDI-II indicate greater severity of depression. The BDI-II has excellent clinical sensitivity. The reliability of the BDI-II is high (coefficient alpha = 0.92).

29.7.7 Dyadic Parent-Child Interaction Coding System (DPICS)

The DPICS (Eyberg, Nelson, Duke, & Boggs, 2004) is a behavioral observation coding system that measures the quality of parent-child interaction during three 5-min standard situations that vary in the degree of parental control. The three situations included are child-led play (CLP; low parental demand), parent-led play (PLP; medium parental demand) and cleanup (CU; high parental demand). The observers tally the use of relationship-building skills taught in PCIT: descriptions of the child's appropriate behaviors, reflections of the child's appropriate verbalizations, and labeled praises of the child. Researchers received extensive (40 h) data collection training to ensure they applied the same observation and recording procedures to ensure reliability. Throughout the study, two researchers independently observed the same individuals for at least 20% of all sessions and maintained a 0.85 inter-rater reliability. The DPICS was administered weekly to the PCIT families.

29.7.8 Measure of Treatment Satisfaction

29.7.8.1 Therapy Attitude Inventory (TAI)

The TAI (Eyberg, 1993) is a ten-item consumer satisfaction measure addressing the impact of parent training skills on such areas as confidence in discipline skills, quality of parent-child interaction, the child's behavior, and overall family adjustment. Parents are asked to rate each item on a 5-point scale from 1 (dissatisfaction with the treatment or worsening of problems) to 5 (maximum satisfaction with treatment or improvement of problems). The TAI was administered at Time 2 and Time 3 assessments to PCIT families only.

29.7.9 Treatment

PCIT sessions were conducted once a week and lasted 60–90 min each. The treatment manual (Eyberg & Funderburk, 2010) provides session outlines in checklist form that were followed to ensure fidelity. Each family was seen by a clinical psychologist. In PCIT, parents are taught skills to establish a nurturing and secure relationship with their child to increase their child's pro-social behavior and decrease negative behavior. Treatment progresses through two phases. The first phase, Child-Directed Interaction (CDI) focuses on enhancing the parent-child relationship and increasing positive parenting. The second phase, Parent-Directed Interaction (PDI), focuses on improving parents' ability to set limits and follow through consistently to reduce child noncompliance and disruptive behavior. In both phases of treatment, therapists actively coach parents toward mastery of the interaction skills as assessed during a 5-min parent-child observation at the start of the session. Parents must master the CDI "Do" Skills (behavioral descriptions, reflections, and labeled praise) and avoid the CDI "Don't" Skills (questions, commands, and criticism), before moving to PDI. The average CDI period lasted 6.5 sessions prior to CDI mastery, and the average PDI period lasted 6.1 sessions prior to graduation. Throughout treatment, parents were asked to practice the skills at home daily in 5–10 min sessions, initially focusing on CDI skills and then incorporating PDI skills at times when a command was necessary.

The therapists included a licensed clinical psychologist and a supervised post-doctoral clinical psychology fellow, each of whom attended a 40-h PCIT Training conducted by a team of Master Parent-Child Interaction Trainers. All therapy sessions were videotaped and checked for integrity using the treatment manual checklist. In addition, supervision from a Master PCIT trainer was received as needed.

29.7.10 Findings

This study provides preliminary empirical support for the use of PCIT among children with ASD and behavior problems (see Table 29.1). Following treatment, all parents reported that their child's behavior was within normal limits compared to the control group (in which 79% of children continued to exhibit clinically significant behavior problems). The rate of compliance to parental commands was also greater for children in the treatment group. Parents found PCIT to be an effective and satisfactory treatment that led to improvements in their child's behaviors and their overall relationship with their child.

Families in the treatment group demonstrated a significant decline in child problem behaviors at the completion of CDI, and this decline continued through the completion of PDI. Children in the treatment group showed a statistically significant decrease in child problem behaviors at posttreatment, whereas this decrease was not present in the control group (as measured using the ECBI; Eyberg & Pincus, 1999; see Fig. 29.1). In addition, children in the treatment group showed a significant decrease in problem behavior intensity at completion of CDI and posttreatment. Furthermore, from pre- to posttreatment, treatment families reported significant improvement in the quality of their interaction with their children, used significantly more relationship-building skills, and obtained significantly more compliance from their children when giving them commands, compared to the control group (see Fig. 29.2). This finding is in contrast to the results of the Solomon et al. (2008) study, which did not report significant improvement in problem behaviors.

The overall quality of the parent-child relationship significantly improved as well. Parents completing PCIT demonstrated a significant increase in their ability to pay differential attention to their children's behaviors through describing their children's actions, reflecting their words, and giving them labeled praises for appropriate behaviors. Parents in the treatment group also demonstrated a significant reduction in the use of commands, questions, and criticisms when interacting with their children. Importantly, parents improved significantly in their ability to give effective commands to their children, resulting in significantly higher rates of child compliance and lower rates of parent-child conflict.

Families found PCIT to be an effective and satisfactory treatment for their children's behavior problems. Over 90% of the families participating in PCIT reported satisfaction with the process and outcome of treatment. Furthermore, over 85% felt it improved their parenting skills, their child's behavior, and the overall functioning of their family. In addition, parents in the treatment group experienced a significant reduction is stress.

29.8 Discussion

PCIT was used in its original form with only tailoring, as suggested by Sheila Eyberg (2005), to meet the needs of individual families. The theoretical and empirical foundation of PCIT was maintained, along with its core defining features. This demonstrated the effectiveness of traditional PCIT for improving the disruptive behavior problems of children with ASD and supported McDiarmid and Bagner's (2005) posit that PCIT can be effective with children with developmental delays without significant changes. To determine whether the treatment gains demonstrated by families completing PCIT would be maintained, follow up data was collected 3 months after treatment completion of the reported study. The results of these data will be reported in future publications.

Table 29.1 Outcome measures

Measure	Group	Pretreatment		Interim		Posttreatment		Pre-to-post Δ		/d^{a}/	*df*	*F*(*P*)
		M	SD	*M*	SD	*M*	SD	*M*	SD			
ECBI-Intensity	CG	153.6	22.7	142.6	27.94	139.0	25.5	−16.2	18.8	2.04	40	38.18 (<0.001)
	TG	158.7	25.8	114.5	33.3	91.1	27.8	−68.5	32.1			
ECBI-Problems	CG	19.6	4.96	17.4	7.79	14.6	8.20	−4.27	4.62	1.09	40	10.51 (0.002)
	TG	20.2	7.18	12.2	8.25	7.81	8.60	−12.91	10.27			
BASC-externalizing problems	CG	73.2	11.5	65.2	11.0	65.6	11.7	−5.42	6.28	1.52	39	22.88 (<0.001)
	TG	74.8	11.1	63.9	10.2	60.2	8.14	−16.86	8.63			
DPICS “Do” Behaviors	CG	3.59	3.02	4.56	3.48	4.68	3.47	1.35	3.59	3.30	40	94.31 (<0.001)
	TG	5.20	3.95	26.88	12.29	35.52	12.35	30.32	11.89			
DPICS “Don’t” Behaviors	CG	19.47	15.55	21.22	9.25	21.53	12.56	2.82	9.46	2.17	40	47.20 (<0.001)
	TG	19.8	9.29	4.25	7.81	1.56	2.52	−18.24	9.94			
DPICS PDP Compliance	CG	0.474	0.270	0.384	0.286	0.471	0.230	−0.021	0.169	1.87	39	32.25 (<0.001)
	TG	0.335	0.195	0.332	0.238	0.727	0.209	0.393	0.264			
DPICS Cleanup Compliance	CG	0.555	0.245	0.594	0.249	0.505	0.135	−0.054	0.224	0.98	40	8.85 (0.005)
	TG	0.465	0.285	0.390	0.236	0.731	0.315	0.266	0.403			
APQ Positive Parenting	CG	83.0	67.6	80.0	62.1	80.4	59.4	−9.22	16.2	0.56	40	2.93 (0.095)
	TG	92.2	72.4	68.0	51.7	57.3	43.3	−27.5	42.9			
APQ Corporal Punishment	CG	11.0	8.59	10.4	8.03	8.84	7.44	−3.00	4.16	0.41	40	1.58 (0.217)
	TG	12.1	10.7	7.57	6.61	5.21	6.54	−6.38	10.8			
Parenting Stress Total	CG	114.4	21.6	114.5	19.1	109.7	22.1	−8.81	15.59	0.82	39	5.95 (0.019)
	TG	122.7	23.1	109.3	23.2	96.6	28.2	−27.7	28.22			
Beck Depression Inventory	CG	11.0	5.39	9.11	8.00	7.00	6.63	−4.33	3.91	0.42	41	1.64 (0.208)
	TG	15.3	7.57	11.8	9.46	8.16	8.19	−7.16	8.74			
Parenting Locus of Control	CG	49.5	10.3	48.1	10.4	47.2	11.6	−4.00	8.70	0.57	41	3.40 (0.072)
	TG	52.3	7.78	48.0	10.0	44.2	8.98	−8.92	8.59			

Notes: ECBI Eyberg Child Behavior Inventory; *BASC* Behavioral Assessment System for Children; *DPICS* Dyadic Parent-Child Interaction Coding System. *DPICS “Do” Behaviors* behavior descriptions, reflections, and labeled praise; *DPICS “Don’t” Behaviors* questions, commands, and criticism; *APQ* Alabama Parenting Questionnaire

Effect sizes of $d > 0.80$ are considered large

[a] Effects of $d > 0.80$ are considered large

Fig. 29.1 Change in ECBI intensity. Change in frequency of child's behavior problems from pretreatment to posttreatment based on the parent-completed Eyberg Child Behavior Inventory (ECBI). Clinical cut-off score is 130. Wilk's λ (2, 39) = 47.28; $p < 0.001$; Partial $\eta^2 = 0.48$

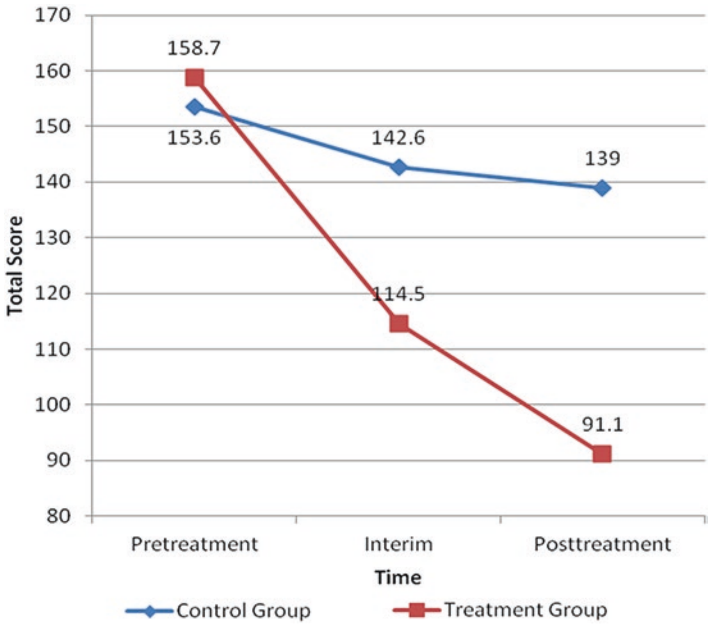
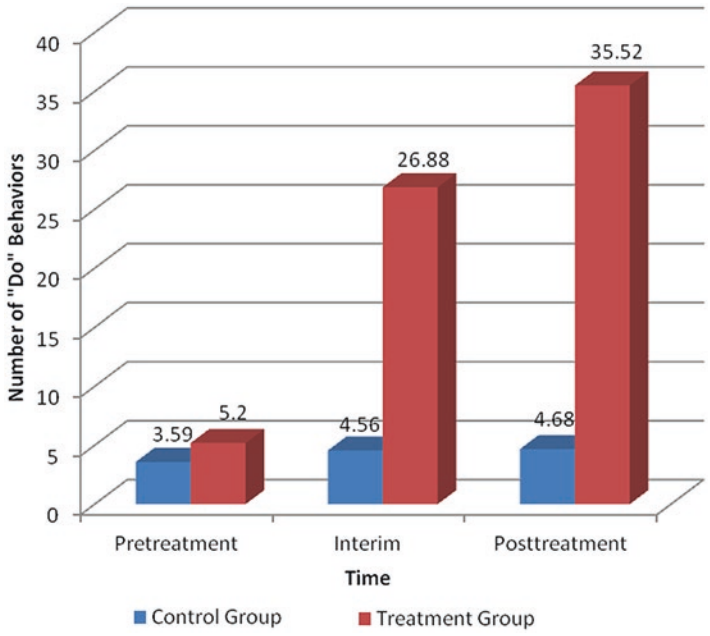


Fig. 29.2 DPICS "Do" behaviors. *DPICS* Dyadic Parent-Child Interaction Coding System. Wilk's λ (2, 37) = 4.67; $p < 0.016$; Partial $\eta^2 = 0.20$



Although attrition in child therapy has been identified as a substantial problem (Kazdin, 1996), no families in this study dropped out of treatment. This demonstrates the need for therapies designed to reduce disruptive behavior problems among children with ASD. This study demonstrated that PCIT decreased behavioral problems, improved compliance, and improved parent-child relationships. Furthermore, the severity of a child's autism may have determined which phase of treatment was most effective. It is possible that additional research may uncover that specific treatment plans utilizing components of PCIT are effective in aiding the unique needs of each child with ASD coming in for treatment.

29.9 Implications for Research, Policy, and Practice

The majority of studies evaluating the impact of autism treatment approaches were conducted with middle- to upper-middle-class families with an estimated annual treatment cost ranging from $25,000 to $60,000 per child and requiring up to 25 h of services a week (Solomon, Necheles, French, & Bruckman, 2007). There is a lack of both treatment availability and family financial resources for most families in many parts of the country. This study demonstrates that PCIT offers an innovative approach to delivering an evidence-based therapy to an underserved population. Benefits are: (a) a family-based approach that addresses family dynamics and works to build parents' and other adult caregivers' capacity to manage ASD-related behaviors at home, (b) a time-limited model that maximizes the translation of direct contact with providers into opportunities for intervention at home, and (c) a treatment model that can be disseminated through professional communication and training of new therapists. Moreover, since very few studies of behavioral treatment of ASD have employed an experimental design (2 of 68 studies per a 2001 meta-analysis; Lord & McGee, 2001), the use of a controlled randomized design for this study addresses a significant gap in the research for this treatment and population.

Treatment research for children with ASD has primarily focused on the benefits of early intensive behavioral intervention (e.g., McEachin, Smith, & Lovaas, 1993; Rogers & Vismara, 2008). Many children receive some form of intensive behavioral training after receiving their diagnosis between the ages of 3 and 4; by age 5, the treatment options begin to significantly decrease. However, the large majority of children continue to experience language, social, and behavioral difficulties throughout their school years. A recent review (Solomon et al., 2008) concluded that children with autism are significantly at risk for problematic behaviors which, without intervention, are more likely to worsen than improve. Despite this problem, our understanding of effective behavioral treatment of school-age children with ASD is limited. This study provides important empirical support for the use of PCIT with these children.

Although this study did not measure non-disruptive behaviors of autism, such as self-stimulation, eye contact, language, and social engagement, positive changes in these behaviors were both observed by therapists and reported by parents and teachers. Future research should quantitatively examine these behaviors to determine if PCIT might be expanded from an intervention to decrease disruptive behaviors to a therapeutic intervention for improving the social skills of children with autism.

This study demonstrated the effectiveness of PCIT among children with ASD and behavioral problems; however, further evaluation is needed to confirm these results and explore modifying PCIT to solicit the greatest positive impact on children's behaviors. As PCIT did not significantly decrease parent depression, future studies should explore ways to improve these measures of parent functioning, possibly through the addition of a parent psycho-education/treatment module or referral for individual parental therapy. A larger sample size would allow for a more thorough analysis of other possible correlates, such as age and gender. Future research should include an evaluation of parental coping strategies; moreover, clinical interventions may need to include a psycho-educational module for parents on how to cope with the stress of raising a child with ASD.

PCIT can effectively prepare children for other intense and focused ASD therapies requiring cooperation and attention. Children with ASD and disruptive behaviors cannot take advantage of needed therapies (e.g., speech, occupational therapy) when behavioral problems limit their ability to engage in the therapeutic process. PCIT has been proven effective for improving behavioral problems in typically developing children (Bagner & Eyberg, 2007; Berkovits et al., 2010; Chase & Eyberg, 2008) with effects lasting up to 2 years (Boggs et al., 2004).

Based on the results of this study, PCIT should be considered a viable treatment for children with ASD and behavioral problems. Parents were satisfied with their experience with PCIT and reported significant improvement in child behavior, compliance, and parent-child interactions. Adaptations to traditional PCIT, based on the child's severity of ASD, may make the treatment even more efficacious for children on the autism spectrum. This study also expands the limited research on PCIT among children with autism by improving the generalizability to children of varying autism severity.

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Internet-Delivered Parent-Child Interaction Therapy (I-PCIT) for Children with Autism Spectrum Disorder: Rationale, Considerations, and Lessons Learned

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Abstract

Despite the efficacy of Parent-Child Interaction Therapy (PCIT) for young children with autism spectrum disorder (ASD), problems with accessibility, availability, and acceptability have historically undermined the broad reach of this valuable intervention. For families of children with ASD, the extent of unmet health care needs is especially concerning—roughly one-third of children with ASD experience problems accessing quality care. Harnessing technology to reach families in their homes not only increases the accessibility of quality treatment, but can also offer additional benefits, such as maximizing the generalizability of care by treating families in their natural settings. In this chapter, we provide an overview of the rationale, considerations, and state of the research for utilizing Internet-delivered PCIT (I-PCIT), with a focus on the treatment of children with ASD. We provide a case illustration and conclude with a summary of lessons learned and future directions for I-PCIT for children with ASD.

Externalizing behavior problems typically manifest early in life and are the most common reason for referral to child mental health services (American Psychological Association [APA], 2000, 2013; Kazdin, 2003; Keenan & Wakschlag, 2000). For children with autism spectrum disorder (ASD), the prevalence of externalizing behavior problems is particularly high, with approximately one in four children with ASD meeting diagnostic criteria for a disruptive behavior disorder (DBD; Kaat & Lecavalier, 2013). Furthermore, behavior problems in children with ASD are significantly related to higher levels of caregiver stress and psychological distress (Estes et al., 2009), which can contribute to negative parent-child interactions (Baker et al., 2003; Baker, Blacher, Crnic, & Edelbrock, 2002; Eisenhower, Baker, & Blacher, 2005). Given the immense and compounded burden of externalizing behavior problems in children with ASD, early and effective intervention is imperative.

For the treatment of externalizing behavior problems in young children, parent training is recommended as a frontline approach (Comer, Chow, Chan, Cooper-Vince, & Wilson, 2013; Eyberg, Nelson, & Boggs, 2008; Kaminski & Claussen, 2017). Parent-Child Interaction Therapy (PCIT) is among the most supported

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parent-training interventions for externalizing behavior problems (Thomas & Zimmer-Gembeck, 2007). Empirical work investigating the application of PCIT for families of young children with special needs demonstrated that PCIT is effective in reducing externalizing behavior problems in children with intellectual disability (Bagner & Eyberg, 2007), children born premature (Bagner, Sheinkopf, Vohr, & Lester, 2010), and children with ASD (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Lesack, Bearss, Celano, & Sharp, 2014; Masse, McNeil, Wagner, & Quetsch, 2016; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). PCIT has also been shown to lead to positive outcomes for caregivers of children with special needs, including significant increases in positive parenting practices and shared positive affect during parent-child interactions (Bagner & Eyberg, 2007; Solomon et al., 2008). Given the large effect sizes of PCIT in these studies, access to PCIT services can provide families of children with ASD and externalizing behavior problems tremendous relief and benefit.

Despite the great promise and efficacy of PCIT, particularly for young children with ASD, problems with accessibility, availability, and acceptability have historically undermined the broad reach of this valuable intervention (Comer & Barlow, 2014). Importantly, problems of limited treatment accessibility are not specific to PCIT and affect most evidence-based treatments (McHugh & Barlow, 2010). According to the National Health and Nutrition Examination Survey conducted by the Centers for Disease Control and Prevention, roughly 50% of children with mental disorders do not receive mental health care in a given year (CDC, 2013). For families of children with ASD, the percentage of unmet health care needs is especially concerning—roughly one-third of children with ASD experience problems accessing quality care, compared to 20% of children with other types of special health care needs (Chiri & Warfield, 2012; Krauss, Gulley, Sciegaj, & Wells, 2003). Logistical and perceived barriers deter many families from accessing mental health treatment, despite the overwhelming need for services.

While the development of large-scale dissemination and implementation efforts may expand the reach and impact of mental health services broadly, need for specialty care remains critical for many families (Comer & Barlow, 2014). In particular, children with ASD and co-occurring externalizing behavior problems require providers with a unique expertise, further highlighting the need for innovative treatment formats that can transcend traditional barriers to care. Fortunately, recent advances in the use of technology have helped to broaden access to expert and specialized care (Comer, 2015; Hilty et al., 2013). Harnessing technology to reach families in their homes not only increases the accessibility of quality treatment, but can also offer additional benefits, such as maximizing the generalizability of care by treating families in their natural settings (Comer & Barlow, 2014; Doss, Feinberg, Rothman, Roddy, & Comer, 2017). In this chapter, we provide an overview of the rationale, considerations, and state of the research for utilizing Internet-delivered PCIT (I-PCIT), with a focus on the treatment of children with ASD. We provide a case illustration and conclude with a summary of lessons learned and future directions for I-PCIT for children with ASD.

30.1 Rationale for Internet-Delivered Treatment for Behavior Problems in Children with ASD

Relative to typically developing peers, children with ASD are at heightened risk for externalizing behavior problems (Bauminger, Solomon, & Rogers, 2010) and associated negative outcomes, such as disturbances in social and family functioning (Burke, 2012; Burke, Rowe, & Boylan, 2014; Greene et al., 2002; King, Iacono, & McGue, 2004; Soderstrom, Sjodin, Carlstedt, & Forsman, 2004). To date, studies have provided evidence of the utility of PCIT in addressing early difficulties associated with ASD (e.g., child externalizing behavior problems, child inflexibility, and negative parent-child interactions; Budd et al., 2011; Ginn et al., 2017; Solomon et al., 2008). However, many families of young children with ASD continue to go underserved due to barriers to care (Andrade et al., 2014; CDC, 2013). Structural and attitudinal barriers influence families' likelihood to initiate and continue treatment (Andrade et al., 2014). For example, the mental health field faces staggering professional workforce shortages. In 2012, the Health Resources and Services Administration (HRSA) reported that approximately 91 million people in the United States lived in mental health professional shortage areas. Further, disparities in care availability persist, particularly in rural areas, where in many counties there are no psychologists, psychiatrists, or social workers providing child services (HRSA, 2013). Moreover, mental health specialists tend to cluster in major metropolitan areas and academic hubs, making it uniquely challenging for large proportions of families in need to access clinicians who specialize, for example, in both ASD and externalizing behavior problems and have sufficient training and expertise to implement PCIT. High caseloads and clinician burnout at underfunded, overburdened community mental health centers can further constrain care (Morse, Salyers, Rollins, Monroe-DeVita, & Pfahler, 2012). Many families in close geographic proximity to mental health clinics are placed on lengthy wait-lists or even declined treatment altogether.

There is also increased potential for family services burnout in this population, as children with ASD are more likely than other clinical populations to have comorbid psychiatric conditions (Joshi et al., 2010) and special needs that require multiple services (e.g., speech, physical, and occupational therapy), even when controlling for psychiatric comorbidity (Cummings et al., 2016). Accordingly, families of children with comorbid ASD and externalizing problems may face particular difficulties coordinating schedules for appointments with various providers. Additional issues of time, finance, transportation, and coordination of childcare can further deter families from utilizing services (Owens et al., 2002). Moreover, stigma concerns and negative attitudes about bringing a child to a mental health facility can discourage families from utilizing office-based services (Talebi, Matheson, & Anisman, 2016).

In addition to the many logistical and attitudinal barriers to office-based mental health care in this population, children with ASD and their families often experience particular difficulty with generalizing skills from treatment contexts to everyday situations (de Marchena, Eigsti, & Yerys, 2015). Because negative parent-child interactions occur most frequently in the home environment, home-based PCIT may be especially beneficial for children and families with difficulties generalizing skills. Research investigating home-based PCIT has demonstrated empirical support for reducing behavior problems in children at risk for severe externalizing behaviors (Bagner, Rodríguez, Blake, & Rosa-Olivares, 2013; Galanter et al., 2012; Ware, McNeil, Masse, & Stevens, 2008). Although home-based PCIT may be an ideal format for families of children with ASD to transcend issues related to generalizability, associated costs and increases in clinician time often hinder the acceptability of home-based PCIT for many families (Chasson, Harris, & Neely, 2007).

Fortunately, advances in telemental health care offer exciting opportunities to overcome traditional barriers and enhance the ecological validity of treatment; this goal is accomplished by using technology to remotely work with families in real time in their natural settings (e.g., the home environment; Comer, Furr, Kerns et al., 2017; Comer & Barlow, 2014; Hilty et al., 2013). Telemental health care refers to services that leverage video teleconferencing (VTC) platforms to facilitate real-time interactions for the provision of mental health care (otherwise traditionally delivered in person; Doss et al., 2017). Such telemental health care is distinguished from asynchronous behavioral intervention technologies, which entail applications of technology used simply to augment in-person treatment (e.g., an app to remind clients of out-of-session homework assignments) or to provide self-help interventions without formal in-person treatment (e.g., an online program, with or without coach support; Doss et al., 2017).

Using VTC to provide I-PCIT (Comer et al., 2015) to the home setting of families of children with ASD and externalizing behavior problems has become an increasingly promising approach to broadening accessibility to quality behavioral parent training. I-PCIT may be particularly useful for families in areas characterized by mental health workforce shortages and geographic barriers to quality and specialized care. Further, VTC reduces burdens associated with traveling to receive services (e.g., travel time, travel costs, time away from work, childcare logistics) and the amount of time associated with each individual treatment session. The reduced transportation burdens and related obstacles afford more flexibility in scheduling, which can be particularly important for coordinating the scheduling of the multitude of services youth with ASD commonly receive. Moreover, treating families remotely in their own homes may overcome stigma-related concerns about attending a mental health clinic.

Relative to other behavioral parent-training protocols, PCIT seems to be a particularly good fit for VTC delivery because PCIT therapists are physically separated from treating families during the majority of each session (i.e., behind a one-way mirror; Comer et al., 2015). In PCIT, separating the therapist from the family is intentional and preferred to maximize the authenticity of parent-child interactions and to put parents on the front line of promoting change in their children. Whereas children may know that therapists are watching and/or instructing their parents during office-based PCIT sessions, the presence of the I-PCIT therapist can be particularly subtle (i.e., no therapist in the next room at a clinic, no therapist visiting the home). Therefore, VTC may offer less disruption to the natural setting than home-based PCIT while still offering the unique benefits of home-based PCIT, such as alleviating concerns related to the generalizability of treatment gains. Furthermore, VTC can be conducted through laptops, tablets, and smartphones, allowing for sessions also to occur in public settings (e.g., restaurants and stores) to further address the goals of PCIT and generalizability for children with ASD and behavior problems (as long as appropriate privacy issues are addressed).

30.2 Research on I-PCIT

I-PCIT mimics traditional, clinic-based PCIT but utilizes VTC (i.e., webcams) and Bluetooth earpieces for observation and communication purposes, rather than one-way mirrors and bug-in-the-ear devices (e.g., walkie-talkies; Comer et al., 2015). Research investigating I-PCIT has showed promising results. Specifically, Comer and colleagues (2017) conducted a pilot randomized controlled trial evaluating I-PCIT relative to standard, clinic-based PCIT for children ages 3 to 5 years old with disruptive behavior problems. This study provided the first empirical evidence that outcomes associated with I-PCIT (e.g., reduction of child symptoms, positive engagement, treatment retention, treatment satisfaction) were comparable to the favorable outcomes associated with clinic-based PCIT. In fact, at posttreatment, 70% of young children treated with I-PCIT were identified as treatment responders by independent evaluators who were masked to children's treatment condition, relative to 55% of young children treated with standard clinic-based PCIT; treatment gains were maintained across a 6-month follow-up period. Importantly, I-PCIT was associated with a significantly higher rate of "excellent response" than standard clinic-based PCIT at posttreatment. Moreover, families receiving I-PCIT also reported significantly fewer barriers to treatment participation than those receiving clinic-based PCIT (Comer et al., 2017).

We are currently extending this work by examining the feasibility and utility of I-PCIT for reducing behavior problems in young children with developmental delay (many of whom have been diagnosed with ASD) in a large randomized controlled trial funded by the National Institute of Child Health and Development (R01 HD084497). Specifically, families of 3-year-old children aging out of the early intervention (EI) system with elevated levels of externalizing behavior problems are randomly assigned to receive either time-limited (i.e., 20 weeks) I-PCIT via a VTC format or community referrals as usual (RAU) in an attempt to bridge the gap between EI and school-based services. Families recruited for this study are predominately Hispanic and Spanish speaking and from low to middle socioeconomic backgrounds. Although the trial is ongoing, we have qualitatively observed success in implementing I-PCIT with this sample, including many children with ASD, and our experience in this trial has brought to light many of the unique considerations for treating this population via VTC.

30.3 Considerations for I-PCIT

Providing I-PCIT requires a set of unique considerations that are critical for successful implementation. Preparation includes, but is not limited to, utilizing the proper technological equipment, finding an appropriate VTC format, ensuring that the home environment is set up in a manner that allows for PCIT fidelity, and giving thought to safety concerns that could arise in the family's home (Chou, Comer, Turvey, Karr, & Spargo, 2016). I-PCIT includes the added complexity of families needing equipment in their homes. Given that PCIT entails both verbal communication and visual observation, families typically need a webcam (or a device with a built-in camera), a Bluetooth earpiece to afford "bug-in-the-ear" coaching, a microphone, and Internet access. In 2012, approximately 75% of households had Internet access in comparison to only 55% in 2003 (United States Census Bureau, 2012). The increasing number of families with Internet access also improves the promise and feasibility of I-PCIT on a broad scale. However, it is important to consider that families with geographical barriers to office-based treatment are also less likely to have access to fast and reliable Internet and cellular service (Chou, Bry, & Comer, 2017). When working with under-resourced families, providers can consider loaning families the necessary equipment or can use reimbursements or grant funding to support equipment purchases for families.

Selecting a secure and efficient VTC platform is important when delivering I-PCIT. There are two main types of platforms: standards-based and consumer-grade applications (Polycom, 2001). While standards-based systems (e.g., Polycom, BlueJeans) are highly secure and permit encrypted communication and firewalls, they are expensive and therefore unattainable for some providers and families. Consumer-grade applications (e.g., VSee, WebEx, Zoom) are more affordable; however, additional precautions must be taken to ensure confidentiality (Myers et al., 2017). When using a consumer-grade application, compliance with Health Insurance Portability and Accountability Act (HIPAA) regulatory guidelines is critical. Providers should confirm that the platform allows users to host unlisted meetings, uses the Advanced Encryption Standards (AES) algorithm, requires all attendees to sign in with a strong password, identifies all meeting attendees, uses an appropriate encryption tunnel for added security, and does not store or retain any session information on a shared network.

I-PCIT additionally requires the therapist to tailor session structure to the family's home environment. For example, an appropriate play area, time-out chair, and time-out room in the family's home must be designated. While it is standard practice in PCIT for families to consider these logistics to implement the skills at home, the therapist needs to guide families in making these decisions prior to the first Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI) coaching sessions. Considering the play space is especially important for children with ASD as they may be less motivated by social interaction and more inclined to leave the play area. Therapists should encourage parents to designate an enclosed play area with little opportunity for destruction should active ignoring become necessary. Location of the time-out chair and time-out room must be carefully considered during the PDI teach session. As recommended in the PCIT manual (Eyberg & Funderburk, 2011), the time-out chair should be far from any distractions and the time-out room should be one in which the child will be safe. Therapists can be the most helpful during coaching if they can see the time-out chair, which may require the parents to move the webcam (or device) when the child is in time-out. Watching the child on the time-out chair during a challenging PDI sequence allows the therapist to fully understand the scope of the situation, guide the parents to adhere to the script, and help parents remain calm. An important advantage of I-PCIT is that the therapist can visualize the family's time-out chair and time-out room setup and problem solve any placement issues that arise.

Delivering I-PCIT presents unique safety concerns given that the treatment setting is not conducted in a clinic. Unlike in clinic-based PCIT, the I-PCIT therapist cannot directly respond to certain clinical emergencies. Therefore, a crisis management plan must be in place from the outset of treatment, along with backup communication plans. Specifically, families should be aware of alternative means to get in touch with the therapist such as VTC chats or phone should the VTC audio malfunction.

30.4 Case Example

30.4.1 Case Introduction

Jared Sanchez was a 3-year-old Hispanic male who had been receiving EI services since the age of 22 months. Jared was eligible for EI due to delays in expressive communication, gross and fine motor skills, and social-emotional functioning; he received speech and language therapy and occupational therapy through the EI program. At the age of 24 months, Jared received a diagnosis of ASD from an autism specialist and began receiving one-on-one applied behavior analysis (ABA) three times a week for an hour per session. When frustrated, Jared exhibited frequent temper tantrums and aggression towards his ABA and occupational therapists. Jared's parents, Mr. and Mrs. Sanchez, reported that Jared displayed similar behaviors at home. Mrs. Sanchez reported that she believed Jared would "lash out" because he had a difficult time communicating and became frustrated when others could not understand him. At the family's exit evaluation from EI, Jared had three words in his vocabulary and mostly used sounds and crying to communicate. At this time, Mr. Sanchez was provided with information about an Internet-delivered parent-training program for young children with developmental delay that was being provided from a mental health center located roughly 1.5 h away from their home. Mr. Sanchez was enthusiastic about a program geared towards parenting and building his relationship with Jared given that Jared often seemed detached or disinterested in playing with him and his wife. Mr. Sanchez additionally expressed that while normally it would be difficult to fit an additional program into the family's already busy schedule, the Internet-delivered aspect might make it feasible. Mr. Sanchez provided consent for participation and an intake assessment was scheduled.

30.4.2 Intake Assessment

At the time of intake, Jared was not enrolled in school but was continuing to receive speech and language therapy twice a week, ABA twice a week, and occupational therapy once a week. Mr. Sanchez was unemployed at the time of the intake and, as the primary caregiver, brought Jared to his speech therapy, occupational therapy, and ABA appointments. Mrs. Sanchez worked full-time during the day and watched Jared and Jared's 4-year-old brother at night while Mr. Sanchez applied to jobs. According to Mr. Sanchez, the primary problems at home included noncompliance and frequent temper tantrums. He reported that every transition to a new activity was "a struggle" and often resulted in Jared screaming or hitting his father or brother. Mr. Sanchez also reported that he often gave Jared his phone to play with to calm him down; Jared often got away with not doing what he was originally asked to do due to the tantrums. Mrs. Sanchez reported that her primary concern was Jared's limited expressive language and that his aggression and tantrums would worsen when he was unable to communicate effectively. Mrs. Sanchez also expressed frustration with speech therapy, claiming that she was seeing little to no results at home.

At intake, Mr. Sanchez was asked to complete a battery of parent-report questionnaires regarding Jared's behavior, parenting stress, and parenting practices. The Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a 36-item measure used to evaluate behavior problems. The Intensity Scale measures the frequency with which the behaviors occur, and the Problem Scale measures whether the behaviors are problematic for the parent. Jared's score on the ECBI Intensity Scale (Raw Score = 190; *T* Score = 77) and on the ECBI Problem Scale (Raw Score = 27; *T* Score = 76) fell in the clinically significant range. The Child Behavior Checklist for children ages 1.5–5 (CBCL; Achenbach & Rescorla, 2000) is a 99-item measure used to examine behavioral, emotional, and social problems. Jared's score on the externalizing behavior problem scale also fell in the clinically significant range (*T* Score = 70). The Family Impact Questionnaire (FIQ; Donenberg & Baker, 1993) is a 50-item measure of impact of the child's behavior on the family, and the Parenting Practices Inventory (PPI; Webster-Stratton, Reid, & Hammond, 2004) is a 72-item measure used to evaluate parenting practices and discipline strategies. On these measures, Mr. Sanchez endorsed high levels of parental stress and maladaptive parenting practices, such as spanking and yelling.

The Dyadic Parent-Child Interaction Coding System-4th Edition (DPICS-IV; Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013) was used to code parenting behaviors during 5 min of child-led play, as well as child compliance to parental commands during 5 min of parent-led play and a 5-min clean up situation. During child-led play, Jared demonstrated limited play skills, and Mr. Sanchez repeatedly yelled at Jared to come back and play when he would wander outside of the play area. During these 5 min, Mr. Sanchez used four unlabeled praises (praises that are non-specific, such as "good job"), but did not use any labeled praises (praises that specify the behavior, such as "good job playing calmly"). Additionally, Mr. Sanchez did not use any reflections (repeating Jared's appropriate speech, such as "you said 'block'") or behavior descriptions (statements describing Jared's behavior, such as "you're stacking the block") during the 5 min. Mr. Sanchez issued 14 commands to Jared and asked Jared 29 questions during the child-led play, which detracted from the child's lead in play. During the 5-min parent-directed interaction and cleanup situations, Jared did not obey any of his father's commands.

Given Jared's oppositional behavior reported by his father as well as the observed parent-child interactions, it was determined that Jared's family would be a good fit for I-PCIT. Treatment would initially focus on decreasing Jared's oppositional behavior and noncompliance by coaching Jared's parents to attend to Jared's positive behavior and ignore Jared's negative behavior (during the CDI phase). Treatment would subsequently focus on providing Jared's parents with effective disciplinary tools (during the PDI phase). Sessions were scheduled in the evening, so that both of Jared's parents would be available to participate in treatment.

30.4.3 Technology Equipment Set Up

Prior to beginning treatment, clinic staff mailed Jared's family an equipment package consisting of a tablet with a built-in camera and child-proof case, a Bluetooth omnidirectional room microphone, and a Bluetooth earpiece. After the equipment package was received, clinic staff conducted an orientation to the equipment with Mr. and Mrs. Sanchez. Both parents became comfortable using the equipment quickly and were enthusiastic about participating in treatment from the comfort and convenience of their own home.

30.4.4 Course of Treatment

The structure of each session consisted of a brief check-in at the beginning of the session followed by a 5-min coding period and a 10- to 15-min coaching period for each parent. While Mr. Sanchez played with Jared, Mrs. Sanchez played with Jared's older brother, who also required supervision during play. The parents then switched roles for the second half of the session. Each session concluded with a brief check-out with both parents to review the session, discuss any concerns, and plan for homework for the week.

During the first three CDI coaching sessions, Jared had a difficult time engaging in play with Mr. and Mrs. Sanchez. For example, in the first CDI coaching session, Jared engaged in play for a maximum of 3 min at a time and repeatedly left the play area to climb on nearby furniture or play with the living room drapes. Parents were coached to use active ignoring in these situations to remove attention from Jared. At times, Jared was not in the therapist's view, requiring the therapist to rely on the parent's report to know whether Jared was behaving appropriately. The therapist used this as an opportunity to remind the parents to describe Jared's behavior when he was behaving appropriately, serving as a means for the therapist to know what Jared was doing *and* for the parents to practice providing attention to Jared's positive behavior. Throughout the CDI phase, Jared responded well to active ignoring and quickly learned to rejoin the play to receive positive attention from his parents. By the fourth CDI coaching session, Jared stayed in the play area with his parents for the entire duration of the session. Mr. Sanchez met criteria for CDI skill mastery (i.e., 10 behavioral descriptions, 10 reflections, 10 labeled praises, and fewer than 3 questions, commands, or criticisms during a 5-min coding period) in the fourth CDI coaching session. Mrs. Sanchez reached CDI skill mastery in the fifth CDI coaching session.

During the PDI Teach session, Mr. and Mrs. Sanchez expressed concern that Jared would not understand most commands. The therapist prompted Mr. and Mrs. Sanchez to come up with a list of simple commands that Jared would be able to understand and collaboratively decided to use "sit here" as the first practice command. During the first PDI coaching session, Jared went to the time-out chair after disobeying his father's command to "sit here;" he sat on the chair for approximately 3 s before getting off. After Mr. Sanchez issued the once-ever time-out room warning, he brought Jared to the time-out room (the parents' bathroom). Jared seemed to enjoy being in the time-out room because he could play with items that were usually off limits (e.g., toothbrushes, soap). The therapist prompted Mr. Sanchez to place all items out of reach, at which point Jared became upset. Once Jared was calm and quiet (after approximately 2 min), Mr. Sanchez guided him back to the time-out chair, and Jared stayed on the chair for the full 3 min and 5 s of quiet. The therapist pointed out to Mr. Sanchez how quickly Jared calmed himself down and praised Mr. Sanchez for staying calm and consistent during his first PDI practice. During Jared's final time-out, he did not cry or attempt to get off the chair. Mr. Sanchez restated the original command, and Jared complied immediately. Mr. Sanchez then immediately gave Jared another direct command ("come here"), which Jared again obeyed without hesitation. Without prompting, Mr. Sanchez gave Jared a hug and an enthusiastic labeled praise ("Thank you so much for listening, J! Daddy loves when you listen"). At checkout, Mr. and Mrs. Sanchez expressed both shock and excitement in regard to Jared's ability to stay on the chair for a full 3 min and appeared eager to practice PDI during the week. The therapist praised both parents for using excellent, effective commands and for modeling calm behavior during the PDI sequence. The therapist also expressed concern about not being able to fully see Jared while he was on the time-out chair, but thanked Mr. Sanchez for reliably letting the therapist know when Jared got off the chair. Going forward, the parents and therapist decided that the parent in PDI would move the tablet to face the chair during time-out to ensure that the therapist could see Jared at all times.

For the remainder of PDI, Jared was mostly compliant, and his parents reported that he only went to the time-out chair during extremely difficult situations, such as transitions to new activities. However, even during these more difficult times of the day, Mr. and Mrs. Sanchez reported that they noticed progressively fewer tantrums. During the fifth PDI coaching session, the therapist introduced using PDI in public to Mr. and Mrs. Sanchez, and they decided to practice at the grocery store—a place that both parents indicated was often difficult to take their children. Mrs. Sanchez admitted that she was anxious to practice in public given the possibility that Jared could throw a tantrum in the middle of the store. Although she had concerns, Mrs. Sanchez stated that she felt more comfortable and confident with tackling the situation by being able to bring the tablet with her to have support from the therapist. Jared was fully compliant during the first public behavior session. At the following public behavior session, the family visited the playground, and Jared went to a time-out mat once for disobeying the "no hitting" house rule. The therapist coached Mrs. Sanchez through the time-out and Jared was compliant for the remainder of the session.

30.4.5 Experiences with Technology

As treatment progressed, Mr. and Mrs. Sanchez became increasingly more comfortable with the technology equipment. However, multiple sessions required that the therapist and parents troubleshoot technology-related issues. For instance, Mr. and Mrs. Sanchez forgot to charge the Bluetooth earpiece prior to the third CDI coaching session. Fortunately, Mr. Sanchez owned his own headset, which he successfully used for the session. Going forward, the therapist reminded Mr. and Mrs. Sanchez to charge all treatment materials the day before the session. During the fourth CDI coaching session, Jared became frustrated and attempted to grab the tablet. Mr. Sanchez calmly removed the tablet from Jared's hands without providing any attention. In future sessions, Mr. and Mrs. Sanchez made sure to keep the tablet out of Jared's reach.

30.4.6 Treatment Outcome

Throughout treatment, Jared's parents completed the ECBI to assess weekly changes in Jared's disruptive behavior. Changes on this measure are illustrated in Fig. 30.1. Following the family's completion of treatment (20 weeks after the initial assessment), Jared's scores on the ECBI Intensity Scale (Raw Score = 64; *T* Score = 41) and Problem Scale (Raw Score = 11; *T* Score = 55) fell within normal limits. Jared's score on the CBCL externalizing behavior problem scale fell in the borderline clinically significant range (*T* Score = 61) but had improved significantly since the initial assessment. Additionally, Jared's parents reported on the FIQ and PPI that their stress levels had decreased

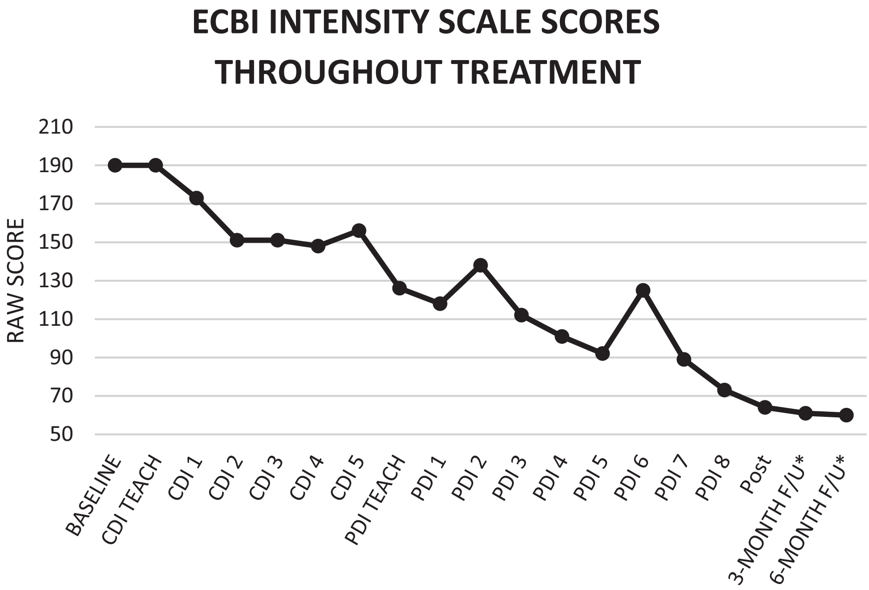

Fig. 30.1 ECBI intensity score change across treatment sessions

significantly, that they no longer used spanking as a form of punishment, and that they only sometimes raised their voices when Jared misbehaved. At 3-month and 6-month follow-ups, scores on parent-report measures remained consistent with the assessment immediately following treatment, demonstrating maintenance of treatment gains.

As treatment progressed, Mr. and Mrs. Sanchez also gained mastery of positive CDI skills (praises, reflections, and behavioral descriptions), although both parents had some difficulty refraining from questions and commands. During the posttreatment assessment, Mr. Sanchez used 10 labeled praises, 11 reflections (mostly of sounds), and 11 behavior descriptions during the 5-min coding period. He did not give Jared any commands and asked three questions.

Mr. and Mrs. Sanchez reported that Jared's vocabulary also had increased since starting treatment, and that he had learned to more effectively communicate when in need of something. Both parents reported that they continued to use the time-out chair warning approximately ten times per day, but that Jared only needed to go to the time-out chair about twice per week. Jared's parents additionally reported that Jared's improvement in behavior generalized to public situations and to the classroom when he started school 3 months following the completion of treatment. Mr. Sanchez endorsed feeling less overall stress due to the decreased number of tantrums and easier transitions during the day.

30.5 Conclusion and Future Directions

Children with ASD present with externalizing behavior problems at a very high rate (Kaat & Lecavalier, 2013), and relative to families of children with other problems, families of children with ASD are particularly underserved with regards to the accessibility and acceptability of needed treatment and quality care (Chiri & Warfield, 2012). In addition to geographic barriers to care and professional workforce shortages, additional logistical and perceived barriers to mental health care further hinder the reach of children's mental health services (Owens et al., 2002).

Recent efforts to broaden the accessibility of specialty care, such as the use of VTC formats, offer innovative approaches to overcoming traditional barriers (Comer & Barlow, 2014). I-PCIT is one such approach that holds promise for effectively treating externalizing behavior problems in children with ASD. Recent empirical work demonstrates that I-PCIT can lead to improvements in child behavior problems (Comer, Furr, Miguel et al., 2017), as well as in ancillary benefits for families, including improving parent-child interactions and reducing parenting stress. Continued efforts are needed to leverage technology to meaningfully expand the reach of recent advances in the application of PCIT for children with ASD and/or related special needs (e.g., Bagner et al., 2010; Bagner & Eyberg, 2007; Ginn et al., 2017; Lesack et al., 2014; Masse et al., 2016; Solomon et al., 2008). Additional research examining I-PCIT for families with young children with ASD—as well as key mediators, moderators, and mechanisms of treatment response—will be critical to optimally inform improved care for this historically underserved population.

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31

What PCIT Clinicians Need to Know About ASD Assessment

Stacy S. Forcino and Cy B. Nadler

Abstract

As a clinician delivering Parent–Child Interaction Therapy (PCIT) who works with children with Autism Spectrum Disorder (ASD), you will play some role in assessment of ASD, either peripherally or centrally. This chapter will help orient you to the intake and assessment tasks you will likely encounter, regardless of your role. Questions about ASD that frequently arise during intake are addressed first. Second, surveillance and screening of ASD is reviewed. Third, the components of evidence-based comprehensive diagnostic assessment, including structured and semi-structured parent interviews, collateral reports, objective assessments of core symptoms of ASD, questionnaire assessment of ASD symptoms, cognitive evaluations, assessment of adaptive behavior, and evaluation of language and communication are discussed. Fourth, ongoing assessment and progress monitoring is addressed, including a review of functional behavioral assessment, preference assessment, assessment of problem behavior, and assessment of core symptoms of ASD. Last, we outline ways to help families pre- and post-diagnosis.

As a clinician trained in Parent–Child Interaction Therapy (PCIT), you already know a great deal about disruptive behavior problems, parent–child relationships, behavior modification, child development, and coaching parents. As you begin working with children with Autism Spectrum Disorder (ASD), your knowledge, skills, and experiences in these areas will serve you well. Indeed, the behavioral principles upon which PCIT is grounded also underlie evidence-based treatments for children with ASD. Many of the same PCIT methods and techniques you currently use with families of typically developing children with behavior problems can be applied to children with ASD and behavior problems. However, it will also be necessary for you to expand your competencies. To work effectively in the field of PCIT with children with ASD, you must gain ASD-specific knowledge, skills, and experiences. Reading this book is a good place to start, and this chapter will help orient you to the intake and assessment tasks you may encounter as a PCIT clinician who works with children with

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ASD, including surveillance, screening, and diagnostic assessment of ASD; therapeutic assessment and progress monitoring; professional referrals; parent education in ASD and related services; parent/family support; and consulting and coordinating with other service providers. Some of these tasks will be essential to provide PCIT to clients with ASD (e.g., ongoing assessment to monitor therapeutic progress), and some may be optional (e.g., diagnosing ASD). Regardless of which tasks you perform, you should be prepared to field questions from parents about ASD and the ASD assessment process. Therefore, we will begin with some frequently asked questions; unfortunately, we cannot provide you the "right" answers (there is no such thing), but we can help orient you toward well-informed answers.

31.1 Fielding Frequently Asked Questions About ASD

31.1.1 What Is ASD?

ASD is a neurodevelopmental disorder, or a disorder of the brain, that causes a child to develop differently than his or her peers. A hallmark characteristic of ASD is profound difficulty in social interaction and/or social communication (American Psychiatric Association, 2013). Children with ASD may have deficits in the basic behaviors underlying successful social interactions, such as eye contact, use of gestures and facial expressions, sharing of emotions or interest, or maintaining a pattern of give-and-take in play or conversation. They may have difficulty in understanding relationships or may even seem to lack interest in relationships. A diagnosis of ASD also requires that a child have a pattern of restricted, repetitive behaviors, interests, or activities (American Psychiatric Association, 2013). Children with ASD may move their body or speak in odd and repetitive ways or engage in unusual, repetitive play activities with toys or other objects. They may show an insistence on sameness, routine, or ritualized patterns of behavior, which could include showing very narrow and intense interests. Finally, children with ASD may display hyper- or hypo-reactivity to sensory input, or have an unusual interest in sensory input. All of these symptoms must interfere with the child's functioning in important areas of his or her life. About 1 in every 75 four-year-olds meets criteria for ASD (Christensen et al., 2016), but diagnostic criteria allow for a great deal of heterogeneity in presentation. Therefore, one child with ASD may behave quite differently from another child with ASD. This fact leads to much confusion among nonprofessionals and professionals alike and should be addressed explicitly with parents.

31.1.2 How Do You Really *Know* that My Child Has ASD?

There is no single definitive biological or behavioral test for establishing a diagnosis of ASD, which frequently leads to confusion for parents. Instead, a clinician must make a *clinical judgment* regarding whether the child's developmental history and behavioral presentation aligns with the current diagnostic criteria. There are well-studied tools (structured interviews, behavioral observation tests, and questionnaires; see below) that can improve the reliability of a diagnosis, but these tools are validated against expert clinical judgment. Finding a clinician with expertise in ASD who uses the best tools available is crucial to obtaining an accurate diagnosis.

31.1.3 Why Does My Child Have ASD?

The significant heterogeneity in ASD presentation corresponds with significant heterogeneity in ASD etiology; that is, many different individual and interacting factors have been implicated in increased risk for ASD. However, our understanding of these pathways is limited. Conservative estimates suggest that about 30% of ASD cases have an identifiable genetic etiology (Schaefer, 2016), and advances in technology will likely continue to identify more underlying genetic factors. Unfortunately, that leaves up to 70% of families with a child diagnosed with ASD left without a clear answer to the "why" question. There is some evidence for environmental and epigenetic factors (Modabbernia, Velthorst, & Reichenberg, 2017), but these are not well understood and rarely provide answers to any individual family.

31.1.4 What Is My Child's Prognosis?

There is no way to definitively predict the prognosis for an individual child. Prognosis greatly improves with early identification and early high-quality treatment (Smith & Iadarola, 2015). Specifically, children who are diagnosed early and receive intensive high-quality treatment are likely to make significant gains in cognitive, adaptive, and communication domains. However, there is no cure for ASD, and even individuals who achieve "optimal outcomes" (an endpoint that is not well defined, and the source of substantial controversy) are likely to retain ASD symptoms (Fein et al., 2013).

31.1.5 How Do I Help My Child?

The most important thing parents can do is learn about ASD and its evidence-based treatments. PCIT clinicians should connect families with resources like the Autism Speaks 100 Days Tool Kit for Newly Diagnosed Families, available for free at https://www.autismspeaks.org. Families with children with ASD often find benefit from connecting with other families with children with ASD, as well; clinicians should be aware of reputable local or online advocacy and/or support groups and refer families to them. Finally, clinicians should ensure that the child with ASD is receiving evidence-based educational and therapeutic services (see below for more details). Get to know your state-based offices and local providers that support children with ASD and other developmental disabilities so that you can help families obtain high-quality services.

31.2 Assessing for ASD

As a PCIT clinician who works with children with ASD, you will play some role in the assessment of ASD, either peripherally or centrally. The following sections are components of assessment and intake that you should be familiar with, regardless of your specific role.

31.2.1 Surveillance and Screening for ASD

Surveillance and screening are first-line approaches to the identification of ASD, intended to improve early and broad identification across the population. The American Academy of Pediatrics defines surveillance as "the ongoing process of identifying children who may be at risk of developmental delays" and screening as "the use of standardized tools at specific intervals to support and refine the risk" (Johnson, Myers, & the Council on Children with Disabilities, 2007, p. 1195). Surveillance includes general strategies such as gathering a family history and eliciting concerns from parents, while screening includes administering standardized tools, such as parent-response questionnaires. Note that neither surveillance nor screening is used to diagnose ASD. Rather, these methods identify risk of ASD. Individuals identified as high-risk are typically referred for a comprehensive diagnostic evaluation.

PCIT clinicians with knowledge of and experience with ASD are in a good position to perform surveillance and screening for ASD. General surveillance methods for PCIT clinicians include gathering a developmental history, assessing for family history of ASD and/or other developmental delays or learning problems, eliciting concerns from parents about development, and observing the child's behavior in an unstructured way. However, you should not expect to accurately identify undiagnosed children with ASD using surveillance methods alone. In a recent study, Gabrielsen et al. (2015) asked autism experts to watch 10-min video clips of a structured play interaction between children and a psychologist, and then to judge which children should be referred for an ASD evaluation. The experts correctly "referred" only 61% of children with ASD. We note these findings not to discourage your use of surveillance, but to encourage realistic expectations and reliance on more standardized approaches to identifying ASD risk.

There are a number of ASD-specific standardized screening tools that you may consider using in conjunction with general surveillance methods. Standardized screening eliminates much of the error associated with clinical judgment, but it is not error-free. Standardized screeners are intended to "catch" as many children with ASD as possible, so sensitivity (the ability to correctly identify children with ASD) is often prioritized. However, even the screener most widely used in pediatric settings, the Modified Checklist for Autism in Toddlers-Revised with Follow-up (M-CHAT-R/F; Robins, Fein, & Barton, 2009) is estimated to correctly identify only about 83% of toddlers who will eventually be diagnosed with ASD (Robins et al., 2014). In other words, 17% of toddlers with ASD will erroneously "pass" the screening (Robins et al., 2014). Please note that this level of sensitivity is considered quite good, and is likely much better than general surveillance methods alone (see above). Unfortunately, good sensitivity is often obtained at the expense of specificity, or the ability to rule out ASD in those children who do not meet criteria for ASD. Therefore, screeners overidentify children as at-risk; for all screeners, some children identified as at-risk will not meet criteria for ASD. We will focus on two screeners that we recommend based on their psychometric properties: the M-CHAT-R/F and the Social Communication Questionnaire (SCQ; Rutter, Bailey, & LeCouteur, 2003a).

The M-CHAT-R/F is a two-step standardized screener for ASD risk in toddlers 16–30 months of age. It must be used in accordance with its copyright but can be downloaded and used in clinical practice for free (see www.mchatscreen.com for details). It begins with a brief 20-item questionnaire completed by parents, which generates a score that falls in a range of low, medium, or high risk for ASD. For children who fall in the medium risk range, the clinician uses a standardized follow-up interview to clarify responses and place the child in either the low risk range (no action needed) or high risk range (referral for evaluation and intervention needed). Most (90+%) of children will only require the initial parent questionnaire, which takes less than 2 min to score. The follow-up interview takes 5–10 min to complete, depending on the number of concerns raised. There are no formal administrator requirements, so a PCIT clinician with knowledge of standardized assessment should have no difficulty learning to administer the M-CHAT-R/F.

The SCQ (Rutter et al., 2003a) is a 40-item parent-report questionnaire designed to evaluate communication skills and social functioning. It typically takes less than 10 min for parents to complete and less than 5 min to score. The SCQ comes in two forms: Lifetime and Current. The Lifetime form covers a child's entire developmental history and is designed for ASD screening. The Current form covers only the past 3 months and is designed for treatment planning and outcome evaluation. Questions on the SCQ were derived from the Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994), and their scores are highly correlated (Chandler et al., 2007). The SCQ is intended for children over 4 years of age who also have a mental age of at least 2 years. It is copyrighted and published and sold by Western Psychological Services (www.wpspublish.com). The publisher advises that the SCQ be administered and scored only by individuals with professional training in the treatment of individuals with ASD (Rutter et al., 2003a).

31.2.2 Comprehensive Diagnostic Assessment of ASD

Performing a comprehensive diagnostic assessment of ASD requires significantly more time, experience, and knowledge than surveillance and screening. Some PCIT clinicians will choose to refer clients to ASD assessment specialists and some will choose to gain the specialized skills, knowledge, and supervised experience necessary to diagnose ASD themselves. Even if you do not perform ASD assessment yourself, it is important that you have a basic understanding of what a comprehensive diagnostic assessment of ASD should entail. This understanding will help you choose a specialist to refer to, interpret and/or assess the validity of a diagnosis you receive from another provider, and/or help parents understand the assessment process.

31.2.2.1 Characteristics of an Ideal Comprehensive Diagnostic Assessment

A comprehensive diagnostic assessment should be evidence-based, meaning the methods and measures used have been tested and found to be reliable and valid for the individual being assessed, as well as useful for the purposes of the assessment. Unfortunately, there is no universal standard for acceptable reliability, validity, or utility. There is clear expert consensus that ASD diagnostic evaluations should include multiple methods of assessment and examine multiple domains of functioning (for an overview, see Huerta & Lord, 2012). Ultimately, though, it is the job of the clinician to choose methods and measures that are best for the client, using research findings as a guide.

An ideal comprehensive diagnostic assessment relies on multiple types of measurement (e.g., behavioral observations, questionnaires, interviews) and sources of information (e.g., client, parents, teachers). Interdisciplinary assessments are recommended: ASD is a complex neurodevelopmental disorder with numerous sequelae, and input from allied disciplines can better define both the child's weaknesses and strengths. Interdisciplinary evaluation teams are often housed in children's hospitals and medical centers, but also exist in free-standing specialty centers and private practices. Professionals in fields such as clinical psychology, pediatrics or behavioral pediatrics, neurology, speech/language pathology, school psychology, special education, and occupational therapy often contribute to the evaluation process. Collaboration during assessment can also increase the successfulness of collaboration during the treatment phase, given the opportunity to define treatment goals and roles before treatment commences. An ideal assessment also is culturally informed, given known disparities in ASD diagnosis (Mandell et al., 2009).

31.2.3 Components of an Evidence-Based Comprehensive Diagnostic Assessment

31.2.3.1 Parent Interview

All comprehensive diagnostic assessments of ASD should include an interview of the primary caregiver(s). For maximal reliability and validity, the Autism Diagnostic Interview-Revised (ADI-R, Rutter, Le Couteur, & Lord, 2003b) is recommended. The ADI-R is a structured parent interview that assesses functioning in three domains: language/communication; reciprocal social interactions; and restricted, repetitive, and stereotyped behaviors and interests. The ADI-R possesses good reliability and validity and is considered a gold standard in ASD assessment. Moreover, it is often used as part of a comprehensive diagnostic assessment in research studies (i.e., Schendel et al., 2012). However, the time and expense required for training and test administration is significant. The ADI-R is copyrighted and published and sold by Western Psychological Services (www.wpspublish.com). The publisher specifies that the ADI-R should only be used for diagnostic purposes by practitioners with the necessary qualifications to make a diagnosis. In addition, practitioners should have the necessary education, training, and experience in both clinical interviewing and service delivery for individuals with ASD. Training is available via in-person workshops or remote, video-based materials and can typically be completed in 14–18 h.

Most clinicians who specialize in ASD assessment opt for a semi-structured interview rather than using the full ADI-R. If combined with standardized assessments, particularly the Autism Diagnostic Observation Schedule (ADOS-2; see below), this approach can be sufficient. A semi-structured clinical interview requires familiarity with child development, ASD signs and symptoms, ASD etiology and course, and related conditions. As with any clinical interview, the initial focus will be on the client's presenting problems and the social-developmental context of those problems. Care should be taken to define the problems in terms of their history, course, frequency, duration/intensity, and related antecedents and consequences (more detailed information on functional behavioral analysis of specific problems can be found in Chap. 10). Context of behavior is important in functional assessment, but it is also important diagnostically. The DSM-5 (American Psychiatric Association, 2013) specifies that deficits in social communication and social interaction must manifest across multiple contexts. However, clinicians should note that core symptoms of ASD do not necessarily occur in every context and are certainly not present at all times in every context. Indeed, individuals with ASD may display far more "typical" than "atypical" behaviors (Gabrielsen et al., 2015). This fact can be confusing to parents and clinicians alike, so careful questioning must be pursued to accurately define the client's symptoms.

Clinicians conducting a semi-structured interview will also need to pay particularly close attention to a child's developmental history, with emphasis on social and language development. The DSM-5 (American Psychiatric Association, 2013) specifies that ASD symptoms must be present in the early developmental period, although it notes that symptoms may not fully manifest until later, when increasingly complicated social demands make deficits more evident. Of note, historical symptoms that are no longer present (e.g., a child who engaged in regular hand-flapping, lining up cars, and echolalia at age 3, but at age 5 engages in rare repetitive movements/vocalizations) may still be considered in making a diagnosis of ASD.

A thorough clinical interview will also include questioning and discussion of medical and psychiatric history. Unfortunately, children with ASD are much more likely than children who are typically developing to have medical and/or psychiatric comorbidities (Mannion & Leader, 2013). Children suspected or diagnosed with ASD should be referred to a pediatrician or subspecialist (often a developmental pediatrician) for a medical evaluation. Common medical problems include seizure disorders, gastrointestinal problems, eating problems, and sleep disorders (Mannion & Leader, 2013). Eating and sleeping problems often become a focus of behaviorally oriented psychotherapeutic treatment and should be investigated thoroughly in the assessment phase (see Kodak & Piazza, 2008 for more information). Children with ASD also have higher rates of Attention-Deficit/Hyperactivity Disorder, anxiety disorders, obsessive-compulsive disorders, and mood disorders than children who are typically developing (Joshi et al., 2010).

31.2.3.2 Collateral Reports

Clinicians should reach out to adults outside of the family who are familiar with the client to gather additional information. Collateral reports can be taken from teachers, daycare workers, physicians, other clinicians (e.g., Applied Behavior Analysis therapists), or any other reliable adult with knowledge of the client. Collateral reports can confirm the presence of symptoms across settings and better define problem areas. Often adults outside of the family have unique knowledge about the client, particularly regarding the client's social behavior with peers (i.e., interacting with other children at school or daycare). This information can be critical to making an accurate diagnosis, as well as defining problem areas, goals, and treatment strategies. In addition to questions regarding core symptoms of ASD, clinicians should inquire about any general concerns the adult has about the child, as well as what strategies (successful and unsuccessful) have been implemented to support the child.

31.2.3.3 Objective Assessment of Core Symptoms of ASD

Standardized, objective assessment of core symptoms of ASD is a vital component of a diagnostic evaluation (Huerta & Lord, 2012). The gold standard and our recommendation is the Autism Diagnostic Observation Schedule—Second Edition (ADOS-2; Lord et al., 2012). The ADOS-2 is a semi-structured behavioral observation measure of communication, social interaction, and restricted and repetitive behaviors. The ADOS-2 can be given to individuals as young as 12 months of age and has no upper age limit. It can be administered with individuals with any language ability, including to those who are nonverbal. Administration takes between 40 and 60 min, regardless of child age and language level. Like the ADI-R, the ADOS-2 requires some investment of time and money. The ADOS-2 is copyrighted and published by Western Psychological Services, who offers clinical training via in-person workshops or DVDs with associated self-guided training materials. Training is typically 2–4 days. However, like the ADI-R, the ADOS-2 training is only offered to those with the relevant prior education, training, and experience, including "extensive exposure" to ASD.

31.2.3.4 Questionnaire Measurement of ASD Symptoms

While the importance of thorough interviewing and standardized direct observation during the ASD diagnostic process cannot be overstated, some clinicians supplement these sources of information with standardized questionnaires. Questionnaires can be useful when eliciting reports from outside informants (e.g., teachers) or when triaging referrals within a larger psychological services clinic. It is important to remember that while questionnaires may be an efficient strategy for gathering additional information, they cannot replace standardized interviewing and direct observation. Questionnaire data should never be used alone to make a diagnosis. In addition to the SCQ (described above; Rutter et al., 2003a), other tools that might be used in this context include the Social Responsiveness Scale, Second Edition (SRS-2; Constantino & Gruber, 2012) as well as the "Withdrawn" syndrome scale and "Pervasive Developmental Problems" DSM-oriented scale on the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000). For a comparison of these questionnaires (including discussion of their shortcomings of their diagnostic validity), see Hampton & Strand's 2015 article.

31.2.3.5 Cognitive Evaluation

A cognitive evaluation is another recommended component of a comprehensive diagnostic ASD assessment. ASD and Intellectual Disability (ID) co-occur in up to half of cases for young children (Christensen et al., 2016) and the DSM-5 requires that an ASD diagnosis be specified as with or without accompanying intellectual impairment. There are a number of well-validated standardized cognitive assessments available, including the Wechsler Scales (i.e., Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition; Wechsler, 2012; Wechsler Intelligence Scale for Children, Fifth Edition; Wechsler, 2014), the Kauffman Assessment Battery for Children, Second Edition (Kaufman & Kaufman, 2004), and the Stanford-Binet Intelligence Scales, Fifth Edition (Roid, 2003). For children with limited language or significantly delayed cognitive abilities, we recommend the Differential Ability Scales, Second Edition (DAS-II; Elliott, 2007). Developmental scales (e.g., Mullen Scales of Early Learning; Mullen, 1995; Bayley Scales of Infant and Child Development, Third Edition; Bayley, 2006) are recommended for very young children, including infants, and could also be considered for children with significantly delayed cognitive abilities. All of these measures require specialized training to administer and score. Full intelligence batteries typically take between 1 and 1½ h to administer and score.

31.2.3.6 Evaluation of Adaptive Behavior

Adaptive behavior must be assessed to evaluate for possible ID (American Psychiatric Association, 2013). Assessment is also essential in determining the severity of social communication impairments and restricted, repetitive patterns of behavior, which must be specified per the DSM-5. Evaluation of adaptive behavior is important from a clinical outcomes perspective as well given an overarching goal of treatment is often to reduce impairment in functioning. There are a number of standardized measures to assess adaptive functioning; we will focus on the Vineland Adaptive Behavior Scales, Third

Edition (Vineland-3; Sparrow, Cicchetti, & Saulnier, 2016) and the Adaptive Behavior Assessment System, Third Edition (ABAS-3; Harrison & Oakland, 2015). The Vineland-3 can be administered via interview or questionnaire. Respondents are typically parents or caregivers, but can be other individuals who are knowledgeable about the child. The questionnaire comes in a parent/caregiver form (with norms available for ages from birth through adulthood) and a teacher form (with norms available for ages 3–21) to assess Communication, Daily Living Skills, and Socialization domains. A convenient feature of the Vineland-3 questionnaire is that single tests can be purchased, administered, and scored online, or emailed to the respondent for remote administration. The ABAS-3 is a behavior rating scale completed by parents/caregivers or teachers/daycare providers. It takes about 20 min to administer, with scoring completed by hand or scoring software. Responses yield standard scores on 11 skill areas assessed, including Conceptual, Social, and Practical adaptive domains. The measure is normed for individuals aged 0–89 years.

31.2.3.7 Evaluation of Language and Communication

Given that deficits in communication are a defining feature of ASD, thorough evaluation of a child's verbal and nonverbal communication repertoire is another key component of diagnostic evaluation. In interdisciplinary diagnostic teams and school-based settings, speech-language pathologists (SLPs) are likely to lead this portion of a child's evaluation. While cognitive testing and administration of the ADOS-2 does yield information about the child's ability to communicate with others, standardized assessment is beneficial to both quantify/categorize a child's strengths and weaknesses, as well as support intervention planning. Note that for children with more advanced verbal repertoires, evaluation may also include attention to social (pragmatic) language skills. For an extensive review of tools and supporting evidence for inclusion in ASD diagnostic evaluation, see Santhanam & Hewitt's, 2015 article.

31.3 Assessment Throughout Intervention

When considering service provision for children with ASD, clinicians should familiarize themselves with the assessment tools and strategies that can both complement and enhance the approaches typically used in PCIT. Parent skill development, parent–child interaction, and child disruptive behavior all remain important to assess throughout PCIT (McNeil & Hembree-Kigin, 2010), but we encourage clinicians to gather additional information to support tailored intervention and outcomes monitoring.

31.3.1 Tailoring Intervention

31.3.1.1 Functional Behavioral Assessment

First-line approaches for conducting functional assessment are descriptive in nature, and might include collecting data on the "ABCs" (antecedents, behaviors, and consequences) of child problem behaviors to identify factors that might be encouraging them (see Chap. 24 of Cooper, Heron, & Heward, 2007). Clinicians can recruit parents to collect this information at home during the first few weeks of treatment. They can also collect this information in real time during standard PCIT clinic observations, such as free play and demand conditions (McNeil, Filcheck, Greco, Ware, & Bernard, 2001).

The most advanced approach to functional behavioral assessment, functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1994), could be used, as well. Functional analysis involves experimentally determining what contingencies are reinforcing the child's problem behaviors. Typically conducted in the clinic setting, the clinician systematically and repeatedly adjusts the social consequences of problem behaviors for 5–10 min at a time. By exposing the child to conditions in which problem behavior is predictably followed by attention (or access to toys, escape from demands, etc.), the clinician can evaluate what condition(s) results in the highest rate of problem behaviors when compared to a control ("play") condition. In this control condition, children have free access to attention and toys, and no work demands. While it may seem counterintuitive to parents (and clinicians) to purposefully reinforce problem behaviors, this assessment approach is akin to allergy skin tests: by systematically testing how the child responds to different responses to problem behaviors, clinicians can empirically determine what social responses are most encouraging the problem behavior.

Functional behavioral assessment is particularly important for children with ASD and developmental disabilities because most interventions for these populations include a targeted, proactive skill teaching component (e.g., teaching the child how to request attention appropriately; see Carr & Durand, 1985). In contrast, traditional PCIT involves coaching parents to praise and attend to desired behaviors whenever they occur, with the assumption that these skills (e.g., using verbal language to make requests) are already within a child's repertoire. Without more information about what is motivating a child's misbehavior, clinicians may struggle to prioritize what skills to teach as a "replacement" for the problem behavior (i.e., differential reinforcement of alternative behavior; DRA). Similarly, standard PCIT uses timeout (removal of attention, toys, etc.) to punish problem behaviors, but timeout may or may not restrict access to the reinforcer(s) motivating a child with ASD. Problem behaviors may be motivated by the resulting escape or avoidance of aversive conditions (like parent instructions, boring social contexts, etc.), and removing the child from the situation for timeout essentially provides a break from these conditions. Even with restatement of the original instruction following timeout (a hallmark of PCIT), children have still avoided the task for several minutes (and anyone who prefers to check e-mail rather than complete a boring task right away can appreciate how reinforcing brief avoidance can be). A recognized best practice in the behavioral treatment of problem behaviors for children with ASD is to conduct targeted assessments to determine what specific classes of reinforcement—attention, tangibles (toys, food, etc.), escape from demands, and/or automatic (sensory) experiences—are most relevant (see Chap. 10 of this volume, as well as Iwata & Dozier, 2008). PCIT clinicians should implement these practices as well.

Whether PCIT clinicians use a functional analysis or less rigorous observational approaches, initial (and sometimes ongoing) conceptualization of why the child with ASD is engaging in problem behaviors will allow the clinician to tailor and augment PCIT in a data-driven way. Functional behavioral assessment approaches also provide a framework for considering how to respond to the emergence of new problem behaviors during treatment, as well as the resurgence of previously eliminated ones.

31.3.1.2 Preference Assessment

Often conducted in concert with functional assessment procedures, preference assessments are recognized as best practice in the development of behavioral interventions for children with ASD and developmental disabilities (see Chap. 9 of this handbook, as well as Cooper et al., 2007). Standard PCIT assumes that parent attention (praise, reflection, imitation, descriptions, etc.) functions as a reinforcer for child behavior; while it is absolutely the case that many children with ASD are motivated by attention (Beavers, Iwata, & Lerman, 2013), the extent to which clinicians can coach parents on the types of attention most valued by the child will directly impact the effectiveness of the intervention (Kelly, Roscoe, Hanley, & Schlichenmeyer, 2014). A hierarchy of a child's highest preference rewards and activities can serve as a roadmap for enhancing child-directed interactions, effectively reinforcing the development and use of the child's new skills, and ensuring the effectiveness of timeout.

For these reasons, clinicians conducting PCIT for children with ASD should include some kind of preference assessment procedures during the initial intake process. Open-ended questions to the primary caregivers (and to the child, if verbal) about favorite activities and toys can provide an initial indication of the child's preferences. This information can then be integrated into a more formal assessment of preferences, often similar in format to a “taste test” that one might use to establish a food preference. One procedure, the Multiple Stimulus without Replacement (MSWO; DeLeon & Iwata, 1996), involves presenting an array of items and prompting the child to choose one. After the child has selected one of the options (verbally, or by physically gravitating toward the item), the child is allowed to engage with the item briefly while the array is shuffled. The process is then repeated again (without replacing the previously selected item) to create a rank-order list of the child’s preferences. A more rigorous approach to establishing a preference hierarchy is the Paired Stimulus (PS) method (Fisher et al., 1992). This involves prompting the child to select between only two items at a time, repeating the process so that every unique combination of items is presented. These data can then be aggregated to yield a rank-order list of preferences as well. Both the MSWO and PS procedure can be repeated as needed throughout treatment, should there be concerns about a child’s waning motivation.

A nuanced understanding of the relative values of different reinforcers can allow a clinician to more effectively arrange environmental contingencies (DeRosa & Roane, 2015), which in turn leads to a more effective intervention (Roane, Vollmer, Ringdahl, & Marcus, 1998). This information might also allow the clinician to make refinements to other PCIT components. For instance, for a child who enjoys playing with cars much more when his parent follows a particular script (vs. simply following the child’s lead), only likes game play if the game can be “finished” in the allotted time, and finds physical touch aversive, tailored types of child-directed “special time” might be developed. For children who have very narrow interests (often a core feature of ASD), preference assessments can even support the development of a wider range of interests (Leaf et al., 2012). Given that preferences change over time, and repeated exposure might result in satiation, regular reassessment of relative preferences and varying reinforcement options may improve child response to intervention over the course of treatment (Milo, Mace, & Nevin, 2010).

31.3.2 Progress Monitoring

Despite decades of rigorous research and clinical intervention for young children with ASD, limited consensus exists for how to define and measure progress, with no “fully robust tools” yet emerging (McConachie et al., 2015). This is due in large part to the wide range of approaches and intervention targets represented in the treatment literature: behavior analytic treatments typically rely on single-subject designs and target idiosyncratic behavioral outcomes (e.g., Ganz et al., 2012); large clinical trials frequently rely on standardized language, cognitive and adaptive measures that evidence developmental gains (e.g., Virués-Ortega, 2010); and gold standard ASD diagnostic tools like the ADOS-2 (Lord et al., 2012) are designed to remain sensitive to the disorder despite reductions in symptoms. Narrowing the field for the PCIT clinician, considerations regarding how to measure change during short-term behavioral parent training are presented here.

31.3.2.1 Problem Behavior Measurement

As a measure of the disruptive behaviors specifically targeted in PCIT, the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) remains a primary tool for clinicians. The ECBI has been employed in numerous behavioral parent training investigations for children with ASD, but a comprehensive psychometric analysis in this population has only recently been published (Jeter, Zlomke, Shawler, & Sullivan, 2017). Parent report data from the ECBI suggest both more frequent and more problematic behavioral issues for children with ASD. However, Jeter et al. (2017) note that the standard ECBI cutoffs should still be used for children with ASD, since problem behaviors at that level are likely clinically significant regardless of how normative those problems are for children with ASD.

Two other narrowband tools that measure disruptive behaviors include the Aberrant Behavior Checklist’s Irritability subscale (ABC-I; Aman, Singh, Stewart, & Field, 1985) and the Home Situations Questionnaire-Autism Spectrum Disorder (HSQ-ASD; Chowdhury et al., 2016).

Used in concert for the Research Units in Behavioral Intervention Autism Network's randomized clinical trial comparing parent training with parent education, both the ABC-I and HSQ-ASD appear sensitive to changes associated with parent training (Bearss et al., 2015). Notably, the ABC-I and HSQ-ASD include items that may be more content valid for children with ASD than the ECBI, capturing behaviors like self-injury ("injures self on purpose"), emotional lability ("mood changes quickly"), and noncompliance with specific daily routines (Noncompliance "at bedtime"). In addition, unlike the ECBI, the ABC-I and HSQ-ASD do not include items that assume verbal fluency ("Sasses adults," "verbally fights") or achievement of specific developmental milestones ("wets bed"). PCIT clinicians should consider the developmental level and verbal abilities of the child when selecting and interpreting measures repeatedly utilized over the course of treatment.

Some investigations of more broadband behavioral questionnaires have shown promise for children with ASD. Initial investigations of the CBCL (Achenbach & Rescorla, 2000) suggest that the norm-referenced scales are supported in this population for both the younger and older child versions (Pandolfi, Magyar, & Dill, 2009, 2012). Since challenges with anxiety, depression, and inattention/hyperactivity symptoms are common for children with ASD, and in fact may share overlap with targeted disruptive behaviors (i.e., tantrums associated with rigid/anxious behaviors), use of broadband measures may be a reasonable adjunct for outcomes monitoring.

31.3.2.2 Autism Symptom Measurement

Besides repeated measurement of specific disruptive behaviors and associated symptoms, PCIT clinicians may consider tools that focus on the primary symptoms of ASD. While PCIT itself is not intended to treat the core symptoms of ASD per se, intensive behavioral interventions have been shown to yield reductions in ASD symptoms. Measurement of ASD symptom severity and change is an area of contention, however, with no agreed-upon gold standard. A review of potential tools by a panel of experts convened by the advocacy group Autism Speaks (Anagnostou et al., 2015) found that only 6 of 38 reviewed measures could be considered appropriate (albeit with some limitations) to measure social communication as a treatment outcome target. The recommended options span the wide range of how social communication outcomes might be conceptualized, and include a narrowband tool (the Lethargy/Social Withdrawal subscale from the ABC; Aman et al., 1985), a broadband behavior measure (Behavior Assessment Scale for Children; Reynolds & Kamphaus, 2006), and even a standardized measure of adaptive behaviors (Vineland Adaptive Behavior Scales, Third Edition; Sparrow et al., 2016). A new tool designed to fill this void called the Autism Impact Measure (AIM; Kanne et al., 2014) has promising properties and additional work is forthcoming. Any of these tools would be a reasonable addition to the PCIT clinician's repertoire, as a means for both monitoring gains during treatment and assessing the need for additional intervention/referral.

Beyond parent report questionnaires, PCIT clinicians who are already used to relying on behavioral observation measures might choose to utilize a similar approach for measuring ASD symptoms. One approach, the Imitation of Pretend Play task, involves standardized modeling of play activities (e.g., feeding a baby doll) and quantifying spontaneous child imitation (Masse, 2009). Given that children with ASD frequently show deficits in their symbolic play and imitation skills, and that PCIT already includes both imbedded play modeled by the parents along with explicit procedures to increase compliance, it would be reasonable to repeatedly assess imitation during treatment. Another newly published measure called the Brief Observation of Social Communication Change (BOSCC; Grzadzinski et al., 2016) uses the context of ADOS administration to identify changes in ASD symptoms; rather than the traditional ADOS coding scheme (rating behaviors from 0 to 3), the

BOSCC uses an expanded range (0–6) to better capture more subtle changes in functioning. More research is needed on the utility of the BOSCC as an outcome measure, and PCIT clinicians who have already adopted one rigorous behavioral observation coding methodology (e.g., DPICS) may find the training for ADOS/BOSCC coding to be unnecessarily rigorous.

31.4 Serving Families of Children with ASD

The depth and breadth of expertise and knowledge of ASD among PCIT clinicians will vary. However, we believe that anyone conducting intervention with this population—whether it is PCIT, more traditional Applied Behavior Analysis (ABA) services, or even primary care medical management—should be prepared to offer families basic information about clinical and supportive services for children with ASD. Questions and discussions often arise during intake and assessment, but clinicians should be prepared for them at any time.

31.4.1 Pre-diagnosis

Whether or not PCIT clinicians engage in ASD screening, they should be prepared to discuss developmental concerns with families. It is important to communicate that ASD risk is suspected so that families are not later blindsided with a diagnosis; that said, placing concerns about the child's development in terms of strengths and weaknesses (rather than emphasizing diagnostic categories) can help families recognize the need for further assessment and intervention. PCIT clinicians should know and communicate to families the limits of their own diagnostic capabilities. As outlined above, even clinicians referring out for a comprehensive diagnostic evaluation should be familiar with the components of an evidence-based evaluation and be prepared to describe it to families.

31.4.2 Post-diagnosis

PCIT clinicians should be able to support the family of a child recently diagnosed with ASD. While comprehensive diagnostic evaluations are typically accompanied by educational, developmental/behavioral, and medical recommendations, families may be provided little assistance in understanding and following those recommendations. We advise PCIT clinicians to review a copy of the diagnostic report and ensure that the family understands and has a clear plan for implementing the recommendations.

For a family seeking PCIT following an ASD diagnosis, we also believe that it is imperative to educate the family regarding the continuum of services recommended for young children with ASD. PCIT may serve as a critical component within a larger framework of care: young children with ASD are most likely to reach their best outcomes when they receive between 25 and 40 h per week of structured, intensive behavioral intervention throughout early childhood (see Eikeseth, Smith, Jahr, & Eldevik, 2007). These services may include a combination of in-home early intervention (available free for children ages 0–3 years through each state's implementation of Part C of the Individuals with Disabilities Education Act), early childhood special education services (available free for children 3–6 through the child's public school district), ABA therapy services obtained through other community groups, and supplementary services like speech/language and (if appropriate) occupational therapy services. While ABA therapy programs should always include parent training components, research evidence supporting parent training models derived from traditional ABA approaches continues to emerge (for a review, see Beaudoin, Sébire, & Couture, 2014, as well as Postorino et al., 2017). PCIT and other evidence-based programs for reducing disruptive behavior may fill a critical need for children with ASD, but are unlikely to supplant ABA services.

Clinicians should also be equipped to provide parents with information regarding other supportive services available in the area including parent and sibling support groups, respite services, legal services, and state-based parent training and information assistance with Individualized Education Programs and/or school issues. Autism Speaks manages state resource guides, which are available on their website (www.autismspeaks.org). We also recommend that you get in touch with your regional University Center for Excellence in Developmental Disabilities (UCEDD) for more information regarding services and supports in your community. UCEDDs are reputable university-linked centers provide training, assistance, services, research, and information sharing for individuals with developmental disabilities, including ASD. There is a UCEDD in every state: they likely have compiled their own lists of services and supports in your state. Although lists can be helpful to clinicians and parents, they cannot substitute for a more intimate knowledge of state and local services and providers, which we strongly encourage you to gain.

31.4.3 Coordinating with Other Providers

A child with ASD will typically have more than one service provider, and coordination among providers is essential to the effectiveness and efficiency of treatment. In some states, disability services provide professional service coordinators who can assist families and providers in the coordination process. Even then, you will need to maintain contact with other providers to consult and coordinate, as needed. At minimum, we recommend talking with other providers about their treatment goals and techniques at the outset of your therapy to avoid service duplication or conflicting goals or treatments. Ideally, services will be coordinated so that behavioral recommendations are similar across settings, to support generalization of parent and child skills and behavior. As a PCIT clinician, you bring a unique skill set to the treatment table: you are an expert in training parents to implement a treatment program at home. Oftentimes, other professionals (e.g., ABA therapists, teachers, speech/language therapists) work with the child with ASD directly and do not have the skills or time to teach parents how to support their intervention at home. With careful collaboration, you may be able to help the other professionals reach their goals by training the child's parents to implement their treatment program in the home. You can also fill a critical gap that is often present in the medical treatment of children with ASD: systematic behavioral data collection to assess the effectiveness of medication and/or the presence of side effects. Typically, you must make the effort to reach out to the prescribing provider and offer such a service; it is often well received and certainly of benefit to the client.

31.5 Summary

Children with ASD benefit immensely from early identification and intensive intervention. Unfortunately, many children are not diagnosed until after age 3 or 4 (Christensen et al., 2016), even though symptoms emerged much earlier in development. Even more troubling is the fact that more than half of parents report difficulties accessing services for their children with ASD (Vohra, Madhavan, Sambamoorthi, & St Peter, 2014), and children from racial/ethnic minority groups face even more barriers to accessing quality care (Magaña, Parish, Rose, Timberlake, & Swaine, 2012). Just as PCIT clinicians have dramatically increased access to evidence-based services for typically developing children with disruptive behavior problems, these same providers may be in a unique position to leverage their roles in community mental healthcare and other settings to improve access to care for children with ASD and other developmental disabilities. This may be particularly relevant as the evidence base for using PCIT with this population grows and clinicians take on the professional tasks outlined here and throughout this volume. This evolution is fitting, given that Hanf's work with parents in the 1960s (laying the groundwork for PCIT) was focused on children with developmental disabilities (Reitman & McMahon, 2013). We hope to see PCIT come full circle.

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32

Child-Directed Interaction Treatment for Children on the Autism Spectrum

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Abstract

This chapter briefly explores the research currently supporting Child-Directed Interaction (CDI) as a treatment modality both as part of broader Parent–Child Interaction Therapy (PCIT) framework and as a stand-alone intervention. It examines theoretical reasons why CDI is an effective and appropriate intervention that benefits children, parents, and the parent–child relationship as a whole as well as its unique value for children on the autism spectrum. The authors discuss effective CDI coaching strategies useful in both PCIT and CDI for children with autism spectrum disorder (ASD), including expanding play ideas, working with stereotyped interests, exploring the appropriateness of using labeled praises as reinforcers, and tailoring reflections for children with limited speech. The authors also suggest therapeutic guidelines for parents who rapidly reach mastery and address issues that commonly occur around the "Don't" skills. Finally, the authors deliberate policy issues concerning the expansion of CDI as a stand-alone treatment to a broader base of health care providers.

32.1 The Power of Child-Directed Play

Research has shown that child-directed, naturalistic play can be an effective technique at increasing parental attachment, decreasing negative child behavior, and increasing child self-esteem (Webster-Stratton & Reid, 2010). By providing children an opportunity to lead the play, children are able to communicate with a caring adult about themes and issues that they may otherwise have difficulty expressing. In addition, child-led play allows children to build play schemes, learn new language skills, and develop valuable social skills. Parent–Child Interaction Therapy's (PCIT) Child-Directed Interaction (CDI) has the potential to meet a child right where they are at—developmentally and emotionally—which can result in significant growth in skills in a relatively short amount of time.

As previously covered in this book, PCIT has been shown to be effective in treating children with autism spectrum disorder (ASD) who are presenting with externalizing behavior problems. The CDI phase of PCIT (which focuses on building the strong and unique attachment between a

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parent and a child) may be especially important for a child who, due to social and language delays, struggles to build relationships with others. When the concept of applying PCIT with children on the autism spectrum was first introduced, PCIT clinicians expressed worry that children on the spectrum would not be motivated to engage in play interactions with their parents and that PCIT would therefore be an inappropriate form of treatment for this population. In fact, PCIT was initially only recommended for "children who would be described as falling on the higher-functioning end of the autism spectrum" specifically because it was hypothesized that children on the lower end of functioning would not be socially motivated enough to respond to differential social attention and engage with their parents during CDI (Masse, McNeil, Wagner, & Chorney, 2007). However, it could be argued that CDI, the phase that brings children and parents together by incorporating a parent into a child's world, is even more important for children on the spectrum than for their typically developing peers and has an important place in behavioral treatment for children with ASD.

This chapter will briefly explore the research currently supporting CDI as a treatment modality, both as part of broader PCIT framework and as a stand-alone intervention. Theoretical reasons concerning why CDI may be an effective and appropriate intervention that benefits children, parents, and the parent–child relationship as a whole will be examined. Effective CDI coaching strategies that can be used to help tailor treatment specifically to individuals with ASD will also be discussed. Finally, the chapter will end with deliberating policy issues concerning the expansion of CDI as a stand-alone treatment to a broader base of health care providers.

32.2 Background of CDI with ASD

There have been only a few studies that have considered the use of the CDI component of PCIT without providing the second phase of treatment, Parent-Directed Interaction (PDI). N'zi, Stevens, and Eyberg (2016) conducted a randomized controlled trial (RCT) that evaluated CDI as a stand-alone intervention for kinship caregivers of children who had been removed from their homes and whose new caregivers were having problems managing their behaviors. When compared to a waitlist control group, families who underwent CDI indicated statistically significant decreases in child externalizing behavior problems, caregiver depressive symptoms, and parenting stress as well as positive changes in caregiver discipline strategies and the quality of the caregiver–child relationship. These gains were maintained for 3 months following the intervention. Bagner et al. (2016) used an adaptation of CDI-only treatment as a home-based program for parents and infants in high-risk families. When compared to a control group (i.e., standard care only), infants who completed CDI demonstrated greater compliance with maternal commands and fewer externalizing and internalizing problem behaviors at post- and follow-up assessments. Mothers also showed higher rates of positive parenting and a lower frequency of negative parenting after CDI.

PCIT, when delivered as a whole, is a highly effective treatment for most children. Due to its potency, therapists and researchers rarely consider analyzing the unique contribution of individual components of PCIT to treatment progress. Indeed, most children can benefit from both the relationship building and the effective discipline aspects of PCIT; however, when working with children on the spectrum, there is a subset of children who do not exhibit clinically significant disruptive behavior problems. Many families with children with ASD seek treatment to learn different ways to interact and engage with their child, to improve language, and to develop play skills. It is not uncommon for a parent with a child on the spectrum, particularly a child who has very narrow interests, to express frustration or to wish for another way to connect and communicate. However, even these motivated parents can have difficulty coming to weekly treatment sessions. Implementing only the CDI component of PCIT reduces the time families are in treatment. In addition, CDI alone eliminates the discomfort many families feel when attempting to implement a consistent discipline procedure, especially for children older than 7 years that may benefit from treatment but who would otherwise be too physically strong for PDI.

Abner et al. (2008) conducted a small pilot study in which they examined the impact of CDI alone with children with ASD whose symptoms varied in severity (from high- to low-functioning). In a series of five single participant designs, the researchers examined the impact of CDI treatment on child behavior problems (as measured using the Eyberg Child Behavior Inventory; ECBI; Eyberg & Pincus, 1999) and language output. Language output was measured by counting every word that the children used during the 5-min coding session (via the Dyadic Parent–Child Interaction Coding System; DPICS; Eyberg & Pincus, 1999) at the beginning of treatment. All five children exhibited clinically significant decreases in parent-reported ECBI scores (i.e., Intensity and Problem scales); in addition, child verbal output doubled in 6 weeks of treatment.

The first randomized control trial (RCT) to examine independently administered CDI on the outcomes of children and parents was published by Ginn, Clionsky, Eyberg, Warner-Metzger, and Abner (2015). In this study, 30 children with a previous diagnosis of ASD were provided CDI. Children were not required to demonstrate significant disruptive behavior problems to participate, but had to speak a minimum of three words and could not be involved with any other behavioral treatments. Families were assigned to either a waitlist control group or an immediate treatment group. All families were recruited from outpatient clinics at the University of Florida and were given a total of 8 weeks of standard PCIT CDI sessions (i.e., without adaptations) conducted by clinical psychology graduate students trained in PCIT (with waitlist controls receiving treatment after study completion). Following 8 weeks of CDI (one teach session and seven coaching sessions), parents showed a significant increase in their positive parenting behaviors and a decrease in their negative leading behaviors (as measured by the DPICS). A significant decrease in disruptive behaviors was also reported on the ECBI Intensity scores with a strong effect size of 1.12.

While no significant changes were seen in child expressive language (as measured by total word count) following the intervention, children did show improved social awareness on the Social Responsiveness Scale (Constantino, 2005). Used to detect the occurrence and severity of impaired social skills for children on the autism spectrum, the Social Responsiveness Scale indicated a robust effect size of 1.03 for families who completed CDI. Parent stress did not change on the Parenting Stress Index (Abidin, 2012), however, parents reported an improvement in their amount of distress associated with child disruptive behavior (as measured by the ECBI Problem subscale). This suggests that parents felt more confident in their ability to manage their child's behavior. Interestingly, the dropout rate was lower than other PCIT efficacy studies (Lyon & Budd, 2010) with only 23% of the total sample discontinuing treatment.

In a RCT first presented at the 2015 PCIT International Convention, Harrington, Allen, Cooke, and Paulson (2015) examined the impact of PCIT on children on the autism spectrum. In line with previous literature, researchers found that PCIT significantly increased child compliance and significantly reduced behavior problems and parental stress. However, contrary to researchers' expectations, children with more severe ASD symptomatology showed greater reductions in problematic behavior during the CDI portion of treatment than their less severe counterparts. There was approximately a 75-point drop in ECBI Intensity scores from pretreatment to when parents mastered CDI. During their presentation, the authors noted, "Our hypothesis about the different trend in treatment response was that the less severe or high functioning children responded similarly to neurotypical children. The parents of more severe children seemed to benefit from learning how to respond to their child and engage in play; and once the interactions improved, most of the behaviors improved as well" (Harrington et al., 2015).

Although more research is needed, the outcomes from the RCTs as well as the overall research support for PCIT should provide clinicians with confidence in using CDI with children on the autism spectrum as an effective treatment approach. Initial efforts have started to examine which children with ASD may reap the greatest benefit from CDI as a stand-alone treatment. Currently, exploratory analyses have not shown any differences in outcomes based on age (between 3 and 7 years old), IQ, language, or adaptive skill level of the child (Ginn, Clionsky, Warner-Metzger, Abner, & Eyberg, 2013). These findings suggest that CDI may work with a variety of children on the spectrum and their families to build positive interaction skills and/or decrease child disruptive behaviors.

32.3 Why Use CDI with Children on the Spectrum?

There are a number of other interventions such as Floortime, and the Early Start Denver Model which focus on making play with parents a positive developmental experience (see Chap. 3 in this book for more details on some of these programs; Dawson et al., 2010; Ingersoll & Wainer, 2013). It is important to consider the unique features that CDI can bring into treating children on the spectrum.

1. Efficiency: Many of the treatments for children with ASD require large time commitments from the parent. For example, Floortime recommends 20 h of parent intervention per week (Greenspan & Wieder, 2006). Applied behavior analysis therapy sometimes requires 30–40 h per week of therapist intervention. In contrast, a parent can be effectively trained in CDI in approximately 6–8 weeks for weekly, 1 h-long sessions and 5 min of practice per day.
2. Efficacy: Significant evidence from RCTs has found that CDI alone can be effective in reducing problematic behavior problems, often in as little as 8 weeks (Ginn et al., 2015; Harrington et al., 2015).
3. Assessment Oriented: Because of the sophisticated coding system used in PCIT, PCIT therapists can quickly assess a parent's strengths and weaknesses on their CDI skills. Therapists can then tailor their coaching to effectively improve the parent's skills and interaction style.
4. Affordability: Because CDI is a time-limited intervention, it is relatively affordable when compared to many other treatment methods. Although more research should be done to compare long-term cost-effectiveness of CDI treatment, the comparatively low cost of CDI-only intervention may make it an attractive option for both parents and agencies who are hoping to intervene with children on the spectrum in a cost-effective way.
5. Multi-theoretical Orientation: One of the unique strengths of PCIT is that it is a multi-theoretical intervention (Eyberg & Funderburk, 2011). PCIT has a strong behavioral background which incorporates learning principles into the coaching method. At the same time, CDI is based on traditional play therapy where it is recognized that play is the most effective strategy to communicate with children and help them learn. Moreover, CDI takes the skills that play therapists use and operationalizes them for parents.
6. The Use of Parents as Therapists: Many treatments for children on the spectrum leave parents in the waiting room. By training the parents in therapeutic play skills, skill generalization for the child is increased to outside of the therapy room, and the impact of therapy becomes much more powerful.
7. Coaching of Parents: By conducting direct coaching of parents, therapists are able to immediately correct errors in parental use of PCIT skills and quickly shape them toward mastery of the technique.
8. Mastery Criteria: Parents are given a standard of success that has been empirically derived (Eyberg & Funderburk, 2011). This standard of success empowers parents by helping them see the progress they have made in learning the technique and allows them to reach an obtainable goal to graduate from treatment.
9. Dissemination Structure: PCIT International has a clear dissemination structure with trained therapists throughout the United States and the world who are prepared to deliver the intervention.

32.3.1 Case Example

"Billy" was a 5-year-old boy with autism with significant behavior problems referred for PCIT. Billy's interests were restricted to a strong stereotyped preference for guitars. Specifically, Billy would spend an inordinate amount of time drawing guitars, but he would not engage in play outside of these drawings. During CDI, his mother would follow along with her PRIDE (*P*raise, *R*eflect, *I*miate, *D*escribe, *E*njoy) skills and imitate his drawing of guitars, using statements such as, "You are drawing a fret," and "I like how you are drawing the D string." While the therapist continued to encourage the use of PRIDE skills for Billy's behaviors, the therapist also instructed the mother to broaden the interaction by incorporating other toys into the scenario and shaping a greater range of play behaviors. Specifically, the mother was coached to have different farm animals (e.g., sheep, horses) play with the guitars; she made the farm animals have a guitar concert with the drawn guitars while sheep and cattle would gather up by the fence to listen. Meanwhile, Billy continued to draw numerous guitars without generalizing out from his "drawing guitars" theme.

It was CDI Coach 5 where both Billy's mother and the therapist were feeling fatigued from the repetitive guitar play. Attempts were made to bring in more attractive toys, but Billy continued to engage in his restricted, repetitive behavior. Despite this fixation, the mother reached CDI mastery during the session and was doing a lovely job of remaining joyful during her child's play. Billy's mother continued to use farm animals in this session to try to expand the play. About halfway into the session, Billy suddenly grabbed a pig and said, "My pig is playing guitar." He then transitioned into a pretend play scenario with the farm animals. Amazingly, he left both the guitar drawing and guitar theme to participate in a unique activity utilizing both creativity and imagination. The therapist excitedly jumped on this opportunity to have Billy's mother give labeled praises for playing with a different object. However, the therapist reduced the coaching intensity when it was noticed that the mother was crying. The concerned coach asked the mother how she was doing. The mother replied, "You'll have to give me a minute. This is the first time I have ever seen him play with anything. It is beautiful."

In most interventions with children on the spectrum, adults are guiding the child's activities: they set the goals, they choose the play materials, and adults spend a lot of time trying to get the children to come join the adult's world. CDI gives adults a chance to meet children in their world. When parents engage with their children's specific interests, children on the spectrum may feel that they are being listened to and understood on a level that has potentially never been accessed before; this can motivate children to engage with their parents in play. Many parents who enter PCIT believe that their child, "just does not like to play with me." Regardless of the child's restrictions and repetitions, parents who can connect with their children by engaging in their interests can then bond with children in other ways too.

32.4 Effective Coaching Strategies in CDI

First and foremost, implementing quality CDI is the best coaching strategy clinicians can use when considering their coaching approach for a child with ASD. There is no need to radically change CDI for children on the spectrum as the basic protocol works quite well. One of the strengths of PCIT is the continuous assessment of parental skills which allows PCIT clinicians to craft and tailor their coaching to address the needs of the parent and child at every session. This process of reevaluating the case through functional analyses and tailoring treatment for every family makes PCIT an effective intervention for a wide variety of diagnostic categories. That being said, there are a number of effective strategies to specifically tailor CDI to individuals with autism that the authors would recommend for consideration when working with children with ASD.

32.4.1 Importance of Imitation

Unfortunately, the PRIDE skill of imitation is frequently overlooked by PCIT therapists. Therapists may instead focus their attention on coaching reflections, labeled praises, and behavioral descriptions since these are at the core of CDI mastery criteria. Yet, imitation is a potent PRIDE skill that accomplished coaches are quick to prompt. Without imitation, a parent's play can devolve into a straightforward, albeit very positive, sportscaster (giving a play-by-play of the child's behaviors without being involved in the play activity). Skilled imitation brings the parent into the child's play scheme and encourages a strong interactional symphony. Any PCIT therapist should be conscious to prompt imitation and to give parents labeled praise for engaging in imitative play.

Similar to other early interventions for children with ASD, PCIT teaches parents to imitate child play and language (Ingersoll, 2010). Parental imitation of child language and actions with toys is particularly important for children with ASD as this promotes the use of spontaneous child verbalizations, joint attention, social responsiveness, and play ideas (Masse et al., 2007). In addition, imitation communicates parental enjoyment and acceptance of child behavior. Lastly, imitation can also send a message to children that they have worth and value, which is particularly important for children on the spectrum since often they receive social messages from their parents, peers, and culture that their interests and activities are not socially acceptable.

32.4.1.1 Case Example

In one PCIT case with a child on the spectrum, a 4-year-old boy would often self-stimulate by twirling objects. When he began PCIT, his parents identified this as a problem behavior that several of his past therapists had tried to eliminate. During his first CDI session, the child began spinning a tinker toy in his hand and his mother looked somewhat aghast when the therapist suggested that she imitate his play.

"Shouldn't I ignore this because it's inappropriate stereotyped play," she asked.

"No," the therapist replied, "this is how he is playing right now and it is not harmful to you or him so go ahead and follow his lead."

The mother began to imitate his twirling of the tinker toy while giving a behavior description, "You are spinning the tinker toy." After several seconds of spinning, the coach told the mother, "Now go ahead and add some items onto your tinker toy structure." The mother began to add items stating, "I'm making my toy into a flower." Soon, the child was imitating her by also constructing a flower. Within several minutes, the boy put his tinker toy flower into a base.

"Describe that," stated the coach.

"You are planting a flower in the garden," said the mother.

Soon, the boy became fascinated with planting tinker toy flowers. The mother's ability to follow the child's lead and imitate something he found fun provided a gateway for the parent into the child's world, and made him more likely to imitate the parent's play.

32.4.2 Stereotyped Behaviors and Expanding Play Ideas

As suggested in the scenario above, CDI therapists working with children with ASD are encouraged to treat most safe, stereotyped play as just another play behavior to imitate and describe. Stereotyped play behaviors are the child's way of engaging with the play materials; rather than ignore these actions, the parent should follow the child's lead. If parents otherwise ignore these behaviors, children without a variety of play skills may end up being ignored for the entire CDI session. Therefore, if the child winds a piece of string over and over again, have the parent grab another piece of string and wind it; if a child is hitting two blocks together, have the parent hit two blocks together as well. The stereotyped play is used as a gateway to follow the child's play, particularly if the child does not have many functional or creative play skills.

Since many children on the spectrum do have limited interests and play schemes, parents are encouraged to use these stereotyped interests and play behaviors while seeking opportunities to expand the play. Thus, parents may imitate, describe, and label praise a child's focused interest, but also should look for opportunities to include additional toys or storylines. When parents are attempting to expand play schemes, it is not unusual for the child to push the new toys out of the way or respond with, "No." Parents are coached to ignore the refusal, but persist in imitating the child's behavior and try adding novel objects and activities over time. Resistance generally eases, and children adapt the new toys into play.

32.4.2.1 Case Example

One girl referred for PCIT had a strong stereotyped interest in Thomas the Tank engines. According to her parents, it was not unusual for her to spend 30–45 min at a time circling her train around the tracks. As her parents and coach learned firsthand, it can get very exhausting and redundant in a short amount of time to say, "I like how you are making Thomas go around the tracks," "Great train rolling," or "You are connecting the cars." As the child played with the train, the parents were instructed to join the child's play while adding new components and describing both the child's play and their own play (while avoiding commands or leading statements). For example, one parent was coached to put animals on the train while describing, "I'm putting the dog on the train. The train is passing a field of cattle. Now the farmer is leading the sheep over the train tracks."

During the first session of coached expansion, the child simply ran their train around the circle for the full 35 min of coaching time and seemingly did not acknowledge her parents' additions to the play. During the next session of coached expansion, as soon as the parent put a dog on the train, the child put a cat on the train. The parent was coached to enthusiastically praise the child, "I like how you put the cat on the train. It looks like it is having fun!" Soon the child was incorporating a variety of animals and people into the train set. By the fifth coaching session, the child was actively choosing other play sets in the room and even went an entire session without touching the train.

Some PCIT therapists may be wondering if it would have been a good strategy to avoid bringing the train set into the session altogether. While the authors feel that this can be an effective strategy at times to help a child increase his or her play repertoire, leaving out a favorite toy can also be very challenging for children with ASD and deter from the primary goal of CDI—to teach the child that play with the parent is rewarding and fun. In the above case, this strategy was attempted during the second CDI coach. When the child discovered that the preferred toy was not available for the session, the child engaged in a 30 min tantrum. Despite the skilled use of ignoring by the parents and copious amounts of enthusiastic descriptions of the parents' own play, the child persisted in the outburst. Both the parents and the therapist felt that it would be more valuable in the next session to have the preferred toy so there would be more time for coaching. Often, the child's preferred toy is an excellent way to help a parent begin to forge a stronger connection with their child; this can be done by using the child's interests to gain engagement in play and stimulate interest in the parent–child interaction as well. However, the therapist must always assess the situation and see if there is more to be gained than lost with removing access to a preferred toy.

32.4.3 To Praise or Not to Praise?

The authors have frequently been told that children on the spectrum do not and cannot learn from social reinforcers, thus PCIT will not be effective. These authors believe that this misconception can guide people into only using material reinforcers when working with children with ASD, which is limiting and unnecessarily restrictive. While these children may have difficulty understanding and processing social reinforcers, they still learn and benefit from both social reinforcers and observation. A useful metaphor may be to consider a child with a severe reading disability. While it is very difficult for the child to learn to read, the child can still learn to read with appropriate intervention. It is not that she is incapable of reading, but the skill may be difficult for her to acquire. Likewise, many children with ASD benefit greatly from labeled praises and reflections, even though they may not respond as quickly as other children.

For example, some children may respond negatively to praise when it is first introduced. One child in CDI sessions would cover his ears and yell, “No I didn’t,” or “Don’t say *good job*,” when his parents gave him praise for various behaviors. Most often when this occurs, it seems that children are responding negatively to a change in parental behavior. Not limited to children with ASD, this rejection often happens for normative developing children as well. For example, children often become frustrated with reflections (e.g., “Why are you repeating me”). Although these remarks are off-putting to families, when parents are coached to ignore the tantrum and to vary the praises that are given, this behavior seems to extinguish over time and children adjust, and even enjoy, this new routine of receiving labeled praises.

Those in opposition to this method have argued that using labeled praises might promote “prompt dependence” in children with ASD, meaning that children are more likely to learn a routine to seek praise or begin to engage in repetitive language (e.g., repeating “good job” after completing activities). In the authors’ experience, however, this has not been an issue of concern in CDI; the skills that are praised are varied and used intermittently with behaviors. As a result, the child does not become conditioned to receive reinforcement or praise each time they exhibit a specific behavior.

Parents in PCIT for children with and without ASD use labeled praise to address a similar set of behaviors: praising listening, following directions, playing gently with toys, and sharing. However, praises can also be used to target core deficits of children with ASD such as rigidity or limited social skills. For example, parents should be coached to praise children’s flexibility in their choice of toys in session and in their play ideas. This is particularly pertinent if the therapist notices the child playing in a different way or if the child allowed the parents to incorporate different ideas into play. Labeled praises can also be used to promote core social communication components. Chapter 25 in this book highlights possible social skills to praise in an effort to increase the likelihood the skills will be generalized for use with others.

32.4.3.1 Brief Case Example

A 3-year-old boy in CDI usually played by himself without ever noticing his mother’s presence. However, he began making brief eye contact with his mother whenever she praised his gentle hands. At first, he seemed surprised by her attention. After several more sessions, he began smiling and making eye contact at the same time in response to her approval.

32.4.4 Tailoring Reflections

A common concern among children with ASD is the presence of language delays. Therefore, one of the most utilized tailoring strategies in PCIT while working with children on the autism spectrum is related to a child’s ability to verbalize. Often, language delays can prevent these children from communicating effectively with their parents; this can make it difficult for parents to reflect their child and reach CDI mastery. Therapists may consider using what is often referred to as the “75% Rule” for CDI skills mastery during the 5 min of DPICS coding. Specifically, if the parent has reflected back 75% of child verbalizations, mastery of the reflection criteria for CDI is achieved. This strategy provides flexibility in the graduation criteria due to a child’s limited words or vocalizations. While coding, the therapists not only keep track of parental reflections but also tally the child’s verbalizations. Hence, therapists should encourage parents to reflect back almost every appropriate verbalization or vocalization of the child.

When working with preverbal children, therapists may need to be very liberal when coaching and coding reflections. During DPICS coding, the general rule is the child's verbalization must be an actual word in order for a therapist to code a parent's statement as a reflection. For example, if a child is playing with a cow and says, "Moo," and then the parent says, "Moo," then the verbalization is coded as a reflection. However, if the child makes a much more realistic cow sound, "Uaaaaaaauuuuuuuu," and the parent reflects this sound back, it is not considered a reflection in DPICS as the child's verbalization was not a word.

Therapists-in-training are often encouraged to code only what you can spell. However, when it comes to working with kids on the spectrum, the therapist may need a little freedom for some creative spelling. In other words, for clinical purposes, a good faith attempt by the parent to reflect back any child verbalization should be coded as a reflection as long as it is not a question. Likewise, during coaching, parental reflection of any appropriate nonword sounds or word approximations should also be praised and encouraged by the therapist. For example, when coaching sessions with a 3-year-old who was just beginning to use single word verbal language, the therapists would coach the parent to reflect all word approximations and then follow up with the correct pronunciation or full word of the toy or object. When the child said, "Choo choo," for train, the parent would reflect, "Choo-choo. You're holding the train." Please note that this coding recommendation does not extend to therapists engaged in research as this would possibly invalidate the DPICS.

Another common situation is that the child may be using sign language exclusively or for the majority of their communication. The authors recommend that in this situation, the parents reflect back the sign language both verbally and visually. For example, one PCIT client loved the color blue and would frequently make the sign for "blue" anytime she saw a blue object. Her mother reflected "blue" to her in both sign and spoken language. Soon, the child was saying "blue" as she was making the sign. In several weeks, she consistently added the word "blue" to her vocabulary.

32.4.5 Patience

PCIT therapists can get a little spoiled. We are used to seeing rapid changes in child behavior, which often can occur over the course of the session itself. When working with children on the spectrum, recognize that progress may occur more slowly and unevenly. It may take several CDI sessions for the child to adjust to the routine of the new treatment environment let alone to begin to see increases in the parent–child relationship, language, or social skills. While some children show rapid and stunning changes during CDI, others may show much slower responses. PCIT therapists are encouraged not to dismiss children as "unresponsive to CDI" after only a few sessions as one may get a significant and dramatic change if more time is invested. Children on the spectrum often have an uneven profile of cognitive skills, and it is not unusual for them to react to CDI with swift changes in some areas and slower changes in others. Additionally, while improvements in the parent–child relationship and decreases in child disruptive behavior remain a core area of focus on PCIT with children with ASD, some of the most dramatic and meaningful changes in families often come from changes in the child's play behaviors and engagement. These changes can be the most important and exciting for families and for you as their therapist; these are important also to highlight and acknowledge in coaching.

It should be noted that while research has shown that CDI has a potent effect size in reducing disruptive behavior problems and increasing social and language skills of children on the spectrum (Ginn et al., 2015), group research may mask individual gains. In one case, a PCIT therapist was working with a 3-year-old child who was diagnosed with the severe form of ASD. His parents were both college-educated and highly motivated for treatment (e.g., practiced every day during the CDI). At the beginning of therapy, the child mainly engaged in hand-flapping and other self-stimulation behaviors. His parents reported that he was only speaking in single-word utterances and would rarely speak unless he wanted an object or food. During CDI Coach 3, he spoke in his first two-word sentence. By CDI Coach 5, he was speaking in three to four word sentences and was engaging with both parents in entertaining play schemes. While these types of results should not be expected for every child, this is not an isolated incident of rapid gains during CDI and may not be illuminated through data in a RCT.

32.4.6 Working with Parents Who Reach Mastery Rapidly

One of the differences that many therapists encounter when they first work with children with ASD is that many of these parents are highly motivated. It is not unusual for parents of children on the spectrum to come to their first CDI Coach session having practiced every day while brandishing a highly detailed homework sheet describing their efforts to conduct special play time. As a result of this motivation (coupled with hard work), some parents may reach mastery by CDI Coach 2 or 3. When a parent reaches mastery quickly, the therapist may want to entertain the possibility of engaging in several more CDI sessions before advancing to PDI. The authors recommend a bare minimum of at least five CDI sessions before moving on. In some clinical situations, the therapist may wish to wait for even longer before advancing to PDI. Sometimes we forget as therapists that just because a parent has mastered the skills, does not mean the child has adjusted to the new style of communication or interaction. Children play an important role in the parent–child relationship, and neglecting to evaluate their readiness for change can hinder the potential gains made by the entire family.

In some cases, a therapist may want to consider providing CDI as a stand-alone intervention with extended sessions (with no intention of ever progressing to PDI); certain cases may lend themselves to this strategy as children who are not exhibiting significantly high levels of disruptive behavior may not have the same benefits from PDI. Based on Ginn et al.'s (2015) findings, improvements in both children and parents occurred after seven coaching sessions of CDI. It is unknown if further gains would have occurred if children had received even more sessions of CDI. Therefore, given that many parents also hope to work on increasing child engagement and play flexibility, it may be helpful to coach additional CDI sessions to improve parental imitation and expansion of the child's play (especially if mastery is attained quickly).

32.4.7 Coaching the "Don't" Skills

As mentioned earlier, many approaches to working with children on the spectrum encourage children to move into an adult or "neurotypical" world and away from their own activities and interests. Parents who have been actively engaged in early interventions, including applied behavior analysis, have often been taught to be very directive and to take on the role as "teacher" in many interactions with their child, including play. Helping most parents to decrease leading behaviors (e.g., questions, commands, and critical comments) is challenging in CDI. Working with parents who have been explicitly taught to be directive by other clinicians may act as an additional barrier to making regular advances in treatment; the process of "following" in child-led play may go directly against what they have previously learned.

Regardless of these barriers, decreasing parental leading may be the key to the reductions in child acting-out behaviors reported in CDI. Ginn et al. (2015) found that reductions in maternal "Don't" skills significantly mediated the relation with child disruptive behavior. In other words, children acted out less frequently when their parents decreased intrusive, verbal demands and prompts in CDI. There is currently no research comparing the frequency of leading behaviors demonstrated by parents of children on the spectrum to the parents of children without an ASD diagnosis; therefore, we do not know if parents of children with ASD are significantly more directive than other parents in CDI. However, leading behaviors may be even more detrimental to children on the spectrum whose sensory sensitivities and slowed verbal processing may become too overwhelmed (thus increasing the incidence of dysregulated behavior). Therefore, therapists should be very sensitive to parental leading and focus on reducing these behaviors during CDI whenever possible (e.g., physical leading behaviors = hand-over-hand physical demands). Therapists need to observe whether children are being overloaded by other potentially intrusive parental behaviors including volume of the parent's voice, physical proximity of the parent to the child, or number of verbalizations directed at the child. Therapists should coach parents to reduce these behaviors, when necessary.

32.4.7.1 Case Example

A 5-year-old boy with sensitivity to loud noises was being coached in CDI with his mother. His mother was very anxious about connecting with her son. She was extremely motivated however, and was using a high frequency of the PRIDE skills, even at CDI Coach 2. However, instead of responding to the skills, the boy was withdrawing and moving further away from his mother. The coach noticed that the mother, while technically using the "Do" skills, was applying them in a way that was making her child uncomfortable; she was talking rapidly and in a loud voice, sitting very close to her son, and touching him repeatedly. In addition, the high volume of statements made it impossible for her son to speak. The coach encouraged the mother to speak slightly above a whisper and to take a breath between each of her statements. The coach also encouraged her to begin imitating the play and to put her hands on the toys instead of her son. She continued to use the PRIDE skills, but she became calmer and allowed her son some room to play as well. Slowly, the child stopped retreating from his mother and allowed her to share his game. He began to speak, and his mom was coached to reflect his statements. The calmer and less intrusive his mother became, the more the child interacted with her.

32.5 Expanding CDI Treatment to Other Health Care Providers

Currently, PCIT training is limited to providers who are licensed to deliver psychotherapy services: counselors, psychologists, social workers, marriage and family therapists, and psychiatrists. However, these professionals are often not the first line of service provision for children on the autism spectrum. Many children on the spectrum receive occupational therapy services, speech language therapy services, and bachelor's level applied behavior analysis services. These children may never meet with a mental health professional, especially if they don't have clinically disruptive behaviors. Yet, these children may be able to gain significant benefits from CDI as a stand-alone approach.

Play interventions are a common treatment component for many ASD interventions (e.g., occupational therapy, speech language therapy). In fact, many therapists in standard services for ASD children receive training in therapeutic play techniques such as Floortime (Greenspan & Wieder, 2006) and Theraplay (Siu, 2014). For example, the American Occupational Therapy Association notes on its website that occupational therapists, (a) "recommend ways for family members to be more involved in the child's play," (b) "suggest toys and play activities for children of all abilities and ages," and (c) "collaborate with educators and caregivers to enhance playtime at home" (https://www.aota.org/about-occupational-therapy/patients-clients/childrenandyouth/play.aspx). Likewise, speech-language pathologists view play therapy as the primary approach to infant and toddler language development. Both applied behavior analysis therapists and speech language pathologist utilize play in pivotal response therapy (Autism speaks; https://www.autismspeaks.org/what-autism/treatment/pivotal-response-therapy-prt).

Since these therapists already use developmental play techniques as a part of their treatment modality, CDI may be an acceptable alternative for these professional populations to broaden the reach of PCIT principles and to allow more children access to CDI. Researchers should consider evaluating the effectiveness of CDI with these professionals. In turn, PCIT International is encouraged to explore the possibility of certifying CDI therapists outside of purely mental health professions.

32.6 Conclusions

One exciting possibility is the treatment potential of using CDI for a subset of children on the autism spectrum. While children with ASD who exhibit clinically significant externalizing behavior problems will typically be best served by a full course of PCIT, children with nonclinical levels of disruptive behavior may benefit from CDI treatment alone. It is hard to overstate the implications of possible widespread dissemination of CDI as a stand-alone treatment for children on the autism spectrum. CDI has the potential to significantly improve the social awareness and play skills of children with ASD. In as little as 6–8 weeks, parents can master developmental play skills which allow them to follow their child's lead in play and have a deeper and more fulfilling relationship with their child.

One could argue that the true purpose of CDI for children with ASD is for the child to learn that interacting with other people can be an enjoyable and rewarding experience. So much of the treatment commonly used with children on the spectrum focuses on directing a child to conform to neurotypical expectations and parental goals, which, while important, is not inherently enjoyable or motivating for a child. CDI provides parents (who have been struggling to know how to connect with their child) with specific toolbox to form a deeper and more rewarding relationship with their child. CDI is an excellent platform for teaching children with ASD that connections with others can be positive experiences.

In addition, parents appear to enjoy CDI and are willing to participate in treatment solely focused on CDI. In two studies of CDI training by itself, there was a 0% (N'zi et al., 2016) and a 5% (Ginn et al., 2015) attrition rate in the treatment group, which are both substantially lower than the 27–47% attrition rates of some previous PCIT full-model efficacy studies (Lyon & Budd, 2010). These findings also suggest that CDI training is a very palatable intervention for parents.

Certified PCIT therapists should be able to effectively implement and tailor CDI to children on the autism spectrum so that effective, affordable, and meaningful treatment is available to more children and families. CDI has the potential to aid parents in being powerful agents of growth and change for their children. PCIT therapists should actively begin to champion our treatment to the autism spectrum community.

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33

Parent-Directed Interaction: Considerations When Working with Young Children with Autism Spectrum Disorders

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Abstract

This chapter discusses the use of the second phase of Parent–Child Interaction Therapy (PCIT), Parent-Directed Interaction (PDI), with children with autism spectrum disorder (ASD). As PDI may not be appropriate for every child on the autism spectrum, the authors focus on the use of PDI with children with receptive and expressive language at or above 30 months. Unique considerations in PDI with children on the autism spectrum and PDI coaching strategies for children with ASD are highlighted.

The vast majority of children with autism spectrum disorder (ASD) exhibit disruptive behavior problems (McTiernan, Leader, Healy, & Mannion, 2011). In fact, children with ASD are three times as likely to demonstrate disruptive behavior problems as their typically developing peers (Hartley, Sikora, & McCoy, 2008; Mazurek, Kanne, & Wodka, 2013; Shawler & Sullivan, 2017). In addition, researchers have reported that rates of comorbid mental health conditions are particularly high for children with ASD. For instance, 70% meet the criteria for at least one comorbid mental health condition including oppositional defiant disorder, attention-deficit/hyperactivity disorder, as well as anxiety disorders (Kaat & Lecavalier, 2013; Leyfer et al., 2006; Simonoff et al., 2008). While children with ASD present with a host of early social, emotional, behavioral, and developmental needs, disentangling comorbid psychopathology in young children is complex. Therefore, many professionals target challenging behaviors within preschoolers with ASD as a means to treat a variety of early developmental and behavioral concerns.

Parents report that noncompliance, oppositional behavior, and aggression are among the most common disruptive behaviors exhibited by children with ASD (Baker & Feinfield, 2003). It is important to note that some disruptive behavior problems may result as by-products of core features of ASD such as engaging in stereotypy, perseverance on topic and activity, and other behavioral rigidities (McTiernan et al., 2011). However, other kinds of disruptive behavior problems (e.g., tantrums, biting, impulsivity) may be exacerbated by the underlying features of ASD and/or other early childhood problems. Furthermore, children with ASD may present

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with more complex forms of disruptive behavior problems such as self-injurious behavior and pica (McTiernan et al., 2011). Given the wide array of presenting concerns, it is always important to conduct assessments and to involve other disciplines (e.g., pediatricians; neurologists) to assist in the assessment of complex problems which may involve biological or neurological underpinnings.

Regardless of the underlying cause, disruptive behavior problems impact educational intervention, social–emotional development, and family well-being (Brereton, Tonge, & Einfeld, 2006; Hartley et al., 2008; Lauderdale-Littin, Howell, & Blacher, 2013; Lecavalier, 2006; McStay, Dissanayake, Scheeren, Koot, & Begeer, 2014). Given the high prevalence of disruptive behavior problems, it is understandable that parents of children with ASD are more stressed than parents of children with other developmental delays and parents of children with other medical problems (Hayes & Watson, 2013). If disruptive behavior problems are left untreated, behaviors may continue throughout the life span (Gray et al., 2012; LoVullo & Matson, 2009; Simonoff et al., 2013). As such, parents and teachers often consider disruptive behavior problems to be a primary treatment target for children with ASD.

Using parents as change agents in managing disruptive behavior problems in children with ASD and developmental disabilities is not a new topic (Breiner & Beck, 1984; Koegel, Schreibman, Britten, Burke, & O'Neill, 1982; Lovaas, Koegel, Simmons, & Long, 1973). It is important to note that parents of children with ASD interact with their children differently depending on several factors (e.g., a child's symptoms; Kasari, Sigman, Mundy, & Yirmirya, 1988). There is much to learn from studies on parent–child interactions in young children with ASD. For example, children with ASD have been shown to be more noncompliant than typically developing children (Bryce & Jahromi, 2013), and, in particular, less compliant immediately following parents' indirect commands, even after controlling for receptive language abilities compared to their peers without ASD (Bryce & Jahromi, 2013). In conjunction, children with ASD are more likely to avoid (e.g., attempt to escape) demands compared to other children (Lemanek, Stone, & Fishel, 1993). Many family factors are also associated with increased disruptive behavior problems. For instance, research has found that family poverty, low maternal warmth, and household chaos are all risk factors for the development of externalizing behavior problems in children with ASD (Midouhas, Yogaratnam, Flouri, & Charman, 2013). Additionally, low parental limit-setting is known to increase child disruptive behavior problems (Osborne, McHugh, Saunders, & Reed, 2008; Osborne & Reed, 2010).

As such, it is important to assess the advantages of equipping parents with skills to prevent, teach, and manage the numerous potential disruptive behavior problems that are present in a large percentage of children with ASD. Treatment may alter the debilitating outcomes that disruptive behavior problems can have on health, safety, learning, and social–emotional relationships (Pearson et al., 2006). Early intervention for disruptive behavior problems may allow young children to more fully benefit from other treatments (e.g., speech and occupational therapy) as well as have more full experiences in early childhood such as the ability to be placed in a mainstream classroom. Furthermore, early treatment may reduce downstream needs for costly restrictive placements and use of antipsychotic medications (Storch et al., 2012).

33.1 Existing Evidence Base for Behavioral Interventions for Disruptive Behavior Problems in Children with ASD

The term parent training has several meanings in the field of ASD (see Bearss, Burrell, Stewart, & Schahill, 2015). In this chapter, the term parent training refers to a primary parent-mediated intervention for maladaptive behavior (Bearss et al., 2015). In other words, parent training is conceptualized as a program that has the parent as the primary change agent. In this case, parent training is specifically designed to reduce disruptive behavior problems in children with ASD. While this chapter is narrowly focused on use of skills to manage disruptive behavior problems and improve child compliance in the context of Parent-Directed Interaction (the second phase of Parent–Child Interaction Therapy targeting the implementation of a structured discipline procedure), it should be noted that the skills utilized in Parent-Child Interaction Therapy (PCIT) may have additional benefits above and beyond decreases in child disruptive behavior problems.

PCIT is rooted in behavior analytic strategies (Greco, Sorrell, & McNeil, 2001). Behavior analytic strategies, including operant procedures, are long established within the literature to reduce disruptive behavior problems in young children with ASD and other intellectual and developmental disabilities (Didden, Duker, & Korzilius, 1997; Doehring, Reichow, Palka, Phillips, & Hagopian, 2014; Horner, Carr, Strain, Todd, & Reed, 2002; Howlin & Rutter, 1987; Matson, Dixon, & Matson, 2005). It important to note that a multitude of behavioral strategies have been developed and are successful at increasing the probability of child compliance. For instance, both antecedent-based (e.g., high probability instructional sequence, errorless compliance training; Ducharme, 1996; Ducharme & Popynick, 1993; Humm, Blampied, & Liberty, 2005; Mace et al., 1988) and consequence-based (e.g., guided compliance; Wilder & Atwell, 2006) interventions have been shown to increase compliance in children with ASD (Fischetti et al., 2012). It is well established that parental involvement in behavioral intervention is helpful for improvements and generalization of skills (Horner et al., 2002). However, many strategies in the field of applied behavior analysis have not been utilized within a parent–child dyad and may be difficult to use in standard outpatient community-based clinics with parents (Doehring et al., 2014). Therefore, the structure and skills utilized within PCIT may have several advantages over other developed methods that have not been designed for parents.

Deepening one's understanding of the vast array of behavioral procedures that have been developed and pairing that with knowledge related to functional based assessment methodologies will help providers best utilize the skill set and structure that PCIT offers. Adherence to fidelity is important to obtain results in all behavioral interventions; however, the structure of PCIT allows providers flexibility to use numerous behavioral strategies throughout the treatment while adhering to fidelity within the model. While not always magnified within the literature, PCIT naturally fosters numerous behavioral strategies to improve child behavior and compliance in both Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI). For instance, PCIT uses both antecedent and consequence-based strategies. Antecedent-based strategies include differential attention to other (positive) behaviors, antecedent manipulation (e.g., providing high preference toys during Special Time to reduce the likelihood of disruptive behavior, providing a command for a behavior that a child is about to do; embedding positive practice for routines during neutral times of day), and offering reinforcement of alternative behaviors. Further, while PCIT makes use of selective attention to extinguish disruptive behavior, the protocol encourages simultaneous embedding of principles of functional communication training (Carr & Durand, 1985). For example, parents are taught to notice and respond to a child's communicative gestures, reinforce approximate attempts at a request, and model phrasing for a child to use in a future situation that has historically been followed by disruptive behavior problems based on a breakdown in communication.

As a whole, the majority of the PCIT skills adhere to positive behavioral supports which shape appropriate behavior without the use of more formal consequence-based and punishment-based procedures. However, in order to improve compliance and reduce disruptive behavior problems, pairing positive and proactive approaches along with consequence-based strategies are needed. This is the premise around the PDI phase of PCIT. One study found that simply altering the demands was not effective at increasing compliance (Fischetti et al., 2012). Therefore, using positive and proactive procedures to reduce disruptive behavior problems in combination with the PDI protocol will maximize the likelihood of improving child behavior and rates of compliance.

33.2 The Shifting Field of Intervention Research for Children with ASD

The field of ASD has continued to rapidly evolve since the initial early intensive behavioral intervention (EIBI) trial (Lovaas, 1987). However, there continues to be wide variability within outcomes for young children with ASD receiving EIBI. Given the variability, a newer line of research was designed to help match client characteristics with specific interventions (Stahmer, Schreibman, & Cunningham, 2011). At the same time, researchers and program developers from applied behavioral backgrounds and the developmental sciences have come together and outlined what is now called Naturalistic Developmental Behavioral Interventions (NDBI; Schreibman et al., 2015). PCIT shares many common features of NDBI (e.g., based on behavioral principles, manualized, child-centered, taught within play, imitation and reflecting child's behavior). Therefore, it is not surprising that the implementation of PCIT for children with ASD is increasing.

The heterogeneity of children with ASD requires a range of interventions to meet the varying needs (Roberts et al., 2011). Disruptive behavior problems occur in the majority of children with ASD. However, one of the largest questions around use of PCIT for children with ASD involves the discussion around discipline strategies and incorporating a punishment procedure (i.e., timeout). As mentioned, there are numerous studies documenting the positive impact of implementing consequence-based strategies in addition to antecedent-based strategies for children with ASD. There is not disagreement regarding use of the positive strategies and use of direct commands to increase compliance. There also is not disagreement around extinguishing behavior through use of differential attention (e.g., ignoring negative behaviors). However, there is debate around the appropriateness of using the timeout procedure, both with children with ASD and as well as others (see Quetsch, Wallace, Herschell, & McNeil, 2015). Therefore, we highlight that PCIT incorporates numerous behavior strategies with a large emphasis on positive approaches. However, we postulate that discipline strategies and limit-setting are needed for all children, including those with ASD. The use of the timeout procedure is one of the most studied and effective strategies to manage disruptive behavior problems reported within the literature. It has been effectively used in the field of ASD to reduce disruptive behavior problems for some time (Howlin & Rutter, 1987). As always, it is important to understand the function of the disruptive behavior problem prior to selecting an intervention method for reducing the behavior within PCIT. Further, it is important that all behavioral strategies are implemented appropriately and with fidelity.

To date, four primary parent training interventions have been used with families of children with ASD and co-occurring disruptive behavior problems. Interventions include PCIT, the Incredible Years (McIntyre, 2008), Stepping Stones Triple P (Whittingham, Sofronoff, Sheffield, & Sanders, 2009), and the RUBI Autism Network Parent Training for Disruptive Behaviors (Bearss et al., 2015). Stepping Stones Triple P assessed parental use and acceptability of timeout (Whittingham et al., 2009). They found that 92% of families with children on spectrum implemented quiet time (i.e., removing a child from an activity in which a problem has occurred and having them sit on the edge of the activity for a set time) and 85% implemented timeout (i.e., the removal of a child to an area away from others for a set time). Of those implementing quiet time, 80% reported it being helpful and 12% not helpful. Of those implementing timeout, 75% reported being helpful and 20% reported not helpful. After the treatment, the majority of families continued to implement the quiet time and timeout procedures with continued success. Therefore, the majority of families found timeout helpful suggesting its acceptability and utility, and supporting the importance of investigating the appropriateness of PDI for families with ASD.

Parents of children with ASD want help in targeting child disruptive behavior problems (Bearss, Johnson, Handen, Smith, & Scahill, 2013). Regardless of the evidence, some parents and professionals are hesitant in using consequences, as implemented in the PDI phase of PCIT. There is much to learn about the benefits as well as the contraindications of PDI for children with ASD. We highlight that PDI may not be appropriate for all young children with ASD. However, in light of the available evidence and our clinical experience, we offer suggestions and considerations for implementing the PDI phase of PCIT for young children with ASD.

33.3 Our Clinical Experiences

Our PCIT work with families of children with ASD has been some of our most challenging, but also our most rewarding efforts. Through this work, we have learned to think quickly as clinicians and coaches and have observed significant changes in family interactions in ways that have facilitated growth and development before our eyes. However, PCIT, and specifically PDI, will not be the right approach for every family with a child with ASD. Completing a thorough developmental assessment is essential for children with ASD, and it should be conducted at the onset of treatment and monitored throughout PCIT. An assessment may include a review of past records, a parent interview, parent and teacher report measures, gathering information from other care providers, a functional analysis or functional behavior assessment, as well as informal and structured clinical observations (see Chap. 31 for an ASD assessment overview). For some, this may also include a standardized assessment battery including intellectual and developmental testing. In regard to thinking about PDI with families, a solid understanding of the child's receptive language skills, an operational definition of problem behaviors, and a working understanding of the possible maintaining function(s) of the disruptive behavior is essential in moving forward.

Carefully reviewing the assessment data is critical before proceeding with PDI. Similar to considerations with typically developing children, if a child's receptive language skills are below 24 months, such as cases of more severe intellectual disability, then the authors would recommend considering strategies other than the PDI timeout sequence. In these cases, such strategies as effective commands, redirection, prompting through procedures, and modeling may be more appropriate (e.g., Hansen & Shillingsburg, 2016; Kohlhoff & Morgan, 2014). Additionally, there are other circumstances in which PDI may be more challenging and clinicians should carefully weigh whether PDI or another approach is best for the family (see Table 33.1 for examples of additional questions and observations).

Table 33.1 Examples of additional questions and observations

Topic	Questions/observations
Cognitive and Language Skills	Has your child ever been tested or assessed previously? [therapist should find out when assessments were conducted and request records] What words does your child understand? What words does your child say? Does your child understand one step instructions? What 2–5 word instructions does your child understand?
Self-Injurious Behavior, Self-Stimming Behavior, Heightened Arousal/Limited Emotion-Regulation	What does the behavior look like? What happens right before? And after? How frequently does the behavior occur? How long does it last? When does it occur? How are you currently preventing or managing it? Does it occur in certain locations or with certain people? How often do you need to intervene? Have you tried other strategies? If so, how effective were they?
Social Responsivity	Does your child respond to your attempts to engage him/her socially (e.g., show objects, play together, call name)? Is this similar to how your child is engaging with peers or others?
Parent Perspectives on Discipline, Current Techniques	What behaviors are most challenging to you and how are you managing? What are the top three areas you want help with?

Some specific behaviors which warrant further questioning or evaluation include:

- Self-injurious behavior (e.g., biting self, head-banging)
- Limited social reciprocity
- Self-stimming behavior/Stereotypy
- Heightened arousal level/Limited emotion-regulation

Prior to the PDI Teach session, it is essential to clearly understand the child's developmental level, including cognitive and language abilities. It is important to elicit the behavioral difficulties that parents are hoping to change as well as understand other strategies the parents have used in the past to help their child. This information is important to have to help parents understand the similarities and differences of PCIT to other approaches.

33.4 Introducing Discipline to Parents of Children with Developmental Delays

Once we decide the child would benefit from PDI, the next step is to engage the parent. A little extra attention and consideration on the front end of the PDI phase can go a long way. We often think of PDI Teach sessions as helping parents prepare for the "the big game." Making changes to discipline can often be more challenging for families with a young child with ASD, so making sure the family is ready is essential. In CDI, make notes of observations and parent reports that you can work into the PDI Teach session. The PDI Teach is an opportunity to really gauge readiness, alleviate any worries, answer questions, and provide additional psychoeducation specific to the family's primary needs, questions, or concerns. Role-play with parents can assist with their confidence in using the skills while anticipating and preparing for potential child behavioral responses.

Many parents have learned through trial and error that simple and direct commands are more effective with a child with ASD. However, many parents have tried multiple attempts at discipline techniques without success. As such, parents may be surprised or even skeptical when introduced to the timeout sequence. Frequently, they have heard from other professionals that they should only be using positive behavioral supports and tangible reinforcers. Other parents may have had failed attempts with implementing a timeout procedure outside the scope of PCIT, including use of blocking behaviors and physical management techniques (e.g., holds). Parents may express concerns that timeout will not work with *their child* or that it is *not fair* given their child's challenges. It is important to take time with families inquiring about their thoughts, beliefs, and concerns during the PDI Teach. It can be helpful for parents to imagine their child on a journey and review where their child has been, where they are now, and where they want to go. Emphasizing parents' goals for their child and recognizing that parents are an important member of the team is vital. Parents have the most significant role and ability to *teach* their child skills such as listening, promptness, and rules (e.g., hurting isn't okay). We find that parents *want* to teach their children and this usually resonates the most.

For instance, we might say:

Therapist:	"I've been working with you and Henry for two months and I know you have used a number of tools to help him in the past. You had schedules for activities, used timers to signal when activities were ending, and were rewarding him with M&M's for certain behaviors. Even with all of your hard work using all of these strategies, he was melting down when screens were turned off, refusing to get in the bath, and throwing objects in speech and occupational therapy sessions. I know you want desperately to help him expand his vocabulary and use of sentences. Right now, he's missing out on learning those skills because he's not cooperating in speech and it's impossible for you to work with him because it takes Herculean efforts just to get him through his daily routine. So we're going to have to do things a little differently than what has been tried and recommended in the past. In order to help him, we would recommend that we use a number of new strategies including a very unique discipline sequence. If you are interested in learning more, I would be glad to share more details."

We also frequently work with parents who are concerned timeout is unfair. This concern often stems from one or several of the following worries: that their child will not understand commands, will not understand the compliance sequence, will not be able to stay seated during timeout, and that timeout will cause unnecessary distress. Here, we emphasize strategies which will be used to set the child up for success in learning these new skills. Together, the parent and clinician will carefully select commands based on words their child understands and may pair effective commands with nonverbal cues. We also highlight our observations during CDI about the child's ability to sit and how this helps us know they can sit for 3 min plus 5 s (or lets us know we need to reduce the length of timeout initially). Further, we explain to parents that their child can learn from consequences and give examples such as the specific changes in their child's behavior that we observe when the parent has attended to or ignored specific behaviors throughout sessions. We often discuss how elements of PDI facilitate learning for children with ASD including consistency, predictability, and follow through. Specifically, we note that their child is going to get a lot of practice responding to commands and that we know repetition is important for skill building and even more critical in children with ASD. Children with ASD respond best to structure and routines. In PDI, we discuss how the predictability of commands and the timeout sequence will aid in providing a consistent structure and routine.

Sometimes we may ask parents,

Therapist:	"How many times did it take you to teach your child to put on his own shirt? … minding and listening is a lot of the same. We are going to have to work a lot… but we are confident that he can and *will* learn these skills, just as he has learned many other skills that you have taught him."

We find that parents need support disciplining their child's difficult behavior. Parents have either tried a number of strategies or found methods to accommodate some challenging behaviors. In these cases, parents need help working through their anticipation of their child's response to timeout and preparing for the distress their child may exhibit when parents are implementing the procedure. We find it helpful to make sure that parents know how we will setup the structure of PDI and the first few sessions to ensure safety. We describe that the timeout process is an opportunity for their child to learn self-regulation and self-soothing. We frequently have parents describe what it would be like if their child still had these behaviors at age 10 or 14. We use this as a motivator that the difficulties need to be taken care of now when they are small because it will be much harder to manage these issues later.

Many children with ASD also have medical problems. Some children may experience hospital stays or require invasive medical procedures. If children are not compliant with procedures, physical restraint may be used. These experiences can be stressful for parents. We clearly differentiate the details of this safe, brief, planned, parent-guided timeout procedure. We express confidence in their child's ability to learn these skills and at the same time validate parent concerns that it may be hard. Discussing PDI as a means to improve compliance with a number of scenarios may be helpful. However, parents may be worried about certain behavioral interventions. Therefore, clinicians should review with the family whether a child has experienced any restraint-based procedures. Emphasize that PCIT is a robust intervention that has been well established in reducing the most challenging disruptive behaviors occurring in early preschool and school-age years. We now have emerging empirical studies that strengthen the substantial clinical evidence establishing the utility of PCIT with children with ASD.

33.5 Assessing and Tailoring PDI to Family Needs

33.5.1 Identifying Known Commands

Assessing a child's receptive language is vital before shifting into PDI. Explicitly identifying and discussing words that the child understands

Table 33.2 Identifying known elements for commands prior to PDI

Actions	Objects
Hand	Cow-Sheep-Barn-Tractor
Put	House-Girl-Boy-Car-Dog-Cat
Sit	Chair-Floor-Mat-Wall-Table
Move	Blocks-Legos-Garage-Roof-Stop sign
Place	Red-Blue-Green-Yellow
Stack	Police officer-Firefighter-Hat-Water hose-Jacket-Badge
Example: ____________	Example: _____________________________________

Notes: PDI Parent-Directed Interaction

or uses is particularly helpful for children with limited language abilities. The discussion around receptive language can be supported through using standardized measures of vocabulary or by more informally identifying with the parent what words a child is currently using or understanding based on CDI play sessions or the parent's report of home. During the PDI Teach, focus is placed on identifying the specific types of commands that will be used in the first PDI Coach session. For instance, it may be important to develop a list of objects, action words, and adjectives the child understands (for examples, see Table 33.2). One must ensure that a child understands each part of the command (i.e., nouns, verbs, and adjectives). It is essential that a direct command include known objects, places, actions, and descriptors. For example, one direct command may be "hand me this animal" while for another child, it could be, "put the yellow duck in the farm." Though this is important with all children, the fluctuations in vocabularies of children with autism make this increasingly important to consider. Preparation can remove instances in which a command is given only to discover that the child does not understand the specific word used.

33.5.2 Children Need Clear Signals

Part of the magic behind PDI with families and young children with ASD is that it can provide clear signals from the parent to the child about behavioral expectations and appropriateness across situations. PDI has very clear rules about giving effective commands. Parents are also commonly coached to emphasize proximity and gestures to add clarity to expectations. These strategies may complement or conflict with other treatments for ASD. For instance, proximity is taught to parents in early intervention programs as a method of getting on the child's level and being close where an adult can prompt a response. Gestures are one level of prompting, but in PCIT we do not typically use hand-over-hand physical prompting as we are addressing the child's independent compliance behaviors.

Parents with a child with ASD often learn to say their child's name to get the child's attention prior to giving a directive. Additional rationale or focus may be needed to adjust this behavior for families of children with ASD, and for some this can be particularly difficult to change. For example, one mother would say her child's name "Frankie" and then say "oops" every time. In discussing this further, we discovered that the child's behavioral support staff worked with mom to "always say Frankie and demand eye contact before talking further." We find it important to coordinate care and treatment planning with other professionals involved in the child's care when at all possible. In this case, we discussed the rationale for using and not using the child's name prior to engaging and we, along with the other provider, supported mom in choosing to use the child's name, followed by "please" at the start of her commands. We worked with mom to avoid stand-alone bids for attention such as "Frankie!" (2 s) "Frankie!" (3 s) "Frankie!" We encouraged her to provide commands when she was close to the child and point to the objects and locations (i.e., visual prompting) used in the command to enhance the clarity of her instructions.

33.6 The PDI Process in Practice

33.6.1 Noncompliance May Look a Little Different

Determining noncompliance can be a bit more challenging when working with children with ASD. Many children with ASD do not show signs that they hear and understand someone else (e.g., adapting behavior to other the individual; looking at the individual speaking). This can leave therapists and parents scratching their head as to whether the child understands. It has been our experience that this type of subtle noncompliance is most difficult to quickly assess. If it seemed that the child did not "hear" the command, we may check in with the parent by saying, "Did he hear that?" Only if the parent believes the child is unaware of the command do we coach the parent to improve his/her location by moving to be closer or within better view for the child, to use pointing and gestures, and to restart the process by restating the command. We find that it is helpful to monitor how the child responds over treatment. Moreover, this ensures that the behavior is not a stall tactic for the child or a parent's avoidance of the timeout warning. We would expect that if this behavior was truly limited social reciprocity, then it would improve with the shifting of parent cues.

Effective coaching requires therapists to help parents give appropriate commands. Therapists should have a copy of words that can be used for commands with them at all times during initial PDI sessions. During these sessions, therapists should stick to commands they have reviewed with the parent and should coach each step including nonverbal steps.

Therapist:	"The next command is going to be, *Hand me the train*. First move close to Tommy, and then move the train away from the tracks."
Parent:	[Moves closer and brings train closer to child].
Therapist:	"Good job getting ready! Now say, *Hand me the train*."
Parent:	[Gives command].
Therapist:	"Nice direct command! Now place your hand next to the train. Good! Point to the train then motion to your open hand. Well done, very clear!"

After a command, therapists need to make quick decisions about compliance (especially subtle noncompliance). When a warning statement is required, therapists should coach parents to move closer to the child and may suggest a gentle, partial physical prompt such as a pat on the arm or back before issuing the warning. When coaching the parent to issue the warning, therapists should continue to coach nonverbal cues. If the child continues to exhibit subtle noncompliance, therapists should coach the parent through timeout and tune in to any signs of parent distress over whether the timeout is fair and whether the child understood. Therapists will want to validate parents' feelings, give rationale for following through, and consider coaching the parents to use a coping skill (e.g., deep breathing, self-statements of affirmation) during this time.

33.6.2 Establishing Appropriate Consequences for Noncompliance

Some children with ASD who may benefit from PDI could have difficulty fulfilling a 3-min timeout. In such cases, we have anticipated this early in our clinical work with the child and family. For example, the child has difficulty sitting during CDI or at times appears to not associate a consequence with a specific behavior. For example, "JoJo," a 4-year-old girl, with limited speech, diagnosed at age 3 years with autism, and displaying intense emotion dysregulation when upset, was brought to our clinic by her adoptive mother. During the initial intake session, as we asked about Jojo's current behavior challenges, her mother estimated that Jojo was "able to sit for 1–2 min at the dinner table before getting up." In session, we too, observed that Jojo frequently moved about the session room during CDI coding and coaching. We then calculated her seat time during our CDI coding across several sessions and found no period in which she sat for more than 2 min as she played with her mother and engaged with the toys at the table. As her family transitioned to PDI, we began her chair timeouts at 1 min. Initially, she would get up after being placed on the timeout chair. However, using the backup procedure, she was able to take a chair timeout by the end of PDI Coach 2. The shortened timeout period was increased to 2 min as JoJo became more regulated over the course of PDI. In turn, JoJo's compliance increased, she learned how to self soothe when upset or frustrated, her aggressive behavior towards her mother and younger sister reduced, and her family could manage her aggression quickly when it occurred. Furthermore, the brief timeout and return to child-led play were clearly distinguished consequences that promoted learning.

33.6.3 Pacing of PDI Sessions and Coaching

"An ounce of prevention is worth a pound of cure."—Benjamin Franklin. Getting the room ready for PDI sessions always follows the mantra "An ounce of prevention is worth a pound of cure." However, we find that it is particularly helpful when working with a child with ASD to "keep it simple." In these sessions, less really is more. For example, often incorporating toys with fewer parts or softer toys can increase the ease of the session by eliminating challenges parents might face when trying to provide quick, calm, and safe consequences following the escalation of disruptive behavior (e.g., removing toys quickly after the child begins throwing toys). Coaching PDI with families of children with ASD may require therapists to think fast on their feet while coaching. Many strategies are used that therapists utilize when working with other populations including children who are explosive and aggressive, inattentive children, or children with speech delays; however, in coaching PDI for children with ASD, therapists at times need to use these strategies at a higher intensity and frequency than with other children.

Many children with ASD are quick to hit, kick, bite, throw toys, scream, and cry when demands are placed. The use of incompatible commands becomes important for managing aggressive and destructive behaviors. Therefore, therapists need to be ready. It's essential that therapists calmly guide parents to move away from harm's way as quickly, safely, and calmly as they can and to avoid removing the demand in response to the child's disruptive behavior. Instead, parents should wait until the child is engaging in more neutral behavior to prevent the child from learning that the disruptive behavior is effective in having demands removed. This requires a therapist to multi-task guiding parents with the original command while simultaneously keeping track of the timing for parents to effectively issue the warning statement and timeout procedure. In these instances, coaches need to prioritize safety by coaching the parent's physical behavior before providing the lines for the discipline procedure.

Therapists also need to be ready to support the parent in "going the distance" both within a session and throughout PDI. Initial timeouts with a child with ASD often are lengthy due to their difficulties with self-regulation and underdeveloped compliance skills. We find it helpful as therapists to use the motto "go hard early so we can go home." Specifically, we try to give more commands towards the beginning of coaching to give more time for an extended timeout, if needed. The use of incompatible commands becomes important for managing aggressive and destructive behaviors.

33.6.4 Progressing Through PDI May Take Longer

PDI in children with ASD is more of a marathon than a sprint. It's a slow and steady race towards graduation. In our experience, parent skill with the sequence and timeout often does not determine progress. Instead, child language skills, child self-regulation skills, and parent distress often determine our pacing. We frequently find ourselves repeating a PDI session once or more following difficult timeouts.

Therapists also need to be prepared that children with ASD need a lot of repetition while learning new skills. We find that PDI often takes longer with this population even in families where parents quickly learn the sequence and practice daily at home. Therapists should follow the same guidelines for progressing through PDI as they would for children without ASD—meaning they should progress when a child masters a step (e.g., play commands) and accepts timeout. They should repeat sessions and homework when there are many timeouts, many escape from timeouts, and missed sessions or homework.

PCIT therapists know that there is only one way to end a PDI session and that is with child compliance with the final session command. When a parent gives a command, they are "buckling up for the ride," and the coach must be there to support and guide the parent back on track through moments of wanting to throw in the towel. Therapists should be prepared for longer and bumpier rides for children with ASD. Therapists need to allow extra time to ensure the child completes the timeout and complies with the initial and follow-up commands. Most of the time with an extended timeout, the child is able to comply with both these commands independently. However, there is a worst case scenario path to compliance. Rarely, therapists will need to coach parents to use hand-over-hand to end the session with child compliance. This should be used extremely sparingly and only when necessary. Times when a therapist should consider hand-over-hand are when the following situations happen:

1. The session has already run over the scheduled time;
2. The child has stayed in the timeout chair for 3 min and 5 s (or a predetermined time in cases where the timeout length is initially reduced) following a long timeout sequence with significant emotional or behavioral dysregulation (e.g., screaming in backup for more than 20 min);
3. The child is showing signs that they will not comply with either the initial command or follow-up command (e.g., appearing as though he or she did not hear or understand the command); or
4. The therapist believes that another timeout will result in similar difficulties regulating emotions and behavior or the parent is showing signs of exhaustion and distress.

In these situations, we coach parents to use hand-over-hand, do not assign PDI homework, and repeat the session the following week. We try to avoid this whenever possible, but we are always prepared for it (especially early during PDI).

33.6.5 Generalization Can Be More Difficult

It is well studied that generalizing learned skills to new persons, places, or things is more difficult for children with ASD than their typically developing peers (Brown & Bebko, 2012). Generalization of PDI can also be more difficult for children with ASD. We have found that as we move families from clinic practice to practice at home and public places, we have witnessed incredible and meaningful changes in their family's life. We have tried to relay to parents as well as clinicians that difficulty generalizing skills should be expected. We find that some parents who came to CDI sessions with daily Special Time recorded diligently on their homework sheets come in to PDI sessions finding PDI homework to be more challenging. Therapists need to be on the lookout for this sign of underlying resistance or distress towards PDI and be prepared to address it early. As PDI progresses, therapists will want to spend more time practicing real-life commands than they would for children without ASD. This is particularly important for children with lower language skills, lower adaptive skills, or more difficulty regulating their behavior and emotions. Appropriate real-life commands vary depending on the child (e.g., shutting the door, coming to the parent, sitting down, putting on coats and other clothing).

33.6.5.1 Case Example

One 6-year-old with ASD who completed PCIT had an unremarkable PDI Coach 1. During his first two PDI coaching sessions in clinic, the child had a few timeouts with relatively brief trips to the backup room without aggressive or destructive behavior. During these sessions, his parents appeared confident and demonstrated an understanding and ability to adhere to the sequence. The therapist confidently assigned PDI 1 homework at the end of session with the usual instructions for the parents to reach out if any problems arose. One day later, the therapist received a message from the parents while they were mid-practice. The parents had done Special Time as usual, however, as soon as they mentioned listening and timeout, the child began hitting, kicking, and pulling the mother's hair. The child threw objects, broke a lamp, and was still yelling when the therapist returned the parents' call. In this instance, the therapist problem-solved the home sessions, making them as similar to the in-session practice as they were able, to promote quick generalization to the home. The therapist also followed up with the child's mother midweek over the phone to make additional shifts in Special Time practice at home.

33.6.5.2 Another Case Example

With another family, we met the family for a "Public Outing" at the local grocery store, just down the block from our clinic. The child's mother provided instructions as they walked through the automated doors and pulled a cart. She began to practice her PRIDE skills along with some interactive games (i.e., "Riddle me, riddle me, re" or "I spy") as she walked through the produce section. She was prepared. The child's mother quickly identified a potential timeout backup space. She provided instructions throughout the trip all followed by labeled praises for great listening behaviors. As the family moved closer to the toy section, the child wanted to take an action figure from the shelf. The family had been in a long habit of purchasing action figures to appease the little boy on shopping trips. The mother's instruction to, "Please put Batman back on the shelf," was particularly difficult for the child, but he complied following the timeout warning. As the trip continued, the little boy returned to the toy section once more as his mom moved towards the checkout. He took one timeout, sitting quietly near his mother in the toy aisle, without the need of a backup. As mom kept time with her watch, she began to cry. "I never thought this could be possible. I thought he would *never* be able to listen to me… and I was worried for the future. I thought we would forever be walking on eggshells. I've never brought him to the store by myself. I cannot thank you enough for the gift that you have given us."

33.7 Tough and Challenging Presentations Requiring more than Standard PDI Protocol

Challenging behaviors or clinical questions can come up more often when working with children with ASD. Clinically, we must be able to think critically about why the challenging behaviors are occurring. Understanding the function or purpose of behavior is commonly more complex for children with ASD than it is for their typically developing peers. Parents (and clinicians) often report that they are uncertain as to why a child with ASD is engaging in a particular behavior. In these cases, a functional analysis (i.e., examining different potential functions of the behavior; see Hanley, Iwata, & McCord, 2003 for a review of best practices of functional analysis of problem behaviors) can assist in gauging whether the use of commands and timeout will likely be effective in managing the challenging behaviors.

Child disruptive behaviors may occur in conjunction or in isolation of others. However, parents and others in the child's environment often respond to these behaviors in ways which maintain and reinforce the behaviors over time. For example, in response to inappropriate behaviors, parents might use one of the following consequences: attention, removal of attention, removal of task limits or demands, or providing access to privileges or tangible rewards. To formally or informally assess the function of particular behaviors, you may track (either in the clinic or natural environment) which consequence resulted in an increase in frequency or intensity of the child's difficult behavior. If the child engages in the behavior on his/her own (irrelevant of consequences), you might suspect it was serving an automatic or sensory stimulation function such as emotional dysregulation or self-stimulation (see Table 33.3 for examples).

Understanding the function of a behavior is important for selecting appropriate consequences. For behaviors which are maintained by

Table 33.3 Understanding the function of challenging behavior

Function	High	Low
Attention	Child runs out of room → parent ignores → child returns Parent praises sharing → child shares in session Parent praises gentle hands → child is more gentle with touches	Child runs out of room → parent ignores → child runs through the clinic Parent praises sharing → child play does not seem to increase or decrease sharing Parent praises gentle hands → child is not more or less gentle with touches
Communication (replacement for verbal communication)	Child climbs on parent → parent plays with child Parent talks to child Parent gives child toy	Child uses words Child engages in solitary play → parent plays with child Parent talks to child Parent gives child toy
Avoidanceescape from social attention/interactions	Parent rubs child's back → child moves further away from parent or swats at parent Parent moves toy cow closer to child's barn → child moves away or child looks away	Parent rubs child's back → child moves closer to parent, continues playing, or engages more Parent moves toy cow closer to child's barn → child opens door or child looks at parent or cow
Escape from task demands	Parent is practicing drawing shapes → child throws crayon Parent builds tower → child knocks over tower Child unable to connect tinker toys or Legos → child starts banging sticks together	Parent is practicing drawing shapes → child picks up crayon Parent builds tower → child watches parent or puts block on tower Child unable to connect tinker toys or Legos → child tries again or allows parent to help
Access to privileges and/or tangible items	Child whining at end of session → parent hands tablet Child gets into parent's bag → child grabs goldfish Child repeated asking in session for snack	During check-in, child waits for parent or plays with toys Parent back in session room at checkout → child does not engage with bag
Emotional dysregulation	In response to a change in environment or play: Child cries, whines, hits, pulls hair Child squeals, smiles, bounces, moves around room	In response to a change in environment or play: Child appears neutral Child behavior remains unchanged
Self-stimulation	Can involve any one or all senses Sensory stimulation, internal pleasure, overstimulating environment, self-soothing Visual: Moving fingers in front of face, hand flapping Auditory: Making vocal sounds Tactile: Rubbing skin with object Vestibular: Rocking body front-to-back or side-to-side Taste: Placing items in mouth, licking Smell: Smelling items or people	Child behavior remains unchanged

attention or to escape from a task, the PDI timeout sequence tends to work well; we also find that PDI works well for children with emotional dysregulation (though timeout often takes longer initially). In circumstances when the function of the child's behavior is to escape from social attention or to self-stimulate, timeout should not be used as it would not be expected to be effective. It is important to have realistic expectations for PDI and to realize that it is going to primarily target noncompliance and disruptive behavior. For example, we may set a goal to work on decreasing disruptive behavior, but not expect PDI to help with some of a child's stereotypy. In cases in which a behavior appears to function due to automatic or sensory stimulation, we must work with the parent to decide the best response: imitation, redirection, or incompatible commands. The potential scenarios of tough and challenging behavior are expansive and not able to fully be reviewed in detail in the current chapter. Instead, we will provide some specific case examples which illustrate how these behaviors might be conceptualized and clinically managed. The nuances of these tough and challenging presentations require consultation. Clinical teams should be continuously monitoring and reviewing treatment plans in clinical supervision or they should be sure to have professional consultation with expert providers in the field who have experience working with children with ASD.

33.7.1 Case 1: Challenging Self-Stimulation Behaviors

A 5-year-old boy referred for PCIT frequently engaged in the self-stimulating behavior of pacing back and forth along the back wall of the clinic's session room. Sometimes, he would become so involved in this self-stimulatory behavior that he could go for long periods of time without interacting with others. This often prevented play or any joint interaction with his parents. In initial PDI sessions, we coached the parent to continue to follow the self-stimulatory behavior by standing and jointly pacing with the child. In addition, we coached the mother to avoid giving a command when the child was actively engaged in self-stimulatory behavior. As the child became familiar with effective commands, we coached the mother to move closer to the child and provide an incompatible command. During some sessions, it became difficult to judge whether the child had "heard" the command when it was given. We then had the parent move closer and restate the original command only in instances that we thought the child did not hear the command. In cases in which the child was not as actively engaged in a self-stimulatory behavior, we coached the parent to provide a timeout warning. This specific behavior appeared sporadically across sessions, however became less frequent as sessions progressed.

33.7.2 Case 2: Challenging Arousal, Attention, and Social Stimulation

One 7-year-old female diagnosed with ASD and attention-deficit/hyperactivity disorder started PCIT in the clinic and responded well to the structure and format of the treatment. Her parents stated their amazement in how her tantrums and noncompliance significantly decreased. Yet, even as she improved in many areas, she continued to struggle socially such that she would hug, kiss, and touch adults as well as children when it was socially unacceptable. In clinic, she would sprint to hug her therapist in the waiting room and also gave hugs to receptionists, teachers, and security guards. During CDI, her parents tried to praise when the child kept her hands and feet to herself and to ignore the hugging; however, these strategies proved ineffective in changing her behavior. Using incompatible commands in PDI (e.g., "Please give a high five") combined with an explanation (e.g., "Nice job giving a high five. Hugs are for family, and high fives help other people know you are happy to see them") helped some in the moment; unfortunately, this strategy was often unsuccessful as well since she continued to frequently dart towards people she saw and excitedly give a bear hug before her parents could issue the first word of a command. In cases like this, we find that some children with ASD benefit from other strategies to address social skills (e.g., Social Stories; Gray, 2000; Gray et al., 1993; Gray & Garand, 1993) after compliance has been addressed.

33.7.3 Case 3: Challenging Rigidity and Emotional Dysregulation

Another 4-year-old boy continued to have difficulties with rigidity following PCIT. His mother expressed concern that his rigidity continued to cause stress at home even though he followed directions and did not lash out with his body when upset. She gave several examples of this including his insistence on watching the countdown after watching a show on Netflix. If she attempted to turn it off part way through the countdown, the child would tantrum. She was at a loss for what to do about this behavior given that he would comply with any commands given even while screaming and crying (and was not aggressive or destructive). We worked with this mother to have her explain the concept of flexibility (or doing things in a different way) to the child before giving commands. We had her set up flexibility practices where she would use commands to have him turn Netflix off at different times combined with praising his compliance and ignoring his tantrums. Practices were carefully planned during times the mother was able to follow through with complete ignoring of any subsequent tantrums. Further, we worked with this mother on her own distress tolerance during this time, and we emphasized her role in teaching flexibility.

33.8 Further Exploration of Recommended Tailoring and Adaptations in PDI

More research is needed to further understand whether PDI modifications will lead to additional treatment gains as well as optimize the model to meet the needs of families of children with ASD (e.g., family satisfaction, generalization). Studies of PCIT with ASD using the standard PCIT protocol have demonstrated significant changes in parent skills, child disruptive behaviors, and treatment satisfaction (e.g., Solomon, Ono, Timmer, & Goodlin-Jones, 2008; Zlomke, Jeter, & Murphy, 2017). Other outcomes such as change in parenting stress and change in children's core features of ASD (e.g., child social skills deficits, rigidity, repetitive behaviors, and restricted interests) have not been assessed consistently across studies. Several studies found improvements in social skills including shared positive affect (Solomon et al., 2008) and increased social awareness (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017). Parenting stress did not significantly change across treatment in group studies (Ginn et al., 2017; Solomon et al., 2008). Further research on core symptoms of ASD and parenting stress is essential to understanding the need for adjunct treatment or modifications to PCIT.

Although most studies and case examples (see Table 33.4) have used the standard PDI protocol when implementing PCIT, the research and clinical teams describe using skillful tailoring of PDI to meet the varied needs of children with ASD while adhering to treatment fidelity. Some have made adaptations to PDI using visual supports to communicate expectations of PDI and other routines (e.g., visual supports and Social Stories; Armstrong, DeLoatche, Preece, & Agazzi, 2015) and changes in the timeout sequence, attempting to address the developmental appropriateness of timeout for some children (Hansen & Shillingsburg, 2016; Lesack, Bearss, Celano, & Sharp, 2014). These changes were reported to have varying degrees of utility in reducing child disruptive behaviors, and were described in some cases as being beneficial (e.g., adding a teaching phase; Lesack et al., 2014; using a three-step guided compliance procedure; Hansen & Shillingsburg, 2016) and in others as being ineffective (e.g., eliminating the backup room and using a holding chair; Lesack et al., 2014). It is likely that treatment tailoring and progression through treatment varies based on many factors including developmental functioning, cognitive functioning, and comorbid psychiatric disorders, which can be highly variable across children with ASD. These initial empirical studies and published cases highlight the nuances of treatment with children with

Table 33.4 PCIT ASD study adaptations and details

Publication	Design	Inclusion criteria—age, language	# PDI sessions	PDI adaptations
Armstrong and Kimonis (2013)	Case study	5-year-old male with Asperger's disorder Full scale IQ in very superior range	5 (including Teach)	None
Solomon et al. (2008)	Waitlist control group (random assignment, matched for abilities)	$N = 19$ males, 5–12 years Excluded IQ under 70, children with low receptive & expressive language	≤6 sessions	PDI = children could not talk about restrictive interests in treatment
Ginn et al. (2017)	Random assignment: treatment or waitlist control	$N = 30$ children, 3–7 years 11 with cognitive functioning ≥2 years equivalent, able to speak three words	N/A	CDI only (no PDI)
Masse, McNeil, Wagner, and Quetsch (2016)	Single subject, multiple baseline	$N = 3$ males, 3–4 years Receptive language skills >24 months	7–11 sessions	None
Zlomke et al. (2017)	Open trial	17 children ages 2–8 (no mention of cognitive or language functioning)	$\bar{x} = 9.18$ coaching sessions	None
Hansen and Shillingsburg (2016)	Two case studies	1. 45 mos. (receptive language: 11 mos. equivalent; expressive language: 10 mos. equivalent) 2. 32 mos. (receptive language: 18 mos. equivalent, expressive language: 9 mos. equivalent)	Not specified	No timeout, three-step guided compliance Reinforcer for compliance varied across children (social praise, access to preferred items)
Agazzi, Tan, and Tan (2013)	Case study	7-year-old male Multiple comorbidities (e.g., intellectual disability)	7 sessions; parent mastery	None Difficult home implementation
Lesack et al. (2014)	Case study	5-year-old male (receptive language: 1 year, 3 month equivalent)	13 coaching sessions	Teaching phase before starting timeout Timeout length = 60 s + 2 s. of quiet Holding chair instead of timeout room (30 s + 2 s of quiet)
Armstrong et al. (2015)	Case study	5-year-old female with ASD, epilepsy, and intellectual disability IQ estimated = 35–55 range	Unclear	Visual schedule for bedtime behaviors (paired with CDI skills) Social story for timeout
Agazzi, Tan, Ogg, Armstrong, and Kirby, (2017)	A/B design	$N = 3$ 1. 3-year-old male (limited language—nonverbal to single words); 2. 6-year-old male (average intelligence) and co-occurring ADHD; 3. 7-year-old female (gifted intelligence) and co-occurring ADHD	Unclear	PDI modified for one child using Lesack et al. recommendations Other two children completed standard PDI
Hatamzadeh, Pouretemad, and Hassanabadi (2010)	A/B single subject	$N = 4$ participants, 3–7 years Full scale IQ = 70	Unclear	None reported

Notes: ADHD attention-deficit/hyperactivity disorder, *ASD* autism spectrum disorder, *CDI* Child-Directed Interaction, *Mos*. months, *PCIT* Parent–Child Interaction Therapy, *PDI* Parent-Directed Interaction

ASD. Given the complexity of this population, more empirical research is needed to delineate best practices.

33.9 Conclusions

The developmental window of opportunity for children with ASD to receive early intervention is brief. This is particularly relevant given the high percentage of young children with ASD with comorbid disruptive behavior difficulties. As a behavioral parent training program, PCIT has been used to address disruptive behaviors for children with ASD with some success. Implementing PDI with this population has been debated, however, as children with ASD have historically been excluded from randomized controlled trials to determine this discipline procedure's effectiveness. Importantly, the clinical need for effective and efficient services for children with ASD has led to an emerging literature examining the effectiveness of PDI in reducing behavioral difficulties. This research is essential as many of these problem behaviors can stand in the way of children with ASD benefiting from therapeutic services (e.g., occupational therapy) or engaging in relationships which may enhance their development. Numerous authors of PCIT and other behavioral parent training programs have made recommendations for adaptations to the standard treatment protocol to increase the efficacy of PDI; however, further clinical and empirical evaluation is needed to examine recommendations for tailoring, adapting, or modifying the intervention for families of young children with ASD (Eyberg, 2005). In this chapter, we focused on our clinical experience in providing PCIT with this population and outlined ways in which PDI may be tailored to meet the needs of specific families of children with ASD.

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Parent-Child Interaction Therapy with a Child on the Autism Spectrum: A Case Study

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Abstract

The application of an evidence-based treatment to a new client population often necessitates careful adaptation to maximize treatment outcomes. The current case study describes the use of Parent-Child Interaction Therapy (PCIT) with a child diagnosed with autism spectrum disorder and oppositional defiant disorder. Treatment was delivered by two graduate students and supervised by a licensed clinical psychologist. This chapter covers the background of the clinical case, the progression of treatment (from intake to graduation), and concludes with a summary of lessons learned. Challenges encountered throughout treatment and subsequent adaptations implemented are explained. Individual child and family information has been modified to protect the privacy of the client. It is the hope and expectation of the authors that the current case will inform the application of PCIT in treatment with other children with autism spectrum disorder and their families.

As therapists, we often strive to maintain strict fidelity to an evidence-based treatment model with the goal of maximizing treatment outcomes with a given client. Generally, higher levels of fidelity have been shown to yield better client outcomes (Durlak & DuPre, 2008; Schoenwald, Sheidow, Letourneau, & Liao, 2003; Timmons-Mitchell, Bender, Kishna, & Mitchell, 2006). However, as treatments are applied to populations that differ from the target group, adaptations may be necessary (Eyberg, 2005). This chapter will discuss a single case study of Parent-Child Interaction Therapy (PCIT) with a client diagnosed with autism spectrum disorder (ASD) and oppositional defiant disorder (ODD). Adaptations applied throughout the course of treatment will be highlighted and discussed. Information has been changed in a manner to assure the child (hereby known as "Eli Smith") and his family cannot be identified.

This chapter will review the referring information and presenting symptoms, discuss how Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI) were adapted for the child and his family, while highlighting the successes and barriers to PCIT treatment.

34.1 Meet Eli

"Eli Smith" was a 6-year-old Caucasian male. He was referred, with his biological mother, Ms. Smith, from an outside agency for PCIT to a

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university training clinic. At referral, he carried a previous diagnosis of Asperger's disorder according to the *Diagnostics and Statistics Manual—Fourth Edition, Revised* (DSM-IV-TR; American Psychiatric Association, 2000). Asperger's disorder was previously characterized by difficulties with social interactions and repetitive and stereotyped patterns of behavior. Due to recent changes in the diagnostic criteria in the updated DSM manual (DSM-5; American Psychiatric Association, 2013), Asperger's disorder become grouped into the diagnosis of autism spectrum, and therefore, from this point forward, it will be referred to as ASD. During the course of therapy, an additional diagnosis of ODD was assigned to Eli due to his extremely irritable and defiant behavior, particularly in the home environment. PCIT was provided by two graduate therapists with supervision from a PCIT Master Level Trainer and a PCIT-based clinical team.

34.1.1 Background

Eli was referred for PCIT due to his aggressive and defiant behaviors. The original referral was provided by a family doctor due to concerns with Eli's severe behavioral outbursts at home, in school, and in public. Importantly, PCIT clinicians were informed that Eli had endured a traumatic experience prior to treatment. Although Eli had previously received treatment for the traumatic event, Ms. Smith believed that this experience contributed to his current behaviors.

34.1.1.1 Medication and Health

Upon beginning treatment, Ms. Smith informed the therapists that Eli was not taking any medications and that he was in good health. Subjectively, Eli appeared taller than average compared to same-aged peers; although he was 6 years old, his height made him look to be around 8 years old. In addition, Eli appeared physically strong and sturdily built. In contrast, Ms. Smith was small in stature and thin. Together, Eli's head came up to approximately Ms. Smith's chest.

34.1.1.2 Home Environment

Eli lived alone with his biological mother. Although Eli lived most of his life with both of his biological parents, Eli's parents had recently divorced; his father (Mr. Smith), who had formerly relinquished parental rights, had moved to a different state. Ms. Smith reported being the victim of domestic violence while in her relationship with Mr. Smith, but that he had cut off all communication with the family and was no longer in their life. She tearfully reported instances of verbal and physical assault against her, to which Eli was exposed. Additionally, she noted that Eli's father had also been emotionally manipulative. No documentation or reports of abuse towards Eli were provided.

Eli's grandparents also played an important role in his life. His maternal grandfather lived nearby and provided some assistance. He, however, was not supportive of Eli and his mother seeking mental health services. This distrust and misunderstanding of mental health treatment is a frequent occurrence in rural communities in which this family was located (Gaventa, 1980; Geisler, 1983). Eli's grandfather instead endorsed corporal punishment (i.e., spanking) as an appropriate and expected consequence for undesirable behaviors. Ms. Smith noted that her father had indicated on multiple occasions that his grandson did not require mental health treatment and did not approve of Eli and his mother attending therapy. Eli's maternal grandmother had recently passed away, causing considerable stress on his mother and grandfather. Eli's paternal grandparents were minimally involved in his life; however, Ms. Smith noted that she was concerned they would soon reappear and potentially interrupt treatment.

34.1.1.3 School Environment

Eli attended a minimally structured private school through preschool and kindergarten. His mother was present as a volunteer in the building during his attendance, and the classroom teacher was able to access her whenever necessary. Eli occasionally exhibited atypical and disruptive behaviors at school, but Ms. Smith quickly made herself available and would remove him from the situation or provide him with a tangible item (e.g., access to electronics) to assist him in calming down. At referral, Ms. Smith was preparing for Eli to enter first grade in a public school. His difficulty interacting with same-age peers in addition to the upcoming educational transition played a significant role in the family's decision to seek services.

34.1.1.4 Ms. Smith

Despite the barriers Ms. Smith experienced with Eli across settings, she communicated a high level of motivation, desire to be involved, and eagerness to be engaged in her son's treatment. Per her reports, Ms. Smith stated that she had been previously diagnosed with both depressive and anxiety symptoms, and she was currently seeking individual treatment for these ailments. However, beyond such services, Ms. Smith reported minimal social supports in her life.

34.2 Intake and Assessment

34.2.1 Intake

Eli's oppositional behavior was apparent upon the first therapy session. First, Eli refused to leave the lobby and enter into the therapy room. Second, when trying to separate from his mother, Eli became defiant and disobeyed his mother's instructions to play with another therapist in a separate room.

Eli presented with both ASD and ODD symptoms. He had difficulty with transitions and maintained a rigid cognitive style. Eli would often become preoccupied with stacking objects, have difficulty reading social cues, and have trouble understanding appropriate social behaviors. In situations when he felt that he was not in control, he became verbally and physically aggressive. Ms. Smith reported that typical discipline did not appear to change Eli's behavior. She was especially fearful because when he became distressed, his aggressive behavior could reach extreme levels. Specifically, Eli would tantrum when told "no," had difficulty accepting responsibility for his actions, and would say hurtful things towards his mother. Ms. Smith believed many of these defiant behaviors were vindictive in nature. Behavioral symptoms were reported to have begun around the age of 2½ years, but continued to increase in severity over time. Finally, a significant change in the intensity of Eli's behaviors was present after his father left the home (approximately 6 months prior to seeking treatment).

During the intake, Ms. Smith became distressed at times, especially when discussing her fears for Eli's future, the past experiences while living with his father, and the potentially negative impact of her relationship with his father. Despite such reservations, Ms. Smith was open and cooperative with the therapists.

34.2.2 Assessment

34.2.2.1 Eyberg Child Behavior Inventory

The Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999) is a 36-item caregiver-report measure used to assess a child's level of disruptive behavior via parent report. The measure is divided between two scales, an Intensity scale used to rate the frequency of each behavior and a Problem scale used to determine the problematic nature of the behavior for a given caregiver. Upon initial assessment, Eli's Intensity raw score was 209 (*T*-score = 82) and Problem raw score was 29 (*T*-score = 78). These scores indicated that Eli was in the clinical range for both scales.

34.2.2.2 Dyadic Parent-Child Interaction Coding System

The Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Duke, & Boggs, 2004) is a standardized observational measure of parental verbalizations and child compliance. In addition, the DPICS is often used to assess the quality of the parent-child relationship. An initial assessment includes the implementation of three 5-min situations in which the parent and child are asked to play together. Firstly, the child is allowed to lead the play (Child-Led Play; CLP). Secondly, the parent is told to lead the play (Parent-Led Play; PLP). Finally, the child is told to clean up the toys independently (Clean-Up; CU). Each parent verbalization is live-coded and categorized across the three situations. Higher levels of positive verbalizations and lower levels of negative verbalizations are indicative of a stronger, more positive, parent-child interaction.

34.2.2.3 CLP

During CLP, Ms. Smith had 2 positive parenting skills (2 reflections), 18 negative parenting behaviors (13 questions, 5 commands), and 39 other verbalizations (5 unlabeled praises, 34 neutral talks). Eli engaged in repetitive behaviors and became upset with his mother when she did not do what he wanted. Often Eli would not verbalize what he wanted her to do.

34.2.2.4 PLP

During PLP, Eli refused to participate. He began to scream and throw toys when his mother attempted to switch the situation.

34.2.2.5 CU

Lastly, Eli refused to clean up the toys during the third portion of DPICS. Ms. Smith maintained a calm voice throughout. She appeared to be very passive in her discipline and, although she would give a developmentally appropriate command (e.g., “I’d like it if you sat in your chair”), she did not follow through with any type of consequence or discipline procedure when he did not comply.

34.2.2.6 Summary

Throughout the DPICS situations, Eli complied with 23% of commands. Ms. Smith indicated that his behavior was similar to or slightly better than his behaviors and compliance in the home environment.

34.2.3 Potential Barriers

After the initial meeting and DPICS assessment, the therapists noted some potential barriers to treatment: the impact of Eli’s previous trauma, Ms. Smith’s mental health difficulties, the possibility of the paternal grandparents and maternal grandfather interfering in treatment, and the physical size differences between Eli and his mother.

34.3 Child-Directed Interaction

34.3.1 Teach Session

During the CDI Teach, Ms. Smith appeared slightly anxious, but she was able to appropriately engage in session. Excited to learn about the CDI skills, Ms. Smith also enjoyed hearing that the CDI skills complemented her parenting philosophy with its inclusion of attachment-style parenting principles. Ms. Smith continued to communicate her concern for her relationship with her son, particularly with regard to his imitation of his biological father’s disturbing behavior. She continued to facilitate appropriate and strong communication with the therapists throughout treatment.

34.3.2 Coach Sessions

During CDI coaching, Eli often presented with a sullen demeanor and was physically and verbally aggressive towards his mother. Ms. Smith was able to quickly decrease her use of questions, commands, and negative statements early in her CDI coaching sessions. Reaching mastery was more difficult for Ms. Smith, however, as Eli’s inappropriate behavior or elevated aggression often forced Ms. Smith into long bouts of ignoring, redirection, or removing herself from the room. Verbal reflections were especially difficult for Ms. Smith as Eli would cover her mouth and push her body into the wall following her reflected statement. Eli appeared to feel little gratification from verbal praise and toy-based play initially. Instead, he seemed to prefer deep physical touch, which he often gained by climbing on his mother’s lap and draping himself over her back. His mother’s attempts to ignore such behavior and verbal indications of discomfort did not appear to deter Eli from such behaviors.

Instead, it became clear that any verbal or physical acknowledgement of the behavior served to reinforce such inappropriate actions. Although Ms. Smith was able to maintain a calm and enthusiastic demeanor during CDI, Ms. Smith would often talk about how hurt she felt about Eli's statements both before and after treatment sessions. Interestingly, she did not appear to be as troubled by his physical aggression. Finally, Ms. Smith was able to successfully utilize active ignoring approaches, especially in reaction to Eli hiding under a blanket he commonly brought to session to avoid playing with his mother.

34.3.3 CDI Adaptations

Eli's play maintained a repetitive quality throughout CDI coaching sessions. He would often stack blocks into basic towers for the entirety of a session. Although such behavior made the implementation of skills difficult for Ms. Smith, she responded well to coaching and allowed Eli to continue to lead the play.

Eli also went through a growth spurt during CDI coaching. Given his highly aggressive behavior, intrusive physical contact, noncompliance to parental directives, elopement, lack of play skills during CDI, and lack of intrinsic enjoyment from social engagement, it was determined that PDI would begin after 5 CDI coaching sessions regardless of Ms. Smith's ability to hit CDI mastery. CDI would then resume after consistent compliance was achieved, following a full course of PDI. It was necessary for Eli to learn to comply with his mother's requests to build the rewarding value of his mother's attention and his interest in his mother's play. Coincidentally, Ms. Smith attained CDI mastery criteria during the fifth and final CDI session.

34.3.4 CDI Barriers

As previously noted, Eli was highly physically and verbally aggressive throughout the majority of sessions. Due to his size and the frequency of these behaviors, it was difficult for his mother to utilize the CDI skills. He would often escalate after being ignored for an inappropriate behavior by throwing toys. In turn, he would use these toys to physically hurt his mother. The therapist often had to remove his mother from the therapy room for brief periods of time due to safety concerns, and remove toys due to his aggression.

Commensurate with his ASD diagnosis, Eli showed less intrinsic interest in joint social interaction with his mother than in his repetitive behaviors. However, he was able to understand basic social interactions as well as cause and effect of his behaviors. For example, he would behave in a socially appropriate manner when desirable toys were placed in the room but would throw less desired toys to have such toys removed from the room. Eli's motivation to engage in socially appropriate behaviors to connect with his mother appeared to be secondary to his motivation for tangible items. Although such preferences are common for children with ASD, Eli's lack of desire for or fulfillment by social connection was particularly distressing for his mother.

34.4 Parent-Directed Interaction

34.4.1 Teach Session

A two-hour PDI Teach session was conducted with Ms. Smith where the core components of PDI (e.g., rules of effective commands, time-out procedures) were discussed and modeled. Given her permissive tendencies, Ms. Smith openly expressed reservations regarding the protocol and her expectations for Eli's reaction to an initial demand. The therapists praised Ms. Smith for expressing her concerns and encouraged her to discuss them further. The therapists then provided a detailed rationale for the PDI procedure and comforted Ms. Smith by describing how they would help her throughout the PDI coaching process. Discussion and modeling of the PDI procedure served as an in vivo exposure opportunity for Ms. Smith to work through her thoughts and feelings related to the first PDI Coach session. Furthermore, such exposure appeared to increase

Ms. Smith's emotional readiness and commitment to the PDI procedure as she felt better prepared to cope with Eli's expected reaction to in-session commands.

By this time in treatment, she had built a strong rapport with the therapists. Such rapport appeared to help Ms. Smith feel emotionally and physically prepared for the initial coach session. Following the PDI Teach, Eli's mother was instructed to review the PDI materials and continue special playtime but not to implement the PDI model in the home environment.

34.4.2 Coach Sessions

34.4.2.1 PDI Coach One

The initial coach session occurred approximately 1 week following the teach session. The rules were explained to Eli and role-played using a stuffed animal ("Mr. Bear"). Upon the conclusion of the explanation, Eli appeared to demonstrate awareness of the procedure in his ability to correctly answer questions regarding the use of time-out following noncompliance as well as the use of the time-out room following escape from time-out. Ms. Smith was instructed to use a simple play-based command which was developmentally appropriate for his capabilities ("Please hand me the red block"). As his mother expected, Eli immediately was noncompliant to both the original command and warning statement.

Eli provided a significant amount of resistance throughout the time-out process. Due to his unique difficulties, adaptations to the standard protocol were made and adjusted in session depending on Eli's responses (for a full list of adaptations, see Table 34.1). At times, Eli would allow himself to become dead-weight when carried back to the time-out chair. He would slink off of the time-out chair in an effort to be placed in the time-out room—a small, enclosed area away from other people. After he completed 1 min plus 5 s of silence in the time-out room, Eli often kicked the door shut when his mother came to bring him back to the time-out chair. Such behavior was indicative of his motivation to remain in the room alone. In an effort to minimize attention for such behaviors, an adaptation was made whereby Eli's time in the time-out room was increased to 3 min. Eli was then provided with the option to return the chair from the time-out room. If he indicated his lack of readiness, he was told to remain in the time-out room for an additional 2-min time period. Once he indicated readiness, Ms. Smith pointed to the chair and Eli was expected to independently sit in the chair. This adaptation was implemented due to his enjoyment of the physical touch that Ms. Smith provided as she moved him between the time-out room back to the time-out chair. In addition, it seemed Eli also found satisfaction from his mother's physical difficulty while carrying him.

The therapists continuously assessed Ms. Smith's needs during the time-out procedure.

Table 34.1 Adaptations of the PCIT protocol made for Eli and Ms. Smith

Traditional protocol	Adaptation
Mastery-based CDI	Limited CDI sessions due to size/aggressive behaviors (*eventually unnecessary*)
1 min + 5 s of silence in time-out room	3 min in time-out room
Take child from time-out room to chair	Ask child if ready to return to chair
Carry child to chair	Gesture for child to return to chair
No sustenance provided for parent	Provided sustenance for parent (water)
No contingencies for elopement	Tangible reward (snack) provided for no elopement
No contingencies for avoiding time-out	Game with therapists at end of session for no time-outs
No specifications related to physical touch	Emphasis on physical touch, partly due to the sensory symptoms of ASD diagnosis
No additional time spent with caregiver	Time allotted at beginning and end of session for rapport-building with caregiver
No/minimal observations outside therapy	Observations and consultation in multiple setting (school, summer camp) to assist with generalization

Note: Adaptations based on this specific case. May not apply to all cases for children on the autism spectrum

Ms. Smith was given a bottle of cold water during these sequences which appeared to help buoy her spirits and increase her resolve to follow through. In the chair, Eli made negative verbal statements to his mother. Ms. Smith was coached to ignore such statements. Given the hurtful quality of such statements and her sensitive demeanor, coaching actively targeted Ms. Smith's automatic thoughts in reaction to her son's words. The attention-seeking function of such behaviors was emphasized in addition to Eli's long history of receiving attention for such hurtful words. Another component which was stressed was the long-term, positive consequences of teaching Eli to regulate his emotions and comply with demands. Ms. Smith's role as her son's teacher, therapist, and mother was discussed. She appeared to respond well to such coaching and embodied her role as Eli's teacher. Despite Ms. Smith's petite stature, clear physical fatigue, history of anxiety and depression, and tearfulness in session when Eli was in the time-out room, her commitment to the model motivated her to continue its implementation until compliance was achieved. Eli finally was able to demonstrate emotional control and complete the original command after an approximately 2-h time-out sequence (in which he escaped from the chair on approximately ten occasions).

34.4.2.2 PDI Coach Two

A second PDI Coach session was conducted the following day after PDI Coach one. This was done to demonstrate the power of consistency, predictability, and follow-through on Eli's compliance and emotion regulation. During this second session, the rules were reiterated to Eli, and Ms. Smith was instructed to give a similar command as she had given the day before. Eli was 100% compliant to all parental demands following an occasional warning statement. The therapists discussed with Ms. Smith about the dramatic change from the previous time-out session.

34.4.2.3 Remaining PDI Sessions

Further PDI sessions were used to increase Eli's compliance, expand his play skill repertoire, and increase his use of appropriate social skills. Although Eli was not 100% compliant throughout all subsequent PDI sessions, the duration and intensity of his time-out sequences decreased overall. Given the physically and emotionally demanding nature of such treatment, treatment sessions often occurred for 90 min.

Multiple adaptations to the standard PDI model were implemented to enable such gains. Namely, rules were imposed on Eli's previously obtrusive behavior when climbing on his mother's lap during play. Initially, he was expected to ask for permission to gain access to his mother's lap, and his requests for lap time were immediately rewarded. Shaping was used to increase the delay between Eli's request and his mother's permission. If he climbed on to his mother's lap without permission, a command was used to tell Eli to move back to his own chair. Noncompliance to such commands would result in a time-out.

At times, Eli engaged in elopement from the therapy room. Contingency management was used to address such safety concerns, whereby he could earn a highly desired edible snack upon the conclusion of the session for remaining in the therapy room. A final adaptation included allowing Eli to play a highly desired, physically active game (e.g., hide and seek) with the therapists when he was compliant (i.e., no time-out) for the duration of the therapy session.

Throughout the course of PDI, it was noted that Eli's persistence and physical size made time-out sequences long and, at times, physically difficult. While in time-out, Eli often engaged in high levels of negative attention-seeking behavior including yelling, crying, and saying hurtful words towards his mother. Consistent, positive coaching was essential to helping Ms. Smith combat her own negative cognitions, praise her commitment and persistence to her child's compliance, and recognize Eli's improved emotion regulation abilities. After approximately five PDI sessions, Eli's play repertoire expanded and his enjoyment of such play activities appeared to increase. Although occasional time-outs occurred, Eli persisted in appropriate play for longer periods of time. His ability to regulate his emotions in the face of previously upsetting situations and compliance scenarios improved. His flexibility, social skills (e.g., allowing his mother to touch his toys, sharing, turn-taking), and tolerance for imperfection increased as well. Eli was able to sit independently for the duration of the therapy session and only occasionally asked to sit on his mother's lap. For the first time, he created imaginative worlds in play and engaged in higher levels of socially appropriate interactions with his mother and the therapists. Finally, his use of eye contact and genuine enthusiasm for play-based social interactions was indicative of his learning process and proved especially gratifying for his mother.

34.4.3 Classroom Visit

A school visit was conducted to assist in generalization of treatment gains to the school setting (appropriate releases were obtained for observations/visits outside of the clinic). During the visit, his teacher mentioned her awareness of Eli's participation in behavior therapy but was had not known that he was diagnosed with ASD. Due to Eli's advanced academic abilities and only minor behavioral difficulties in the school environment, no academic or behavior accommodations were in place. Pleasantly surprised, the therapists conducted a behavior observation and discussed basic behavioral principles with Eli's teacher. Recommendations related to his social interactions with peers (e.g., praising socially appropriate behaviors) were provided. The therapists did not observe any instances of aggression or difficulties with compliance. It was concluded that generalization of treatment gains had likely occurred within the school environment, as such behavioral difficulties had existed in the classroom prior to treatment. Additionally, Eli's teacher had independently implemented a color-based token economy system whereby he could earn preferred tangible rewards for appropriate behaviors. Aware of Eli's social and behavioral difficulties, his teacher had placed him in a group of well-behaved children and secured a spot for him near her on the carpet during circle time. It was hypothesized that his teacher's calm manner and structured, predictable environment assisted in setting Eli up for behavioral success in the classroom.

Socially, Eli struggled to maintain appropriate boundaries with other children. His desire for physical contact led to situations in which he and other children would enter into play-based physical games that were frequently noted to be too rough (e.g., pushing during a game of tag, wrestling others). Although such situations were often prevented by keeping Eli separated from certain children, occasional instances necessitated diffusion by his teacher. Upon the conclusion of the school year, it was highlighted that Eli was retained in a regular-education classroom—a symbol of treatment success.

34.4.4 Summer Vacation

Following the conclusion of school, a summer camp visit was conducted. Eli was observed to play appropriately with peers by engaging in active, joint-play games (e.g., tag, hide and seek). Although he continued to appreciate structure and predictability, his counselors noted that he did not appear different from his peers within the environment. They were unaware that he was diagnosed with a developmental delay.

34.4.5 PDI Summary

The entire PDI course lasted approximately 20 sessions; at this point, Eli's compliance was determined to be within normal limits, his mother reached mastery on PDI skills, and a graduation session occurred. Eli was given a highly desired toy and a certificate of graduation. Finally, Ms. Smith reflected upon the changes in her response to her son's behavior since beginning treatment. Ms. Smith felt an increasingly strong, positive bond with Eli, and his respect for her words and actions had increased. She noted that she had the behavioral understanding and specialized parenting skills to manage his behavior in the home and public environments. As a result, instances of intense behavioral escalation had decreased. Additionally, Ms. Smith discussed her improved confidence in parenting Eli, whose behavior prior to treatment had felt overwhelming and frustrating to manage. A discussion regarding relapse prevention techniques occurred, particularly in light of his ASD diagnosis. Namely, the importance of consistency, predictability, and follow-through were stressed as such structure would continue to provide Eli with the controlled environment he needed. Moreover, the significance of high levels of positive attention following appropriate behavior, paired with firm, positive touch was discussed.

It was recommended that Ms. Smith continue to provide opportunities for Eli to develop his social skills by enrolling him in social activities, particularly those in line with his natural interests. Ms. Smith was also instructed to consider attending her son's social activities (e.g., play dates) and coaching him in appropriate social skills (e.g., praising sharing, turn-taking, remaining calm when things do not go his way). Creating rules for social interactions was suggested as a method of making abstract concepts more concrete and predictable. Tangible rewards were explained as another method to aid in Eli's compliance with Ms. Smith's prescribed rules. The therapists also emphasized the importance of Ms. Smith taking time to care for herself as her mental well-being had a significant impact on Eli's emotions and behavior. Upon the conclusion of the graduation session, Eli and his mother thanked the therapy team and were told to contact the clinic should any future concerns arise.

34.5 Lessons Learned

Perhaps the most salient lesson learned from the implementation of PCIT with Eli was the combination of his noncompliant and aggressive behaviors along with his inflexible and persistent disposition contributed to an extended and intense course of treatment. Although an overall trend of positive progress was present, long time-out sequences occurred throughout PDI therefore causing the therapists and Ms. Smith to re-evaluate treatment procedures. Specifically, Eli's mood on a given day greatly contributed to his likelihood of compliance and behavioral success. At times, it would appear that Eli had regressed in treatment (e.g., an intense time-out following a series of highly compliant sessions). Helping Ms. Smith see past such hurdles was integral to treatment success. In addition, increased time was spent with Ms. Smith at the beginning of treatment to help her emotionally prepare for the session. Importantly, Ms. Smith's strong commitment to behavior therapy proved to be another key component to overcoming these difficulties with Eli.

Highly preferred rewards (e.g., access to physically active games with therapist, food) were strategically used throughout the PDI sequence to help motivate positive behavior when social attention was not reinforcing enough. Higher-level commands were often provided within the context of shaping Eli's socially appropriate behaviors (e.g., sitting on his own chair, sharing a desired toy with his mother). Upon the conclusion of treatment, Ms. Smith became an advocate for her son's condition. Her experience of success motivated her to encourage other professionals in his life to implement similar behavior management skills across settings (e.g., school) to increase the likelihood of treatment generalization.

The relationship between a parent and the therapist often plays an important role in treatment progress; in Eli's case, strong rapport was imperative for treatment success. Specifically, Ms. Smith was socially isolated due to her previous traumatic experiences and her inability to take her son in public due to his unpredictable and often extreme behaviors. Therefore, the social support provided by a strong relationship with the therapists was critical in her ability to complete treatment.

Finally, Ms. Smith expressed concerns regarding Eli's ability to navigate more complex social experiences in the future. The therapists helped Ms. Smith understand the application of PCIT skills and principles in social situations to help Eli develop over time. Although such intense treatment with him was successful, it was expected that Eli and his mother would return for services in the future as he continued to grow and as new, particularly challenging social situations arose. Future booster sessions were expected and typical given the complex, multi-faceted nature of Eli's behavioral presentation and family history. Despite such expected needs, Eli and his mother were discharged from treatment, allowing them to feel a sense of accomplishment and closure to the intense work they had completed.

34.6 Conclusion

Overall, PCIT was indicated as the best course of treatment for Eli given his presenting concerns and history of disruptive behaviors. PCIT provided Ms. Smith with specialized skills and a team environment where she felt supported throughout the challenging therapeutic process. It is hypothesized that implementing the traditional PCIT protocol would not have enabled Eli and his mother to maximize the treatment gains that were achieved with such adaptations. Rather, an approach grounded in the theoretically strong principles of PCIT provided Eli and the treatment team with the necessary tools and methods to achieve success.

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A Case Study of Parent-Child Interaction Therapy with Adaptations for the Treatment of Autism Spectrum Disorder in Early Childhood

35

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Abstract

Children with ASD commonly exhibit disruptive behaviors, which are often the primary referral concern for treatment. Although PCIT was originally developed for typically developing children with externalizing behaviors, several studies have demonstrated its success in reducing behavioral problems in more specialized populations, including children with ASD. This chapter describes a clinical case study conducted with a 3-year-old female diagnosed with ASD. This case study illustrates that PCIT can be a successful treatment for children with ASD and other comorbid conditions. The chapter will describe the case in detail, while dedicating special attention to the considerations and adaptations used when working with the child and family. The section will conclude by highlighting future directions for practice and research when using PCIT for children with ASD.

"Olivia" was a 3-year-old girl with autism spectrum disorder (ASD) who was referred to a university-based child development center for treatment for disruptive behaviors. A university-based developmental pediatrician reviewed Olivia's medical history, previous psychological and educational evaluations, and decided that further evaluation was unnecessary. The pediatrician then referred Olivia and her family directly to the Parent-Child Interaction Therapy (PCIT) clinic. When Olivia presented to the PCIT clinic, her parents reported that she was an active and impulsive child. They were concerned with Olivia's inability to follow simple directions as well as her aggressive behaviors, which included pulling her mother's hair, hitting her parents, grabbing her parents' eyeglasses, throwing toys, and breaking things around the house. She also engaged in aggressive play with her siblings (e.g., pushing). Olivia liked to line up her toys and would become upset when her toys were moved. When upset, Olivia would spit, kick, or scream. Olivia's parents were concerned about their ability to respond to Olivia's disruptive behaviors and were seeking treatment recommendations.

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35.1 Background Information

35.1.1 Developmental and Medical History

Olivia was born full-term with no lasting medical concerns. According to Olivia's mother, Olivia began using single words at 12 months old, but stopped talking soon after. A pediatrician diagnosed Olivia with verbal apraxia and sensory integration disorder when she was 28 months old and referred Olivia for a comprehensive developmental evaluation under the Part C of the Individuals with Disabilities Education Act (IDEA) program (which provides early intervention services to at-risk children from birth to their third birthday). The outcomes of the developmental evaluation indicated that Olivia was eligible for early intervention services due to delays in her speech, communication, adaptive skills (e.g., behavioral feeding problems), and cognitive skills (e.g., attention and learning). Her Individualized Family Support Plan had two primary outcomes: (1) use single words to interact with family members/caregivers/school staff, specifically to greet others and to communicate wants and needs (e.g., "go," "more," "please," "hi," "bye," "mama," "dada") and (2) use words in place of challenging behaviors (e.g., biting fingers and hands, spitting on furniture and mirrors) to get attention during mealtime routines. To meet these outcomes, Olivia was provided several early intervention services including: (1) speech therapy for 60 min a week, (2) occupational therapy for 60 min a week, and (3) monthly consultation sessions between the speech therapist, occupational therapist, and staff psychologist. All three providers had experience with behavioral feeding problems and the psychologist specialized in interventions for young children with challenging behaviors. The psychologist provided consultation to support the therapists in creating intervention plans that would reduce challenging behaviors and teach replacement skills.

When Olivia was 30 months old, a community neurologist diagnosed her with ASD and receptive and expressive language disorder. Olivia's parents sought a second opinion at a pediatric autism specialty center and the multidisciplinary team confirmed the ASD diagnosis with associated expressive and receptive language disorders.

35.1.2 Sleep and Nutrition

When Olivia presented for PCIT at age 3, her parents reported that she slept only 7–8 h a day, 3–5 h fewer than the recommended amount for her age (Paruthi et al., 2016). Olivia demonstrated difficulty with her bedtime routine. Specifically, when she was placed into her bed, Olivia would jump up and down while actively refusing sleep. She had frequent night awakenings, during which time she would wake up and scream. Olivia's parents tried melatonin and reported that it improved Olivia's sleep, but the effects were short-lived.

In addition to Olivia's difficulty with sleep, she was also described as a picky eater. Her diet was mostly limited to chicken nuggets, fruits, and chips. Olivia used her fingers to feed herself, even though she knew how to use a fork. In addition, Olivia still drank from a sippy cup. While Olivia's parents wanted Olivia to eat a wider variety of foods, her diet was somewhat limited due to her food intolerance.

35.1.3 Family and Social History

Olivia lived with her parents and two older brothers, aged 5 and 7. Her father worked as an engineer and her mother stayed at home to care for the children. Their home living was described as very stressful due to Olivia's challenging behaviors and speech and language delays. Olivia required constant and close supervision in the home. She was not aware of common dangers and would open the doors and run outside when given the opportunity. To complicate matters, Olivia's 5-year-old brother also had speech delays and behavior problems as well.

35.1.4 Early Intervention and Educational History

Olivia attended a private daycare when she was 2 years old. At 2 ½ years old, Olivia attended preschool 6 h a day and received speech and feeding therapy at the school through the Part C Early Intervention program until her third birthday. Once she was 3 years old, Olivia was made eligible for a Part B prekindergarten program through the local public school system. Olivia was placed in the same classroom as her older brother who had speech delays and behavior problems. Olivia had an Individualized Education Plan (IEP) under the eligibility categories of ASD and impairments in speech and language where she received speech and language therapy. According to teacher report, Olivia was easily frustrated by changes in daily routines and during transitions. When she was upset, Olivia would often cover her ears or scream. Additionally, Olivia had difficulties with peer interactions and preferred to engage in parallel play when around her peers. While Olivia had difficulty sharing, her aggressive behaviors were not reported in the school setting.

Despite Olivia's diagnosis of ASD with severe global developmental delays, she had not received any intensive behavioral therapies like applied behavior analysis (ABA). Unfortunately, her family's private insurance did not cover the cost of the ABA treatment and her family was unable to afford the out-of-pocket costs associated with the treatment. This was the impetus for the family seeking out behavioral supports available through a research program. Olivia was referred to a research study to investigate the effects of PCIT for children on the autism spectrum.

35.2 Assessments

35.2.1 Results from Previous Evaluations

Therapists were provided with Olivia's previous testing evaluations. Olivia completed the following evaluations between 28–34 months of age (Table 35.1).

Table 35.1 Results from previous evaluations

Evaluation tool	Brief description	Standard scores	Score interpretation
Battelle Developmental Inventory—2nd Edition (BDI-2; Newborg, 2005)	A developmental assessment to screen for early childhood milestones.	Personal-social = 70 Motor = 79 Adaptive = 70 Communication = 61 Cognitive = 70	Mean = 100 (SD = 15) Eligible for early intervention services if scores are less than 1.5 SD from the mean in two or more areas
Wechsler Preschool and Primary Scale of Intelligence—Fourth Edition (WPPSI-IV; Wechsler, 2002)	A cognitive development measure for preschoolers and young children.	Visual spatial = 106 Unable to complete other scales due to limited verbal skills	Mean = 100 (SD = 15) Scores below 70 are considered as significantly delayed
Preschool Language Scale-5th Edition (PLS-5; Zimmerman, Steiner, & Pond, 2011)	A developmental language measure that requires the child to point or respond verbally to pictures and objects.	Auditory comprehension = 55 Verbal communication = 73	Mean = 100 (SD = 15) Eligible for early intervention services if scores are less than 1.5 SD from the mean in two or more areas
Childhood Autism Rating Scale—2nd Edition (CARS-2; Schopler, Van Bourgondien, Wellman, & Love, 2010)	A 15-item rating scale that identifies key areas that are associated with ASD to determine if further evaluation is warranted	Total raw score = 40 (severe symptoms)	Mild/moderate = 30–37 Severe = 38–60
Autism Diagnostic Observation Schedule, 2nd Edition (ADOS-2; Lord et al., 2012)	A gold-standard measure of ASD which includes semi-structured observations of communication skills, social interaction skills, play/imagination, and restricted and/or repetitive behaviors.	ADOS-2 module 1 Overall raw score = 19 (autism)	For children with few to no words, cutoff score for an autism diagnosis is 16 or higher
Vineland Adaptive Behavior Scales, 2nd Edition (Vineland-II, Sparrow, Cicchetti, & Balla, 2005)	A measure of adaptive behaviors, which include communication, social, motor, and living skills.	Communication = 66 Motor = 79 Social = 72 Living skills = 71	Mean = 100 (SD = 15) Scores below 80 are considered significantly delayed

35.2.2 Initial Observations

Olivia did not make eye contact with the therapists when she was greeted at the PCIT clinic. Her communication was limited. Olivia used mostly single-word utterances and made frequent vocalizations. She had difficulty engaging in playtime with her mother and was constantly moving around the playroom, throwing objects, and kicking toys. At times, Olivia would jump on her mother and try to grab her eyeglasses. Olivia's mother made several attempts to get Olivia to play with her (e.g., "Olivia, look!") but she was unsuccessful in redirecting Olivia's behaviors. Instead, Olivia found the light switch and repeatedly turned it off and on. When told to stop, Olivia whined and yelled. Olivia would also spit and let her saliva remain on her chin while watching herself in front of the one-way mirror. Olivia's mother told her that it "was gross" and wiped her mouth with a paper napkin. Olivia only sat still on the chair when given her iPad. She played with the iPad quietly and did not respond when her name was called.

35.2.3 Measures Delivered in the Clinic

35.2.3.1 Eyberg Child Behavior Inventory (ECBI)

The ECBI (Eyberg & Pincus, 1999) is a caregiver rating scale that assesses disruptive behavior problems in children ages 2–16 years. The ECBI contains 36-items that generate two separate scores on the Intensity and Problem scales. The Intensity scale measures the frequency of the problem behavior (ranging from 1—Never to 7—Always) while the Problem scale measures whether the behavior is endorsed as problematic (Yes or No) by the caregivers. A *T*-score of 65 or greater on the Intensity Scale is an indication for intervention, and a *T*-score of 55 or below is an indication of response to intervention. The ECBI was administered to Olivia's mother at baseline, weekly throughout treatment, and at 3-month follow-up. The baseline ECBI *T*-scores were 68 (Intensity) and 59 (Problem). Both scales indicated clinically significant levels of behavior problems.

35.2.3.2 Child Behavior Checklist (CBCL)

The CBCL (Achenbach & Rescorla, 2001) is a caregiver rating scale that measures childhood competencies, emotional concerns, and behavioral problems in children 18 years and younger. The CBCL contains 113-items yielding two outcome scales: Internalizing (e.g., anxious, depressed) and Externalizing (e.g., disruptive behavior). A *T*-score higher than 65 is considered within the clinical range. The CBCL was administered to Olivia's mother at baseline, at the end of treatment, and at 3-month follow-up. The baseline CBCL scores were 63 (Internalizing) and 76 (Externalizing) indicating at-risk internalizing concerns and clinically significant externalizing problems.

35.2.3.3 Dyadic Parent-Child Interaction Coding System, 4th Edition (DPICS)

The DPICS (Eyberg, Ginn, Bhuiyan, & Boggs, 2014) is a behavioral observation coding system that assesses parent verbalizations and child compliance to parent commands during PCIT sessions. During a 5-min interval, parent-child interactions are coded to measure parents' use of Child-Directed Interaction (CDI) skills, which include the "Do" skills (Behavioral Descriptions, Reflections, and Labeled Praises) as well as the "Don't" skills (Questions, Commands, and Negative Talk). These data are used for progress monitoring, developing weekly coaching goals, and determining transition to Parent-Directed Interaction (PDI). During PDI, parents' use of effective and direct commands, accuracy of follow-through with disciplinary procedures, and child compliance are coded during a 5-min interval as well. At baseline 1 when coded for 5 min, Olivia's mother did not use any of the "Do" skills but used several "Don't" skills (Questions = 1, Commands = 2, and Negative Talks = 3). At baseline 2, Olivia's mother used five questions and three commands. She also used several reflections, but the reflections were in response to Olivia's random vocalizations instead of functional communication.

35.3 Case Conceptualization

After the initial assessment, the clinic therapists agreed that Olivia was a good candidate for PCIT. A comprehensive interview with parents and review of previous evaluation records indicated that Olivia's problem behaviors were present across multiple settings, had been previously documented using multiple assessments, and the assessments had been rated by multiple sources including clinicians and therapists, caregivers, and her teachers. Olivia presented with extremely disruptive behaviors including not following directions, acting physically aggressive towards her parents, throwing objects, and breaking objects in the home. Olivia appeared to be more disruptive with her mother (e.g., physical aggression). Her mother reported being less able to manage Olivia as compared to Olivia's father.

Using a problem-solving process (see Table 35.2 below), we hypothesized that Olivia's behaviors served multiple functions including: to obtain attention, escape demands, and express frustration. The problem-solving process, which includes four major steps, (a) problem identification, (b) problem analyses, (c) plan development and implementation, and (d) plan evaluation/response to intervention, is

Table 35.2 Problem-solving process

<table>
<tr><td colspan="3">Step 1: Problem identification—identify the presenting problems and desired behaviors</td></tr>
<tr><td>Desired behavior</td><td colspan="2">Parents would like for Olivia to increase her ability to follow simple directions in the home setting so they can prevent her from engaging in disruptive and dangerous behaviors.</td></tr>
<tr><td>Current level of performance</td><td colspan="2">Parents reported inconsistencies in Olivia's ability to follow simple directions (e.g., sit down, go upstairs, and come here). Sometimes she only complied after the commands were repeated at least four times. Two baseline DPICS observations conducted over a 5-minute interval at the clinic indicated that Olivia did not comply with any of the commands given by her mother (compliance rate = 0%).</td></tr>
<tr><td>Desired level of performance</td><td colspan="2">When given a simple command from her parents, it is desired that Olivia complies with at least 3 out of 5 opportunities.</td></tr>
<tr><td colspan="3">Step 2: Problem analyses—collect data to determine possible explanations for why the problems are occurring</td></tr>
<tr><td>Hypotheses</td><td>Predictions</td><td>Relevant data</td></tr>
<tr><td>(a) Olivia engages in noncompliance and disruptive behaviors because she receives parents' attention for such behaviors.</td><td>If parents learn to use planned ignoring skills and reinforcement for positive opposites of behavior problems, then Olivia's problem behaviors will reduce.</td><td>Based on parent interviews and behavioral observations, Olivia's parents often react to Olivia's disruptive behaviors by giving her verbal and social attention (e.g., commenting on her negative behavior – "No, Olivia, stop doing X"; laughing at her behaviors), giving her physical touch (e.g., hugs to calm her down), and giving her preferred objects (e.g., iPad, her favorite blanket) as a distraction.</td></tr>
<tr><td>(b) Olivia engages in noncompliance and disruptive behaviors because she does not understand parent directions.</td><td>If Olivia is taught specific behavioral expectations, then Olivia is more likely to comply with parent directions.</td><td>Due to Olivia's severe speech and language delays, parents are unsure if Olivia understands parent directions. According to school records, Olivia scored a standard score of 55 on the Auditory Comprehension Composite of the Preschool Language Scale-5 (PLS-5; Zimmerman, Steiner, & Pond, 2011). This suggested that Olivia's receptive language skills were very delayed. During behavioral observations, Olivia did not respond to her mother's verbalizations or simple commands.</td></tr>
<tr><td>(c) Olivia engages in noncompliance and disruptive behaviors because parental directions are not clear and/or effective.</td><td>If parents learn to use clear, effective commands, then Olivia is more likely to comply with parent directions.</td><td>Based on behavioral observations, Olivia's mother frequently asked Olivia to stop doing something (e.g., "Stop playing with the lights") instead of telling her what to do. She also tended to use indirect commands that suggested she would assist in the direction or that involved a question (e.g., "Let's clean up," and "Would you like to sit here and play?").</td></tr>
<tr><td colspan="3">Step 3: Plan Development and Implementation—develop and implement evidence-based interventions based on data collected</td></tr>
<tr><td colspan="3">Step 4: Plan evaluation/response to intervention—evaluate the effectiveness of interventions</td></tr>
</table>

commonly used in behavioral consultation (Bergan & Kratochwill, 1990).

PCIT was recommended as part of the intervention plan because it is an evidence-based treatment for young children with disruptive behavior disorders and developmental disabilities (Eyberg, Boggs, & Algina, 1995). Olivia's developmental disabilities were quite severe, especially when compared to most case reports and randomized-controlled trials of PCIT with children with ASD (Agazzi, Tan, & Tan, 2013; Agazzi, Tan, Ogg, Armstrong, & Kirby, 2017; Armstrong, DeLoatche, Preece, & Agazzi, 2015; Armstrong & Kimonis, 2013; Hatamzadeh, Pouretemad, & Hassanabadi, 2010; Masse, McNeil, Wagner, & Chorney, 2007; Masse, McNeil, Wagner, & Quetsch, 2016; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). However, the severity of Olivia's delays were similar to those of the case described in Lesack et al.'s (2014) study, and Olivia's parents had been unable to access other behavioral interventions for disruptive behaviors; therefore, we decided to replicate the Lesack et al. (2014) protocol with Olivia's parents' in full disclosure and after obtaining their consent. Further, Olivia's parents reported that Olivia was motivated by their attention at times and enjoyed playing with them as long as the play adhered to some of Olivia's stereotyped and repetitive behaviors and interests. The entire family was overwhelmed with Olivia's behaviors and the degree to which they disrupted family routines and rituals. The family voiced readiness to commit to weekly sessions of PCIT.

35.4 Intervention Plan Development and Implementation

Based on the information gathered, the intervention plan was developed with the goal to increase Olivia's current compliance rate from 0% to at least 60% (e.g., comply with three out of five commands). The intervention plan also aimed to reduce Olivia's disruptive behaviors, as well as to improve positive parenting skills.

The first phase of PCIT, CDI, was aimed at teaching and coaching Olivia's parents to increase their use of positive parenting strategies during a structured play situation. The positive parenting strategies (e.g., "Do" skills) of the standard PCIT protocol were taught including: describing appropriate behaviors, providing specific labeled praises for appropriate behavior, reflecting Olivia's appropriate verbalizations and functional communication, imitating Olivia's play while enjoying the interactions, and following Olivia's lead during play. Parents were also coached to use planned ignoring for minor inappropriate behaviors (e.g., spitting on the mirror, licking the mirror, drooling down her chin), and to avoid asking questions, giving commands, or negative feedback during the play situation (e.g., "Don't" skills).

During the second phase of treatment, PDI, parents were taught and coached to give clear, effective commands and follow-through with the commands. Behavioral compliance was followed with a labeled praise, and behavioral noncompliance resulted in the initiation of the time-out sequence. Because of the severity of Olivia's developmental delay, several modifications and adaptations to the PCIT protocol were made based on the Lesack et al. (2014) case study.

To decrease the likelihood that Olivia's receptive language deficits interfered with her compliance, Olivia was taught one direction at a time using a step-by-step teaching phase prior to introducing time-out for noncompliance. The teaching phase involved the use of three levels of prompting (i.e., verbal/gestural, adult modeling, and physical assistance) to teach the target skill (Lesack, Bearss, Celano, & Sharp, 2014). When giving directions, parents were also instructed to use Olivia's name as a means of getting her attention, a strategy that is not employed in standard PCIT. The sequence began with a verbal command combined with a gestural cue (e.g., "Olivia, sit here," while pointing to the designated spot). If Olivia did not respond after 5 s, her parents modeled the command, along with the verbal command (e.g., "Olivia, sit here like this"). If Olivia did not respond after 5 additional seconds, a physical command along with the verbal command was given (e.g., "Olivia, sit here like this," with parent physically guiding Olivia to complete the requested action). Each compliance behavior was then rewarded with a labeled praise as well as with a preferred snack (e.g., chips or gummies). Time-out was introduced as a response to noncompliance following the mastery of the target skill. Mastery was defined as three consecutive compliance behaviors following the verbal or gestural prompt.

In consultation with Olivia's parents, two target commands were identified, "Sit here," and "Give me *X*." These commands were selected to address safety concerns and reduce disruptive or aggressive behaviors. The first direction, "Sit here," was selected as a *positive opposite* for behaviors like climbing on furniture and Olivia's tendency to run away from caregivers. This behavior was also incompatible with aggressive behaviors like grabbing her mother's eyeglasses from her face and could be utilized to redirect Olivia when necessary. Olivia's parents created a visual aid. They used a photo of Olivia with the word "Sit," to indicate the spot in which they would like Olivia to sit. The second direction, "Give me *X*," was selected to address Olivia's aggressive behaviors like throwing and grabbing objects. Olivia was instructed to give her parents a specified item to prevent her from throwing and destroying the item.

The time-out procedure was also adapted based on our observations of Olivia's attention-span and parent reports. Olivia had a difficult time remaining seated for more than 30 s. The length of time Olivia was required to sit in the time-out chair was initially reduced from the standard 3 min (+ 5 s of quiet) to 25 s (+ 2 s of quiet). It was further reduced to 10 s (+ 2 s of quiet) as Olivia demonstrated significant difficulty staying on the chair. Olivia's parents preferred to use a time-out holding chair procedure as the backup to time-out (5 s +2 s of quiet) over using the time-out room due to concerns about isolation. Specifically, they were worried that isolation may scare Olivia and cause her to experience anxiety. While we explained that time-out room would be very brief and would result in the parents' returning to the room once Olivia had calmed, Olivia's mother wanted to try the time-out holding chair and we respected her wishes. However, after a difficult session that involved several rounds of the time-out holding chair, Olivia's mother requested to convert to time-out room (5 s +2 s of quiet). She reasoned that holding Olivia in a chair against her wishes was causing Olivia stress and was physically difficult to implement, and she feared that one of them may be injured in the process or that mother's eye glasses would be broken. While we would have preferred to use time-out room first, we believed it was important to strike a balance between implementing the protocol and adapting it to meet the needs of caregivers.

35.5 Plan Evaluation/Response to Intervention

35.5.1 Child Outcomes

35.5.1.1 ECBI

Olivia's mother completed the weekly ECBI behavior rating scale at the beginning of each session. At the first baseline, Olivia's mother rated the intensity of Olivia's problem behaviors in the clinically significant range (*T*-score = 68). Her ratings of intensity and problems slightly decreased over the first few CDI sessions, but Intensity scale ratings hovered just above the clinical cutoff over the course of treatment. Olivia's Problem score remained at or below the clinical cutoff (see Fig. 35.1). At the end of treatment (PDI 9), the Intensity and Problem *T*-scores were 61 and 56, respectively, and were slightly increased at 3-month follow-up (Intensity = 64 and Problem = 58).

35.5.1.2 Compliance Rates and Time-out Frequency

Olivia's compliance rates (following verbal or gestural prompt) and time-out frequency were monitored throughout the PDI phase regardless of PDI coding. This means we tracked every single command issued during each session. Thus, unless otherwise stated, the data presented are representative of coaching versus coding. During baseline

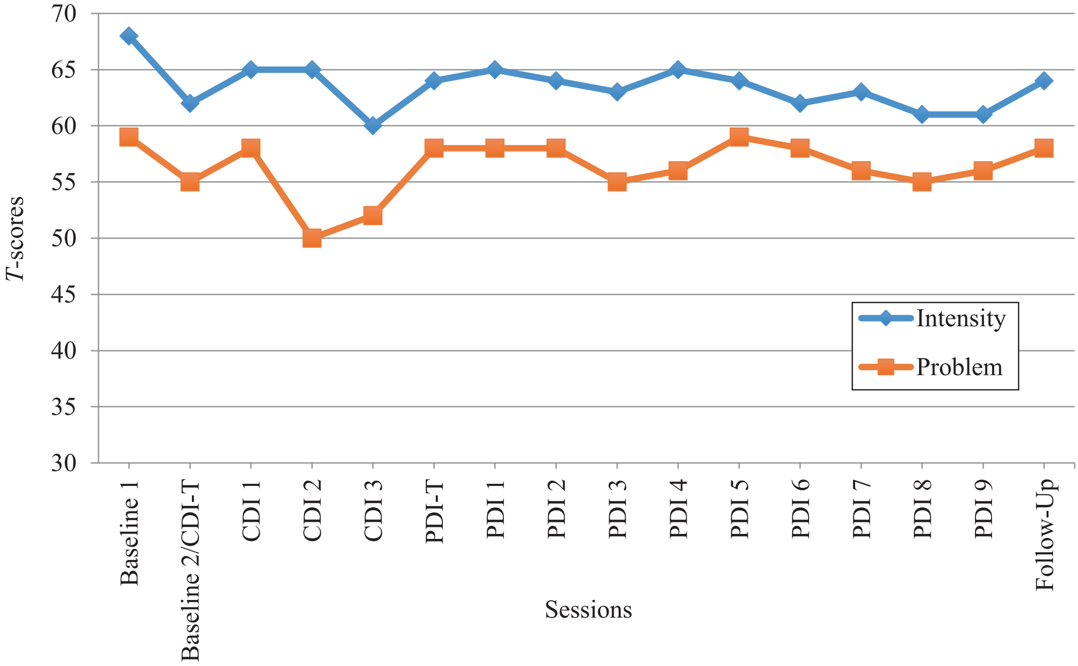

Fig. 35.1 ECBI ratings

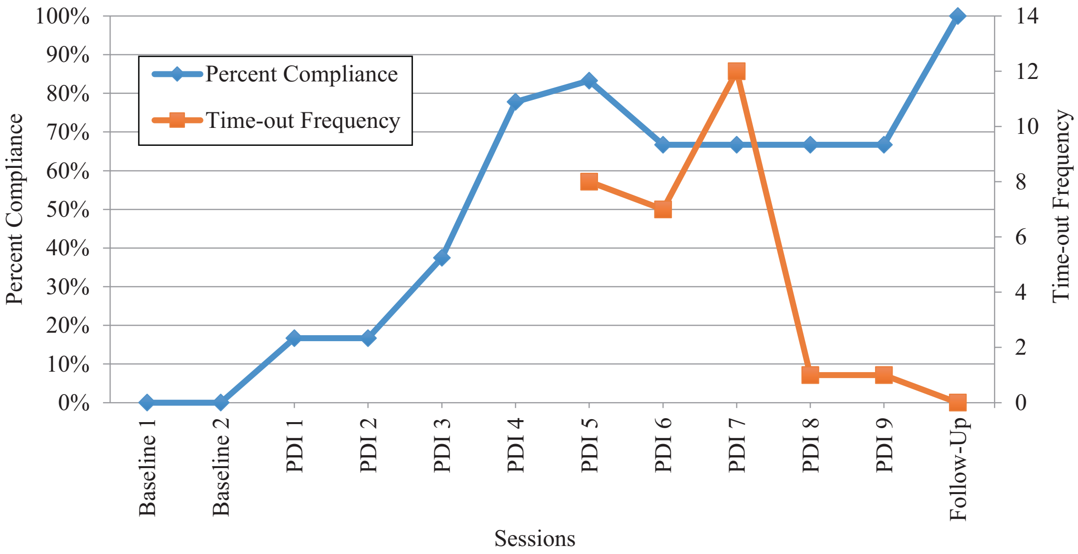

Fig. 35.2 Compliance rates and time-out frequency

observations, Olivia's compliance rates were 0%. Her compliance rates gradually increased over the course of treatment (83.3% during PDI 5), maintained at 66.7% during the last few weeks of treatment, and were at 100% at follow-up. As shown in Fig. 35.2, Olivia's frequency of being placed in time-out decreased significantly over time.

The first 4-weeks of PDI involved teaching Olivia two commands: "Sit here," and "Give me *X*." During PDI Coach 1, Olivia's mother issued five commands to “Sit here.” Olivia required the physical command for four of the five, but did comply once after a verbal command only. Olivia’s father issued five commands as well with Olivia complying with two verbal commands, one modeling command, and two physical commands. Olivia received labeled praises and preferred food for compliance with these commands. In PDI Coach 2, Olivia’s mother was coached first and Olivia was able to comply with four physical commands and one verbal command. Later in the PDI 2 session, Olivia demonstrated mastery of the “Sit here,” command with her father by complying three consecutive times when her father issued this command verbally. From this point forward, Olivia’s parents were instructed to only provide a labeled praise (e.g., eliminate the preferred food reinforcer) after compliance with the “Sit here,” (verbal) command and to give the time-out chair warning for noncompliance with this command.

In PDI Coach 3, the second command (e.g., “Give me *X*”) was introduced. We initially coached the caregivers to request that Olivia hand them toys with which they were playing. We then were immediately were concerned with whether Olivia understood the commands. Therefore, since Olivia always brought several preferred items with her to treatment, we instructed parents to request these items, which included a blanket, book, sippy cup, and iPad. This ensured that Olivia was familiar with the word for each item. Olivia’s mother issued eight commands (three for “Sit here,” and five for “Give me *X*”). Olivia complied with all three verbal commands to sit and required five physical commands to give her mother an item. Each of the physical commands to give an item was paired with labeled praise and a preferred food. Father issued 11 commands (three for “Sit here,” and eight for “Give me *X*”) and Olivia complied with all the commands similarly to how she complied with her mother.

In PDI Coach 4, Olivia demonstrated mastery of the “Give me *X*,” command by complying on three consecutive trials to a verbal command alone. Olivia gave her caregivers her cup, blanket, a bag, and two new items (e.g., a lion and a horse). In total, she followed 18 commands across caregivers and continued to receive labeled praise plus the preferred food reinforcer for giving items (with only a labeled praise when she sat). Given her ability to follow both targeted commands, we instructed caregivers to no longer provide the preferred food as part of the labeled praise after Olivia’s compliance.

The time-out chair for noncompliance was used for the first time in PDI Coach 5 (one time) because Olivia non-complied with father’s command to “Give me a red triangle.” Olivia was sorting shapes and discriminated between the shapes and colors. Olivia successfully sat in the time-out chair and complied with the task upon release from time-out. In total, Olivia’s parents gave 12 direct commands during PDI 5; Olivia complied with ten of them immediately, one required a warning, and one required the time-out chair as described above.

In PDI Coach 6, we coded CDI. Olivia’s mother met mastery criteria. We also attempted to code Olivia’s mother in PDI. In the third minute of the coding observation period, Olivia disobeyed a direct command and her mother was not able to follow-through with the correct PDI procedure. Olivia’s mother asked the coaches for help as she was unsure of how to proceed. We discontinued coding and switched to coaching as requested by Olivia’s mother. We then prompted Olivia’s mother to provide the warning statement. Olivia disobeyed the warning and was sent to the time-out chair. She got off the time-out chair three times and her mother utilized the holding chair as a backup procedure prior to successfully completing time-out. Later in the session, Olivia disobeyed another direct command and was sent to time-out chair again. She got off the chair four times and her mother utilized the holding chair as a backup procedure the first three times. On the fourth trial, Olivia’s mother said she could no longer hold Olivia in the chair due to the intensity of Olivia’s physical aggression. Olivia’s mother requested to immediately convert to use of time-out room to complete the backup procedure. By using the backup room, Olivia was able to calm down very quickly. After completing her time in the time-out room (e.g., adapted to 5 s in room +2 s quiet), Olivia sat in the chair and complied with the original command prior to ending the treatment session.

In PDI Coach 7, while Olivia obeyed most commands, she disobeyed one command and this resulted in a time-out. Olivia would not remain seated in time-out. She was getting out of the chair frequently and the time-out room was repeated 12 times (5 s +2 s of quiet) before Olivia complied with sitting in the time-out chair (10 s +2 s of quiet). She then was able to comply with the original command and successfully completed a follow-up command on the first attempt. In PDI Coach 8, we successfully coded both CDI and PDI where Olivia's mother met mastery criteria for both. Olivia continued to comply with most of the issued commands. In turn, the time-out chair was not utilized. Due to their success, we prepared the family for graduation which we discussed would happen at the family's next session (i.e., PDI 9). In PDI 9, Olivia's behavior was stable and rated near the clinical cutoff on the ECBI (Intensity = 61, Problem = 56), Olivia's mother had demonstrated mastery of CDI and PDI, and she reported marked improvements in her ability to manage Olivia's behavior at home and in community settings. We reviewed other discipline procedures during this session, as well as how to use visual schedules to facilitate transitions and public outings (e.g., visual schedules). We also scheduled a follow-up session for 12 weeks later. Olivia's mother was instructed to call us if there were any problems prior to follow-up.

35.5.1.3 CBCL

Olivia's mother completed the CBCL behavior rating at baseline, end of treatment, and 3-month follow-up. As seen in Fig. 35.3, Olivia demonstrated a decrease in internalizing and externalizing problems from baseline to posttreatment. There was a slight increase in the *T*-scores from posttreatment to 3-month follow-up, but the scores were still reduced from baseline levels.

35.5.2 Parent Outcomes

35.5.2.1 "Do" Skills

Olivia's mother was coded on her use of positive parenting strategies ("Do" skills") during two baseline observations, all CDI sessions, selected PDI sessions, and at 3-month follow-up. The three "Do" skills included: Behavioral Descriptions, Reflections, and Labeled Praises. Mastery of the skills is defined as demonstrating use of ten of each of the skills within the 5-min coding session. Olivia's mother demonstrated

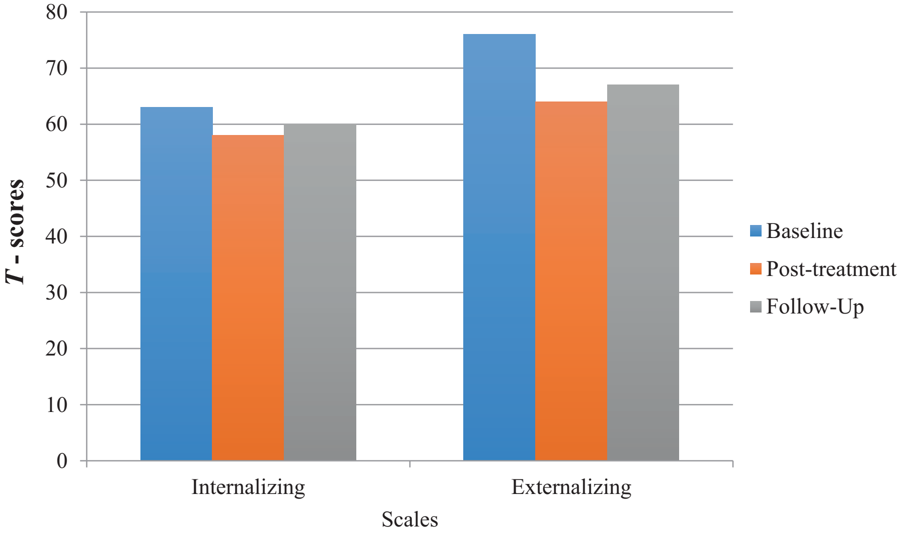

Fig. 35.3 CBCL ratings

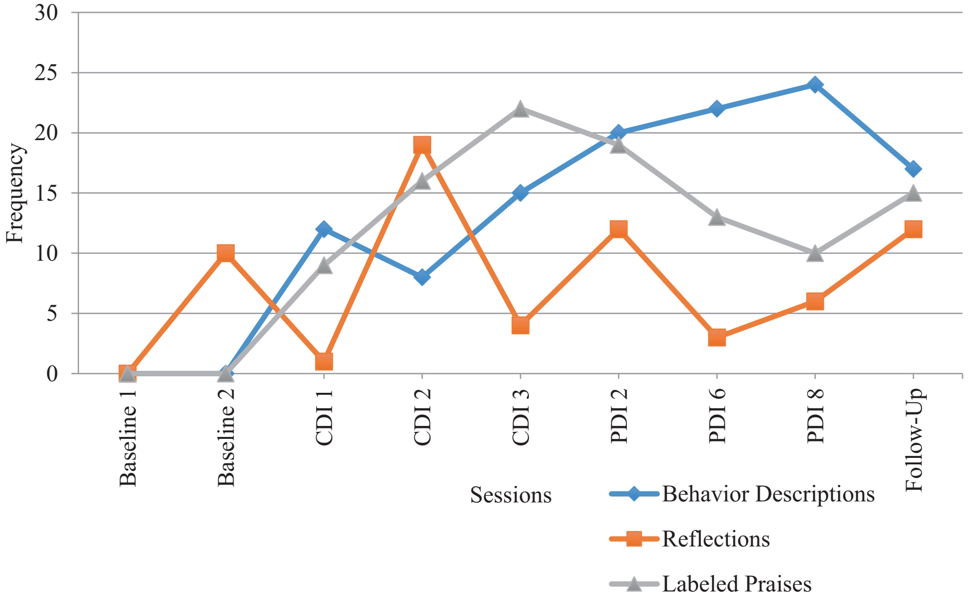

Fig. 35.4 Frequency of "Do" skills

improvement in her positive parenting skills (see Fig. 35.4). Following two sessions of CDI coaching, Olivia's mother demonstrated consistent mastery for all the "Do" skills, apart from reflections. Olivia's lack of communication limited the opportunity for Olivia's mother to reflect her appropriate verbalizations, although she did reflect the majority of intelligible verbalizations.

35.5.2.2 "Don't" Skills

Olivia's mother was also coded on her use of "Don't" skills during two baseline observations, all CDI sessions, selected PDI sessions, and at 3-month follow-up. The three "Don't" skills included: Questions, Commands, and Negative Talk. Based on Fig. 35.5 below, Olivia's mother's use of the "Don't" skills decreased throughout treatment. At baseline observations, Olivia's mother made several commands and questions that took over the lead of the CDI structured playtime. By the end of PDI sessions, Olivia's mother did not use any of the "Don't" skills. However, at 3-month follow-up, Olivia's mother made several questions during the 5-min coding session.

35.6 Conclusion

This case study discussed the use of adaptations in the implementation of PCIT with a 3-year-old girl with ASD, comorbid disruptive behaviors, global developmental delays, and very limited verbal communication skills. The treatment was successful in reducing parent ratings of disruptive behaviors and improving the child's compliance rates and positive parenting skills. Notably, Olivia's mother was instrumental in the implementation of PCIT with adaptations. She was actively engaged throughout the treatment process and was open to problem-solving the difficulties encountered during treatment as well as the proposed adaptations to standard PCIT (e.g., teaching commands, time-out). As noted in the description of PDI, some adaptations had to be implemented on the spot during episodes of very challenging behaviors (e.g., convert to time-out room, reduce duration of time-out). This highlights the importance of establishing parental involvement and buy-in to ensure treatment acceptability, fidelity, and success. We established

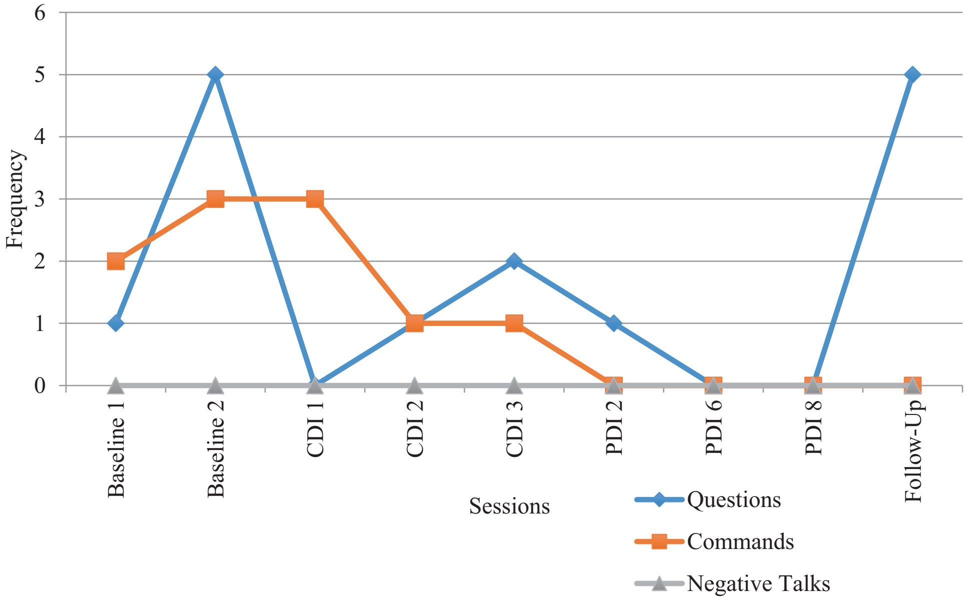

Fig. 35.5 Frequency of "Don't" skills

a strong rapport with Olivia's mother and she trusted us to make adaptations that would best support her treatment goals, even during very stressful moments of therapy.

Overall, the findings of this case study provide additional support for the feasibility of PCIT with children with ASD, including those who present with significant developmental disabilities and limited speech and language. However, this case study also highlights the additional work and adaptations that were required to ensure that this child and family succeeded. Similar to typically developing children, Olivia's parents learned to follow her lead in the play by attending to appropriate behaviors and communication only, while ignoring those that were inappropriate or nonfunctional. Olivia's mother mastered CDI in only three sessions, which is indeed remarkable given the challenges presented.

PDI, on the other hand, was much more difficult to implement, in part due to Olivia's immature receptive language, short attention span, and the mother's reluctance to consider the time-out backup room. Commands were limited to the two commands that her parents believed were most important for Olivia to learn: "Sit here," and "Give me *X*." Additionally, we were unable to code PDI skills as recommended by the standard PCIT protocol guidelines and had to suspend one PDI coding session to coach the parent through a challenging situation. Time in the time-out chair and room were also reduced from the standard 3 min to 25 s and finally 10 s, to ensure that Olivia could complete the command sequence successfully given her difficulty staying seated for more than 10 s. Notably, while Olivia and her mother required more PDI coaching sessions for mastery than most families do, by PDI 7, Olivia's noncompliance had rapidly declined and were maintained at follow-up.

Other issues to consider in utilizing PCIT with children with ASD is generalization and durability of the skills learned in the training environment to the natural environment (Stokes & Baer, 1977). As in the case of Olivia and her parents, additional treatment time might be required to maintain treatment gains and reduce challenging behavior. Other strategies to maintain treatment gains and increase generalization might include teaching the skills in the natural environment (e.g., conduct home and public outing sessions), encouraging and reinforcing parents' problem-solving skills to address future problems, and teaching others within the child's social system (e.g., grandparents, teachers, and therapists). While identifying funding mechanisms to support these activities may prove challenging, therapists may consider flexible spending dollars available through autism support groups and health savings accounts. Therapists should also be aware of wrap-around services in their local communities that families with ASD may access.

Future research must involve rigorous evaluations of PCIT for children with ASD. Studies should explore randomized-controlled trials which evaluate the effect of PCIT on parenting skills and on child behaviors, whether PCIT affects ASD-specific behaviors (e.g., social communication, repetitive behaviors), and generalization effects. While previous PCIT research has documented generalization effects in the classroom for children with disruptive behavior disorders (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991), generalization must be further explored for children with ASD to determine if PCIT affects classroom behavior, academic achievement, or engagement in community settings due to the children's unique needs. PCIT may serve as a gateway treatment by increasing parent-child interactions and child compliance. This may then set the stage for greater child compliance during academic instruction and adjunct therapies like speech and language therapy (Masse et al., 2016). Another future direction for research relates to dissemination. Specifically, researchers should look at how to make PCIT training more accessible to community providers through local trainings and available at an affordable rate. Community providers must be trained in evidence-based strategies to expand the network of high-quality behavioral interventions readily available to families and children affected by ASD (Brookman-Frazee, Drahota, & Stadnick, 2012).

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36

PCIT and Autism: A Case Study

Amelia M. Rowley and Joshua J. Masse

Abstract

Behavioral difficulties are widely recognized in children on the autism spectrum. Research has demonstrated that up to 80% of children with autism spectrum disorder (ASD) present with a range of comorbid difficulties, and up to 37% meet full diagnostic criteria for a disruptive behavior disorder. Left untreated, behavioral difficulties persist and can result in social isolation as well as exclusion in educational and community settings. Parent-Child Interaction Therapy (PCIT), an evidence-based treatment for externalizing behavior disorders, has been empirically shown to ameliorate problem behaviors while increasing positive parenting behaviors and prosocial behaviors for children with ASD. The following case study further extends the literature by showing positive behavior and social outcomes for a 4-year-old boy with ASD at posttreatment and 3-month follow-up. In addition, through the lens of this individual case, the manuscript examines the general application of PCIT with the ASD population from a theoretical, therapeutic coaching, and case management perspective.

36.1 Reason for Referral

"Mason" was a 4-year, 2-month-old boy with a history of premature birth, developmental delays, and concern for possible autism spectrum disorder (ASD). His pediatrician referred him to a university-based outpatient clinic for neuropsychological and behavioral evaluation and treatment. Mason's pediatrician and parents reported concerns about language delays, periodic motor and verbal stereotyped behavior, emotional dysregulation, noncompliance, poor social interactions, repetitive behaviors, and inattention.

36.1.1 Family History

Mason's parents were divorced. He lived primarily with his mother (who maintained primary custody) but often spent several days a week at his father's home. While Mason did not have any siblings, he frequently spent time with his extended family (including cousins) from both his mother's and father's sides. Each of Mason's parents was college-educated, his father was

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employed as a business analyst, and his mother was a homemaker. English was the only language spoken in both homes.

36.1.2 Medical and Developmental History

Mason was delivered after only a 30-week pregnancy. He was delivered vaginally following a prolonged labor weighing only 4 pounds. He was immediately treated in the neonatal intensive care unit (NICU) with a brief course of continuous positive airway pressure (CPAP), a feeding tube, and phototherapy. Mason was kept in the NICU for approximately 8 weeks where he progressed favorably. He was described as a quiet and content infant who was easy to feed and slept well.

Although he was fairly easily soothed, Mason was described as being somewhat aloof, was delayed in developing a "social smile," and would underreact when a caregiver entered his environment. In addition, he was delayed in meeting many of his milestones (e.g., first words at 16 months, walked at 18 months). He began receiving Early Intervention (EI) services as an infant and toddler including speech-language services and physical therapy. He had not received behaviorally based treatment at the time of referral. Other notable developmental concerns included his propensity for spinning toys, frequent arm flapping, unusual vocalizations, poor eye contact, and prolonged visual inspection of objects. Mason had a history of sensory sensitivities including touch, clothing texture, and food texture.

Medically, Mason was in good health. His parents reported no long-term NICU-related concerns. He had no history of seizure, head injury, or loss of consciousness. His vision and hearing were intact, and he was not prescribed medication. Regarding sleep, his mother was transitioning Mason from co-sleeping; Mason, however, typically co-slept with his father. When co-sleeping, he was able to sleep for 12 h at night; when alone, he woke often requesting his mother. Regarding eating behaviors, he had difficulty tolerating new foods as they were introduced to his diet and would often bring a food item to his mouth and immediately refuse to taste it.

36.1.3 Presenting Concerns

Mason's parents described several concerns related to behavioral and emotional dysregulation, noncompliance, perseveration, and inattention. Generally, he had difficulty sustaining attention on tasks that were less preferred and following multistep instructions. Additionally, completing and persisting through tasks were challenging for him. Mason engaged in daily tantrum behaviors if a task was too challenging for him to complete, if he was told to do something that he did not want to do, or if there was an unexpected change in his routine. He had much difficulty transitioning between activities both at home and school. During tantrums, he would cry, yell, protest verbally, and occasionally be mildly aggressive toward his parents. He engaged in occasional hand-flapping behavior or vocal stereotypies (i.e., humming), namely during moments of overstimulation or task demands. His parents noted this behavior declined in frequency and intensity over the past 18 months.

Mason spoke in sentences with some articulation and verbal fluency difficulties. His parents reported that he had "more information inside than he is able to get out" and that he had difficulty engaging in back-and-forth conversations. Socially, he often had difficulty understanding social cues (e.g., when a child does not want to play with him) or joining a group of peers. For example, he may have approached a group of children who were playing together and roar at them pretending to be a dinosaur rather than asking to join. He did play appropriately with peers at times, but most of the play was focused around his interests (e.g., numbers, dinosaurs, cars). Occasionally he became physical with peers (e.g., pushing) to gain their attention, when he was unable to access a preferred item, or when a peer wanted to play with his preferred items. He also had difficulty understanding limits in social situations. For example, if he engaged in rough-housing with friends, he often extended the physical play further than his peers.

Mason's parents reported that he initially adjusted well to preschool upon his enrollment at 3 years old. However, when transitioning back to his second year of preschool following summer break, he experienced significant behavioral difficulties. At this time, he engaged in frequent behavior outbursts (e.g., throwing self on ground, hitting peers, noncompliance) and required significant support and supervision within the classroom. When he presented to the clinic, these behaviors had somewhat improved due to the addition of a one-to-one aide; even still, teachers continued to have difficulty increasing Mason's on-task behavior within the classroom. Teacher-report indicated that Mason had difficulty comprehending material in the absence of a visual representation. He also had difficulty retrieving vocabulary, engaging in conversation with peers, and expressing himself appropriately when in a heightened emotional state. Mason's teacher reported that he often appeared to be "flooded" with language input, especially during transitions, sometimes resulting in intense stereotyped behaviors. When Mason was overwhelmed, he had more difficulty with language as well. It was discovered that he benefited from a "wait time" (e.g., where he was given more time to comprehend what was going on around him before replying) and visual supports to assist him with accessing language and complying with directions.

36.1.4 History of Parenting Practices

Mason's parents reported using a number of discipline methods, and did not feel that these methods had been fully effective in managing his behavior. They stated that some of the techniques would be effective but only for a short period of time. They also noted that expectations varied depending on which home Mason was staying. Parenting methods included removing Mason from a problematic situation, taking a walk around the neighborhood, sending him to his room, or giving him a cup of water "with magical powers" to help calm him down. Mason's mother had attempted "timeout" in the past, which consisted of sitting him on a chair for approximately 2 min, or sending Mason to his room until he was able to calm down. His mother admitted she was inconsistent in her discipline methods, namely around timeout. Also, Mason began having more frequent toileting accidents around the same time she began implementing timeout, and she discontinued this strategy (toileting was not an issue at time of treatment). Mason's father reported that because he spent less time with Mason, he had difficulty consistently following through with discipline strategies since he did not want to spend his limited time with Mason disciplining him. When Mason engaged in tantrum behavior, his father typically provided reassurance and ultimately allowed him to "have his way." Overall, both parents agreed that their discipline practices had not helped to manage Mason's behaviors effectively or taught him to cope with or manage his frustration.

36.2 Assessment

Mason underwent a full neuropsychological evaluation to examine his cognitive profile, confirm diagnostic presentation, and to assess his intervention needs. The evaluation consisted of standardized assessments, parent and teacher measures, and behavioral observations.

36.2.1 IQ

Mason was administered the *Wechsler Preschool and Primary Scales of Intelligence, Fourth Edition (WPPSI-IV*; Wechsler, 2012*)* to assess his overall level of intellectual functioning. His intellectual abilities fell in the low average range overall; however, his performance reflected some variability across and within areas of his intellectual functioning indicating that his cognitive skills had developed unevenly. His fluid reasoning skills and verbal comprehension abilities were areas of strength and fell in the high average and average range. In contrast, his performance across visual spatial tasks was quite variable, and his overall performance fell in the low average range. Mason's working memory abilities and processing speed skills were similarly low average, representing relative weaknesses in his profile. Overall, while his foundational cognitive abilities were intact (e.g., verbal and nonverbal reasoning), Mason had more difficulty understanding spatial relationships. He also demonstrated weaknesses in secondary cognitive skills including his ability to process information quickly and to hold information in his short-term memory to readily use it.

36.2.2 Vocabulary and Verbal Comprehension

Mason's performance varied across measures of basic vocabulary and verbal comprehension. His performance was average on a measure of basic expressive language (*Expressive Vocabulary Test—Second Edition; EVT-2*; Williams, 2007) while his performance on a measure of basic receptive vocabulary fell in the low average range (*Peabody Picture Vocabulary Test—Fourth Edition; PPVT-4*; Dunn & Dunn, 2007). Similarly, his ability to follow directions and process complex language information fell in the borderline range (*Differential Ability Scales—II; DAS-II*; Verbal Comprehension subtest; Elliot, 2007). Although Mason's ability to organize and retrieve words when provided semantic cues (i.e., verbal fluency) was average (*NEPSY-II*; Word Generation subtest; Korkman, Kirk, & Kemp, 2007), he had difficulty initiating his responses to this task but eventually provided many responses with encouragement. Overall, although Mason's expressive language abilities were intact, he had more difficulty processing and understanding language.

36.2.3 Memory

Consistent with his low average working memory abilities, Mason's recall of a short story fell in the low average range. When asked to recall story details, he became visibly overwhelmed and stated that the task was too difficult. When provided recognition cues, his performance improved to the average range (*NEPSY-II*; Narrative Memory subtest). On a verbal memory task, Mason was asked to repeat increasingly complex sentences (*NEPSY-II*; Sentence Repetition subtest). His performance fell in the borderline range, and he was able to repeat basic sentences with up to five words. Mason's performance suggested that he had difficulty recalling and retrieving verbal information; he benefited from repetition and cues.

36.2.4 Autism Symptomatology

Mason was also administered the *Autism Diagnostic Observation Schedule, Second Edition* (*ADOS-2*; Lord et al., 2013)*, Module 3*, a semi-structured observation tool used to assess social functioning, communication, and interests using a series of "presses" (i.e., opportunities for a child or adolescent to demonstrate social competence). The *ADOS-2* allows the examiner to observe behaviors that are helpful in evaluating the presence of ASD, identifying social communication and behavioral strengths and challenges, and capturing the severity of ASD-related symptoms.

36.2.4.1 Strengths

Mason demonstrated both areas of strength and impairment throughout the *ADOS-2*. Regarding areas of strength, he engaged in cooperative joint play with the examiner and demonstrated clear enjoyment during several interactions. He also directed a variety of facial expressions to the examiner. Mason engaged in interactive play with the examiner and demonstrated some emerging imaginative play skills.

36.2.4.2 Impairments

Despite these strengths, he also demonstrated several areas of impairment including stereotyped use of phrases and poorly modulated eye contact. He became fixated on a toy dinosaur during the assessment and had difficulty transitioning away from the toy, which he referred to frequently for the duration of the observation. Regarding nonverbal communication, he displayed few gestures to accompany his language. Although he responded appropriately to some of the examiner's conversational bids, he had difficulty building upon them to engage in back-and-forth conversation. He was also observed to engage in occasional stereotyped motor mannerisms (e.g., arm flapping). Overall, his total score on the *ADOS-2* was above the threshold for ASD.

36.2.5 General Functionality

Functionally, Mason's parents and teachers reported significant levels of inattention and hyperactivity/impulsivity on the *Behavior Assessment System for Children, 2nd Edition* (*BASC-2*; Reynolds & Kamphaus, 2004). On the *Behavior Rating Inventory of Executive Function, Preschool Version (BRIEF-P)*, his parents and teacher reported significant difficulties on the Inhibition, Working Memory, and Emotional Control scales. Mason's parents and teacher rated his overall social functioning to be in the severely impaired range on the *Social Responsiveness Scale, Second Edition* (*SRS-2;* Constantino & Gruber, 2012). Scores on the *Sutter-Eyberg School Behavior Inventory* (*SESBI;* Eyberg & Pincus, 1999) demonstrated general behavioral difficulties at school with compliance, attention, and peer relationships. Lastly, parent ratings on the *Vineland Adaptive Behavior Scales, 2nd Edition* (*Vineland-II;* Sparrow, Cicchetti, & Balla, 2005) placed Mason's adaptive functioning to be within the borderline range overall. Overall, Mason has difficulty with a variety of adaptive skills as well as behavioral and social functioning.

The *Eyberg Child Behavior Inventory* (*ECBI;* Eyberg & Pincus, 1999) suggested that Mason was exhibiting a significant level of disruptive behavior (see Figs. 36.1 and 36.2). Specifically, Mason's mother and father rated his behaviors as being clinically significant in intensity (Mother: Intensity = 165; Father: Intensity = 158) and both viewed these behaviors as significantly problematic (Mother: Problem = 14; Father: Problem = 15). Both phases of treatment began with a didactic parent teaching session followed by weekly coaching sessions. In addition, both parents were instructed to practice their skills on a daily basis. Mason's parents were consistent in completing home practice with the exception of the first 2 weeks of treatment due to increased work demands for Mason's father.

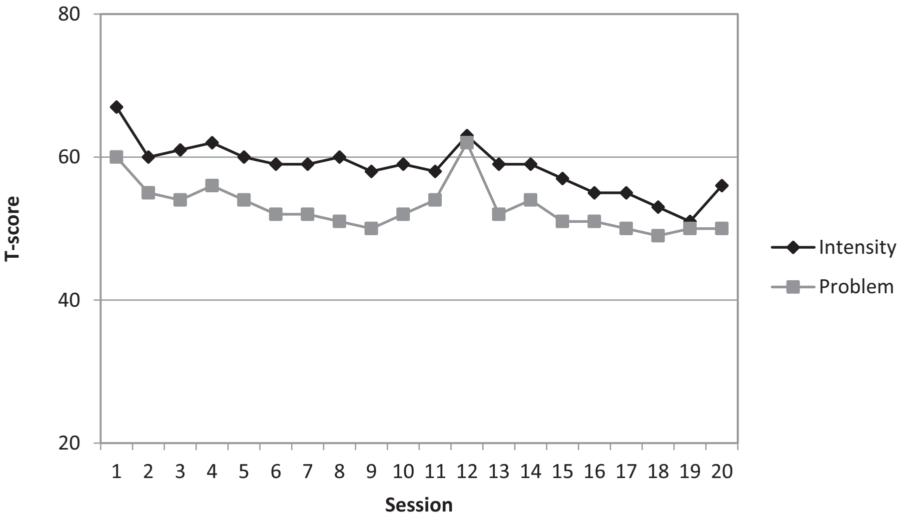

Fig. 36.1 Father's ECBI ratings over 19-week intervention and follow-up. PDI coaching began at Session 10. Discharge criteria, *T*-score = 55. *ECBI* Eyberg Child Behavior Inventory, *PCIT* Parent-Child Interaction Therapy, *CDI* Child-Directed Interaction, *PDI* Parent-Directed Interaction

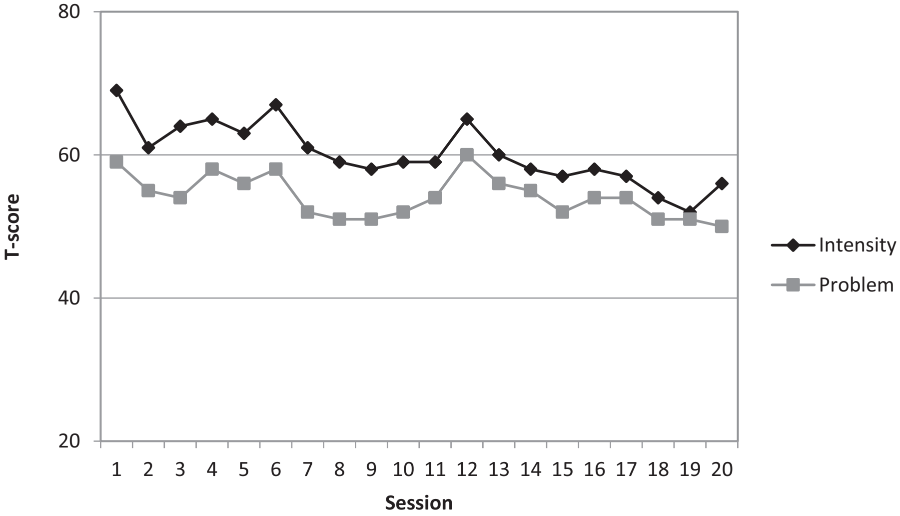

Fig. 36.2 Mother's ECBI ratings over 19-week intervention and follow-up. PDI coaching began at Session 10. Discharge criteria, *T*-score = 55. *ECBI* Eyberg Child Behavior Inventory, *PCIT* Parent-Child Interaction Therapy, *CDI* Child-Directed Interaction, *PDI* Parent-Directed Interaction

36.2.6 Behavior Observations

The *Dyadic Parent-Child Coding System, Third Edition* (*DPICS*; Eyberg, Nelson, Duke, & Boggs, 2004) was administered at pretreatment (and throughout therapy) to measure the content and quality of parent-child interactions. Frequency counts for parent verbalizations and child responses to commands were recorded during three 5-min standardized situations: child-directed play, parent-directed play, and clean up. The *DPICS* includes specific categories of parent verbalizations: positive parenting behaviors (e.g., behavior descriptions [BD], reflections [RF], labeled praises [LP]) and avoid skills (e.g., questions [QU], commands [CO], negative talk [NT]). At pretreatment, Mason's parents demonstrated more avoid skills than positive parenting skills (see Figs. 36.3 and 36.4). Also, during *DPICS* assessment, Mason had difficulty transitioning away from playing with toy cars and dinosaurs, two of his highly preferred toys. At the start of treatment, it was decided to create a more natural environment where Mason would be more interested in play and to develop a paired association between his parents (using the skills) and his favorite items; therefore, Mason's preferred toys were made available with those in the clinic as well as several he brought from home.

36.3 Case Conceptualization

Results of the evaluation reflected a number of strengths in Mason's neurocognitive profile. His general intellectual functioning fell in the low average range, and his high average visual spatial abilities emerged as an area of strength. His verbal abilities were more variable however. Despite his history of language delay and communication difficulties, Mason's expressive language skills were intact. Unfortunately, his receptive language abilities were below age-based expectations, suggesting that caregivers and teachers may have overestimated Mason's ability to comprehend language at times.

In spite of his strengths, Mason also displayed some weaknesses in the areas of attention, executive functioning, and rote verbal memory. Across testing, he had more difficulty with auditory learning, consolidation, and retrieval of verbal information, suggesting that he benefited more from visual rather than verbal instruction. This deficit also likely impacted his ability to rapidly generate language and learned information. Parent- and teacher-report indicated that Mason struggled with language retrieval and was also easily overwhelmed and frustrated by large amounts of spoken language toward him.

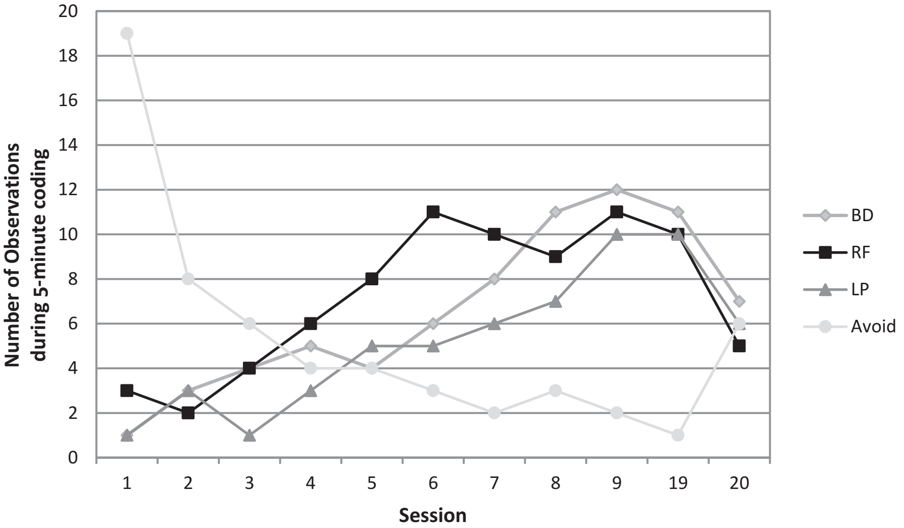

Fig. 36.3 Father's progress in mastering PCIT CDI skills. Graduation at Session 19; Follow-up at Session 20. *PCIT* Parent-Child Interaction Therapy, *CDI* Child-Directed Interaction, *BD* behavior description, *RF* reflections, *LP* labeled praise, *Avoid* CDI don't behaviors

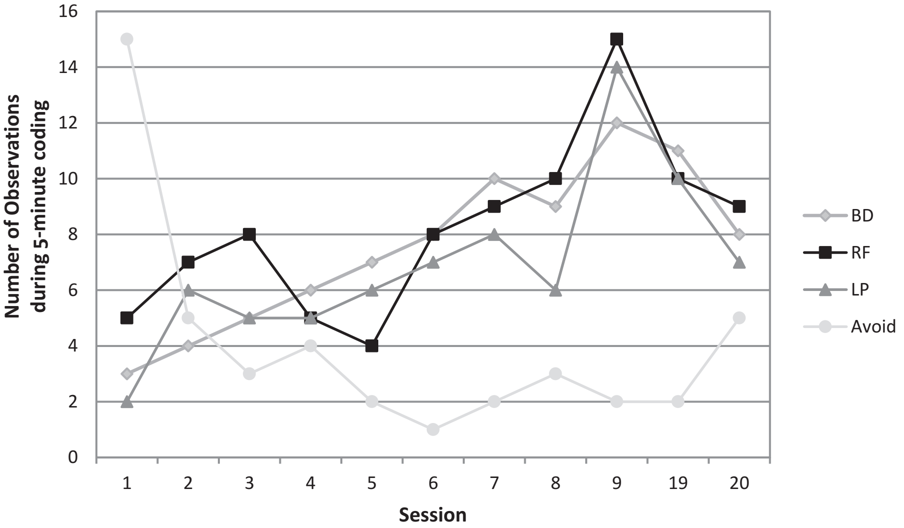

Fig. 36.4 Mother's progress in mastering PCIT CDI skills. Graduation at Session 19; Follow-up at Session 20. *PCIT* Parent-Child Interaction Therapy, *CDI* Child-Directed Interaction, *BD* behavior description, *RF* reflections, *LP* labeled praise, *Avoid* CDI don't behaviors

Although he performed well on testing, Mason was observed to withdraw and become upset during tasks that required language retrieval and rapid language generation. Lastly, Mason demonstrated difficulties with social awareness, social communication, and restricted and repetitive interests and behaviors. Parent and teacher ratings also reflected significant deficits in social and behavioral functioning across settings.

Based on information gathered in the intake, neuropsychological evaluation, and *DPICS* assessment, a certain level of Mason's noncompliance was attributed to his rigidity and restricted interests. When Mason was engaged in these interests, it was often difficult to direct his attention elsewhere. These behaviors are common in the clinical presentation of children diagnosed with ASD and thus were considered to be accounted for under such a diagnosis (Volkmar et al., 2014).

Although Mason's behavioral issues initially were centered on behavioral inflexibility (e.g., transitioning away from make-believe play with cars), the frequency and intensity of his defiance, tantrums, and emotional dysregulation, coupled with his parent's reluctance or inability to implement consistent discipline strategies, appeared to have extended to a more general oppositional presentation across situations and contexts. Of note, it was clear that Mason's behavior was also impacted by parental attention. For example, his disruptive behavior often increased at the outset of being ignored (i.e., extinction burst) and he would respond positively when provided with social reinforcement (e.g., therapist and parent praised Mason for allowing adult conversation to take place during intake session; he responded by hugging his parent and returning to play).

As such, it appeared Mason's behavior served multiple functions ranging from escape/avoidance, self-reinforcement, and social reinforcement. Overall, the evaluation and test findings, combined with Mason's developmental history and behavioral profile, were consistent with a diagnosis of ASD and oppositional defiant disorder. Research has demonstrated that up to 80% of children with ASD often present with a range of comorbid difficulties and up to 37% meet full diagnostic criteria for a disruptive behavior disorder (Kaat & Lecavalier, 2013; Simonoff et al., 2008).

36.3.1 Treatment Recommendations

In an effort to ameliorate Mason's behavioral difficulties, Parent-Child Interaction Therapy (PCIT), an empirically based parent training program for young children exhibiting disruptive behaviors (Zisser & Eyberg, 2010), was recommended. Many efficacy studies utilizing PCIT with children with disruptive behavior disorders have demonstrated positive outcomes that include improvements in the parent-child relationship (a focus of the first phase of treatment, Child-Directed Interaction; CDI), and reductions of child disruptive behavior (through a structured discipline procedure—the focus of the second phase of treatment, Parent-Directed Interaction; PDI) and parental stress (Lieneman, Brabson, Highlander, Wallace, & McNeil, 2017). PCIT focuses on parent management strategies and the generalization of skills and strategies learned in-session to the home environment and in the community. Although PCIT was not originally developed for children with ASD, preliminary studies suggest that PCIT shows promise for decreasing disruptive behaviors and increasing prosocial behaviors with this population (Agazzi, Tan, & Tan, 2013; Masse, McNeil, Wagner, & Chorney, 2007; Masse, McNeil, Wagner, & Quetsch, 2016; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). Additionally, parents of children with ASD have benefited from PCIT, showing reductions in parent perceptions of child problem behaviors as well as decreases in stress related to parent-child interactions (Agazzi, Tan, Ogg, Armstrong, & Kirby, 2017; Solomon et al., 2008).

36.4 Course of Treatment

Mason's parents both identified the primary treatment goal as reducing Mason's noncompliance and problem behaviors across settings. This was especially important as behavioral difficulties and problem behaviors, although common in children with ASD, can result in social isolation as well as exclusion in educational and community settings (Horner, Carr, Strain, Todd, & Reed, 2002). Treatment involved both parents and consisted of 20 treatment sessions conducted over approximately 5 months (10 CDI sessions, 10 PDI sessions). Mason's mother met CDI mastery in CDI Coach 8 while his father met mastery in CDI Coach 9; both parents met mastery for PDI skills in PDI Coach 8. Of note, despite meeting quantitative mastery just prior to CDI session 9, CDI coaching was extended to practice differential attention skills with Mason and his parents. Given that a large amount of Mason's behavior was reinforced by social attention, having Mason's parents use differential attention effectively was high priority before moving on to PDI.

36.4.1 CDI

At the outset of CDI, Mason's parents were coached to provide a great deal of attention to Mason's activity with the restricted set of toys. As his parents began to utilize more CDI skills (Praise, Reflection, Imitation, Describe, Enjoy; PRIDE skills), they began to incorporate non-preferred toys into the playtime. For example, Mason's parents were instructed to build a road and garage made of Lincoln Logs while saying, "I am going to build a road for your cars and a garage as a place for them to sleep." The road was built strategically so that it was required to interact with Mason's toys ("You're making your car go down the road! Nice job of gently moving your car into the garage! I like when our toys play together"). Although Mason seemed somewhat disinterested in his parents' play at first, coaching focused on praising behavioral approximations (e.g., looking over toward his mother, touching the Lincoln Logs or Legos) until he eventually joined in more reciprocal play. Over time, whenever Mason began to incorporate car or dinosaur themes into the play ("This Lego tower is like a growling dinosaur") his caregivers would proceed with a "one-and-done" approach; this approach involved attending to Mason's behavior once ("A growling dinosaur"; [RF]) and then redirect with neutral talk ("I am going to put a window on the tower"; see Chap. 24 for more information on this technique).

During the initial CDI sessions, Mason's mother began to quickly incorporate PRIDE skills into her playtime with Mason, but also engaged in a significant amount of neutral talk at the expense of allowing Mason to generate verbalizations (one of his areas of relative weakness). Although she frequently attempted to engage Mason in play, he initially appeared to prefer playing alone. In contrast, Mason's father engaged in very little speech and rarely imitated Mason's play behaviors (typically sitting to the side and watching Mason play). After observing this pattern during the first two CDI Coach sessions, Mason's mother was coached to decrease vocalizations (Therapist: "Go ahead and reflect that and then let's just listen and see what he's going to say next"). To prevent Mason from becoming overwhelmed by too much language, his father was encouraged to increase his rate of vocalizations while engaging in imitative play.

36.4.2 PDI

During the PDI phase, Mason required five clinic-based timeouts and six home-based timeouts. The initial timeout took place in PDI Coach 1 when Mason was instructed to transition away from playing with cars to a less-preferred toy. The timeout lasted approximately 45 min requiring several chair-to-room iterations. During the timeout, Mason was initially aggressive with his parents (e.g., punching, pulling away) on the way to the chair, namely when coming from the timeout room. As such, the following adaptations were made to protect the safety of Mason and his parents.

36.4.3 Adaptations

36.4.3.1 Social Story

In an effort to incorporate Mason's strengths and preference with visual learning, Mason and his parents developed a Social Story (Gray & Garand, 2016) with each page displaying a picture and short statement demonstrating all the critical elements of the timeout procedure. This method was introduced (prior to moving on to PDI) to allow Mason time to form an understanding of the structured discipline procedure. Mason's story emphasized all the positive benefits of listening to his parents as well as the notion that if a timeout would be needed, it could be brief (if he stayed on the chair), didn't "have to ruin his day," and would always end with special time with his parents. Each day between the PDI Teach session and PDI Coach 1 (and thereafter during the acute PDI training phase), Mason and his parents read the social story. Given his deficits, repetition of the story was important and provided more confidence that Mason had an understanding of the procedure without solely relying on the more verbal-laden timeout explanation that occurs during PDI Coach 1. Of note, teaching of the timeout still occurred with Mason at the outset (using Mr. Dinosaur) of PDI Coach 1 but included more emphasis on visual demonstration.

36.4.3.2 Additional Prompt Before Returning to Timeout Chair

Before attempting to get Mason from the room to the chair, his parents were coached to say, "Since you are being quiet in the room, are you ready to sit on the timeout chair?" If Mason gave any physical or verbal indication of refusal, the 1 min +5 s of quiet period was restarted. This modification was needed only in early PDI sessions due to potential safety issues. Thereafter, Mason required the timeout room less and, if needed, he was able to self-regulate more quickly.

Following the PDI Coach 1 timeout, as a way to capture behavioral momentum and for Mason to experience positive attention for more immediate listening, Mason was administered and complied with four consecutive commands of varying difficulties. PDI Coach 2 contained two timeouts with the first being 10 min in length and the second 5 min in length. The final two timeouts came in later PDI sessions and were both short-lived (i.e., likely a demonstration of spontaneous recovery of behavior).

36.4.3.3 Social Story for House Rules

Although active ignoring was effective in managing many of Mason's behaviors, he continued to be mildly aggressive toward his parents on occasion at home. As such, both parents identified this behavior as a target for house rules. During the explanation of the house rule, a Social Story was created for Mason illustrating a boy going to the timeout chair for hitting his parents and friends. Similar to introducing PDI, to ensure Mason understood the house rule, his parents spent 1 week identifying and labeling the hitting behavior and reviewing the Social Story daily. The following week, the house rule of "no hitting" was introduced within both homes. While Mason initially received approximately two timeouts per week, this number decreased to approximately one per week after 3 weeks.

36.4.3.4 Public Behavior Precautions

Next, PDI sessions focused on public behavior. Mason's parents worked closely with the PCIT clinicians to carefully choose public outing locations for both in-session and home practice that would reduce the likelihood of Mason becoming overstimulated by noise, light, or other children. Mason's mother initially practiced at an outdoor market during an off-peak time, and his father took Mason to a local park during school hours—when it was less busy. While the PCIT therapists would have typically conducted an in-session practice at a local children's museum or library activity center, these locations were deemed as being too stimulating (e.g., having too many children, too much fluorescent lighting). Instead, Mason's parents gave commands within a local coffee shop (during off-peak times) with a small play area to increase Mason's likelihood of compliance. Once consistent compliance was attained in these settings, the locations were slowly expanded to places his caregivers would more regularly visit. Throughout this learning phase and thereafter, Mason's caregivers remained cognizant about the impact of Mason's environment on his behavior.

36.4.4 Posttreatment and Follow-Up

Table 36.1 displays parent and teacher-rated assessments at pretreatment, posttreatment, and 3-month follow-up while Figs. 36.1, 36.2, 36.3 and 36.4 display *ECBI* scores and positive parenting skills for each parent. At posttreatment, both parent *ECBI* scores were well below the clinical cutoff (Mother: Intensity = 105, Problem = 8; Father: Intensity = 100, Problem = 7), and parenting skills remained above mastery levels.

Table 36.1 Pre- to posttreatment assessment results

Assessment tool	Pre	Post	Follow-up
ECBI-mother			
Intensity	69	52	58
Problem	59	51	50
ECBI-father			
Intensity	67	51	56
Problem	60	50	50
BASC-2—PRS			
Hyperactivity	75	64	65
Aggression	73	57	58
Anxiety	48	45	45
Depression	56	62	59
Somatization	59	55	54
Atypicality	70	68	66
Withdrawal	65	59	62
Attention problems	77	65	64
BASC-2—TRS			
Hyperactivity	72	66	66
Aggression	61	54	56
Anxiety	47	49	47
Depression	42	44	44
Somatization	50	46	45
Atypicality	72	65	66
Withdrawal	61	57	58
Attention problems	73	65	65
ROWPVT-4	85	92	91
SRS-2—PRS	77	65	64
SRS-2—TRS	78	73	74
SESBI—R			
Intensity	67	64	64
Problem	66	64	62

Note. All scores are *T*-scores ($M = 50$, $SD = 10$); *ECBI* Eyberg Child Behavior Inventory, *BASC-2* Behavior Assessment System for Children, Second Edition, *PRS* Parent Rating Scale, *TRS* Teacher Rating Scale, *ROWPVT-4* Receptive One-Word Picture Vocabulary Test, Fourth Edition, *SRS-2* Social Responsiveness Scale, Second Edition, *SESBI-R* Sutter-Eyberg Student Behavior Inventory-Revised

36.4.4.1 Mason's Father

Mason's father reported that prior to PCIT, he was unsure of how to play with Mason. Often, when he would attempt to engage in play, Mason would become fixated on a preferred toy, engage in self-stimulatory behavior, or ignore his father. This eventually led his father to reduce his efforts to play with Mason, likely impacting the quality of the relationship. Through PCIT, Mason's father learned how to utilize positive communicative skills to increase Mason's prosocial behavior (including increasing his ability to engage in conversation surrounding play), and to redirect Mason's behavior when he became fixated on toys or other activities.

36.4.4.2 Mason's Mother

Although Mason's mother was able to engage him in play more easily at pretreatment, she reported that she was unaware of how much her language (e.g., word choice, rate of speech) impacted Mason's behavior. Through PCIT, she learned how to use her language more effectively to increase Mason's receptive vocabulary and expressive language, help him build language around emotions, and provide structure by giving commands in a predictable and measurable manner. Most importantly, she felt confident in knowing that both she and Mason's father were consistent in their play strategies, expectations, and discipline procedures across homes.

36.4.4.3 Mason

Prior to treatment, Mason had difficulty sustaining attention on less-preferred tasks, would often not complete tasks that were challenging for him, and had trouble navigating transitions. Following PCIT, these behaviors improved considerably. Mason persisted more during times of frustration, and his reflexive "no" response to requests diminished. In doing so, his ability to make transitions improved, he appeared to develop more self-efficacy and confidence with a broader range of tasks, and he was able to expand his play and social repertoire; he was thus more willing to approach unfamiliar tasks and experience subsequent positive feedback. Interestingly, Mason's amount of expressive language and verbal fluency also improved over the course of PCIT therefore supporting theoretical notions that PCIT facilitates language development (Tempel, Wagner, & McNeil, 2009) and extending prior research demonstrating similar results (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2015; Masse et al., 2016). Lastly, Mason exhibited less vocal and self-stimulatory behavior at the completion of treatment, likely as a function of being less overwhelmed and overstimulated by parental language and demands.

36.4.4.4 Follow-Up

At 3-month follow-up, Mason's parents showed some regression in their level of PRIDE skill use compared to posttreatment. However, their skills remained at a high level compared to pretreatment assessments. Interestingly, both parents reported higher *ECBI* Intensity scores at follow-up, yet Problem scores remained below clinically significant levels; this suggests that although Mason's disruptive behavior may have intensified after treatment, both parents felt that they were able to effectively manage these behaviors. Given the chronic nature of ASD and likelihood that some externalizing behaviors will persist, parental perception of ability to manage difficult behaviors is critical in the long-term maintenance of behavior.

In general, Mason's parents reported more improved scores across assessments in comparison to his teachers showing that some of Mason's improved behaviors may not have generalized. The exception to the trend was aggressive behaviors, which also reduced in the school setting. Both his parents and teachers did see a slight improvement in social relatedness (e.g., *SRS-2*) namely in the area of social communication. Specifically, both raters noticed some improvement on items involving turn-taking, making friends, and relating to peers.

Lastly, Mason's scores on a receptive language measure improved over the course of treatment. This score may be a reflection of his behavior disallowing him from performing at his optimal level. It is possible that his improvement in behavior following treatment resulted in a more valid assessment of his capabilities. Alternatively, Mason's improved behavior may have increased parent-child communication placing him in a position to enhance his vocabulary skill set over the course of several months.

36.5 Theoretical Considerations

36.5.1 Social Reinforcement

A crucial consideration with conducting PCIT with the ASD population is determining whether social attention positively reinforces neutral or positive behavior while the removal of social attention diminishes or extinguishes unwanted behavior. Essentially, the effectiveness of PCIT is predicated upon this notion. An advantage of PCIT coaching is that it serves as a continuous functional analysis of behavior to assess whether social attention indeed impacts behavior. Clinical successes and research findings have demonstrated that PCIT does affect positive change mediated by social attention for children on the spectrum. Determining the rate of the impact or the particular subset of children who respond more favorably to PCIT is an area in further need of empirical attention.

For Mason, the impact of social attention on both positive and negative behavior was evident during the initial evaluation phase, so there was some expectation that he would respond favorably to PCIT. His parents' skill acquisition initially progressed slowly but rapidly increased after several sessions. Of note, his parents were more inconsistent with home practice over the first 2 weeks of CDI likely impacting the rate of PRIDE skill acquisition and limiting Mason's exposure to the skills. Once the skills started to be delivered at higher frequencies, the value of differential reinforcement increased and had a strong bearing on his behavior. Since differential reinforcement was a crucial part of therapy for Mason, an extra CDI coach session was dedicated to practicing this skill. During PDI, functional assessment revealed that Mason's noncompliance often served two functions: self-stimulation and avoidance of less-preferred tasks or activities. As noted below, differential attention did not entirely eradicate self-stimulatory behavior, but did reduce the behaviors drastically. For behaviors with an avoidance function, time-out proved to be very effective at quickly increasing his initial compliance rate and demonstrating that removal from positive attention improved Mason's behavior.

36.6 Coaching Considerations

Conducting PCIT with children on the autism spectrum can be different than the traditional course of therapy. In fact, PCIT for ASD is sometimes referred to as "snowflake" PCIT as each case is different than the next. This requires some clinical agility to ensure that coaching is tailored to meet the needs of the family and child. It also requires practice, keen observation skills, and the ability to connect coaching statements with overarching treatment goals. For example, instead of, "Great labeled praise," a coach could say, "Nice labeled praise, and I notice that he's sitting closer to you now and making great eye contact." Also, "It's good to observe you ignore his self-stimulation so we can see how it influences his behavior." "Have you noticed he's no longer drawing the same number and is allowing you to draw on his picture?" By doing this, parents may be more motivated to continue with PCIT. This is especially important given that research suggests more CDI sessions are needed for children on the autism spectrum (Masse et al., 2016).

36.6.1 Imitation and Neutral Talk

Imitation and neutral talk were emphasized during the course of PCIT given their ability to be used as "entry skills" into the play. Specifically, imitation allowed Mason's parents to play with Mason while still keeping him in the lead. Strategic neutral talk was used as a skill to increase verbalizations with Mason in early CDI sessions. Each parent was coached to relate the play to Mason's favorite topics: cars and dinosaurs. For example, a parent would say, "This red block reminds me of that Mustang we saw on the highway," or "The giraffe looks sort of like a Brontosaurus." These statements were bids for communication and did not require a response. In short time, Mason engaged his parents in these topics and was quickly praised (e.g., "Thanks for talking with me, you're right, the giraffe *does* look more like a Brachiosaurus"). Eventually, once momentum was established, Mason's parents began to slightly veer from the fixed interest to expand Mason's conversational repertoire (e.g., "That *is* a '67 Mustang. A mustang is also another name for a horse"; <Expansion>).

Building comfort with silence was also an important part of treatment. Mason's parents were encouraged to allow silence following an ignore or a command sequence. This silence gave Mason time to behaviorally return to baseline before continuing play. In addition, this also prevented him from further escalating or engaging in self-stimulatory behavior due to being overstimulated. At the outset of treatment, Mason's mother had the tendency to administer statements in "rapid fire" succession. As such, she was coached to pace her neutral statements more evenly. By slowing down the verbal tempo, Mason's stimulation levels were more homeostatic, enabling a richer parent-child interaction. Additionally, Mason's parents eventually incorporated neutral talk around emotions. Because Mason tended to have difficulty expressing himself when experiencing strong emotions, his parents began to label and praise *obvious* emotion whenever possible (e.g., "I see that you are smiling. That shows me that you are happy"). Further, Mason's parents were also instructed to model emotion (e.g., block tower falls over and parent states, "That's frustrating, I'm making my frustrated face," or "It makes me happy to see you happy, so I am smiling too").

36.6.2 Self-Stimulatory Behavior

Mason's motor and verbal self-stimulatory behavior was targeted throughout PCIT. For verbal behavior (e.g., buzzing lips, humming), his parents were instructed to ignore and praise positive opposite behaviors (e.g., engaging in conversation with them, playing quietly). Mason also engaged in periodic motor stereotypies (e.g., arm flapping). Early on in PDI, it was determined that the function of the behavior was, at times, self-stimulatory, as he did not appear to engage in the behavior to avoid following commands or engaging in less-preferred activities. Similarly, if the behavior was not interfering with the situation, his parents were again coached to engage in active ignoring and to praise Mason for engaging in positive opposite behaviors (e.g., sitting nicely, standing calmly).

For behaviors that interfered, served as an escape function to demands, or were used as transition avoidance, clinicians instructed parents to give incompatible commands during PDI.

Initially, his parents instructed him to engage in an opposite behavior (e.g., pick up a toy, stack a block) or that encouraged him to reengage in play with his parents (e.g., sit next to parent, place cow in the parent's barnyard set). Although these strategies did not appear to decrease the overall frequency of Mason's stereotyped behavior, they did decrease the duration of the behavior. Moreover, they provided a technique for his parents to redirect the behavior when demands were placed on Mason, thus disallowing escape or avoidance. As such, his parents reported feeling more confident in their ability to manage his stimulatory behavior at home and in the community.

36.6.3 Restricted Interests

In terms of incorporating restricted interests into the play, Mason was allowed to bring cars and dinosaurs into the first CDI sessions. Including such toys is a case-specific clinical decision that should be weighed carefully. Ultimately, the long-term goal was for Mason to have a broad range of interests. However, excluding these toys can oftentimes create a non-naturalistic environment that may impact a child's initial adjustment to the treatment. As mentioned previously, parents can integrate other toys with preferred items as a way to expand play repertoire. In addition, Mason often created structured "rules" with his toys resulting in a patterned, ritualistic manner of play (e.g., only the red car can cross the bridge, a required count of three cars prior to pushing them down the track). Although Mason's parents were instructed to follow his lead and play along according to his rules, on occasion, his parents were told to verbally narrate their own imitative play that purposely broke his rules (e.g., allowing different colored cars to cross the parent's bridge, not counting cars before starting them down the track). Whenever a rule was "broken" in the context of Mason's play (e.g., a parent drives a blue car across Mason's bridge), his parents were then required to notice and praise the behavior with a socially based rationale ("Thanks for letting me use my car on your bridge. That's being flexible and friendly and I know children at school would love to play that way too").

Mason's restricted interest in numbers also became apparent throughout PCIT, and created distress for both parents. When out in public, Mason frequently became preoccupied with numbers on clocks, aisles, or items within a store, and his parents would spend long periods of time attempting to pull him away without "creating a scene." When provided with paper and crayons during special playtime, Mason would begin writing numbers repeatedly in different orders. Throughout CDI, Mason's parents utilized a "one-and-done" approach where they worked to describe or reflect, and then quickly redirected to a different toy.

During PDI, his parents learned how to join his activity, describe it once, and then use commands to decrease his fixed behavior surrounding the activity. Initially, in an effort to develop behavioral momentum, commands focused on stimuli within his fixed interest (e.g., "Please write the number 3," "Please draw a number on my piece of paper"). Once Mason demonstrated compliance to this level of instruction, commands surrounding drawing and writing were intensified (e.g., "Please draw a circle around the number," "Please make the number 1 into a stick figure person"). Efforts were made to provide an adaptive replacement behavior by purchasing basic math workbooks to encourage Mason to use numbers and letters in an appropriate manner (e.g., not writing long lists of numbers on paper in a random fashion). Both parents reported that prior to beginning PCIT, it was almost impossible to gain Mason's attention when he became fixated on a number, toy, or other activity and that the PDI strategies expanded his play repertoire.

36.7 Case Management Considerations

36.7.1 Managing Stressors

Conducting PCIT with divorced parents does not always progress as seamlessly as this case. A typical concern is that PCIT skills may not be consistent across contexts, which Mason's mother reported at the outset of therapy (of course there are other concerns such as over-involvement of children in the parent's relationship or lack of involvement of one parent in therapy, though these issues are beyond the scope of this case study). As such, much of PCIT focused on helping Mason's parents become consistent regarding parenting and discipline strategies. Since Mason's parents were committed to treatment and shared about an even amount of time with Mason, it was decided that PDI would be withheld until both parents reached mastery. Although the environment in each home was different, both parents acknowledged that consistency would be important in managing Mason's expectations across settings. As many of the problem behaviors occurred when he did not get his way or when there was an unexpected change in routine, helping to make daily routines (e.g., visual schedules, Social Stories) as well as discipline practices consistent across home settings was important to both parents. Additionally, they recognized the importance of helping Mason cope with frustration or anxiety in unknown or unexpected situations (e.g., providing a rationale for the change, engaging in active ignoring, following the timeout procedure for escalating behaviors or house rules). Following PCIT, both parents reported feeling a great sense of relief in knowing that they had gained skills to co-parent more consistently going forward as well as gaining language (e.g., PRIDE skills) to increase Mason's rate of positive and prosocial behaviors.

Related to parental divorce is parental stress. Research shows that parents with children on the autism spectrum experience a significantly greater level of stress in comparison to non-ASD children or even children with other disabilities (Hayes & Watson, 2013). Both of Mason's parents experienced a large amount of stress as a result of Mason's diagnosis, their divorce, and from the father's demanding job and schedule changes. As such, clinicians were careful to monitor parental mental health and dedicate more time in the check-in/out to process stressors. Clinicians often met separately with parents as to preclude potential conflict and to respect privacy. This made session timing difficult at times and would require some creativity (e.g., check-in via phone, dedicated time to each parent at beginning/end of sessions).

During the course of therapy, Mason's mother reported very high levels of stress and behaviors consistent with depression. As such, clinicians provided support and psychoeducation (not treatment) focused on the mental health impact of parenting children with ASD and facilitated a referral for individual therapy. Fortunately, much of the stress focused on Mason ameliorated over the course of PCIT as parents learned ways to better manage Mason's behavior. Both parents reported by the end of PCIT that they had a "new lease on life," felt like time spent with Mason was less contentious, and were able to have more meaningful experiences with Mason.

36.7.2 Incorporating Neuropsychological Findings

In this case, findings from neuropsychological testing helped to inform treatment decisions. Specifically, Mason's neurocognitive profile was an important consideration throughout the course of treatment. As Mason was quickly overwhelmed with verbal input, his parents were encouraged to pace their use of skills accordingly and to monitor for cues that suggested Mason needed a neurological "break." Also, rather than relying on his weaker verbal learning abilities, visuals were incorporated during teaching moments. Mason's introduction to the timeout procedure relied on multi-modal instruction to maximize his learning. A timeout visual was also incorporated throughout PDI to remind Mason of the timeout procedures (e.g., when parents gave timeout warning they provided a visual of the timeout chair) and a Social Story was used to assist with teaching house rules and public behavior.

Based on testing results, Mason's treatment also incorporated a more developmentally appropriate command sequence. Specifically, Mason's caregivers first modeled the command-compliance sequence prior to administering contingency-based commands. This way, the procedure included a vicarious learning element to ensure Mason understood the details of PDI. Due to his weaker working memory skills, Mason's parents provided simple, concrete commands throughout PDI. Due to his slower processing speed, consideration was also given to Mason's potential need for slightly more than 5 s to process commands. Although the level of testing in this case is not always available in outpatient clinical settings, this report highlights the importance of utilizing assessment data during PCIT implementation to ensure the treatment is assessment driven and developmentally appropriate. Oftentimes, children with ASD present to PCIT with prior testing reports. It's encouraged that clinicians read these reports with an eye toward PCIT treatment planning; this can help inform their clinical approach based on the varied sets of strengths and weakness profiles of children on the spectrum.

36.7.3 School/Teacher Involvement

The involvement of Mason's teacher consisted of completing checklists and providing classroom-based observations. As noted in the teacher report, Mason's behaviors in the classroom were not positively impacted to the extent they were in the home environment. Although some research suggests PCIT outcomes generalize to the classroom setting (McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991), Mason's teachers certainly would have benefited from more on-site coaching to help manage his behaviors. Also, it was unclear as to whether the school would be able to support Mason's one-on-one aide going forward, so school-based assistance would have been a beneficial complement to PCIT. With Teacher-Child Interaction Training programs beginning to proliferate (Fernandez, Gold, Hirsch, & Miller, 2015), it would be interesting to determine the level of impact this intervention could have with children on the autism spectrum.

36.8 Conclusion

Conducting PCIT with children on the autism spectrum is both challenging and rewarding. Each case (and sometimes each session) brings along an element of uncertainty, different questions, and various challenges that require clinical flexibility grounded in sound behavioral theory. Moreover, therapeutic "success" is measured in different ways. Overall, Mason benefited tremendously from PCIT across both behavioral and social domains, and treatment gains maintained at 3-month follow-up. Mason's parents reported less parental stress, developed confidence in their overall parenting approach to manage a range of behaviors, and concurrently strengthened their relationship with Mason. This case study serves as additional empirical evidence that children with ASD and co-occurring behavioral difficulties benefit from PCIT. Clinically, details of the case hopefully serve to guide PCIT clinicians as they continue work with the ASD population.

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37

Parent-Child Interaction Therapy (PCIT): Autism Case Study #4

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Abstract

A majority of children with autism engage in behavior problems including tantrums, noncompliance, and physical aggression. Managing these behavior problems for parents can be difficult and ultimately can limit the family's participation in educational, community, and family social activities. Therefore, interventions that teach parents to effectively manage behavior problems may significantly improve functioning in these areas. In addition, evidence for the use of behavior programs such as Parent-Child Interaction Therapy (PCIT) to treat behavior problems—and potentially autistic behaviors—in children with autism is still accumulating. The following case study presents the effectiveness of PCIT in the treatment of noncompliance for a 4-year-old boy with autism spectrum disorder (ASD) and limited language skills. Rating scales and observations of behavior problems, social interactions, and repetitive behaviors were collected at pre- and posttreatment, with parent/teacher ratings of behavior also collected at 12-month follow-up. Results of this case study demonstrate that PCIT was effective in reducing parent/teacher ratings of behavior problems, and improving parent-child interactions, child compliance, and objective indicators of social interaction (e.g., eye gaze, prosocial behaviors) and repetitive behaviors. The case study provides clinicians with specific examples in which PCIT was tailored to address or circumvent difficulties associated with autism, and provides recommendations for use of PCIT in this population.

The following case study presents the application and individualization of Parent-Child Interaction Therapy (PCIT) to address the co-occurring behavioral difficulties and autistic behaviors exhibited by a 4-year-old boy with autism spectrum disorder (ASD). The case study attempts to (a) illustrate the conceptualization for how PCIT was used to target these dual features, (b) review clinical efforts to apply PCIT procedures uniquely in the context of interfering autistic behaviors, (c) present methods for modifying treatment features that individualized therapy while maintaining fidelity to PCIT, (d) demonstrate evidence for PCIT efficacy and maintenance, and (e) address barriers experienced. An overarching goal of the chapter is to provide a clinical example highlighting the strategies we used and lessons we learned so that other clinicians interested in applying PCIT to children with autism may use it as a reference in their own practice.

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37.1 Case Introduction

"Harley" was a 4-year-old boy who was seen at a medical university outpatient developmental-behavioral clinic for behavior problems and language deficits. His behavior problems included noncompliance, severe tantrums, and safety compromising behaviors (i.e., screaming, flopping to the floor, eloping). Tantrums usually occurred when he was asked to engage in a nonpreferred activity (e.g., using the toilet, sharing a toy) or when he wanted something and was told "no." Harley displayed his behavior problems across multiple settings. His biological parents found his behavior difficult to manage in most public places, especially restaurants or stores. Behavior problems also occurred at preschool and resulted in a reduction in his schedule from attending three mornings per week down to only two. Harley received occupational and speech therapy at school and experienced little progress in part because he did not stay seated or follow directions. Harley's pediatrician had previously diagnosed him with ASD at age 3. In addition, he was given an autism ruling through his public-school district.

37.1.1 Present Complaints

Harley's parents described their son as having a "very easy temperament" as a baby. However, behavior problems surfaced in toddlerhood when Harley was not able to verbally express his needs and wants. His difficulty to communicate and disruptive behaviors became increasingly problematic over time. Specifically, Harley's parents reported he was noncompliant with almost all requests including holding a parent's hand in public, putting toys away, using the toilet, and remaining seated at the dinner table. He often whined, ran throughout the house, eloped in public, refused to eat during mealtimes, physically aggressed toward family members (e.g., pushing, pinching), and threw toys.

Prior behavior management strategies employed by Harley's adult caregivers were generally not effective. Harley's parents used verbal reasoning and reprimands to manage his behavior, and they also reported having tried time-out with little success because Harley did not stay in the time-out area. Because these methods were not effective with Harley, most of the time parents gave in to Harley's demands.

Harley attended a Mother's Morning Out program (a daycare-like community program for young children) once weekly and an early intervention preschool class through his school district. His placement was scheduled to be changed from three mornings per week to two mornings due to behavior problems in the classroom. For example, Harley did not transition well from preferred activities (free play) to nonpreferred activities (circle time); he often screamed and ran back to his preferred activities. In addition, he did not share with peers and was observed to push others and grab objects in an aggressive manner. At preschool, Harley's teacher also used verbal reasoning, reprimands, and frequent prompting back to the task at hand with little success. The teacher utilized a strategy to teach Harley appropriate responses to difficult situations through the use of several Social Stories™ (Gray & Garand, 1993). Social Stories™ are a social learning tool that are frequently used to promote the acceptance and learning of new routines among children with autism through the depiction of social interactions and scripts in visual narratives. Harley's Social Stories™ described how to play nicely and were read regularly by the teacher to Harley. However, this strategy was also unsuccessful at reducing Harley's problem behaviors. Harley received speech and occupational therapy at preschool. Unfortunately, progress was reportedly limited due to Harley's interfering behavioral difficulties including staying seated or complying with the therapies. Although Haley's parents wanted him to attend a private school that focused on language, Harley did not follow directions or comply with the demands of the entrance assessment; therefore, he was not accepted for placement.

At the time of the intake, Harley spoke in single words with extremely poor articulation—making his language nearly unintelligible by parents and teachers. He spontaneously said a handful of words including “yellow,” “no,” and “daddy”; he also was able to label letters of the alphabet and numbers. Harley competently used words to request “drink,” but he continued to mainly pull his parents by the hand to items he wanted. He did not ask questions, answer questions, nor state his name when asked. Receptive language was also delayed as Harley pointed to only a few body parts and followed one-step directions “when he felt like it.”

Harley’s father reported one of his biggest concerns was that he did not know how to play with his son and thought Harley did not seem to “care” whether or not his father interacted with him. Harley’s play skills were often repetitive and involved lining objects in a row by color or size, spinning himself in circles, and moving his fingers repetitively. Harley did engage in some varied activities however, as he enjoyed swinging, sliding, and watching Mickey Mouse and science videos. Play-Doh was a preferred toy, but when he was prompted to share, he often engaged in a tantrum or took the Play-Doh to another room to play undisturbed. Harley demonstrated some responsibility as he was in charge of letting the dogs outside (which was a favorite activity). His father reported that Harley was affectionate with parents and enjoyed tight hugs.

37.1.2 History

37.1.2.1 Medical/Developmental

Harley was born full-term weighing six pounds following an uncomplicated pregnancy, delivery, and nursery course. Early developmental milestones with respect to motor skills were reached at appropriate ages; at intake, he was just learning to peddle a tricycle. Verbal developmental milestones, in contrast, were delayed. For instance, Harley began saying single words by 12 months; however, by age 4 he was not yet saying two-word phrases. Most of Harley’s language was unintelligible by others, even his parents. He was not yet potty-trained, and any attempt to have him sit on the toilet resulted in severe tantrums.

Harley was also an extremely picky eater; he did not eat any vegetables and did not eat much meat except for chicken nuggets. He used utensils independently and was working on putting his dishes in the sink after meals. At the time of the intake, his parents were committed to keeping him on a gluten-free diet for a 1-year period (although he did not appear to have allergies or gastrointestinal problems). Although this diet was not recommended by a healthcare provider, Harley’s parents thought it could decrease behavior problems and autism symptoms; fortunately, this belief was not a barrier in his eventual treatment (See Chap. 6 in this book for descriptions of unsubstantiated treatments). Harley dressed himself although he frequently needed assistance fastening buttons and snaps. He had difficulties sleeping and took Melatonin Gummies to help him settle down to sleep at night. Harley was not on any other medications at the time.

Medically, Harley was in good physical health and had no prior remarkable injuries, illnesses, or medication use. His parents were committed to addressing behavior problems through behavior therapy rather than medication therapy (see Chaps. 3 and 5 for more information). Harley also had not received any prior behavioral interventions or supports targeting autism behaviors or functional impairment, including applied behavioral analysis or related interventions for autism. One reason for this is the extreme lack of accessibility of autism-specific services in the state of Mississippi, as is observed in other largely rural states.

37.1.2.2 Family

In the home, Harley resided with his biological parents and his 2-year-old typically developing brother. His mother was a nurse and was employed full-time. His father was not currently working outside of the home and therefore was able to participate, along with Harley, in the weekly PCIT therapy sessions.

37.1.3 Assessment

An assessment battery was administered prior to beginning PCIT. Some rating scales, observations, and test batteries were readministered at posttreatment and after a 12-month follow-up.

37.1.3.1 Language

At baseline, Harley was administered the Preschool-Language Scales-5 Screener (PLS-5; Zimmerman, Steiner, & Pond, 2011) to screen overall language and communication abilities, and the Peabody Picture Vocabulary Test-4 (PPVT-4; Dunn & Dunn, 2007) to assess receptive language skills to ensure his capacity to understand directions in PCIT. Both tests were administered to Harley at pretreatment (Form A for PPVT-4) and repeated at posttreatment (Form B for PPVT-4). The Social Communication Questionnaire (SCQ; Rutter, Bailey, & Lord, 2003) was also completed.

37.1.3.2 PLS-5

The PLS-5 Screening Test is an interactive screening assessment for developmental speech and language skills across language, articulation, connected speech, social/interpersonal communication skills, stuttering, and voice quality. Harley failed performance criteria across all measured domains, confirming broad speech-language impairment.

37.1.3.3 PPVT-4

The PPVT-4 is a standardized test of receptive vocabulary. Harley's score on the PPVT-4 at pretreatment was 64 with an age equivalent of 2.4 years. Harley's posttreatment score was 68 with an age equivalent of 2.8 years.

37.1.3.4 SCQ

The SCQ is a quick screening instrument that helps identify children with autism spectrum disorder. Paternal ratings on the SCQ Total Score was a 20, which exceeded recommended cutoff threshold of 15 for a high probability of autism.

37.1.3.5 Parent Stress

Harley's parents completed the Parent Stress Scale (PSS; Berry & Jones, 1995) to assess for parenting stress throughout treatment in relation to Harley. Ratings of parenting stress were elevated.

37.1.3.6 Behavior Problems

His parents completed a variety of behavioral rating scales before and after intervention including the Early Childhood Behavior Inventory (ECBI; Eyberg & Pincus, 1999), Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2000), and the Kiddie-Schedule for Affective Disorders and Schizophrenia (K-SADS, 2013-update; Kaufman et al., 1997).

37.1.3.7 The ECBI and Sutter-Eyberg Behavior Inventory-Revised (SESBI-R)

The ECBI and SESBI-R (Eyberg & Pincus, 1999) were completed by Harley's father and teacher, respectively. His father completed the ECBI each week and the SESBI-R was completed by Harley's teacher at pretreatment, posttreatment, and follow-up to assess for the intensity of behavior problems and perceptions of how problematic these behavior problems were viewed. Harley's pretreatment T scores on both the ECBI and SESBI-R fell within the clinically significant range ($T > 60$), although his father reported somewhat more severe child disruptive behavior problems (see Table 37.1).

37.1.3.8 CBCL

The CBCL 1.5–5 (Achenbach, 2001) is a standardized rating scale completed by caregivers to assess emotional and behavior problems in children 1.5–5 years old. Harley's scores on the CBCL fell within the borderline/clinical ranges on the Total, Externalizing, and Internalizing broad-band scales, as well as Clinical Syndrome and DSM-oriented scales.

37.1.3.9 K-SADS

The K-SADS is a structured behavioral interview. This was administered to assess for behavioral problems including attention-deficit/hyperactivity disorder, oppositional defiant disorder, and conduct disorder. The K-SADS interview with Harley's father indicated that Harley was exhibiting behaviors that met diagnostic criteria for attention-deficit/hyperactivity disorder

Table 37.1 Parent and teacher ratings at pretreatment, posttreatment, and 12-month follow-up

Measure	Pretreatment	Posttreatment	Follow-up
ECBI (T scores)			
Intensity	79	55	51
Problem	82	64	54
SESBI-R (T scores)			
Intensity	67	44	51
Problem	66	43	43
CBCL (T scores)			
Total problems	77	68	—
Internalizing	72	65	—
Externalizing	83	63	—
Affective problems	70	56	—
Anxiety problems	63	51	—
Pervasive developmental problems	79	68	—
Attention-deficit/hyperactivity	71	54	—
Oppositional defiant problems	70	59	—
Social communication questionnaire (raw scores)			
Total raw score	20	17	—
Reciprocal social interaction	7	4	—
Communication	4	5	—
Restricted, repetitive, stereotyped POB	8	7	—
Parenting stress scale (raw scores)			
Total stress raw score	37	24	—

Note. *CBCL* Childhood Behavior Checklist, *ECBI* Early Childhood Behavior Inventory, *POB* Patterns of Behavior, *SESBI* Sutter-Eyberg Student Behavior. For Parent Stress Scale, higher values reflect greater reported stress

(15 total symptoms) and oppositional defiant disorder (6 total symptoms), but not conduct disorder (0 total symptoms).

Collectively, the overall behavioral assessment indicated that Harley was exhibiting severe and pervasive behavioral difficulties across multiple settings.

37.1.3.10 Treatment-Related Behavioral Observations

Behavioral observations were conducted on two primary levels: (1) observations of parental positive parenting behaviors based on a behavioral coding system (Dyadic Parent-Child Interaction Coding System; DPICS; Eyberg, Chase, Fernandez, & Nelson, 2014) across both phases of PCIT (i.e., Child-Directed Interaction [CDI], Parent-Directed Interaction [PDI]) and at 12-month follow-up (see Fig. 37.1) and (2) behavioral observations of Harley's verbal/nonverbal social behavior, prosocial interactions, and restricted/stereotypic behaviors taken at pre- and posttreatment during the DPICS observation sequences (5 min each of Child-Led Play, Parent-Led Play, and Clean-Up situations). For the latter category, behaviors were selected to be representative of deficits commonly experienced by both Harley and children with ASD, in general. The 15-min observation period was divided into 60, 15-s epochs; a partial interval coding scheme was used to determine whether Harley exhibited the targeted social-interactive and stereotypic behaviors during each 15-s interval.

Eleven categories capturing Harley's social behavior, prosocial interactions, and restricted/stereotypic behavior were tracked. These included (a) social overtures, (b) eye gaze, (c) eye gaze duration, (d) showing, (e) sharing, (f) laughing, (g) smiling, (h) spontaneous (non-stereotypic) speech, (i) appropriate verbal responses, (j) preoccupations, and (k) grunting. Operational definitions for social overtures, eye gaze, and showing were based on the corresponding categories contained in the Autism Diagnostic Observation Schedule, Second Edition, Module 1 (ADOS-2; Lord et al., 2012). One graduate- and

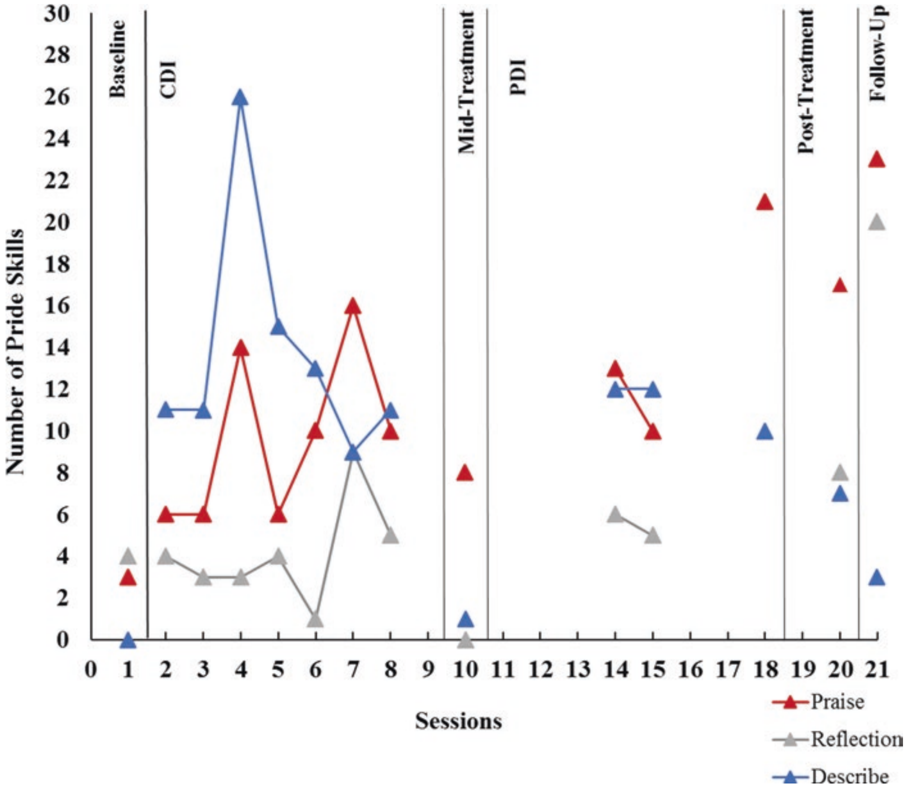

Fig. 37.1 Child-lead parent PRIDE skills across PCIT treatment

one undergraduate-level research assistant were trained on the specific behavioral definitions by the second author and independently coded the videos with 98.8% agreement. The percentage of intervals in which Harley exhibited each of the behaviors at pre- and posttreatment is displayed in Table 37.2.

37.2 Case Conceptualization

Harley's behavior problems occurred at school, at home, and in public places and included noncompliance, eloping, screaming, throwing objects, pushing, pinching, and flopping to the floor. The functions of these behavior problems were to gain access to preferred objects or to escape from a task demand. Other functions may have included attention (e.g., when he eloped he was often followed by an adult, from which he seemed to derive enjoyment). Overall, his

Table 37.2 Behavior observations of social and stereotypic behavior during 5-5-5 interaction sequences at pre- and posttreatment

Category	Pretreatment (%)	Posttreatment (%)
Nonverbal social behavior		
Social Overtures	0	9.5
Showing	0	7.9
Eye Gaze	1.4	20.6
Mean Eye Gaze Duration (s)	0.5	3.3
Verbal social behavior		
Spontaneous Speech	18.6	38.1
Verbal Response	21.4	22.2
Prosocial behavior		
Sharing	0	15.9
Laughing	0	7.9
Smiling	0	33.3
Restricted/stereotypic behaviors		
Preoccupations	38.6	9.5
Grunting	52.9	0

Note. Rates of behavior were calculated using partial-interval scoring for the 60, 15-second total intervals contained across the child-led, parent-led, and clean-up behavioral observation situations.

behavior problems appeared to be multifunctional as they occurred for attention, to access toys, to escape a social interaction, and often to engage in a repetitive activity (e.g., lining toys in a row). PCIT was selected for Harley to teach Harley's father to better manage behavior problems at home and in public places. A secondary goal was to improve interactions between Harley and his father by teaching him new ways to play with his son. Specifically, Harley's father was taught to ignore inappropriate play behavior routed in Harley's stereotypic preoccupations (e.g., lining toys in a row) and model appropriate play behavior in an effort to expand Harley's play skills.

37.3 Course of Treatment and Assessment of Progress

37.3.1 Overview

PCIT treatment was provided by the first author, a licensed psychologist and Board Certified Behavioral Analyst, and was at the time undergoing formal PCIT therapist certification under the supervision of a PCIT master trainer. Harley and his father attended 20 weekly, 60-minute sessions over the course of 5 months. Three of these sessions included the initial interview, CDI Teach, and PDI Teach sessions. Harley was not present for the CDI and PDI teach sessions which gave Harley's father the opportunity to learn the skills uninterrupted and to role play these skills with the therapist. PCIT was delivered according to the manualized procedure (Eyberg & Funderburke, 2011) with a few modifications to address issues around Harley's unique needs from his ASD diagnosis (described below). Coding of all CDI and PDI skills was based on the DPICS manual (Eyberg, Chase, Fernandez, & Nelson, 2014). CDI and PDI sessions were conducted in two rooms connected by a single door with a one-way window. A bug-in-the-ear device was used to coach Harley's father through both treatment phases.

37.3.2 Child-Directed Interaction Sessions

Parental behaviors and Harley's compliance were coded during the baseline DPICS situations. Harley was observed to play repetitively with toys—particularly cups and Play-Doh. For example, he exhibited preoccupations with lining up small tea cups in a row, pinching off small pieces of Play-Doh, and placing the Play-Doh in each cup multiple times. Behavior problems were noted to increase when Harley's father interrupted his son's activity (e.g., screaming, shoving toys off the table). Socially, when his father attempted to join this activity, Harley would take the toys to a corner to play in isolation.

During baseline, Harley's use of social interaction and prosocial skills were very minimal; he spent a significant amount of time engaged in restricted or repetitive behaviors (see Table 37.2). He was also not observed to share or try to engage his father in play with him. At first, the lack of social interaction was suspected to be a potential barrier for delivery of PCIT given PCIT's use of social attention to direct and shape positive behavior.

Over the course of CDI coaching sessions, Harley's eye contact appeared to improve. He also began to imitate words without prompts, which was later verified by video coding (Table 37.2). On one occasion, Harley's father removed the middle blocks in his tower so he could see Harley. His father said, “Harley, I see you!” and Harley responded, “I see you Daddy,” a phrase he had not been observed to say before. Harley also enjoyed playing with a dollhouse and pet parlor. During these CDI play sessions, he was observed to imitate giving a dog a bath, feeding small play animals with a bag of food, imitating phrases (e.g., “Take a bath,” “Eat some food”), and making small dolls interact. New phrases began to emerge as Harley was observed to say, “Who is it,” in response to his parent knocking on a playhouse door. He was observed to say other phrases, including “Another bone,” “Open the door,” “Let's eat,” “More please,” "Wait a minute," and "Roll and press" (with Play-Doh). Initially, it was extremely difficult for the parent to understand some of Harley's speech, making reflecting his phrases a little problematic.

37.3.2.1 CDI Personalization for ASD Behavior

Several modifications were made to the CDI phase that targeted aspects of Harley's ASD behaviors or circumvented them in an attempt to personalize treatment. For example, rather than describing Harley's play, which was largely repetitive and nonfunctional, Harley's father was instructed to enthusiastically describe his own play by building a castle with large foam blocks (e.g., "I'm building a big castle! My castle is getting so big it is going to fall down"). This was done in an effort to draw Harley over to his father without the use of direct commands. As Harley's father became more enthusiastic, Harley was observed to leave his solitary activity of lining up cups and move toward his father and the blocks. With even more enthusiasm from his father, Harley began to laugh, smile, and stay within a foot proximity of his father. When Harley began to stack blocks unprompted, his father was coached to then describe his son's activities (e.g., "You are making a tall castle too! I like how you are sharing with Daddy").

Over the next several CDI sessions, Harley was observed to engage in new play activities including using a toy garage (e.g., rolling cars down a ramp, moving them up and down in an elevator) all without direct commands to do so; this then enabled his father to practice behavioral descriptions. In addition, Harley's father was instructed to ignore Harley's repetitive behavior or play related to Harley's preoccupations (e.g., lining toys in a row, placing small pieces of Play-Doh in cups). Instead, he was coached to continue modeling appropriate play since Harley did not play appropriately with toys. The decision to selectively ignore repetitive play was made following initially unsuccessful attempts at coaching Harley's father to join in the repetitive play and gradually introduce play variety. Harley was highly emotionally reactive (e.g., screaming, shoving toys) when attempts to imitate his play were initiated. Functional analysis while coaching showed that Harley exhibited improved behavior and greater mimicry when his father was coached to ignore repetitive play and increase enthusiasm with similar, but more varied toys.

Over the next several CDI sessions, duplicate toys were scattered on the floor. This strategy was done to promote an increase in shared interests between Harley and his father and to promote flexibility over Harley's play choices. PCIT encourages using imitation skills (which are often part of applied behavior analysis programs). Since Harley's father had tried to follow his son's lead by imitating without success, he was instead instructed to engage with the available toys with the hope that his son would engage by imitating his father. Research suggests imitation skills in children with ASD may promote joint attention, language, and play skills (Ingersoll & Schreibman, 2006). Explicit decisions to avoid toys linked to Harvey's preoccupations (e.g., cups) were made, but slowly introduced after achieving success in CDI in later sessions. Toys spread around the playroom included two giraffes, two elephants, two cars, and similar objects and figurines. Harley's father was coached to make a tree with blocks and pretend his giraffe was climbing the tree. Without direct instruction, Harley picked up the second giraffe and imitated his father by making his own giraffe "climb a tree" made of blocks while Harley simultaneously said, "Climb a tree." Other activities Harley was observed to imitate included flying his giraffe through the air, putting his elephant in the barn to sleep, and having his elephant run through a forest and over some mountains. Over the remainder of the CDI sessions, Harley began to share more regularly and take turns with his father with other toys (e.g., putting a ball down a shoot). After four CDI coach sessions, Harley did not resist when his father took a pinch of his Play-Doh.

37.3.2.2 CDI Summary

CDI skills appeared to improve father-son interactions. Harley's father demonstrated improved warmth and CDI skills (Praise, Reflection, Imitation, Descriptions, Enjoyment; PRIDE),

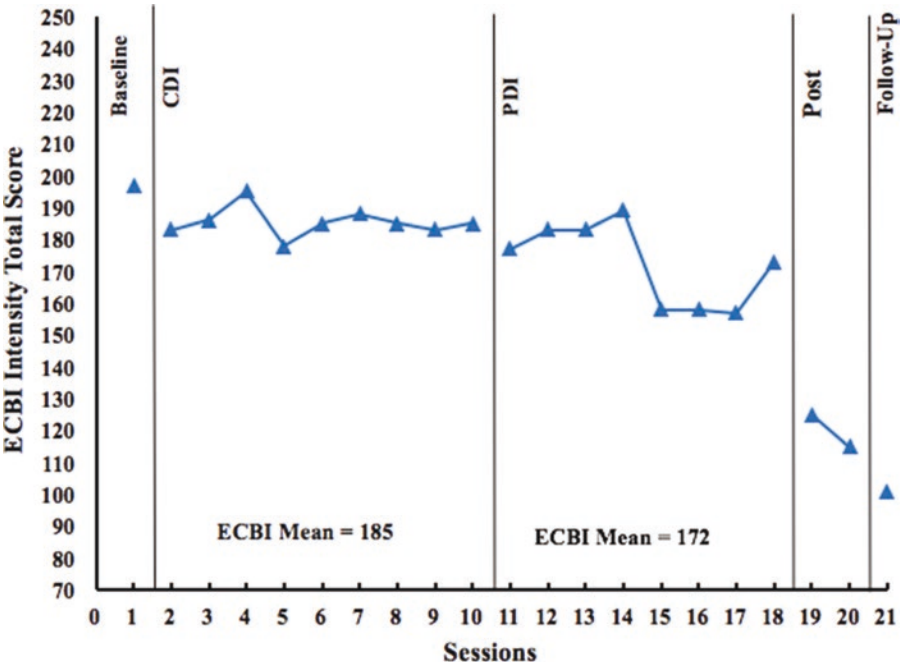

Fig. 37.2 Parental ECBI T scores across PCIT treatment phases

and reported that Harley enjoyed playing with him. Positive parenting skills were increased throughout CDI (though temporary regression occurred during the mid-treatment assessment; Fig. 37.1). He also learned to enjoy their CDI homework sessions as they learned new ways to play together. Importantly, however, compliance and overall behavioral difficulties displayed by Harley did not improve with CDI alone, which was reflected in minimal change in weekly ECBI scores (see Fig. 37.2).

37.3.3 Parent-Directed Interaction Sessions

The first two PDI sessions in clinic were lengthy, with each lasting well over two hours. Overall, Harley was not disruptive or destructive and did not tantrum during any of the PDI sessions. However, Harley did not comply with his father's commands (e.g., hand him a toy) and actively refused to sit in the time-out chair. Due to the room configuration, the "Swoop and Go" procedure was initiated (rather than a backup room); Harley's father took the toys and left the room as outlined in the PCIT protocol (Eyberg, Chase, Fernandez, & Nelson, 2014). Even though the "Swoop and Go" time-out room had no toys, Harley entertained himself with non-functional activities. For example, he sat on the floor and picked tiny pieces of Play-Doh from the carpet and crawled under the rug as if it was a blanket. On another occasion, he attempted to walk on the arms of the time-out chair, a dangerous behavior resulting in a swap for a time-out chair with smaller arms. During the first two PDI sessions and well over 2 h later, Harley still did not comply with father's command to stay in the chair. Although Harley was quiet (not making noises) when his father left the room, sometimes his hands or body was not "behaviorally quiet" as he was playing with the carpet or rolling on and under a table. The 1 min of quiet was often extended for several minutes until his hands and body were not moving about the room. Even with this modification, both sessions ended with a draw by having Harley comply with a different task (e.g., putting a block in a bucket).

Harley's use of nonfunctional activities during the "Swoop and Go" time-out sequence provides an admonishment for future clinicians conducting PCIT with ASD. Specifically, clinicians should be aware that some PDI sessions may be longer than others due to the ease in which children with ASD may preoccupy themselves in isolation. Our recommendation based on Harley's case is to schedule ample time to conduct PDI sessions, perhaps more than initial PDI sessions with non-ASD children, so that sessions can be more likely to end in compliance rather than draws. Perhaps hand-over-hand physical guidance could be used to guide the child to comply with the parent's original directive.

Another adaptation may be to make the time-out room as boring as possible by removing all items (e.g., carpets, time-out chair) when the parent leaves the room during Swoop-n-Go. It is possible that if the time-out chair is also removed during this procedure, the chair could be brought back when the parent returns to the room (then allowing the time-out to continue). Another option may be to mark an area on the floor with tape indicting where the child should stay rather than using a chair.

An additional complication was that it was difficult to determine if Harley enjoyed playing by himself when his father left the room because his facial expression did not show either contentment or displeasure. Given that affective expression and recognition abnormalities are common in ASD (Wong, Beidel, Sarver, & Sims, 2012), options to manage these situations may include extending the backup procedure a little longer to encourage children to sit in the chair, or providing instructions to parents to overemphasize their affective expressions so children may be able to better notice parental emotional tone/valence.

Lastly, clinicians may want to consider other options in cases where PDI time-out sequences are complicated by the child's ASD. These options may include incorporating additional response cost or minor external incentives/rewards based on avoidance of backup room or "Swoop and Go" procedures. If clinicians elect to incorporate any incentives, they must be very careful to fade these out and redirect the rewards to even more appropriate behavior (i.e., compliance) so as not to reinforce the child's misbehavior (e.g., reinforcement for being in time-out).

The procedures we used for Harvey were effective. From PDI session three to nine, Harley complied with all commands given in the clinic and did not need to be directed to the time-out chair. On several occasions, when Harley's father gave the time-out warning Harley screamed, "No time-out!" Harley then complied immediately, suggesting his immediate learning.

37.3.4 Generalization

37.3.4.1 Home Practice

Time-out at home was conducted on a chair in the family's foyer. Harley's bedroom was used as the backup space if he left his chair during time-out. Harley's father began implementing the time-out procedure at home during play after the second PDI coaching session. He reported that Harley did in fact sit in the chair at home. In addition, he generally followed directions and did not appear to enjoy being sent to time-out.

37.3.4.2 Clinic

PCIT procedures were generalized in the clinic lobby and outside in the courtyard during the last two sessions (PDI Coach 8 and 9). To target Harley's tendency for elopement, outings concentrated on having Harley comply with directives to hold his father's hand and walk slowly (rather than run). Harley appeared to enjoy receiving praise after he complied as he was observed to smile while he gazed toward his father.

37.3.4.3 PDI Personalization for ASD Behavior

During the PDI teach session, Harley's father was taught to give effective commands using a neutral voice, follow through with commands, and implement a time-out procedure at home. Harley was introduced to the PDI discipline sequence initially by role play using a teddy bear (as instructed in the PCIT protocol). Unfortunately, Harley refused to engage in the role play activity and sat under a table playing with the carpet.

It was unclear as to whether Harley was listening to the instructions for the PDI procedure. Therefore, a second strategy—the PCIT Time-Out Flip Book (Masse & Girard, n.d.)—was employed to introduce the time-out sequence to Harley. The PCIT Time-Out Flip Book is based on the principles of Social Stories™ (Gray & Garand, 1993) and outlines each step of the time-out sequence with words and illustrations. To accommodate learning difficulties, Harley's father read the PCIT Time-Out Flip Book to Harley at home each day for 2 weeks as a prompt just prior to practicing PDI in play.

37.3.4.4 School Generalization of PDI

Although Harley's compliance at home was improving, his compliance at school was still problematic. On one occasion, Harley's father observed his son refusing to follow teacher directives. Subsequently, Harley's father demonstrated effective instruction delivery and the time-out procedure by putting his son in time-out (a chair in the classroom). Harley's father gave the teacher permission to use the procedure each time Harley did not comply with directives. From that point on, Harley's teacher reported a decrease in tantrums, impulsivity, pushing, and an increase in following directions as evidenced by verbal report and scores on the posttreatment SESBI-R (Eyberg & Pincus, 1999). She also reported an increase in group participation, sharing, and language skills. Harley was no longer in jeopardy of a reduced class schedule.

After Harley's father had been implementing treatment successfully at home and had introduced the concepts to his wife, Harley's mother attended five sessions to ensure she was implementing the PDI procedure correctly. PRIDE skills, effective commands, and the discipline sequence was reviewed and practiced with feedback during the sessions.

37.3.4.5 PDI Summary

Compared to CDI, Harley showed marked improvement across PDI (see Fig. 37.2). Treatment gains were made steadily with the largest improvement in behavior problems occurring after several PDI sessions. ECBI scores at posttreatment showed a marked decline at the termination cutoff ($T = 55$). Importantly, a classic extinction burst of worsening behavior was observed during the 19th PDI coaching session when Harley was denied access to a preferred item. However, this behavior was shown to decrease in the following assessment periods.

Teacher ratings on the SESBI-R posttreatment also showed a marked decline and fell within the nonclinical range (SESBI-R; $T = 44$). Additional documentation of PCIT effectiveness was observed on the CBCL, which showed large decreases in emotional and behavioral difficulties across most areas. Harvey's father also demonstrated maintenance of his CDI skills throughout the PDI phase (Fig. 37.1).

37.3.5 Follow-Up Summary

A 12-month follow-up was conducted with Harley's parent (paternal data presented only for completeness) and new classroom teacher. ECBI and SESBI-R scores were in the nonclinical range for both parent- (ECBI; $T = 51$) and teacher-reports (SESBI-R; $T = 51$). It should be noted that teacher ratings reflected Harley's current teacher at his private school placement rather than his teacher during PCIT treatment.

Another DPICS 15-minute observation sequence was conducted. Treatment gains were maintained with 100% compliance to father's direct commands. In addition, positive parenting practices based on the coding of the PRIDE skills indicated that Harley's father continued to use the skills effectively in the 12 months following intervention. Moreover, Harvey's father demonstrated long-term maintenance of his positive parenting skills as evidenced by increasing the number of labeled praises and reflections at the 12-month follow-up (a decrease in behavioral descriptions was noted).

Unfortunately, behavioral observations of Harvey's autism-related behaviors were unable to be completed due to technical difficulties and video failure of this 12-month follow-up.

37.3.6 Treatment Progress Summary

Overall, Harley's father demonstrated gains in positive parent-child interactions as measured by weekly coding of PRIDE skills (see Fig. 37.1). At the same time, Harley demonstrated significant improvements in parent- and teacher-rated behavioral difficulties (Table 37.1), as well as in verbal and nonverbal social behavior (Table 37.2). Mixed evidence for change in restricted interests and stereotypic behaviors were found, with only modest decreases in overall parent-rated SCQ scores, but some improvements on the CBCL Pervasive Developmental Disorder subscale (though this was still elevated). However, significant decreases in the amount of these behaviors (as documented by behavioral observations of treatment videos and on the CBCL) were observed (Table 37.2). While gains in eye gaze frequency and social interaction were measured, the overall rate of some of the social behaviors continued to be low (e.g., overtures) or displayed briefly (mean eye gaze duration). Harley's post-treatment behavioral rating scale scores were no longer within the clinical range except for his Pervasive Developmental Delay scale score which fell to the borderline clinical range.

Additional documentation of PCIT effectiveness for his behavioral difficulties was the broad decreases in parent-rated behavioral difficulties on the ECBI and CBCL, which showed large decreases in emotional and behavioral difficulties across most areas. For comparison purposes, the magnitude of within-person differences on Harvey's ECBI Total Problem Severity and CBCL Externalizing Problems scores would be equivalent to a substantially large-magnitude Cohen's d effect size of 2.4 and 2.0, respectively (i.e., transformation of pre/post T-score differences divided by T-score standard deviation: (79-55)/10 = 2.4). These within-person changes for Harvey fair favorably or better than overall effect sizes from within-subject changes in previous PCIT randomized controlled trials. Collectively, this suggested that PCIT was effective at normalizing Harvey's emotional and behavioral difficulties, and improving behaviors linked to pervasive developmental difficulties.

Importantly, the improvements in both parenting and child behavior were mostly maintained across a 12-month period following PCIT treatment. Indeed, behavioral observations of Harley's father's positive parenting (PRIDE) skills actually showed improvement in the year after, with the exception of behavioral descriptions. At the same time, Harley's behavioral problems remained in the normal range across both parent and teacher perceptions. This collective pattern provides evidence that PCIT treatment is appropriate for children with ASD and that long-term gains can be maintained.

37.4 Barriers to Treatment

Despite evidence for PCIT's effectiveness with Harley's behavior problems and social interaction behaviors, several treatment barriers were encountered that may have impacted outcomes. Sessions were held in late afternoons after Harley's mother arrived home from work so she could tend to his younger sibling while his father attended the PCIT sessions. However, if our clinic had available staff, another individual could have provided childcare so that both parents may have attended. Another option would have been to hold sessions earlier in the day (if adequate childcare was available) to potentially reduce disruptive behavior due to hunger or tiredness. Other options such as home-based PCIT treatment or internet-delivered PCIT treatment are opportunities for circumventing problems with parent accessibility to treatment.

Another barrier to treatment was that the PCIT treatment room in the university's outpatient treatment clinic was a multipurpose room containing large pieces of furniture (two chairs, a large desk, and round table) that was used for other reasons besides PCIT. This set up required the therapist to remove all of the furniture prior to sessions. Over time and once compliance improved, these items were slowly reintroduced back into the clinic play room. This room also had two exit doors which posed elopement risks. One door was blocked by the therapist during PDI "Swoop and Go" and the other door was held closed by either the parent or a student (if one was available). Harley's therapist was available by phone and email (as needed) if any problems came up while implementing the procedure at home.

After treatment was completed with Harley's father, Harley's mother attended eight sessions to learn the procedure as well. However, due to scheduling limitations, the PCIT room was not available on her day off from work. Therefore, sessions were held after she was done at work late in the day. Additionally, these sessions were conducted in a regular office without the one-way window and with in-room coaching. Because Harley's father was implementing the PDI procedure at home, Harley's mother jumped ahead and began implementing the procedure before she mastered CDI skills and before she was fully trained in using the PDI procedure. During follow-up, she reported that compliance improved tremendously overall, but that Harley complied more with father's directives than with hers. This suggested that Harley's mother could have benefitted from additional training (she attended 8 total sessions), particularly with regard to additional practice in CDI skills. Because attendance from multiple caregivers is not uncommon, clinicians should be careful to review, monitor, and emphasize foundational positive parenting skills when caregivers receive treatment at different time points.

37.5 After Treatment

Harley's parents reported Harley exceeded their expectations and continued to progress daily after treatment was complete. At the end of the school year, Harley's teacher recommended he be placed in a regular education classroom. Ultimately, they chose a private school with the expectation he would join the autism classroom. However, private school personnel also recommended he be placed in a regular education blended Kindergarten/first grade classroom. Harley had homework every night and had just passed his first spelling test at the time of follow-up. His parents were overjoyed with Harley's overall progress although he still had occasional "meltdowns." Harley's family reported they were ready to tackle other issues including behavior problems during meals (e.g., remaining seated, pushing food away).

37.6 Recommendations to Clinicians

This case study supports the use of PCIT for a young child with ASD and limited expressive language skills. For Harley, compliance improved during the course of treatment both at home and at school. Once compliance improved, Harley was no longer asked to leave school early each day; by the end of the year, Harley was recommended for a regular education placement in his public school and in a private school setting. The relationship between Harley and his father improved significantly over the course of treatment as they learned new ways to play together. Harley's play skills improved dramatically through differential reinforcement of appropriate play behavior and ignoring minor disruptive and repetitive play activities. His father's enthusiasm during play was essential and kept Harley engaged in varying play schemes. After the initial CDI teach session, Harley's father was skeptical and reported "this was not going to work" because his son had no interest in playing together. He also reported if given the choice, Harley would choose playing alone. However, this did not end up being the case. As Harley's father decreased commands and questions, and modeled enthusiastic and appropriate play, Harley was observed to engage with his father for longer periods of time as well as imitate the play and language that was modeled.

It is also important to state that Harley *was not taking medication* for behavior problems (or other health conditions) during treatment and had not previously received medical or behavioral interventions for ASD. This fact provides some evidence that improvements were attributable to PCIT and not alternative medical or nonmedical interventions. This is all the more striking given that changes to social behaviors commonly observed as deficits in ASD—and which frequently do not improve without treatment—were observed to change across treatment.

Future studies may include applying PCIT skills to other problem areas for children with autism including improving mealtime behavior (e.g., sitting at the table) and using PRIDE skills to reinforce eating new foods during meals. A formal functional assessment at school is also suggested to help teachers identify the function of problem behavior so that behavior intervention plans may individualized. Although Harley's teacher supported the use of time-out in the classroom, formal training in Teacher Child Interaction therapy (TCIT; Lyon et al., 2009), a school version of PCIT, should be considered to help teachers manage a variety of difficult behavior problems, reinforce appropriate child behavior, individualize treatment, and promote positive teacher-child interactions.

37.7 Conclusions

In summary, Harley and his father demonstrated improvements across PCIT in parenting behavior, child compliance, play, and social interactions. Response to treatment for Harley was most pronounced during PDI. Importantly, treatment gains accrued in the area of Harley's behavioral functioning; these gains maintained after a 1-year follow-up, fell within the normal range for children, and generalized to the home and school settings. Collectively, this evidence indicates that PCIT can be helpful in improving behavioral and social functioning in children with ASD, limited expressive/receptive language skills, and significant autism symptoms. PCIT provided Harley's parents with the confidence to manage his behavior. In addition, PCIT had significant benefits on the course of Harley's educational future (i.e., providing the opportunity for a school placement that otherwise would have been more restricted).

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38

Parent-Child Interaction Therapy-Toddler (PCIT-T): Case Overview for a Child on the Autism Spectrum with a Comorbid Developmental Disability

Victoria E. Montes-Vu and Emma Girard

Abstract

This case study describes the use of Parent-Child Interaction Therapy with Toddlers (PCIT-T) with a child diagnosed on the autism spectrum who also has an intellectual disability. The child presented with limited receptive and expressive communication skills, a history of aggression, tantrums, and noncompliance. Children with autism spectrum disorder and intellectual disabilities frequently present with co-occurring disruptive behaviors (e.g., noncompliance, defiance, aggressions) that impair their participation in important educational, home, and community activities. PCIT-T, an adaptation of standard PCIT, focuses on a developmental model for working with toddlers 12–24 months of age (Girard et al., 2018). This includes an emphasis of coaching floor play, proper toy selection, coaching verbal animation during interactions between the caregiver and child, as well as coaching animated facial expressions from the caregiver to the child. Results indicate that the coaching interventions were associated with acquisition of parenting skills and reduced problem behaviors, suggesting modifications to standard PCIT may hold benefit for children with developmental disabilities.

Disruptive behaviors in young children such as noncompliance, aggression, defiance, and property destruction are concerning for parents and may impair their children's ability to participate in important educational, home, and community activities (Loeber, Burke, Lahey, Winters, & Zera, 2000). Findings estimate that between 2 and 16% of children meet criteria for a disruptive behavioral disorder such as Oppositional Defiant Disorder (ODD) and Conduct Disorder (Loeber et al., 2000).

Although disruptive behaviors are common for young children with normative developmental trajectories, children who have developmental difficulties (e.g., autism spectrum disorder, intellectual disability) may have increased challenges with disruptive behaviors (Ageranioti-Bélanger et al., 2012; Hill et al., 2014). Children diagnosed with autism spectrum disorder (ASD), characterized by difficulties with reciprocal social communication and stereotyped interests or behaviors (American Psychiatric Association, 2013) often display comorbid disruptive behaviors. In fact, research studies have found that aggression, property destruction, tantrums, self-injury, and stereotypies are primary challenging behaviors for children with ASD (Horner, Carr, Strain, Todd, & Reed,

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2002). Additionally, empirical findings indicate that parents rate children with an intellectual disability greater on exhibiting disruptive behaviors than their same-age typically developing peers (Dekker, Koot, Ende, & Verhulst, 2002). Intellectual disability (intellectual developmental disorder) refers to intellectual and adaptive functioning deficits in conceptual, social, and practical domains during the developmental period (American Psychiatric Association, 2013).

Children with intellectual disability experience deficits in their ability to reason, problem-solve, learn from experience, as well as utilize abstract thinking, judgment, and academic learning. Deficits in adaptive functioning result in failure to meet developmental and sociocultural milestones in the areas of independence and social responsibility (e.g., communication, social participation, and independent living; American Psychiatric Association, 2013). Research findings describe that 75% of individuals on the autism spectrum show some levels of intellectual disability (Croen, Grether, & Selvin, 2002).

Parent-Child Interaction Therapy (PCIT) is an evidence-based treatment that addresses disruptive behavior (McNeil & Hembree-Kigin, 2010a). PCIT has been shown to decrease child problem behaviors and increase parental positive skill use, among other outcomes (McNeil & Hembree-Kigin, 2010b). Importantly, it has also been found to be effective with children who exhibit co-occurring disruptive behaviors and intellectual disability (formally mental retardation; Bagner & Eyberg, 2007).

The present study explores using an adaptation of standard PCIT, PCIT-Toddlers (PCIT-T), with a child diagnosed with disruptive behaviors, autism spectrum disorder, and intellectual disability. Background, specific adaptations, and outcomes are discussed.

38.1 Case Description

A 4-year-old female (“Sophie”) was referred to treatment for disruptive behaviors by her preschool. She was referred for an evaluation due to behavioral concerns including crying, screaming, yelling, throwing things, kicking, throwing herself on the floor, and refusing to listen when asked to do something. She was diagnosed with autism spectrum disorder through the school district via psychoeducational testing, a developmental disability due to not meeting developmental milestones, and a genetic disorder that was associated with intellectual disability. She presented with limited language skills and poor balance and coordination. Sophie’s mother, Ms. Thomas, agreed to regularly attend therapy sessions with her daughter.

38.1.1 ASD Diagnosis

Sophie was identified by her preschool as being in need of additional services due to experiencing difficulty with expressive language skills, social skills, disruptive and aggressive behaviors, understanding and following directions, as well as poor balance and coordination. Sophie was assessed by the school district via psychoeducational testing. Upon being evaluated, she was diagnosed with autism spectrum disorder and started receiving special education services. During the course of treatment, Sophie received an individualized educational plan (IEP) which included occupational, speech, and physical therapy. Prior to treatment, Sophie met criteria for Disorder of Infancy, Childhood, or Adolescence NOS. In addition, Sophie’s caregiver reported significant levels of parental distress. The family was referred to a community mental health agency where it was determined the best course of treatment was parent training (i.e., PCIT).

38.1.2 PCIT Overview

PCIT is an evidence-based behavioral parenting training program that involves working with children who exhibit disruptive behavior, ages 2–7 years, along with their caregivers (McNeil & Hembree-Kigin, 2010a). In PCIT, parents are taught skills to establish a nurturing and secure relationship with their child while also increasing their child's pro-social behavior and decreasing the child's problem behavior. PCIT is composed of two phases: Child-Directed Interaction and Parent-Directed Interaction. The first phase, Child-Directed Interaction (CDI), focuses on enhancing the parent-child relationship, increasing positive parenting, and improving the child's social skills. The second phase, Parent Directed Interaction (PDI), focuses on increasing the parent's ability to set limits and to be consistent by following a structured discipline sequence aimed at reducing child noncompliance and disruptive behavior (McNeil & Hembree-Kigin, 2010b). Therapists actively coach parents toward meeting mastery of CDI. Once CDI mastery is obtained, parents continue to utilize CDI skills while also moving on to PDI. A child's graduation from treatment is determined on parents' demonstration of both CDI and PDI mastery, parents' ratings of child behaviors to within normal limits (as measured on the Eyberg Child Behavioral Inventory), and the parents' confidence in their ability to handle their child's misbehavior (McNeil & Hembree-Kigin, 2010a).

38.1.3 Course of Treatment: Modifications

At the onset of treatment, Ms. Thomas was unaware of Sophie's full range of capabilities. Due to concerns from Sophie's mother however, Sophie was assessed to determine her developmental level. Results indicated that although Sophie was 4 years old, her developmental level appeared to be less than 24 months of age. Sophie displayed limited eye contact, no parallel play, no engagement in play, and no imaginative play. Sophie also did not have appropriate levels of communication and her speech was unintelligible. However, Sophie used verbalizations which included tunes and changes in pitch. To communicate, Sophie often pointed and made noises to ask for help. Moreover, Sophie struggled to comply to one-step commands, unless she was physically assisted by her parent.

In addition to Sophie's developmental challenges, she also was unbalanced and clumsy compared to typical children her age. The clinician noted that she seemed unaware and uninvolved with her surroundings. Ms. Thomas even stated that she was "in her own little world at times." She was not potty-trained at the time of intake.

Sophie was diagnosed with a genetic disorder later on in treatment. After receiving this diagnosis, Sophie's parents received genetic counseling and developed a greater understanding of Sophie's cognitive and developmental abilities. Due to these deficits, standard PCIT was modified and PCIT-T was utilized.

In PCIT-T, Ms. Thomas was coached to praise, describe, and reflect when Sophie was playing gently, carefully, slowly, and using soft touch during interaction with others to decrease reported aggressive behaviors. Parallel play and proximal praise between Sophie and her parent was utilized to promote listening, gentle touches, and sharing. A stuffed animal, "Mr. Bear," was used to demonstrate these skills to Sophie at the start of treatment. Specifically, Sophie's emotional outbursts were handled in PCIT-T by coaching Ms. Thomas to come in close to Sophie, label Sophie's emotional state, provide understanding of her frustration, and offer support and help in problem solving (Girard et al., 2018). Ms. Thomas was then prompted to redirect Sophie and to immediately reengage and praise her for playing calm while using an excited and highly animated praise. She was encouraged to continuously remind Sophie throughout treatment that if she needed help to state "help please," to praise when Sophie attempted to verbalize "help please," and to rub her back to reinforce approval for using her words. Ms. Thomas was coached to address Sophie's physical needs first (e.g., fatigue, hunger, illness) prior to engaging in any selective attention for attention seeking behavior.

After four sessions of PCIT-T, Ms. Thomas felt that she was able to meet Sophie's emotional needs by providing her with understanding during frustrating tasks (i.e., emotional labeling, physically coming in close and calm to Sophie). Ms. Thomas was able to help Sophie communicate her needs and maintain a greater sense of support through scaffolding and teaching Sophie how to communicate with words. The coaching techniques of PCIT-T helped Ms. Thomas to be a role model for her daughter Sophie as she practiced appropriate emotional responses to frustrating situations. Ms. Thomas became more confident over time with her ability to handle difficult situations and comfort Sophie during Sophie's emotional melt downs. Ms. Thomas also was more likely to engage Sophie in new activities that used to lead to a tantrum that she "[didn't] know how to handle…" Eventually, Ms. Thomas was able to successfully transition to standard PCIT CDI sessions. She incorporated the skill of selective attention after feeling confident in her ability to distinguish between Sophie's emotional melt down and attention seeking misbehavior.

Sophie often utilized only babbling or gestures to indicate what she wanted when interacting with Ms. Thomas. The therapist coached Ms. Thomas to describe what Sophie was doing which allowed Sophie to connect specific words to her behaviors, to increase her vocabulary, and to increase her recognition of certain noises. For example, Ms. Thomas would often describe the toy Sophie was playing with and the associated sound the toy made such as: "You're driving the car. Vroom, vroom," or "You've got the cow. Moo, moo." In addition, due to Sophie's limited vocabulary, Ms. Thomas was encouraged to use short-term phrases when praising or describing such as: "Good sharing," or "Good job looking at me." Ms. Thomas also would label everything Sophie was doing. Once, when Sophie wanted to sit in her booster seat, Ms. Thomas stated, "You're pointing to sit, sit, sit. I'm going to sit." Sophie responded by clapping to indicate her approval. Ms. Thomas then responded by saying, "You're clapping. Clap, clap, clap."

Although Sophie's speech was limited (e.g., babbling) , Ms. Thomas was coached to reflect all of Sophie's speech to acknowledge Sophie and encourage her to try more words that Ms. Thomas was utilizing. In addition to modeling language, Ms. Thomas practiced modeling positive behaviors such as soft touches. Ms. Thomas accomplished this by placing her hand over Sophie's hand to first touch Ms. Thomas softly and then touch Sophie softly, while saying, "good soft touches." Lastly, Ms. Thomas showed her approval of Sophie's appropriate behavior through imitation and enthusiasm (e.g., walking around the room in a circular motion while Sophie did the same).

38.1.3.1 Ms. Thomas Met Mastery During the Fourth CDI Session

After attaining Parent-Child Interaction Therapy-Toddlers (PCIT-T): CDI-T phase mastery, the family then transitioned to the PDI phase of treatment. Due to Sophie's limited developmental abilities however, modifications to standard PDI were necessary. PDI-Toddlers strategies were implemented for seven PDI-T sessions to teach listening and learning skills prior to starting standard PDI. Specifically, due to Sophie's slow comprehension abilities, she was given several opportunities to comply to her mother's simple direct commands. Moreover, when Ms. Thomas stated a direct command, she had to accompany the command with a visual prompt. For example, when Ms. Thomas stated, "Please give Mommy the cow," Ms. Thomas repeatedly pointed back and forth to the cow and her open hand. Sophie was then given 5 s to process the command while Ms. Thomas continued to provide the visual pointing prompt. If Sophie did not comply, her parent was coached to repeat the same direct command a second time adding a *"show"* step (i.e., "Give Mommy the cow like this," while showing Sophie how to complete the task). This was again followed by a 5 s silent pause. If Sophie still did not comply, Ms. Thomas was instructed to state *"*Your turn*"* (labeled as a *"try again"* step) and repeat the direct command followed by a 5 s pause for compliance. If the demonstration and prompt of "your turn" still did not result in compliance, the final step in teaching listening skills was for Ms. Thomas to *"help"* Sophie complete the task. Ms. Thomas would state, "Mommy will help you," while using a hand–over-hand intervention. Sophie's mother would then place her hand on top of Sophie's hand, together picking up the toy cow and placing the object in Ms. Thomas's other hand. Upon completion of the task, Ms. Thomas would then provide a behavior description such as, "That's giving Mommy the cow." Ms. Thomas was also coached to provide Sophie a labeled praise for compliance to the command at any stage prior to the hand-over-hand technique. The PDI-T sequence to teach listening of Tell-Show-Try Again-Guide are provided by Girard et al., (2018).

Sophie continued to struggle with physical aggression throughout treatment. To address this in PDI, an automatic timeout for hitting was implemented. During modified PDI, the timeout chair length began with 2 min. Time in the chair gradually increased to the standard length stated in PDI protocol (i.e., 3 min plus 5 s of silence). It is noteworthy that at school, the standard school protocol was to set a timer to 3 min for thinking time. Sophie would sit at a table during this time with an Instructional Assistant who monitored Sophie's completion of timeout. Sophie was able to accomplish this regularly. When the 3 min timer rang, Sophie was allowed to rejoin the rest of the class. The family successfully accomplished PDI with the time-modified protocol.

To reinforce the skills learned in PDI and to help the skills generalize to the home environment, the therapists attended a visit to the family's home. The visit allowed the therapists to help problem solve with the family how to conduct the timeout sequence effectively and safely given the home structure. Ms. Thomas then was able to conduct the timeout sequence without any concerns within her home. After attending a total of 25 sessions (i.e., 4 PCIT-T sessions, 4 CDI-Coach sessions, 7 modified PDI-T sessions, and 10 standard PDI sessions), Sophie's problem behaviors reduced significantly and Ms. Thomas felt confident in handling Sophie's behavior difficulties in the future.

38.2 Results

38.2.1 Overview

Sophie and her mother successfully graduated from PCIT, while first learning skills utilized in PCIT-T and then progressing to standard PCIT. PCIT-T provided Sophie and Ms. Thomas an opportunity to improve their relationship. Ms. Thomas would engage in floor play where toys were on the floor or low cabinet. Ms. Thomas would then use PCIT's PRIDE skills. Ms. Thomas was able to express enjoyment during this time while imitating Sophie's play. In addition, Ms. Thomas worked on reflecting Sophie's speech, despite Sophie's difficulty with speech clarity. After reflecting Sophie's verbalizations, Ms. Thomas would then state the correct word Sophie was trying to say in an effort to increase Sophie's vocabulary.

Due to Ms. Thomas reporting that Sophie continued to be noncompliant and physically aggressive toward family members, the PDI phase of treatment focused on reducing the presence of aggressive behavior. Importantly, PDI was modified to address Sophie's limited capacities by first introducing PDI-T techniques. These techniques included the direct command sequence of telling, showing, try again, and help (guided with a hand-over-hand intervention) to reinforce listening and learning behavior. Once Sophie understood what was expected of her when given a direct command, standard PDI procedures were implemented. The only modification she received during the standard PDI sequence was starting out with shorter time in the timeout chair (starting at 2 min, gradually increasing to 3 min plus 5 s of silence). Ms. Thomas continued to express concerns about Sophie's physical aggression which led to the behavior being addressed as a "house rule." A total of ten standard PDI sessions were coached.

Sophie was able to successfully graduate from PCIT. Ms. Thomas reported a decrease in physical aggression, increase in compliant behavior, and an increase in Sophie's ability to express needs, such as "help please" and "thank you."

38.2.2 Measures

Ms. Thomas completed the Eyberg Child Behavioral Inventory, Child Behavior Checklist, and Parenting Stress Index measures three times during treatment: pretreatment, mid-treatment, and posttreatment.

38.2.2.1 Eyberg Child Behavior Inventory (ECBI)

The ECBI is a 36-item parent-rating scale used to assess both the frequency of child disruptive behaviors and the extent to which the parent finds the child's behavior problematic (Eyberg & Robinson, 1983). The Intensity scale assessed the frequency which Sophie displayed specific behaviors. The Problem scale assessed whether Ms. Thomas considered the behavior a problem. If the *T*-score exceeded 60, it was a clinically significant concern. Scores below 60 were within normal range. Intensity scores higher than 131 (raw scores cutoff for clinical significance) indicate a greater level of conduct behavior.

As illustrated in Fig. 38.1, Sophie's initial Intensity score in pretreatment presented within at-risk for clinical significance with a *T*-score of 58. At mid-treatment, the Intensity score increased by 10% to a *T*-score of 64. This increase in Intensity may be explained by Ms. Thomas underreporting due to her increased awareness of Sophie's disabilities over time. During pretreatment, however, the Problem scale was clinically significant. Again, it could be attributed to Ms. Thomas being aware that these behaviors were an issue, but nonetheless normalizing the intensity of Sophie's daily interactions. Intensity scores decreased by 21% and Problem scores decreased by 40% from mid-treatment to posttreatment. Given this, Sophie's Intensity and Problem scores presented within normal limits at posttreatment. Importantly, from pretreatment to posttreatment, Intensity scores and Problem scores decreased by 14% and 36%, respectively. Sophie's level of Intensity and Problem scores were both within normal range during posttreatment.

38.2.2.2 Dyadic Parent-Child Interaction Coding System—Fourth Edition (DPICS-IV)

The DPICS-IV is a coding system to measure specified behaviors used with a child during a structured behavioral observation. Verbalizations and behaviors measure such things as PCIT's PRIDE skills (e.g., praises, reflections, behavioral descriptions, commands, critical statements) as well as child behaviors (e.g., compliance to commands; McNeil & Hembree-Kigin, 2010b).

Figure 38.2 illustrates a significant increase in caregiver's "Do Skills": labeled praises, behavioral descriptions, and reflections from pretreatment to posttreatment. It also shows a decrease in "Don't Skills": questions, commands, negative talk from pretreatment to posttreatment.

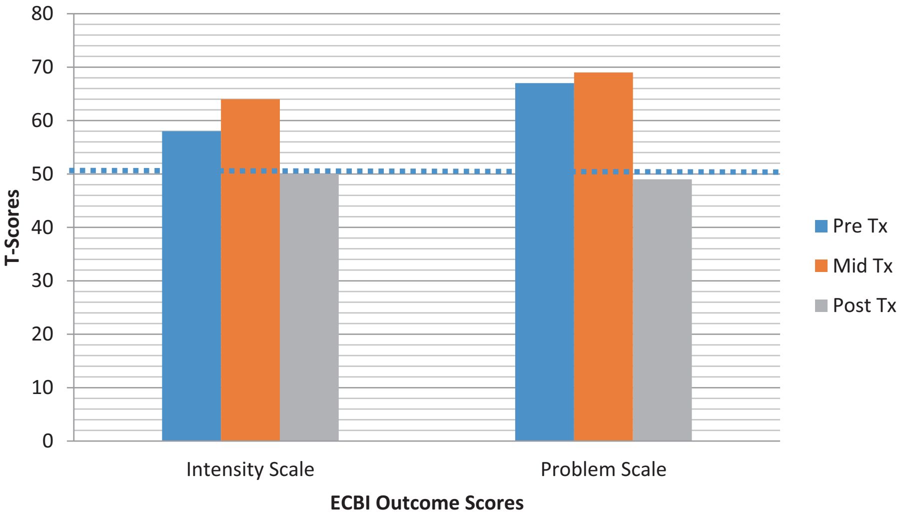
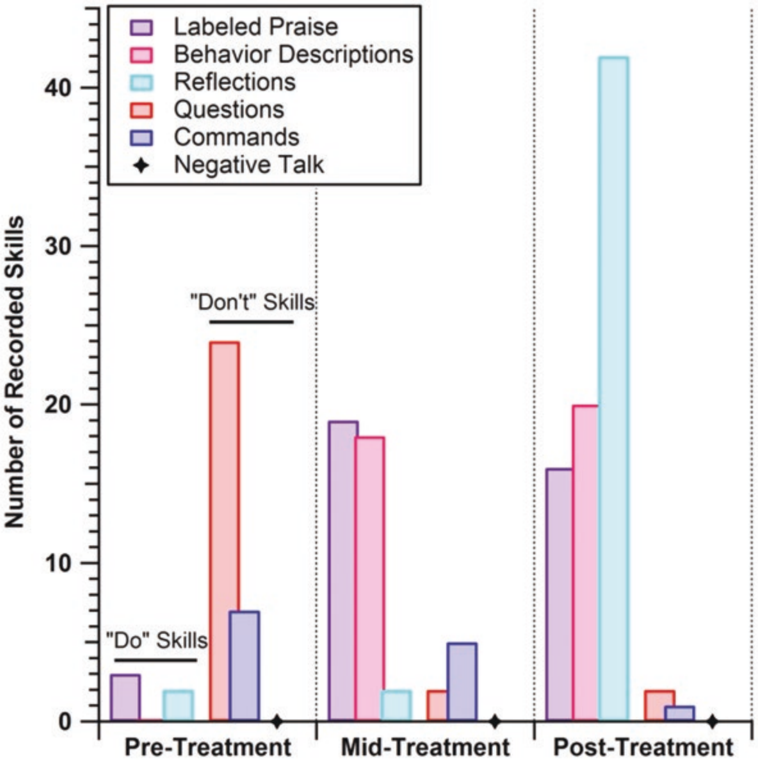


Fig. 38.1 Outcome data from the Eyberg Child Behavior Inventory (ECBI)

Fig. 38.2 Outcome data from Dyadic Parent-Child Interaction Coding System—Fourth Edition (DPICS-IV)



38.2.2.3 Child Behavior Checklist (CBCL)

Child Behavior Checklist (CBCL) is a parent-report measure used to assess a child's externalizing behaviors and internalizing emotions. Scales included both the Internalizing scale (subscales = Emotional Reactive, Anxious/Depressed, Somatic Complaints, Withdrawn) as well as the Externalizing scale (subscales= Attention Problems, Aggressive Behaviors). If a *T*-score exceeds 65, it is identified as being clinically significant (Achenbach & Rescorla, 2000, 2001) (Fig. 38.3).

During pretreatment, the Withdrawn subscale for the Internalizing scale was identified as being within the clinically significant range (with a *T*-score above 65). Oppositional defiant problems and aggressive behavior were also identified to be clinically significant. Scores from mid-treatment identify a decrease in the Withdrawn subscale for the Internalizing scale from pretreatment to a *T*-score within the borderline range of clinical concern. During posttreatment, the Withdrawn subscale of the Internalizing scale significantly decreased from pretreatment, as it fell within normal range. Aggressive Behaviors and Oppositional Defiant Behaviors subscales also significantly decreased and fell within the normal range. Some scales remained in the clinical range. This finding is not surprising given Sophie's comorbid diagnoses. Even still, Ms. Thomas felt able to handle aggressive behaviors when they occurred with confidence and no longer felt intimated to set limits. Ms. Thomas's reports on the CBCL indicated that there was a significant decline in Sophie's externalizing and internalizing problems from pretreatment to posttreatment as her symptomology was rated as within normal limits.

38.2.2.4 Parenting Stress Index (PSI)

The PSI is a 36-item cognitive/affective measure with a validity check (parental defensive responding) on parental-reports of Parental Distress, Parent-Child Dysfunctional Interaction (PCDI), and perceptions of a Difficult Child. Child and

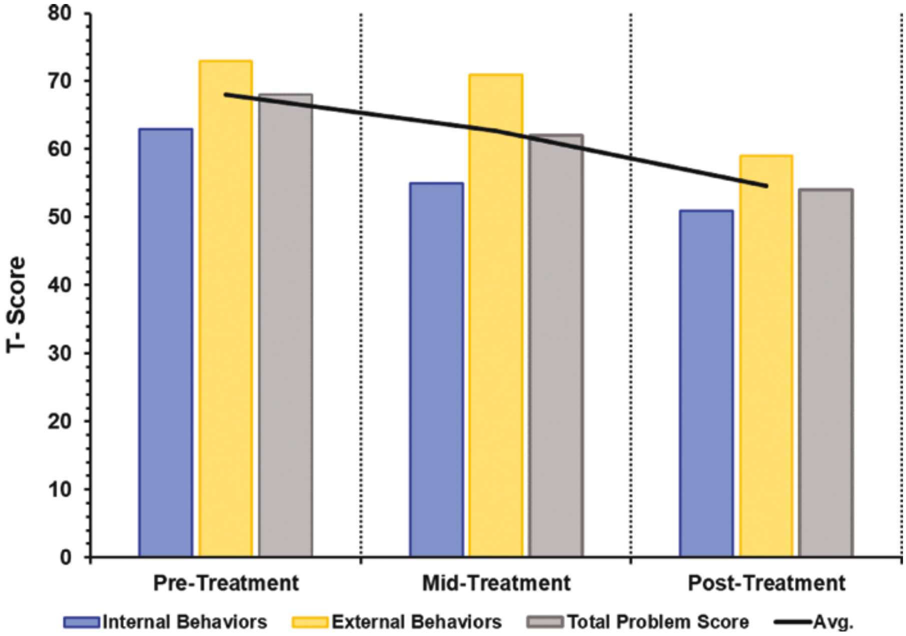


Fig. 38.3 Outcome data for the Child Behavior Checklist (CBCL)

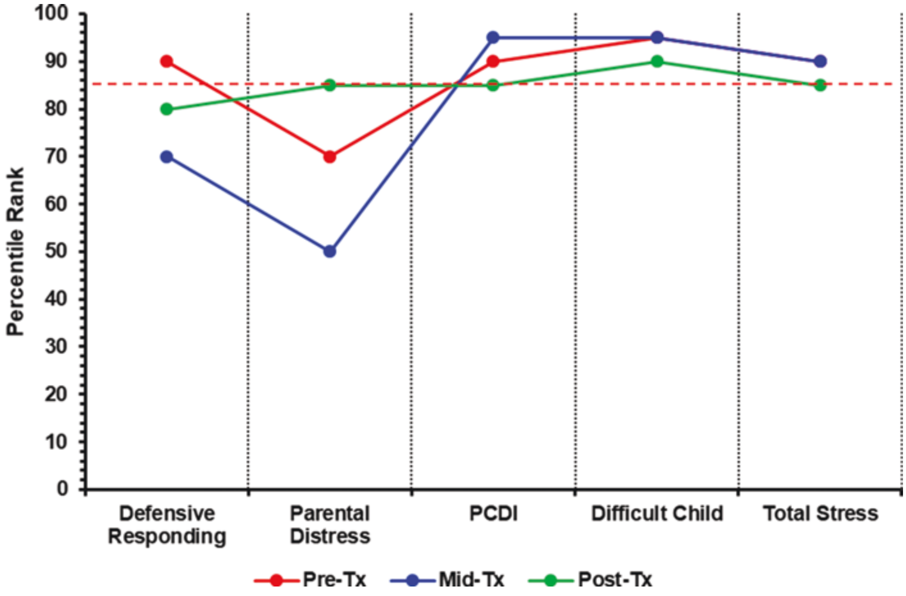


Fig. 38.4 Outcome data for the Parental Stress Index (PSI)

parent domains combine to form the Total Stress score. The clinical cutoff is 85% (Abidin, 2012) (Fig. 38.4).

Ms. Thomas presented within the normal range for Parental Distress from pretreatment to posttreatment. Still, her Parental Distress decreased overall from pretreatment to posttreatment. Importantly, Ms. Thomas had elevated levels of Defense Responding at pretreatment that decreased at posttreatment.

Despite this response concern, Parent-Child Dysfunctional Interaction, Difficult Child, and Total Stress continued to be in the clinically significant range throughout treatment. This level of stress is not uncommon given Sophie has a lifelong disability and her behaviors will continue due to her level of functioning. Even still, Ms. Thomas now has consistent strategies to handle the behaviors that arise. The intensity in reported scales, however, did decrease from pretreatment to posttreatment.

38.2.3 End of Treatment

Ms. Thomas provided a testimonial at the end of treatment in which she stated, "Just [Sophie's] listening before – it was hard. We were going through it every day and she was having temper tantrums every time she had to do something that she did not want to do. Now I feel that I am conscious of all the tools available to help [Sophie]. Now I'm more patient and not worried about every little thing that she is doing. It's a lot less stressful."

38.3 Discussion

Outcomes from the ECBI Intensity Scale, DPICS, CBCL, and PSI indicated that treatment improved Ms. Thomas and Sophie's interaction, increased Ms. Thomas's positive parenting skills, decreased her level of stress (although she still struggled with this at the end of treatment), and decreased Sophie's internalizing and externalizing problem behaviors. Findings in the ECBI were aligned with findings outlined in the PSI that showed an increase in child's difficult behaviors during mid-treatment, and a decrease in difficult behaviors during posttreatment.

Alao (1981) discussed Piaget's contribution to the understanding of the child in his theory of intellectual development, and that he viewed the course of intellectual development in terms of progressive changes in cognitive structures (Alao, 1981). Piaget's four stages of cognitive development include the Sensorimotor period (0–2 years), Preoperational period (2–7 years), Concrete operations (6 or 7–11 or 12 years), and Formal operations (11 or 12 years onwards) . Due to parental concerns and clinical concerns pertaining to Sophie's developmental level being under 24 months of age, tailoring provided additional precautions to ensure Sophie understood her mother's verbalizations while enhancing the parent-child relationship. According to Piaget's stages of cognitive development, during the Sensorimotor stage, children use their senses and their motor skills, and learn object permanence. During the Preoperational stage, children represent things with words and images (Alao, 1981). Sophie presented with limited language skills, poor balance and coordination, and received a number of additional services (i.e., occupational, speech, and physical therapy) while participating in PCIT. Given Sophie's development, she fell within the Sensorimotor stage. Therefore, PCIT-T treatment focused on incorporating appropriate toy selection such as musical toys, cause-and-effect toys (e.g., toys with push buttons and pop up objects), and mirror play for Sophie to see mimicking behavior. In addition, the clinicians actively coached Ms. Thomas to use verbal animation with tone inflections, sing song style of speaking, and facial animation to model and imitate appropriate feelings and facial expressions.

Modeled off research findings by McDiarmid and Bagner (2005), Ms. Thomas was coached to praise, describe, and reflect Sophie's speech while using short, concrete, and repetitive verbalizations. Ms. Thomas was also taught to demonstrate positive physical touch (e.g., rubbing and patting Sophie on the back) when Ms. Thomas praised Sophie for using gentle and soft touch. The purpose of the gentle touches was to reduce Sophie's emotion dysregulation and aggressive behavior. Ms. Thomas learned how to utilize increased enthusiasm in her tone of voice during "Do Skills" and then was coached to use a neutral tone of voice when giving direct commands during the PDI phase of treatment. This contrast was emphasized due to Sophie's difficultly with differentiating when Ms. Thomas was giving her a command. Ms. Thomas was also coached to smile and laugh when Sophie did to teach Sophie appropriate interaction and behaviors. Therapists coached Ms. Thomas to reflect Sophie's speech and describe what she was doing or what she wanted as she pointed. In addition, Ms. Thomas focused on increasing Sophie's use of two-word sentences to expand her vocabulary. Ms. Thomas was further coached to highlight when Sophie complied to commands and to praise her for listening. Ms. Thomas learned how to frequently reflect and describe when Sophie was using her words to say things such as "help please," "open," "close," or "sit" which assisted Sophie in increasing her vocabulary as well as increasing her feelings of being heard and understood.

Clinical experience suggests that children with a developmental disability respond to PCIT with the same amount of success compared to typically developing children (Bagner & Eyberg, 2007). The outcome of this study may indicate that future clients with developmental disabilities (e.g., autism spectrum disorder, co-occurring developmental concerns) may benefit from adaptations of the PCIT-T model to provide developmentally appropriate interventions, as needed.

38.4 Conclusions and Study Limitations

At the conclusion of treatment, Sophie's behavioral concerns were rated within normal limits, she no longer met criteria for services in post-treatment measures (i.e., ECBI, CBCL), and her mother reported a substantial decrease in her own stress level, as well as an increase in positive parenting skills. In sum, this study supports future research in using PCIT-T with children who have comorbid developmental disabilities and disruptive behaviors.

There are study limitations that warrant attention and suggest possible avenues for future research. The lead therapist (first author) was unable to receive school testing which would have provided Sophie's developmental age; thus, treatment tailoring occurred based on a clinical estimate of Sophie's ability and Ms. Thomas's self-report of school testing records. Further, there is an absence of follow-up data posttreatment to further assess and evaluate how long skills continued to be utilized by Ms. Thomas and be effective in behavior management.

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39

Parent-Child Interaction Therapy for a Child with Autism Spectrum Disorder: A Case Study Examining Effects on ASD Symptoms, Social Engagement, Pretend Play, and Disruptive Behavior

Corey C. Lieneman, Mary M. Ruckle,
and Cheryl B. McNeil

Abstract

Recent studies have highlighted the efficacy of PCIT with children diagnosed with autism spectrum disorder (ASD) for decreasing disruptive behavior (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Zlomke, Jeter, & Murphy, 2017); however, little research has examined the impact of PCIT on social engagement or other symptoms of ASD. The current case study used the Gilliam Autism Rating Scale (GARS-3; (Gilliam, 2014), the Dyadic Parent-Child Interaction Coding System (DPICS; Eyberg, Nelson, Ginn, Bhuiyan, & Boggs, 2013), the Eyberg Child Behavior Inventory (ECBI; Eyberg & Pincus, 1999), a social preference assessment, and other novel observational coding schemes. These measures were used to assess the effects of PCIT on child social engagement (i.e., words spoken, eye contact, proximity-seeking, physical touch), pretend play, total ASD symptoms, behavior problems, and caregiver skills, with a child on the autism spectrum. Over the course of treatment, "Charlie," a 5-year-old Caucasian male, and his mother, showed significant improvements in ECBI Intensity and Problem Scores, caregiver skills, and some measures of child compliance. Observational measures of ASD symptoms demonstrated improvements in pretend play and social engagement (verbalizations, physical touch, and proximity to caregiver). Two other observational measures of social engagement (child eye contact and unique verbalizations) showed potential improvements, but a caregiver-report of total ASD symptoms showed no difference. Results of the study may inform future tailoring or adaptations of PCIT for the unique needs of children with ASD.

The Centers for Disease Control estimates that by 8 years of age, 1 in 59 children will be diagnosed with autism spectrum disorder (ASD), a developmental disorder that affects social and cognitive processing (Baio et al., 2018; CDC, 2014). Because this disorder is so prevalent, it is crucial that researchers design, develop, and

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increase access to effective interventions for individuals with ASD. Currently, some established treatments for ASD based on Applied Behavior Analysis (ABA), such as Early Intensive Behavioral Intervention (EIBI), can be financially prohibitive, time-consuming, and inaccessible to many families of children with ASD (Green, 1996; Lovaas, 1987).

Parent-Child Interaction Therapy (PCIT; Eyberg, Nelson, & Boggs, 2008; McNeil & Hembree-Kigin, 2010) is an evidence-based treatment for disruptive behaviors in children ages 2–6 years that has shown promising results when treating children with ASD (Ginn, Clionsky, Eyberg, Warner-Metzger, & Abner, 2017; Zlomke, Jeter, & Murphy, 2017). It has been suggested that PCIT could be used as a supplement or precursor to other interventions to decrease problem behaviors associated with autism and increase functional behaviors including compliance (Masse, McNeil, Wagner, & Chorney, 2007). Because PCIT typically requires significantly fewer hours of treatment (i.e., 16–20, 1-h sessions) as compared with ABA-based treatments (20–40 h per week for several years commonly recommended), PCIT may be a viable alternative for many families without access to established treatments for ASD. Further, behavioral caregiver skills acquired in PCIT may be easily adapted to target improved language and social skills in children with ASD.

39.1 Purpose of the Present Study

Using PCIT for a child with ASD and significant disruptive behavior problems, this study investigated changes in a number of variables relevant to children with ASD. It was hypothesized that the participating child's social engagement (i.e., proximity to mother, eye contact, words spoken, and physical touch) and pretend play would improve from pre- to posttreatment. Improvements in child disruptive behavior, child compliance, caregiver skills, and total ASD symptoms were also expected. Findings from this study were intended to augment the literature concerning effective therapies for children with ASD and to inform modifications to PCIT for this population.

39.2 Method

39.2.1 Participants

The participating family was recruited from the local community for involvement in research. To be eligible for the study, the child had to have been between 2 and 7 years of age, be previously diagnosed with ASD, have clinically significant behavior problems, and have the ability to verbalize ten or more words independently. The participating caregiver had to have been at least 18 years of age and have had primary custody of the participating child. The participating child, "Charlie," was a 5-year-old Caucasian boy from a middle-income family living in a medium-sized town. Charlie turned five during the Child-Directed Interaction portion of the study and had been attending preschool for about 2 years. Mrs. Brown, Charlie's mother, was a married, Caucasian female who worked as a stay-at-home mother and had some college education. Charlie's father (Mr. Brown) and Charlie's teenage sibling also lived in the home.

39.2.2 Setting

The initial interview took place in a behavioral health clinic. Following consent procedures, the family was offered the choice to receive treatment in the home or clinic. The family chose to participate in in-home PCIT, but several sessions were conducted in the clinic. These included CDI and PDI teach sessions, to minimize distractions, the first two PDI sessions, to increase environmental control, and sessions involving public behavior and strangers, to provide opportunities to engage with others outside of the family.

39.2.3 Measures

39.2.3.1 Dyadic Parent-Child Interaction Coding System (DPICS)

The DPICS (Eyberg et al., 2013) is a behavioral observation scheme used to measure child compliance and caregiver behaviors/verbalizations. During DPICS coding, a therapist prompts the caregiver to engage with the child in three 5-min situations (Child-Led Play, Parent-Led Play, and Clean-Up). Reliability and validity of the DPICS have been established (Eyberg et al., 2013). Interobserver reliability for DPICS coding was calculated for 73% of sessions with 74% coded live and 26% coded from videotape. The average interobserver agreement for DPICS coding of all behaviors during Child-Led Play across all observation and treatment sessions was 81.5%. Alpha compliance percentages, the number of commands with which the child complied divided by the number of commands with which the child had the opportunity to comply, were calculated in this study.

39.2.3.2 Eyberg Child Behavior Inventory (ECBI)

The ECBI (Eyberg & Pincus, 1999) is a 36-item caregiver-report inventory of child behavior. Caregivers rate the estimated frequency of their child's engagement in each listed problem behavior (e.g., "Refuses to go to bed on time.") on a seven-point Likert-type scale ranging from "never" to "always." Caregivers also circle "yes" or "no" for each item to indicate if the behavior is problematic. The ECBI yields an Intensity Score and a Problem Score. The ECBI has demonstrated adequate validity and reliability (Eyberg & Pincus, 1999).

39.2.3.3 Gilliam Autism Rating Scale, Third Edition (GARS-3)

The GARS-3 (Gilliam, 2014) is 56-item caregiver-report behavior inventory used to measure autistic behavior of individuals ages 3–22 years. The GARS-3 is comprised of six subscales: Restrictive and Repetitive Behaviors, Social Interaction, Social Communication, Emotional Responses, Cognitive Style, and Maladaptive Speech. This inventory reflects diagnostic criteria for ASD from the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-5). The GARS-3 has demonstrated adequate reliability and validity (Gilliam, 2014).

39.2.3.4 Pretend Toy Play

This novel pretend play coding scheme was designed to code for different types of play (i.e., no toy play, nonsymbolic toy play, and pretend toy play). Pairs of coders, blind to each other's scores and to the child's scores on other measures, watched the 5-min segments of Child-Led Play from each session and coded play in 30-s intervals. For each 30-s interval, toy play was coded for the highest level of play in which the child engaged from lowest to highest: no toy play = 0, nonsymbolic toy play = 1, pretend toy play = 2. A coding designation for no toy play (0) indicated that the child was not playing with toys (e.g., not attending to objects, looking at objects without acting on them) during that 30-s period. Any type of toy play that did not involve pretending was coded as nonsymbolic play (1); e.g., piling and stacking objects, spinning, tossing, or banging objects with no clear non-stimulatory purpose). Finally, the pretend toy play code (2) was designated for toy play that involved some type of imaginary component. For example, building a structure while describing it as a house, manipulating animal figurines to simulate chasing or climbing, or pretending to feed a play partner with toy food. Therefore, the lowest possible score for any 5-min period was 0 (i.e., 10 consecutive 30-s periods with no toy play), and the highest possible score for any 5-min period was 20 (i.e., 10 consecutive 30-s periods each including pretend toy play).

39.2.3.5 Social Preference Assessment

In this novel observational measure, researchers placed two sets of identical toys (i.e., magnetic tiles) on opposite sides of the living room with tape on the floor, dividing the room into two halves. After directing the child's mother to sit next to one of the toy sets, researchers instructed her using the following script:

> Please, sit quietly with this toy. You should not interact with the toy until Charlie has begun to play with it on your side. Do not speak to Charlie or coerce him in any way unless he has spoken to you. If you are asked a question by Charlie, you may answer in one to two words. If Charlie comes near you, you may play with the toy, still remaining quiet. You may touch Charlie if he is within arm's reach.

Researchers varied which side of the room Mrs. Brown sat on during different observations to control for the child's potential preference of room side. Next, a researcher instructed the child by reading the following script:

> Stand on this line. You get to play with some toys now. Mom will be on this side with the magnetic tiles, but the same set of magnetic tiles will be on this side all by itself. Both sets of magnetic tiles are exactly the same. My friends and I are going to be watching you play, but you can pretend like we are not in the room. Pick one side.
>
> For the subsequent 5-min period, researchers coded for the following variables:

Eye Contact

A single tally mark reflected each instance of eye contact, defined as the child's gaze meeting the caregiver's gaze for at least 1 s.

Physical Touch

A single tally mark reflected each instance when any part of the child's body touched the caregiver's body. Sustained touches, those lasting longer than 1 s without separation, were coded as only one instance of physical touch. Therefore, a high-five counted for one tally and lap-sitting for 1 min counted for one tally.

Proximity

Researchers coded the amount of time the child spent on each side of the room (i.e., the side with the toys alone or the side with the mother and toys) as defined by the side of the tape on which more than 50% of his body was located at any given time.

Language Coding

Video tapes of each social preference assessment were transcribed. Researchers coded the total number of words spoken by the child. In addition, the number of unique words, defined as those words not already spoken during the 5-min period, was also tallied. Unique words were measured to account for potential echolalia and/or perseverative speech. For example, "cars go fast" counted as three total words and three unique words while "go cars go" counted as three total words and two unique words.

39.2.4 Assessment Procedures

At the initial interview, Mrs. Brown completed an ECBI and a GARS-3. Before beginning PCIT, researchers conducted five observation sessions in the home to establish baseline measures of behavior. Mrs. Brown completed an ECBI at each observation and PCIT treatment session. At mid-treatment, the session following CDI mastery, researchers conducted one observation session, and Mrs. Brown completed a GARS-3. At post-treatment, following PCIT graduation, researchers conducted five observation sessions, and Mrs. Brown completed a GARS-3.

39.2.4.1 Observation Sessions

During these sessions, Charlie and Mrs. Brown participated in the 5-min social preference assessment procedure followed by typical DPICS coding of Child-Led Play, Parent-Led Play, and Clean-Up. Researchers observed from the next room in the family's home and provided caregiver prompts during DPICS coding through a mobile bug-in-the-ear system.

39.3 Treatment

A clinical child psychology doctoral student certified in PCIT delivered PCIT according to the 2011 Protocol (Eyberg & Funderburk, 2011) with weekly supervision from a PCIT Master Trainer. All therapy sessions were video-recorded.

39.3.1 Presenting Problem and Case History

Mrs. Brown sought treatment due to problems with Charlie's aggressive, disruptive, and destructive behaviors and noncompliance. At intake, Mrs. Brown reported that Charlie frequently threw things, screamed, hit, whined, bit himself and others, ran away from caregivers in public, banged his head against objects, and broke objects (e.g., the television). She explained that these behaviors had been problematic for the past 2–3 years and occurred when Charlie became frustrated or was asked to do something he did not want to do, especially when tired. Mrs. Brown was also concerned with Charlie's safety. The family used a handicapped parking pass to facilitate quick entry to businesses as Charlie had a history of running from his caregivers in parking lots, heedless of danger. Charlie also wore an ankle monitor provided by Project Lifesaver, a program run with the help of the local police department. This monitor was intended to provide location tracking and rescue services in the event that Charlie became lost. Charlie wore the monitor due to his history of wandering away from home toward a nearby highway.

Charlie had been diagnosed with autism spectrum disorder, level two, by a psychologist at the age of 27 months. He was referred to that evaluation due to concerns about his language development, limited responses to others, and lack of pointing to items of interest. He received speech therapy, occupational therapy, and developmental specialist services (e.g., sensory and large motor skill development) beginning at the age of 26 months. At 27 months of age, Charlie was not using language to communicate at all, used limited social gestures, and rarely responded to his name. At that time, Charlie also showed some sensory-seeking and repetitive behaviors, such as flipping book pages near his eyes, saying "eee," and spinning. He was assessed via EEG for the presence of seizures as indicated by short staring spells, but there was no evidence of seizures. Charlie's medical history was unremarkable. Mrs. Brown stated that Charlie had met all motor developmental milestones on time. Charlie had a history of some difficulty falling and staying asleep. Mrs. Brown had reported Charlie eating a somewhat limited diet in toddlerhood based on his preferences of carbohydrate-heavy foods and drinkable yogurts. Prior to age 3, Charlie was also diagnosed with global developmental delay, speech delay, expressive delay, and sleep/eating disorders.

39.3.1.1 Current Functioning

Charlie presented as a happy, affectionate boy. He displayed limited eye contact which only occurred when Charlie initiated it himself. His social interactions also followed this pattern as Charlie largely ignored bids for attention by others but enjoyed interacting when he had initiated the interactions. For example, Charlie did not respond to therapists' greetings upon entry to the home but often asked therapists to play toys with him in his room shortly after arrival. Charlie appeared to be on-target or advanced for his age with letters and numbers in writing, spelling, and reciting aloud. Mrs. Brown reported that Charlie had several restricted/repetitive interests including earthquakes, storms, roads signs and wet floor signs, and number writing, about which he would ask repetitive questions and spend much of the day discussing or engaging in related activities. Charlie enjoyed several self-stimulatory behaviors like hand-flapping, jumping, spinning, running, making noises, and being tickled. At baseline administration of the GARS-3, Mrs. Brown's score indicated that Charlie was functioning at level three in severity of autism symptoms.

Charlie took melatonin (10 mg) nightly for sleep as well as Hydroxyzine and Singulair for allergies. Mrs. Brown explained that Charlie typically slept well but would awaken for the day around 3:00 or 4:00 am on occasion. She described Charlie as somewhat of a picky eater, estimating that he would eat around 20 different types of foods but was particular about food texture.

39.3.2 Child-Directed Interaction (CDI)

Mrs. Brown attended the CDI teach session in the clinic alone. Mr. Brown did not participate in therapy sessions due to his work schedule but implemented some of the PRIDE skills with Charlie via Mrs. Brown's teaching. CDI was coached in the Brown's home twice weekly for ten sessions until Mrs. Brown reached CDI mastery. Homework compliance was high with Mrs. Brown returning homework sheets reflecting more than 95% completion rates for daily CDI practice. Mrs. Brown quickly learned the concept of ignore and redirect, implementing it effectively with Charlie's negative attention-seeking behaviors during special playtime (e.g., throwing toys). During CDI, Mrs. Brown was coached to reflect, imitate, and describe Charlie's repetitive and self-stimulatory behaviors. This seemed to increase his social engagement and the reinforcing value of his mother's attention; however, Mrs. Brown elected not to reflect the noises (e.g., "eee") that she found irritating. Mrs. Brown was also encouraged to emphasize praising social skills, particularly playing with toys "the right way" (e.g., driving cars as opposed to lining them up), making eye contact, and pretending, as these skills had potential to help Charlie connect better with other children.

Charlie often got up and ran around the room unexpectedly during CDI sessions. This behavior decreased markedly when Mrs. Brown learned to ignore it and praise Charlie for returning to play with her. Because several of Charlie's behaviors were thought to have the potential to decrease future social interactions with other children (e.g., getting up and running around the room sporadically, writing numbers repetitively), Charlie was taught to ask for permission to engage in these behaviors. Mrs. Brown periodically reminded Charlie that if he would like to run around or write numbers, all he had to do was ask. Mrs. Brown was advised to grant Charlie permission to engage in these behaviors and to praise his asking permission. From pre- to posttreatment, these behaviors diminished and ultimately ceased during CDI practice sessions.

Between CDI coach sessions two and three, Mrs. Brown recounted that Charlie had thrown the family's new puppy, breaking the dog's leg. Mrs. Brown believed that Charlie had not understood the potential for pain or injury caused by his actions and had simply wanted to help the dog get outside. She also explained that Charlie frequently treated the dog roughly and that the family's previous dog had been afraid of Charlie. Therapists showed Charlie the difference between gentle and hurtful touches, allowing Charlie to practice using stuffed animals. Mrs. Brown was encouraged to provide copious prompts, enthusiasm, and praise for Charlie's gentle touches throughout the week. Within the first 2 weeks of frequently reinforcing these skills, Mrs. Brown reported that she no longer needed to supervise Charlie with the dog, and Charlie demonstrated gentle touches with the dog 100% of the time.

39.3.3 Parent-Directed Interaction (PDI)

Following CDI mastery and the mid-treatment observation session, Mr. and Mrs. Brown attended a PDI teach session in the clinic. Both parents were open to the PDI principles and optimistic that they would work with Charlie. Mr. Brown did not attend any future sessions but implemented PDI skills in cooperation with Mrs. Brown at home. Mrs. Brown and Charlie were coached in 11 PDI sessions. Because Charlie was large for his age, PCIT time-out procedures were modified to avoid Mrs. Brown having to lift Charlie. The following four steps were planned: (1) If a time-out was needed, Mrs. Brown would **physically guide** Charlie to the chair; (2) If Charlie refused to sit on the chair, Mrs. Brown would issue the following warning statement and "**swoop-and-go**" consequence (if necessary): "If you do not sit on the chair, I will take the toys and wait in the hall," and "You did not sit on the time-out chair, so I will take the toys and wait in the hall." Then the therapist would enter the room and block the door with her back facing Charlie while Mrs. Brown waited with the toys in the hall. At 1-, 2-, 3-, 4-, and 5-min intervals, Mrs. Brown would poke her head in the door and say, "Are you ready to sit on the time-out chair?"; (3) If, after the fifth minute, Charlie still refused to sit on the chair, Mrs. Brown would give the following warning about **restriction of privilege**: "You have two choices. You can sit on the time-out chair now, or there will be no hide-and-seek at the end of the session," and "You did not sit on the time-out chair, so there will be no hide-and-seek at the end of the session." Then Mrs. Brown would engage Charlie in CDI and restrict the privilege of hide-and-seek at the end of session.

Mrs. Brown and Charlie were coached in the first two PDI sessions in the clinic to increase effectiveness of the swoop-and-go procedure if needed. During these two sessions, Charlie complied with time-out warnings 100% of the time, and no swoop-and-go or restriction of privilege procedures were necessary. Charlie required only two in-session time-outs in total during the clinic-based PDI sessions and was compliant with the original command after three and 6 min respectively. Charlie seemed to understand the time-out procedure well. Again, Mrs. Brown was highly compliant in at-home practice assignments and reported that Charlie rarely needed even a time-out warning. Charlie received two time-out warnings and one time-out total during the remaining PDI sessions. "Mr. Bear" role-plays were used to keep the time-out procedure fresh in Charlie's mind since his experiences in time-out were rare. He expressed understanding during these role plays.

39.3.3.1 Bedtime Concerns

Mrs. Brown reported that one of Charlie's most problematic behaviors was refusing to get ready for bed in the evenings. She described giving many commands which were met with noncompliance. Charlie typically dawdled by playing his tablet and continuing to eat. Once Charlie's compliance had increased during PDI sessions, the therapist constructed a role-play scenario in which Mrs. Brown gave the Mr. Bear stuffed animal a 5-min warning (e.g., "It's almost time to get ready for bed.") and then an indirect command to begin the bedtime routine with teeth brushing. Indirect commands were employed at this time to decrease demands placed on Charlie when he was tired and to prevent potential disruption of bedtime if time-out sequences were needed. Charlie enjoyed this role-play. By the following session, Mrs. Brown was thrilled to report that Charlie was 100% compliant in following her bedtime instructions, even taking his nighttime medicine independently.

39.3.3.2 House Rule

After the Browns reached PDI skills mastery, a house rule was contemplated to decrease aggressive physical behaviors between Charlie and his older sibling. Mrs. Brown and the therapist planned a three-pronged approach to ensure that Charlie understood expectations clearly. In the first phase, lasting for 1 week, Mrs. Brown taught both children to tell the other, "Stop. That hurts." each time the other child engaged in an unwanted physical behavior (e.g., biting, sitting on the other). She explained that once the house rule started, Charlie would receive a time-out and his sibling would receive a short restriction of privilege if the behavior was not discontinued. The following week, Mrs. Brown attested to the children using the signal phrase as necessary and noted a significant reduction in sibling conflict. In the second phase, Mrs. Brown planned to issue a warning statement about time-out or restriction of privilege for any physical conflicts between the children and in response to one of the children stating the signal phrase. This would have been followed with the respective consequence (i.e., time-out or restriction of privilege), but the children were 100% compliant with the warning statement.

39.3.3.3 Public Behavior

To address Mrs. Brown's safety concerns about Charlie running away from her in public, often out of her sight in stores or into traffic, the Browns attended a session in the clinic. The therapist used the Mr. Bear stuffed animal to role-play holding hands and staying close to caregivers in public. Then Mrs. Brown was coached to keep Charlie close to her on a walk around the building. This involved giving Charlie direct commands to hold her hand with appropriate follow-through, providing frequent praise for staying close and holding hands, and prompting Charlie to ask permission if he wanted to go somewhere. Because Charlie was fascinated with wet floor signs, the therapist placed signs throughout the building. Through the exercise, Charlie learned to stay with his mother and ask permission before running over to investigate a sign. Following the session, Mrs. Brown reported that Charlie was highly compliant in holding hands or staying close on shopping trips.

39.3.3.4 Sibling Session

Charlie, Mrs. Brown, and Charlie's older sibling attended one session in the clinic to address remaining verbal sibling conflict. Therapist provided Charlie's sibling with an abbreviated CDI teach and allowed the child to be coached in play with Charlie using a bug-in-the-ear system. Charlie's sibling did quite well with the skills, and Mrs. Brown commented on the remarkable difference in the children's interactions in session. Both children received a prize for their cooperation in the task.

39.3.4 Social-Directed Interaction (SDI)

Following graduation from PCIT and posttreatment assessments, it was determined that Charlie and his family could benefit from additional training in a phase of treatment deemed Social-Directed Interaction (SDI). The idea behind SDI is that children with ASD who have deficits in social functioning (e.g., social reciprocity, conversational turns, interactive play) or language skills can be coached by their caregivers to improve in these areas. In SDI, the caregiver is taught to coach his or her child in whatever skills are deemed necessary. The PRIDE skills are used as a framework for developing the child's social skills because they are familiar to the caregiver, encourage appropriate conversation and play, and make the child's play more reinforcing to other children. In addition to the PRIDE skills, other targets (e.g., eye contact, asking questions, pretending) should be incorporated based on baseline assessments of the child's strengths and weaknesses; see the Appendix for more examples.

In Charlie's case, clinical observations, caregiver report on the GARS-3, and teacher report indicated that Charlie had deficits in social communication, interactive play, and boundaries with strangers. The therapist and Mrs. Brown collaboratively identified an SDI coaching target for each consecutive session, which included imitation, stranger safety, and praise. Mrs. Brown observed or participated for the entire length of all four, 1-h, weekly SDI sessions. At the first SDI session, the therapist taught Mrs. Brown how to coach Charlie. The therapist explained that in SDI coaching, Mrs. Brown, who would serve as the coach, would sit off to the side while the child interacted with another play partner (e.g., another parent, sibling, or therapist in session). As the coach, Mrs. Brown would reinforce the selected skill (e.g., imitation) using labeled praises and indirect commands as prompts. The therapist highlighted the goal that, during coaching sessions, Mrs. Brown would observe and provide intermittent coaching statements as opposed to interacting with Charlie using all of the PRIDE skills. To encourage the child's participation, a reward of a fun activity at the end of session (e.g., playing hide-and-seek with therapists) was promised, contingent on his cooperation.

39.3.4.1 Homework

During SDI, Mrs. Brown was assigned 5-min daily homework assignments in which she was to practice coaching Charlie in one or more target social skills while the child engaged in play with a partner. Ideally, the Charlie's play partner on a given day was to be another child or adult, perhaps another family member or friend. If no play partner was available, Mrs. Brown was instructed to serve dual roles as the play partner and coach; however, this was more complicated, so involvement of a third person was preferable. See Appendix 1 for a copy of the SDI homework practice sheet.

39.3.4.2 Imitation

Imitation was selected as the first SDI target because it was thought to be the simplest of the skills and be likely to facilitate engagement with a partner, teach functional play skills, and interrupt repetitive play. To begin, a "Mr. Bear" stuffed animal was used to model the concept of imitation for Charlie. Then Charlie, the therapist, and Mr. Bear role-played with imitation. The therapist reiterated that imitating and "playing the same thing" makes play more fun for everyone and makes everyone happy. Next, the therapist used CDI skills with Charlie for a few minutes while modeling imitation skills. During this time, the therapist labeled and praised Charlie and herself each time imitation occurred, intermittently prompting Charlie to imitate. Then, the therapist modeled coaching while Charlie and Mrs. Brown engaged in CDI with intermittent imitation. Here, the therapist sat off to the side, providing only labeled praises and indirect commands or prompts related to imitation. Lastly, Mrs. Brown practiced coaching Charlie in imitation, sitting off to the side while Charlie played with the therapist as his play partner.

Mrs. Brown picked up on the coaching format quickly. When she accidentally used her PRIDE skills, Charlie came to her immediately and disengaged from play with the therapist. When coaching became too directive, Charlie behaved in a somewhat oppositional manner, taking toys away from the therapist. When the therapist and Mrs. Brown shifted to a pattern of longer intervals (30-s to 1-min) of child-led play between prompts to imitate, Charlie was more cooperative. During the next session, Mrs. Brown explained that over the past week, Charlie had begun to imitate frequently. For example, when Mrs. Brown began to cook in the kitchen, Charlie would begin cooking as well, and when Mrs. Brown went to her room to get dressed, Charlie would do the same.

39.3.4.3 Stranger Safety

Because Mrs. Brown expressed concern about Charlie being overly friendly with strangers (e.g., telling others in the grocery store line his phone number, hugging, running off unattended in public), a module on stranger safety was added. Before the session, Mrs. Brown and the therapist devised a plan to teach about this topic without creating a new fear for Charlie. Mrs. Brown explained that previously, Charlie had been introduced to several concepts, which had become repetitive interests or sources of great anxiety. For example, when taught about wood splinters, Charlie had become overly fearful of wooden surfaces, refusing to hold railings or touch cars because he worried that they were made of wood. After discussion, Mrs. Brown and the therapist decided to use the term "stranger safety" rather than "stranger danger" and frame the topic as rules for "how we act around strangers" instead of explaining the potential consequences for being too friendly with strangers (e.g., being kidnapped). The therapist and Mrs. Brown also planned to respond similarly if Charlie asked repetitive "why" questions about the topic (e.g., "Those are just the rules about strangers," "See? Mommy doesn't hug strangers."). Two categories of people were established to keep the concept simple enough for Charlie to understand: (1) strangers and (2) friends/family.

In the session, while Mrs. Brown observed, the therapist explained the differences between strangers and friends/family to Charlie. Charlie learned that friends are people we know well, including their names, where they live, how old they are, and what they like. The therapist created two blank posters to which Charlie sorted and attached pictures of strangers and friends/family. The therapist then explained what types of behaviors were acceptable for strangers (e.g., high-fives, smiles, waves) and friends/family (e.g., hugs, telling all about me, going alone together). Charlie sorted and attached labeled pictures of these actions to the appropriate posters as well. A Mr. Bear role-play was used to demonstrate these actions. Finally, Charlie, the therapist, and family walked around the clinic together to practice. When Charlie approached someone, Mrs. Brown was coached to ask Charlie about which category the individual belonged to, stranger or friend/family. Then Mrs. Brown was coached to prompt Charlie to choose an appropriate action from the corresponding poster, complete the action (e.g., say "hello!" to the stranger), and then give Charlie a labeled praise including the name of the action and the type of individual (e.g., "Great job saying, 'hello,' because he was a stranger"). Mrs. Brown was encouraged to prompt and coach Charlie in similar exercises throughout the week.

The following week, Mrs. Brown reported feeling relieved that Charlie had not inquired about why there were rules about strangers or express any new stranger-related fears. She reported that Charlie had been practicing his new skills (e.g., gave a stranger a high-five) with the help of her coaching.

39.3.4.4 Praise

To increase the reinforcing value of Charlie's play to other children, the therapist explained the idea of praise to Charlie. Again, using Mr. Bear, therapist modeling, and role-play, Charlie was taught about praise. Next, the therapist coached Charlie in praise and imitation while Mrs. Brown engaged him in CDI. Then, Mrs. Brown practiced coaching Charlie in imitation and praise while the therapist engaged Charlie in CDI. Mrs. Brown showed progress and increased self-confidence in her coaching skills over the last session. Charlie had a bit more difficulty with learning to praise than he had in learning imitation. He behaved slightly more defiantly, refusing to follow some indirect commands to praise or shortening labeled praises (e.g., "Thank you for bringing me the puppy.") to unlabeled praises (e.g., "Thank you."). In addition, the therapist and Mrs. Brown found it cumbersome to provide a labeled praise for Charlie's labeled praise; "Good job of praising by saying thank you for bringing me the puppy." The therapist and Mrs. Brown determined that giving Charlie a small number of predetermined praises to practice may be more successful. Charlie was then prompted to and praised for saying, "thank you," "I like that," or "good job." These simpler praises were much more successfully executed by Charlie and coached by Mrs. Brown. Charlie's use of "I like that" was especially successful. Charlie enjoyed being tickled and frequently complied when prompted to say, "I like that," because it was rewarded with more tickling.

At the following session, Mrs. Brown reported that Charlie had increased his use of praise over the previous week. She explained that when praise was modeled or prompted, Charlie would say, "good job" or "thank you." Mrs. Brown provided labeled praises for these statements throughout the week. She expressed increasing confidence in her abilities to successfully implement coaching with target behaviors throughout the day.

39.3.4.5 Reflection

The therapist planned to teach Charlie about reflection in hopes that it would help him follow along with others' conversational topics, a goal presented by Charlie's teacher. However, Mrs. Brown had serious reservations about echolalia. She feared that if Charlie learned reflection, he may repeat too often or too many times, creating additional social problems. At Mrs. Brown's request, the therapist did not teach Charlie this skill.

39.3.4.6 Social Interaction Coaching

In one session, Mrs. Brown practiced coaching Charlie while he played with another young child (a family friend whose parent provided permission for participation in the social skills training session). After the two previous sessions of practice with coaching Charlie in imitation and praise, Mrs. Brown was proficient in coaching these skills, responding to their occurrences with labeled praises and prompting these behaviors as necessary. At times, Charlie did not seem able to formulate his own praise when prompted generally (e.g., "She made a cool tower. What can you tell her?"), but was quick to comply when given a more specific prompt (e.g., "Why don't you tell her, cool tower?"). The therapist discussed providing scaffolding for this skill until Charlie became more familiar with it. In addition to praising pretend play, playing with toys "the right way," and making eye contact, as introduced during CDI, Mrs. Brown was also encouraged to praise any instances of asking or answering questions, playing with the same toy at the same time, taking turns, showing the other child something, and other apparent positive social interaction skills. Therapists and Mrs. Brown repeatedly stated to the children that these behaviors make play more fun, make friends happy, and make other children want to play with them. Mrs. Brown expressed satisfaction with the coaching process and felt comfortable with continuing this practice on her own in the future.

39.4 Results

There were a number of successful or partially successful outcomes measured in this study. As expected, when comparing ECBI scores throughout treatment (see Table 39.1 and Figs. 39.1 and 39.2), it was evident Mrs. Brown experienced dramatic decreases in Charlie's behavior problems. Both ECBI Intensity and Problem Scores fell well below their respective clinical cutoffs during PDI and posttreatment, with the Problem Score dropping below the clinical cutoff beginning at CDI coach session four. ECBI score changes coincided with qualitative caregiver reports and therapist observations. Confirming hypotheses about caregiver improvements, there was also clear evidence of increases in caregiver positive and neutral talk and decreases in caregiver negative talk during Child-Led Play; see Figs. 39.3, 39.4, and 39.5. Charlie's alpha compliance percentages showed clear increases from pretreatment observations to posttreatment during Parent-Led Play but no improvement to slight decreases during Clean-Up observations; see Figs. 39.6 and 39.7.

Positive changes were also measured in several ASD symptom-related domains. Charlie's time spent in pretend toy play demonstrated marked increases from pre- to mid- and posttreatment; see Fig. 39.8. Evidence showed some support for hypotheses that Charlie's social engagement would improve. During the 5-min social preference assessment period, Charlie clearly sought closer proximity to his mother, engaged in more physical touch, and talked more to his mother from pre- to posttreatment; see Figs. 39.9, 39.10, and 39.11. Eye contact and unique words spoken by Charlie during this social preference assessment provided potential support for hypothesized increases from pre- to posttreatment; see Figs. 39.11 and 39.12. Finally, there were no meaningful changes in GARS-3 scores across treatment, although the Emotional Responses subscale showed consistent decreases; see Table 39.1. These findings did not support the hypothesis that total ASD symptoms as measured by caregiver report would decrease during PCIT.

Table 39.1 Changes in raw scores of caregiver-report measures

Measure	Pretreatment		Mid-treatment (following CDI mastery)		Posttreatment (following PCIT graduation)	
Eyberg Child Behavior Inventory (ECBI)						
Intensity score	187 ($T = 76$)		147 ($T = 64$)		100 ($T = 51$)	
Problem score	18 ($T = 64$)		1 ($T = 42$)		0 ($T = 41$)	
Gilliam Autism Rating Scale (GARS-3)	Scaled score	%ile rank	Scaled score	%ile rank	Scaled score	%ile rank
Restricted/repetitive Behaviors (RB)	14	91	15	95	15	95
Social interaction (SI)	8	25	7	16	8	25
Social communication (SC)	12	75	12	75	12	75
Emotional responses (ER)	14	91	13	84	12	75
Cognitive style (CS)	14	91	14	91	13	84
Maladaptive speech (MS)	16	98	15	95	15	95
Autism index total	112		112		112	
Probability of ASD	Very likely		Very likely		Very likely	
Severity level	Level 3		Level 3		Level 3	

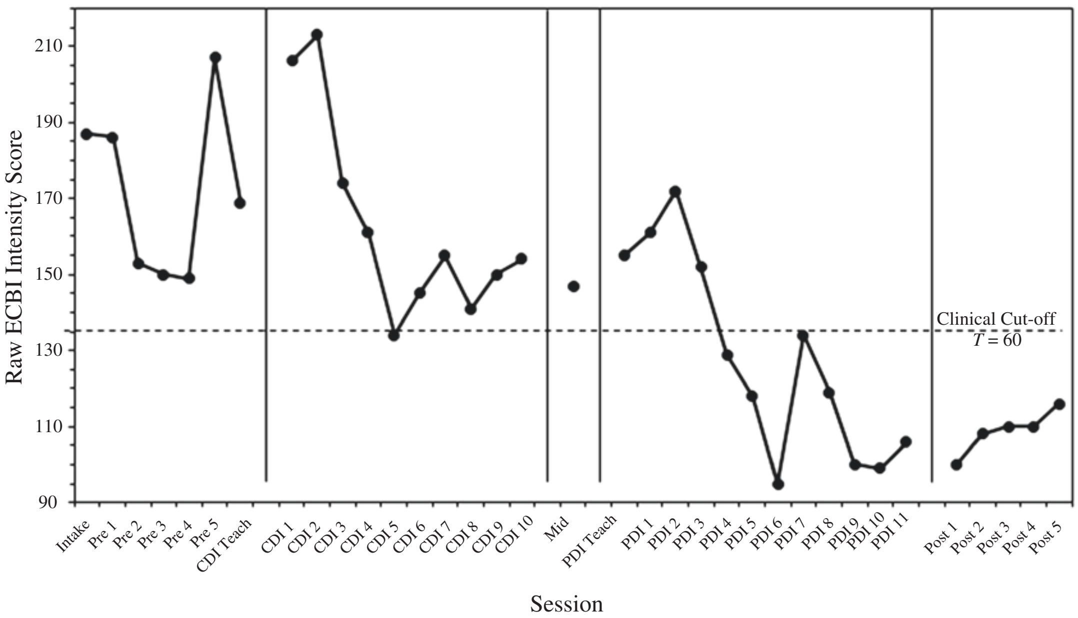

Fig. 39.1 ECBI Intensity score change. *Pre* = pretreatment observation, *CDI* = child-directed interaction session, *Mid* = mid-treatment observation, *PDI* = parent-directed interaction session *Post* = posttreatment observation

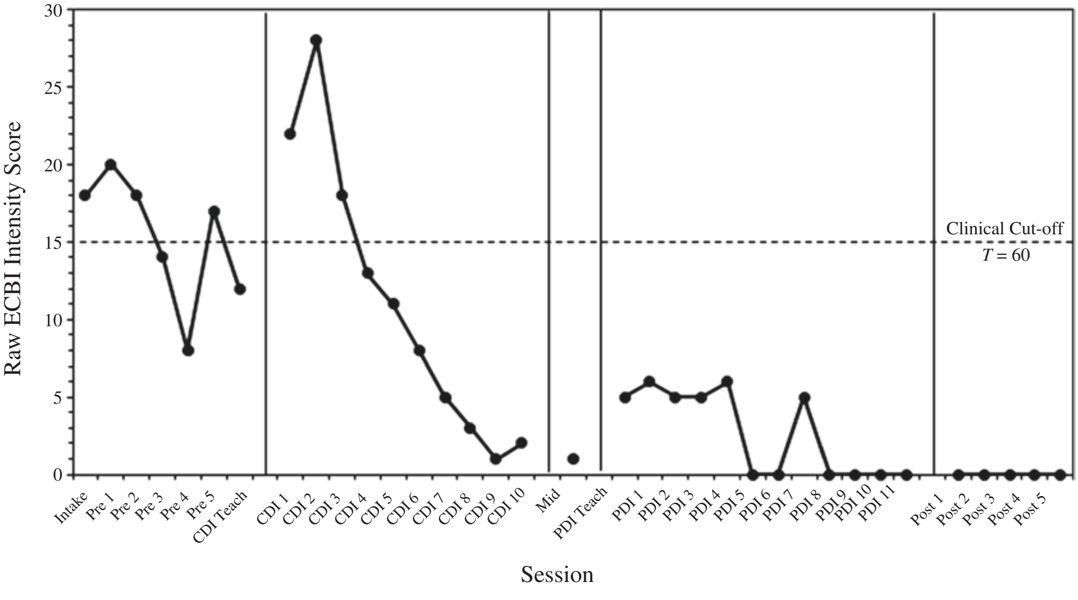

Fig. 39.2 ECBI problem score change. *Pre* = pretreatment observation, *CDI* = child-directed interaction session, *Mid* = mid-treatment observation, *PDI* = parent-directed interaction session, *Post* = posttreatment observation

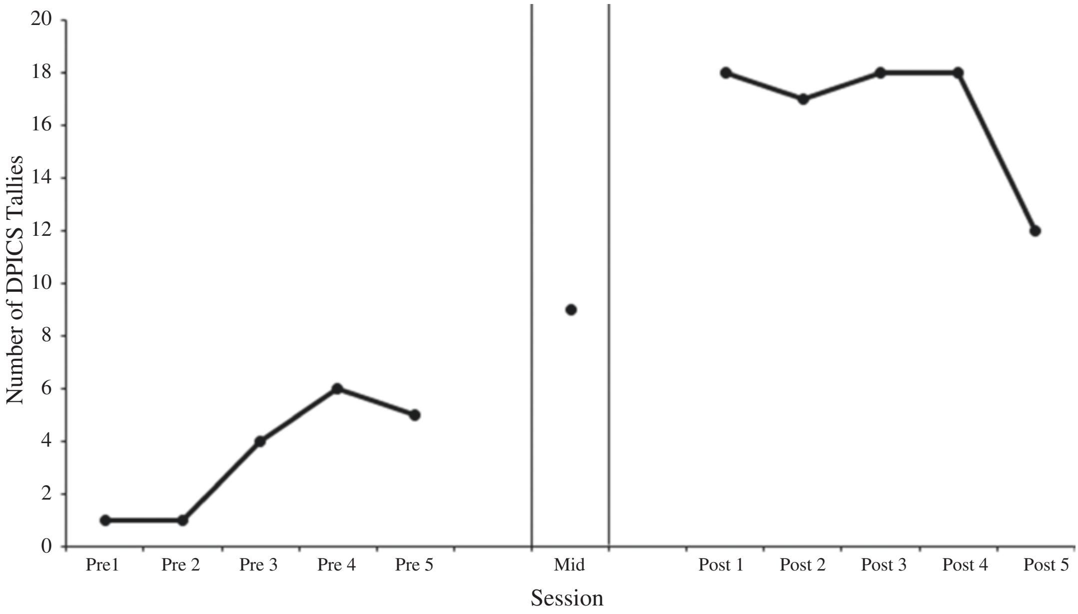

Fig. 39.3 Mother positive talk (labeled praises + reflections + behavior descriptions) during 5-min Child-Led Play DPICS coding. *Pre* = pretreatment observation; *Mid* = mid-treatment observation, *Post* posttreatment observation

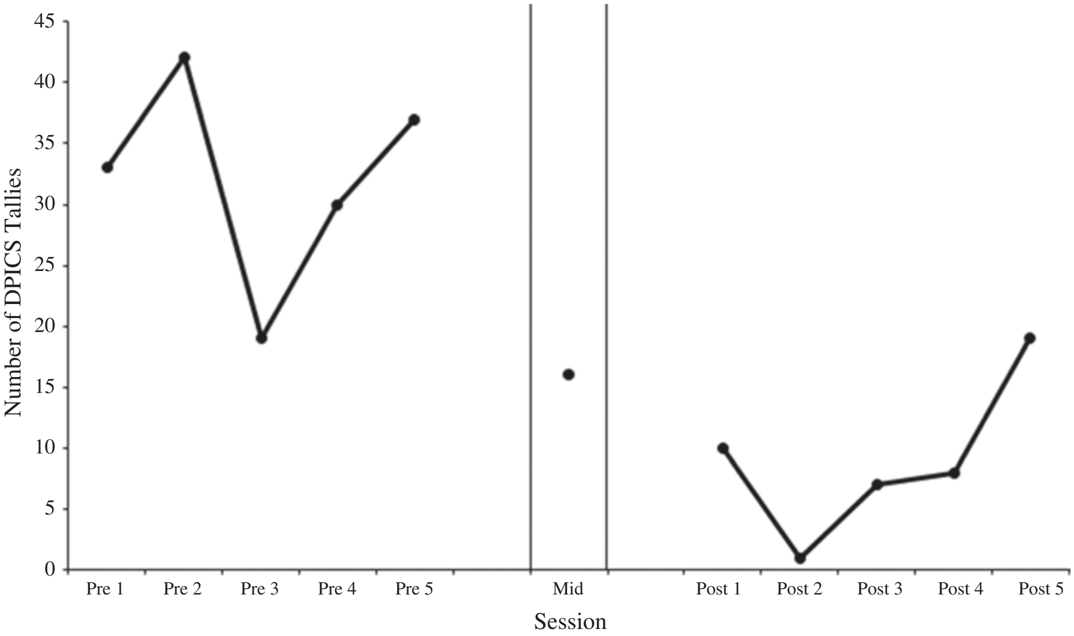

Fig. 39.4 Mother negative talk (questions + commands + criticisms) during 5-min Child-Led Play DPICS coding. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

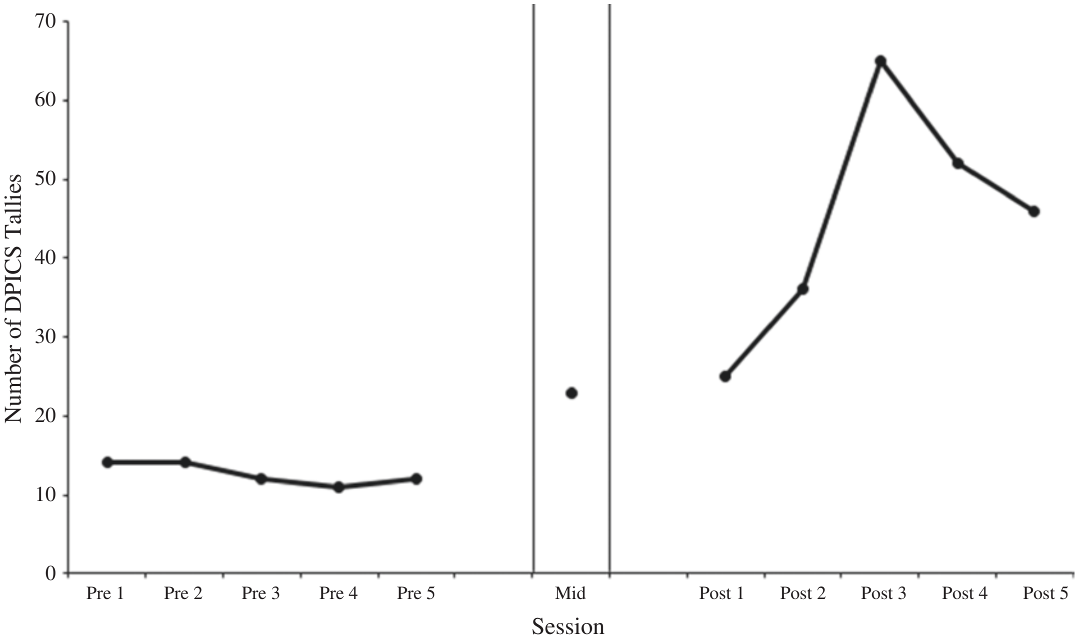

Fig. 39.5 Mother neutral talk (neutral talk + unlabeled praises) during 5-min Child-Led Play DPICS coding. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

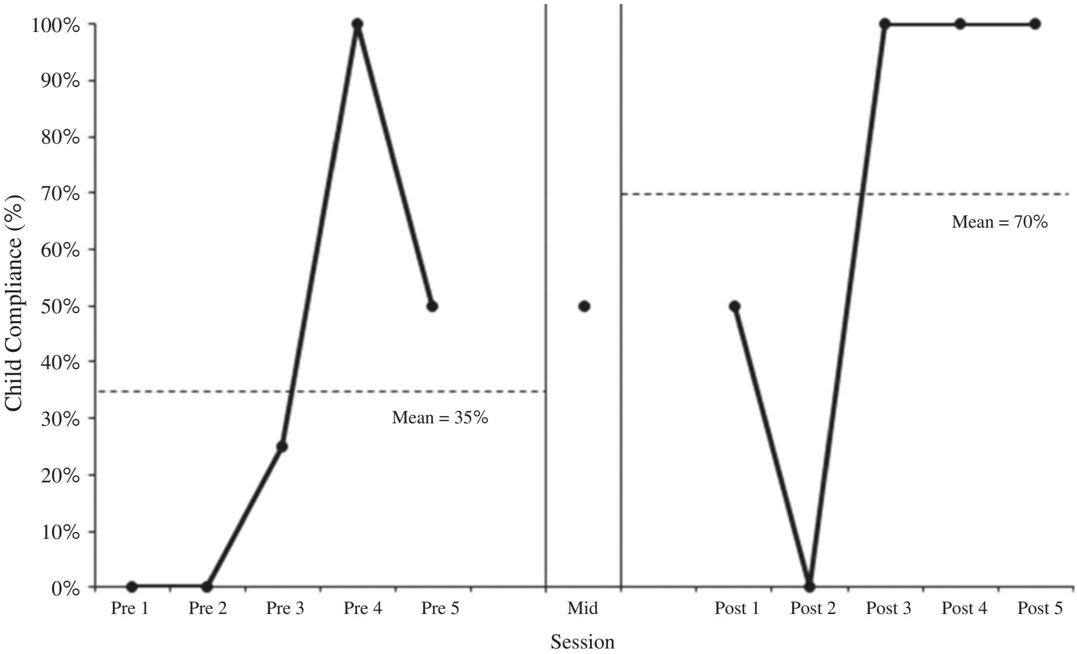

Fig. 39.6 Child alpha compliance during 5-min Parent-Led Play DPICS coding. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

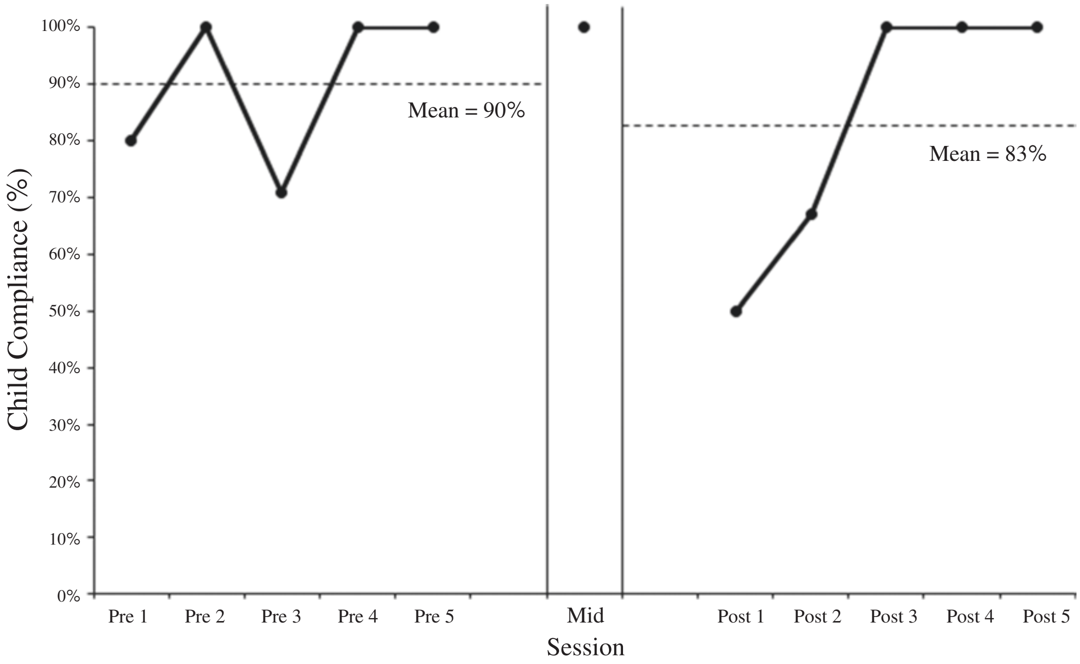

Fig. 39.7 Child alpha compliance during 5-min Clean-Up DPICS coding. *Pre*=pretreatment observation, *Mid*=mid-treatment observation, *Post*=posttreatment observation

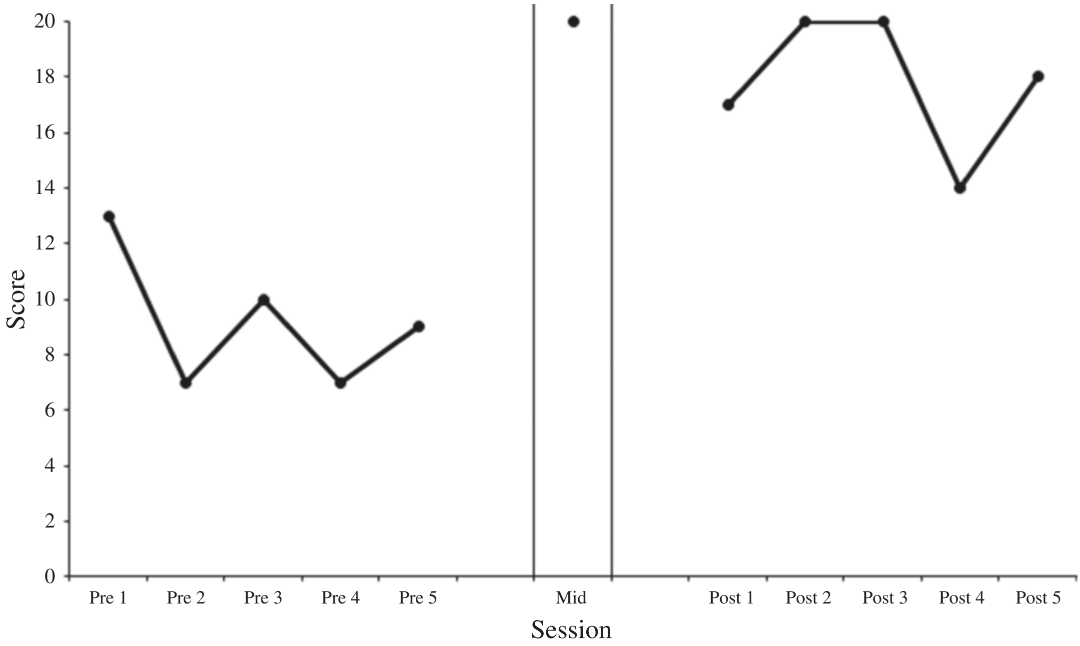

Fig. 39.8 Child pretend toy play during 5-min Child-Led Play DPICS coding. *Pre*=pretreatment observation, *Mid*=mid-treatment observation, *Post* posttreatment observation

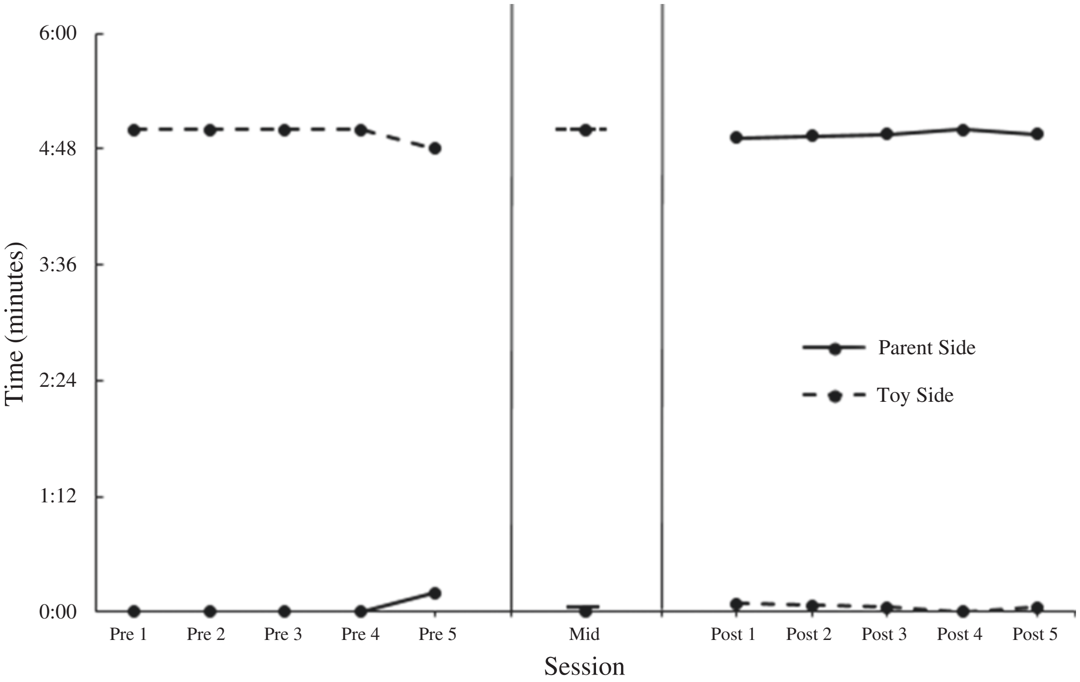

Fig. 39.9 Child proximity to mother during 5-min Social Preference Assessment. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

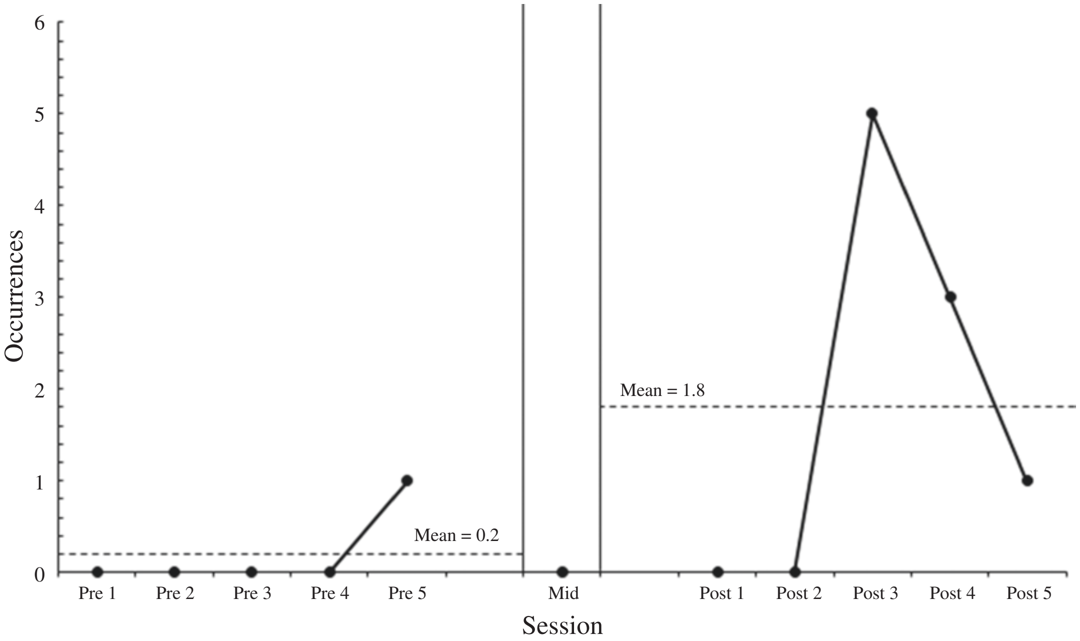

Fig. 39.10 Child-mother physical touch during 5-min Social Preference Assessment. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

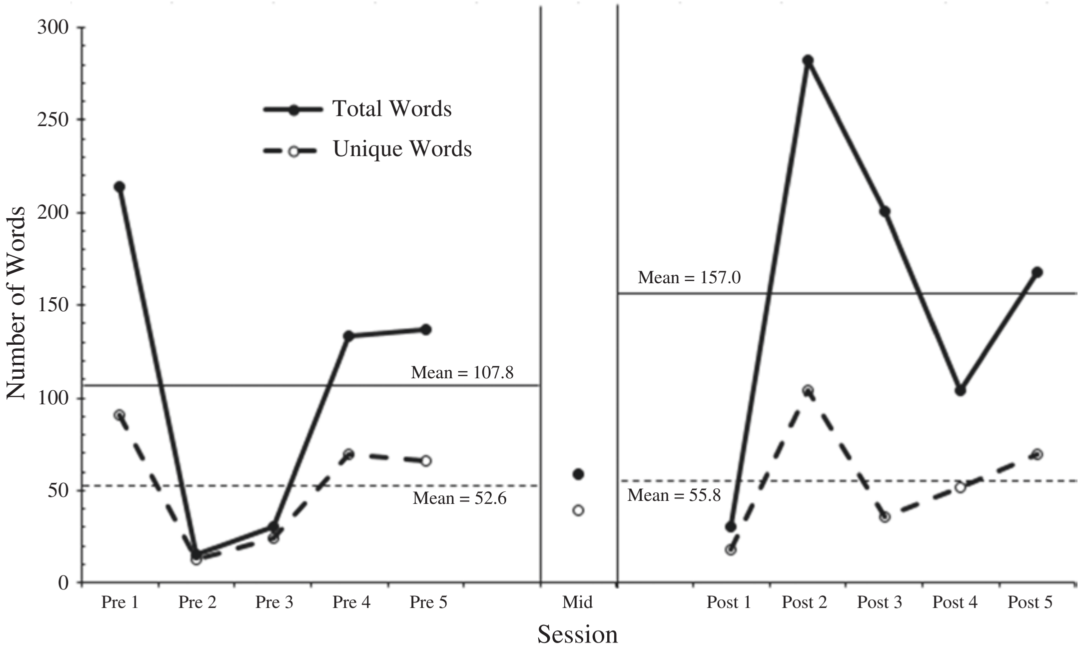

Fig. 39.11 Child words spoken during 5-min Social Preference Assessment. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

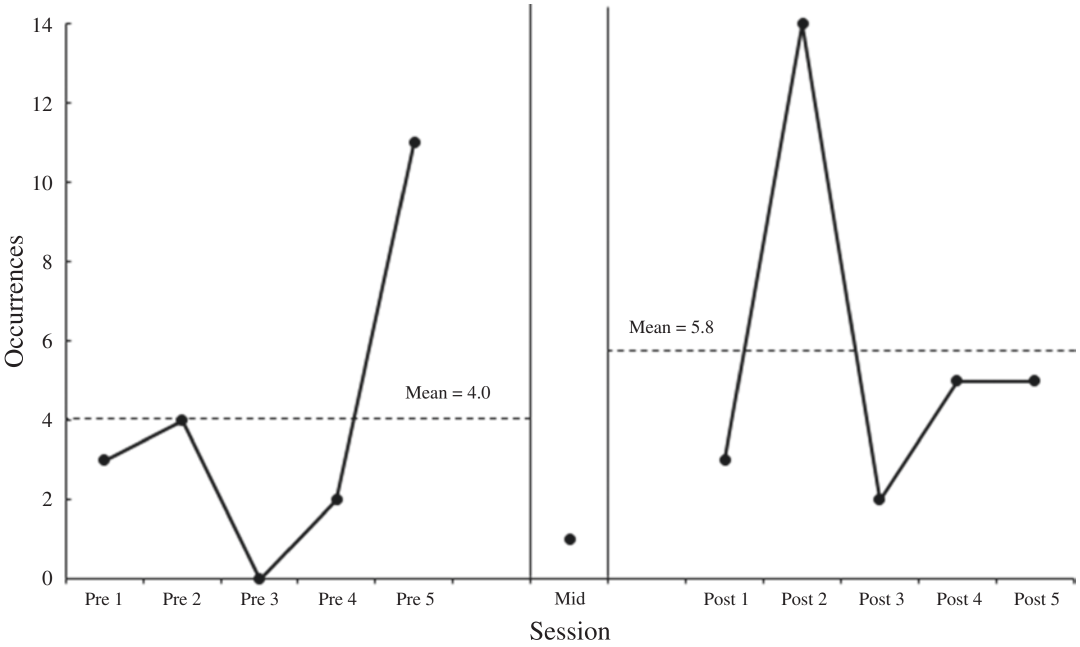

Fig. 39.12 Child eye contact during 5-min Social Preference Assessment. *Pre* = pretreatment observation, *Mid* = mid-treatment observation, *Post* = posttreatment observation

39.5 Discussion

This is one of the first studies to measure the impact of PCIT on ASD symptoms, vocalizations, pretend play, and social engagement. Treatment lasted for 28 sessions, including 10 CDI coaching sessions, 11 PDI coaching sessions, and 4 SDI coaching sessions. From pre- to posttreatment, data indicated strong improvements in child behavior problems and intensity, caregiver talk, child compliance during Parent-Led Play, pretend toy play, child proximity-seeking, physical touch, and verbalizations toward his caregiver. Evidence also suggested potential improvements in child eye contact and unique words spoken.

Hypotheses were fully or partially supported by all data except for child alpha compliance during Clean-Up and total ASD symptoms as reported by the GARS-3. The surprising mean decrease in child alpha compliance during Clean-Up observations may have been influenced by the structure of observation sessions. During CDI and PDI sessions, Charlie was typically allowed to play with the toys for nearly the entire therapy hour, but at pre-, mid-, and posttreatment observations, he was told to clean up the toys after just 15 min of play. His relatively lower alpha compliance for the first two posttreatment observation sessions may have reflected his confusion at the change in session structure. Additionally, compliance with cleaning up commands was a particular strength of Charlie's even before treatment, so his compliance levels during Clean-Up at baseline were extremely high.

Although significant improvements in ASD-related symptoms such as eye contact, proximity-seeking, vocalizations, pretend play, and physical touch were noted in observational measures, no changes in ASD symptoms were reflected in the caregiver-report inventory (GARS-3). It may be that changes in the broad range of ASD symptoms measured by the GARS-3 will develop or become more apparent to caregivers over time or that this measure did not capture change. Mrs. Brown informed researchers that she had completed the GARS dozens of times throughout Charlie's life, which could have affected her responding. While some ASD symptom-specific skills were reinforced during CDI and PDI (e.g., eye contact, pretend toy play), specific social behaviors in deficient areas (e.g., imitation) were more intensely targeted during the SDI portion of treatment, which did not occur until after the posttreatment administration of the GARS-3. It is important to note that we provided only an abbreviated version of SDI to serve as a pilot. It is possible that a longer course of SDI would have provided the further skills-training and time necessary to demonstrate improvements in ASD symptoms as measured by the GARS-3.

In addition to evaluating the effectiveness of PCIT tailored to a child with ASD, this study marks the first implementation of a Social-Directed Interaction (SDI) phase following CDI and PDI. The novel SDI portion of treatment had two main foci. First, it aimed to introduce caregiver and child to skill areas for improvement. In typically developing children, skills like imitation and boundaries with strangers may not need to be taught explicitly. However, children with ASD and their caregivers may benefit from understanding the importance of teaching these skills. Second, SDI was employed to provide the caregiver practice in coaching her child. Theoretically, because caregivers are proficient in behavioral parenting skills following PCIT graduation, these skills can be used to shape nearly any desired child behavior. Once caregivers become adept in the practice of coaching, they can target an evolving list of child behaviors throughout development.

In line with the idea of explicitly teaching skills to children with ASD, the use of visual modeling and role-playing with Mr. Bear was extremely fruitful in this case. Once introduced to a concept, such as staying close, imitating, or getting ready for bed, via modeling, Charlie was willing and able to engage in the appropriate behaviors. In fact, he picked up on these ideas quickly, often immediately or within a week's time with high frequency. Once the reinforcing value of caregiver interactions increased (during CDI) and compliance increased (during PDI), there was fertile ground for planting the seeds of social skill development.

39.5.1 Limitations

Several observational measures used in this study (e.g., social engagement, preference assessment) have not been validated. They are not necessarily indicative of meaningful changes in functioning or generalizations to other families. This single-case study is meant to demonstrate that these changes are possible and to provide an example treatment framework, but it does not draw conclusions about efficacy across children. SDI has not been evaluated for its efficacy and serves merely as a theoretical framework for techniques thought to be useful in this case.

39.5.2 Future Directions

Larger-scale studies of the impact of PCIT on ASD symptoms are needed. Future investigations of the SDI portion of this treatment would also be beneficial. Further, the utility of specific language and social skill modules for children with ASD should be investigated. Relatedly, the feasibility and acceptability of a longer SDI treatment phase should be examined. If found to be effective, families with willing caregivers could learn to coach their children to improvements in a variety of language and social skills as a stand-alone treatment or in addition to ABA services.

Acknowledgments We would like to thank this family for participating in our research and providing permission for the publication of this case study. Although their names and some details have been changed for the purpose of anonymity, "Charlie" and "Mrs. Brown" were delightful to have as participants. They gave generously of their time and energy to complete additional measures and observations, opening their home to our team for several months. We are grateful to the Browns and families like them who work tirelessly and selflessly to improve the lives of children with autism.

Appendix: Social-Directed Interaction Practice Sheet

Child's name ____________________________ Caregiver's name __________________________

Date	Did you practice SDI for 5 min in a **social situation?**	Which skill did you target?	Place a tally mark each time the **child used the skill**	Who did the child play with? Other **comments**
Monday _______________				
Tuesday _______________				
Wednesday _______________				
Thursday _______________				
Friday _______________				
Saturday _______________				
Sunday _______________				

<u>Possible skills to target</u>:

Praise	Describe	Ask a Question	Play Pretend
Reflect	Enjoy/enthusiasm	Answer a question	Play with toy the "right way"
Imitate	Eye contact	Use a greeting	Other: ____________

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40

Putting It Together: Takeaway Points for Clinicians Conducting PCIT with Autism Spectrum Disorder

Cheryl B. McNeil and Lauren B. Quetsch

Abstract

The chapter integrates key clinical recommendations from the present handbook's chapters in a brief, outline format. The editors present a synthesized approach to addressing the use of Parent-Child Interaction Therapy (PCIT) with children on the autism spectrum. Takeaway points are highlighted by providing short descriptions and examples. Additionally, a novel third phase, entitled Social-Directed Interaction (after standard PCIT treatment is completed), is introduced by the authors as a method of employing parents to assist in the critical areas of child communication and social functioning. The chapter highlights ways that PCIT can be used to address disruptive behavior, the parent-child relationship, and core features of autism spectrum disorder.

The present chapter integrates key clinical recommendations from McNeil, Quetsch, and Anderson's (in press) handbook chapters in a brief, outline format. The editors (C. B. McNeil and L. B. Quetsch) present a synthesized approach to addressing the use of Parent-Child Interaction Therapy (PCIT) with children on the autism spectrum. Takeaway points are highlighted by providing short descriptions and examples. Additionally, a novel third phase, entitled Social-Directed Interaction (after standard PCIT treatment is completed), is introduced by the authors as a method of employing parents to assist in the critical areas of child communication and social functioning. The purpose of this chapter is to highlight ways that PCIT can be used to address disruptive behavior, the parent-child relationship, and core features of autism spectrum disorder (ASD) in an easy-to-reference structure as therapists adapt PCIT to work with ASD populations. We wish to thank all of the chapter authors who contributed to the helpful clinical tips that are included in this summary chapter.

40.1 Comprehensive Services for ASD

There are a number of interventions that are commonly provided as part of a comprehensive care package to address deficits related to ASD.

- Applied Behavior Analysis (ABA)
  Discrete Trial Training (DTT)
  Early Intensive Behavior Intervention (EIBI)
  Early Start Denver Model (ESDM)

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  Pivotal Response Training (PRT)
  Verbal Behavior Intervention (VBI)
- Developmental Individual Differences, Relationship-Based Approach (DIR; “Floortime”).
- Speech Therapy.
- Occupational Therapy.
- Medication.

These interventions vary regarding the degree of evidence supporting the approach. See Carroll and Kodak (in press; Chap. 3 in this handbook) for a thorough review of evidence-based interventions for ASD.

Treatment for ASD can be difficult to obtain in a timely fashion due to the lack of trained providers. Over the years, the number of ASD specialists has remained stable and has not been able to match the increased rate of ASD diagnosis in the United States (American Psychological Association, 2015; Centers for Disease Control and Prevention [CDC], 2014). In addition to long wait-lists and mental health deserts, these factors have limited the accessibility of evidence-based ASD treatments for families in need. As a result, there has been an increased number of ASD referrals to certified PCIT therapists who treat behavior problems in the early intervention age range. The rationale for using PCIT as part of the milieu of services includes (a) a strong theoretical background that overlaps with common ABA-based ASD treatments, (b) the success of initial studies of PCIT with ASD, and (c) PCIT’s success with managing behavior problems in the 2–7-year-old age range (Owen, Stokes, Travers, Ruckle, & Lieneman, in press; Williford, Lieneman, Drain, & McNeil, in press; see Chaps. 15 and 16 of this handbook).

40.2 Why PCIT?

1. PCIT has refined the technology for transferring skills to parents (McNeil & Hembree-Kigin, 2010).
   (a) PCIT is based on ABA principles—Yet PCIT focuses on giving these skills to the parents.
   (b) Parents are with the child for more hours per day and throughout the course of a child’s life.
     - Parents need to have enough expertise to be a therapist for their child 24/7.
   (c) PCIT has been shown to have the strongest technology currently available for effectively and efficiently transferring therapeutic skills to parents.
   (d) PCIT uses a well-researched observational coding system (DPICS) to track change and allow assessment data to guide treatment.
   (e) PCIT uses a state-of-the-art coaching approach using bluetooth technology for teaching parents new skills.
     - Immediate feedback.
     - Reinforcement.
2. PCIT is based on mastery criteria.
   (a) Over-train parental skills to point of habit.
3. PCIT has strong research support for modifying parenting skills and child behavior.
   (a) Hundreds of controlled studies of children within this age range (Brabson, Jackson, Liebsack, & Herschell, in press; see Chap. 14 in this handbook).
     - Developmental knowledge.
   (b) Outstanding effect sizes.
     - Parent behavior and functioning: *d* = 0.76–5.67 (Thomas & Zimmer-Gembeck, 2007).

40.2.1 Theory: PCIT’s CDI Phase Makes Parent Attention and Play More Rewarding

- Typical parenting is based on the child’s natural, evolutionary motivation to please the parent/seek out parental attention.
- Parenting strategies (e.g., reasoning, criticism, yelling, spanking) have developed because they work for typically developing children who are wired to seek out parental attention.
- Need to make attention more rewarding for parents of children with ASD (vs. tangibles, edibles).
- Children with ASD often withdraw into solitary pursuits.
- PCIT’s Child Directed Interaction phase trains parent in therapeutic skills for relationship enhancement that increase the reinforcing value of parental verbal attention and play.

40.2.2 Theory: PCIT's PDI Phase Increases Child Compliance Which Greatly Enhances Learning Potential

- Compliance is the gateway to education, social communication (see Fig. 40.1).
- Non-referred, typically developing children are approximately 62% compliant on DPICS (Eyberg & Robinson, 1983).
- ASD children improve from 30–40% compliant at pretreatment to 80–90% compliant after PCIT (Zlomke, Jeter, & Murphy, 2017; Masse, McNeil, Wagner, & Quetsch, 2016).
- Parenting a child on the spectrum is much more effective once the child is complying at a rate that is higher than the rate of typically developing children.
- Compliance training = emotion regulation training.
  - Children with ASD respond well to the rules and predictability of PDI.

40.3 Research Examining Compliance Changes in PCIT with ASD

40.3.1 Case Studies

First, see Lieneman, Ruckle, and McNeil (in press) for more details on the highlighted case (Chap. 39 in this handbook).

Figure 40.2 illustrates the effects of PCIT on problem behaviors for a 5-year-old child with ASD in a case study from the United States. The parent reported a large reduction in problem behaviors to within normal limits at the end of treatment and at follow-up appointments.

Another important study done with three children with ASD was conducted by Masse, McNeil, Wagner, and Quetsch (2016). Masse et al. (2016) found significant reductions in parent-reported intensity of problem behaviors to below clinical cutoffs for three children with ASD. Average compliance rates for the three children improved 55% from pretreatment to 3-month follow-up. The average compliance percentages were 35.5% at pretreatment, 80.7% at posttreatment, and 90.5% at 3-month follow-up.

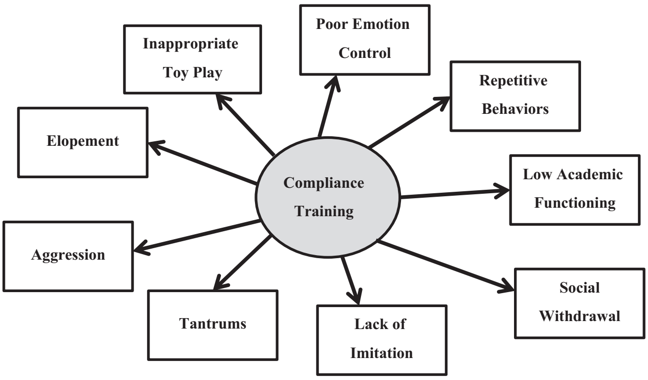
40.3.2 Open Trial Study

In an open trial, pilot study of PCIT with 17 children with ASD, an average of 19 sessions were conducted, and compliance of the participants improved 46% (from 41% before PCIT to 87% after PCIT; Zlomke et al., 2017). Outcomes show promise for increasing compliance rates across subjects in PCIT for children with ASD.

40.4 ASD: Emotion Regulation Challenges

- Individuals with autism experience many big emotions.
- These individuals can become dysregulated in everyday situations.

Fig. 40.1 Areas impacted by compliance training for children with ASD



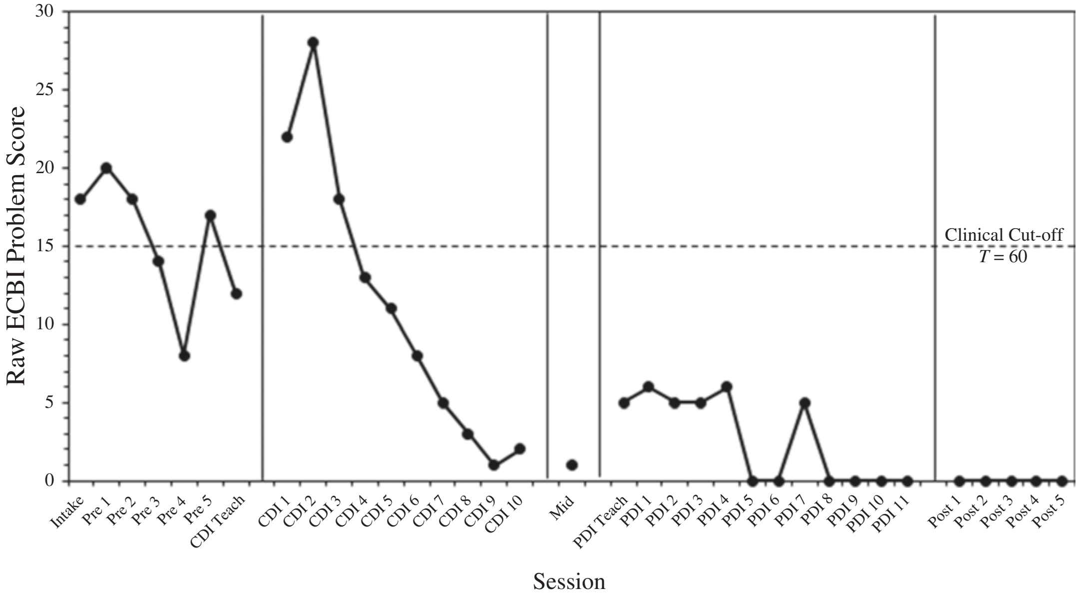


Fig. 40.2 ECBI Problem Score Change. *Pre* pretreatment observation, *CDI* Child-Directed Interaction session, *Mid* mid-treatment observation, *PDI* Parent-Directed Interaction session, *Post* posttreatment observation

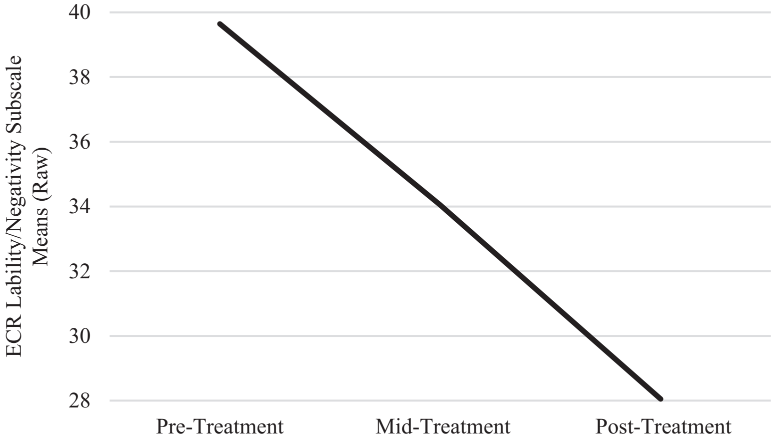


Fig. 40.3 Changes in child emotion regulation lability/negativity across PCIT for a non-ASD, community mental health sample. *ERC* Emotion Regulation Checklist

- Individuals with autism are able to cope with many stressors, but ONLY when the situation is predictable, and no obstacles arise.

Although not yet tested with children with ASD, a recent study with a PCIT population found significant decreases in parental emotion dysregulation and child lability/negativity as well as increases in child emotion regulation abilities (Fig. 40.3) for families who completed PCIT (Lieneman, Girard, Quetsch, & McNeil, in preparation).

40.5 Controversial Issues with PCIT and ASD

1. Lack of functional analysis?
    (a) Critics of PCIT claim that PCIT **Does Not** use functional analyses because PCIT is a manualized treatment**.**
    (b) **However—**PCIT is based on behavioral principles which recognize the ABC's (Antecedents → Behaviors → Consequences)

  (c) PCIT's CDI phase deals with the function of attention.
  (d) CDI coaching involves functional assessment of attention, as the parent is coached to ignore certain behaviors and attend to others, while the coach observes the child's responses (typically from behind a one-way mirror).
  (e) PCIT is tailored to every family by recognizing the family's strengths and weaknesses and how the relationship and environment shape the child's behavior.

2. Time-out reinforces escape?
   (a) Critics also claim that PCIT's use of time-out **ALLOWS CHILDREN TO ESCAPE** from the original command.
   (b) **However—**Handen, Parrish, McClung, Kerwin, and Evans (1992) found that a 30-s time-out followed by a return to the demand was equally or more effective than guided compliance, suggesting that time-out did not reinforce escape behavior.
   (c) PCIT's PDI phases deals with the function of escape by:
   - Having the child complete the original command once the child is ready.
   - Since many children have learned to avoid commands through defiant and aggressive behavior, they continue to utilize these behaviors until the command goes away.
   - PCIT's time-out procedure teaches the child to self-regulate, as the child learns to calm down and stay on the time-out chair.
   - In PDI, children cannot avoid or escape the original command, as time-out does not end until the child complies with the original task.

40.6 ASD and Family Wellness

- The most stressful aspect of parenting the child with ASD is not managing core symptoms, but the presence of co-occurring disruptive behaviors (Davis & Neece, 2017; Osborne & Reed, 2009; Trembath & Dissanayake, 2015).
- Importantly, as many as 50% of children with ASD exhibit high rates of disruptive behaviors (e.g., tantrums, aggression, property destruction, noncompliance; Kaat & Lecavalier, 2013; Kanne & Mazurek, 2011; Maskey, Warnel, Parr, Le Couter, & McConachie, 2013; Mazurek, Kanne, & Wodka, 2013).
- These disruptive behaviors can significantly interfere with a child's capability to engage in educational interventions and gaining adaptive skills.
- Children with ASD also may experience a lack of social support and their parents may continually be stressed from regular interruptions to their daily lives (Maskey et al., 2013).
- Disruptive behaviors also can negatively impact the family's quality of life (Herring et al., 2006).

For a further detail, see Bearss (in press; Chap. 12 in this handbook) (Fig. 40.4).

40.7 When Should Children Receive PCIT?

- PCIT is a gateway intervention that opens the door for improved behavior with the entire milieu of services.
- PCIT leads to quick improvements in compliance.
  - From less than 30% to over 70% compliance after only 16–20 h of PCIT services.
- PCIT is best used during the wait for ABA or at the beginning of ABA services to increase child compliance with all other services.

40.7.1 PCIT Is Best Implemented as One Component of a Continuum of Care

- Implemented alongside.
  - Speech therapy.
  - Occupational therapy.
  - ABA treatments.
  - Early Intervention Educational Services (e.g., Birth to Three).

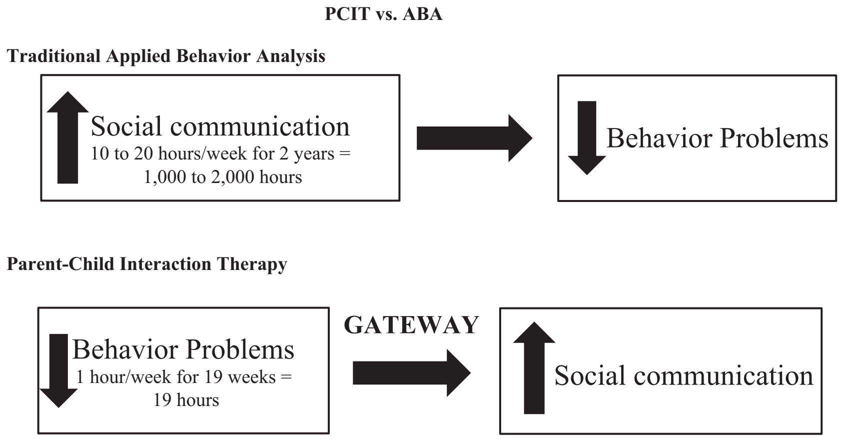


Fig. 40.4 Difference in treatment approach conceptualization between PCIT and ABA

40.7.2 What If PCIT Is the Only Treatment?

- Some families may not have access to the other recommended services.
- PCIT may be the first time families are receiving any form of care.
- PCIT clinicians need to be trained to address the challenges and concerns associated with this population.

40.7.3 Length of Treatment

- PCIT may take longer with this population.
- While typically developing children have core social skills, children with ASD need to learn:
  - Play skills.
  - Communication skills.
  - To enjoy parental verbal attention.
- This all needs to be done before you can modify behavior.

40.8 Training Required for PCIT with ASD

- Although not required, it is recommended that PCIT therapists who want to do PCIT with ASD seek out additional training and experience in ASD.
  - Understand the principles of ABA, including functional assessment.
  - Consultation from someone with PCIT expertise with this population.
- Experienced PCIT therapists who receive only 1–8 h of extra workshop training can be effective with children on the higher functioning end of the spectrum.

See Warner-Metzger (in press; Chap. 18 in this handbook) for greater detail.

40.9 Recognizing Family Needs

- Having a child with ASD has been shown to be more stressful than having children with other long-term disorders (Hayes & Watson, 2013).
- Respite and social support need to be addressed at the onset of treatment.
- Need to be prepared to devote time at check in, check out, and occasional midweek calls on discussing self-care, breaks, recharging batteries, spousal support, and having reinforcement away from the house (Poe & Owen, in press; Chap. 19 in this handbook).

40.9.1 Working with Parent on the Autism Spectrum

- The etiology of autism involves a genetic component.
- When working with children with ASD, it is

likely a therapist will encounter a parent on the spectrum as well.
- Rule-based nature of PCIT is well suited for parents with ASD.
- Parents with ASD would fit well in PCIT as there is more focus on behavior than emotion and insight in treatment.
- Over-practice of skills to mastery fits well with parents with ASD.
- Biggest challenges in PCIT for these families:
  – Warm and sensitive aspect of the authoritative balance.
  – A parent on the autism spectrum may become dysregulated when the child is screaming and becoming aggressive during PDI.
  – Enjoyment/enthusiasm may not come naturally (it is also hard to teach).
    Parents need to be directed to be silly, use funny voices, include sound effects, spontaneous, creative, and change their inflection (may need to tell families to be like an actor in a play).

40.10 PCIT: Phases

The following section will highlight the four phases of PCIT conducted with children with ASD (see Fig. 40.5). While the two main phases of PCIT remain (i.e., Child-Directed Interaction [CDI] and Parent-Directed Interaction [PDI]), recommendations for adaptations will be addressed. In addition, two optional phases, Time-out Readiness and Social-Directed Interaction (SDI), conducted prior to PDI and after PDI graduation, respectively, will also be covered.

40.11 Child-Directed Interaction

40.11.1 ASD Education

- A recent report found 1 in 59 children are diagnosed with ASD (CDC, 2014).
- One reliable place to find information and resources for families for children with autism is Autism Speaks (AutismSpeaks.org).

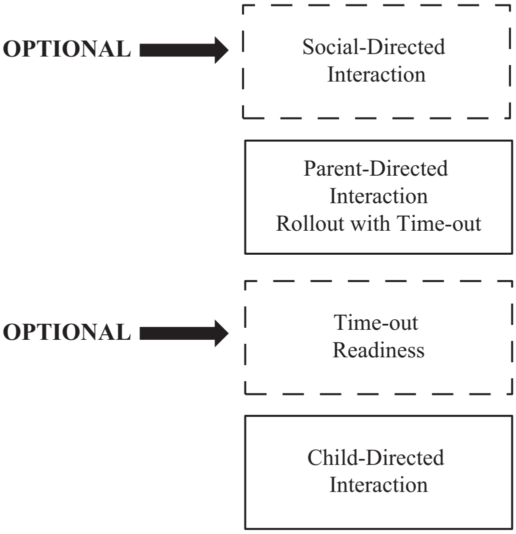


Fig. 40.5 PCIT phases of treatment for children with autism spectrum disorder

- Children under 4 years.
  – *A Practical Guide to Autism: What Every Parent, Family Member, and Teacher Needs to Know* (Volkmar and Wiesner, 2009).
- Make best use of first 100 days after diagnosis.
  – Visit AutismSpeaks.org to download the family services toolkit entitled "100 Day Kit for Newly Diagnosed Families of Young Children."

Bearss (in press; Chap. 12 in this handbook)

- Children with ASD are often not trying to be difficult, their brain works differently.
- Difficulty communicating, socializing, and playing.
- Important to understand their special needs.
- Parenting requires patience, understanding, and compassion.
- They live in a social and sensory world that may be confusing and overwhelming.
- Sensory and social differences cause anxiety, acting out, and avoiding new situations.
- Difficult to play with your child.

Burrows, Parladé, Garcia, and Jent (in press; Chap. 22 in this handbook)

40.11.1.1 Unique Strengths

- Attention to detail.
- Excellent memory.
- Logical and rule-oriented personality.

Burrows et al. (in press; Chap. 22 in this handbook)

40.11.1.2 Symptoms and Challenges

- Communication and Social Challenges**.**
  - Difficulty with:
    - Using words to express needs (leads to frustration and tantrums).
    - Nonverbal communication (e.g., eye contact and gestures; leads to lack of social reciprocity).
    - Noticing social cues and rules (e.g., interrupting, talking too much about a single interest).
    - Sharing and taking turns in play and conversation.
    - Reading the emotions of others and themselves.
    - Knowing how to play with toys or repetitive play.
    - Playing with others (prefer to play alone).
- Restricted or Repetitive Behaviors.
  - Difficulty with:
    - Making unusual noises.
    - Saying the same thing repeatedly.
    - Moving hands or body in unfamiliar or repetitive ways.
    - Becoming upset when moving from one activity to the next.
    - Trouble with sudden changes in routine or schedule.
    - Strong or "obsessive" interests in certain toys or topics.
    - Getting easily overwhelmed by loud, new, or crowded situations.
    - Having strong, emotional outbursts and trouble calming down.

Burrows et al. (in press; Chap. 22 in this handbook)

- Children with ASD with disruptive behavior may actively deny acquiring new or adaptive skills.
- Children with ASD are often a full standard deviation below their assessed cognitive ability for measures of adaptive function (Kanne & Mazurek, 2011; Perry, Flanagan, Dunn Geier & Freeman, 2009).
- Connection between disruptive behavior and impaired adaptive functioning.

See Bearss (in press; Chap. 12 in this handbook)

40.11.1.3 Levels of ASD

Diagnostic and Statistical Manual of Mental Disorders, Fifth edition (DSM-5; American Psychological Association, 2013)

1. Level 1: "Requiring support."
   (a) Social Communication:
   - Deficits in social communication.
   - Can speak in full sentences.
   - Difficulty with give-and-take of communication.
   - Difficulty making friends.

   (b) Restricted, repetitive behavior:
   - Inflexibility.
   - Difficulty switching between activities.
   - Repetitive talk about restricted interests.
   - These behaviors interfere with functioning in one or more places.
2. Level 2: "Requiring substantial support."
   (a) Social Communication:
   - Marked deficits in verbal and nonverbal communication.
     - Odd nonverbal communication.
   - Limited initiation of social interactions.
   - Reduced or abnormal responses to social engagement by others.
   - Simple sentences.

   (b) Restricted, repetitive behavior:
   - Inflexibility.
   - Distress when coping with change.
   - Repetitive behaviors are obvious to others.
   - These behaviors interfere with functioning in a variety of contexts.
3. Level 3: "Requiring very substantial support."
   (a) Social Communication:
   - Severe deficits in verbal and nonverbal communication.

  - Very limited social initiation.
  - Few intelligible words.
  - Communication largely used to get needs met.

(b) Restricted, repetitive behavior:

  - Extreme difficulty coping with change.
  - These behaviors interfere with functioning in <u>all</u> areas.

Who Is PCIT for?

- PCIT has been shown to be successful with children in both Level 1 and 2.
  - Level 1 and 2 represent the majority of children with ASD.
  - 40% of children with ASD have average to above average IQ (Autism Speaks, 2012)
  - Only 25–30% of children with ASD are nonverbal (Anderson et al., 2007; Autism Speaks, 2012).
- Not enough studies have been conducted with understanding the effects for children at Level 3.
- Children must have <u>receptive language</u> skills at 24 months.
  - Must understand simple commands accompanied by a gesture.
    "Please sit in your chair."
    "Please hand me this."
    "Hold my hand."
    "Put this in the box."
- Many 7, 8, and 9 year olds with developmental delays are appropriate for the CDI phase of PCIT (see Timmer, Hawk, Tudor, & Solomon, in press; Chap. 27 in this handbook).
- PDI can be used if the parent is able to safely use physical guidance and carry the child.

40.11.1.4 Comorbid Conditions

- Medical.
  - Seizure disorders.
  - Gastrointestinal problems.
  - Eating problems.
  - Sleep disorder.
- Psychological.
  - AD/HD.
  - Anxiety.
  - OCD.

Forcino and Nadler (in press; Chap. 31 in this handbook)

40.11.1.5 Special Assessment for Children with ASD

- Surveillance and screening.
  - Developmental history.
  - Assessing for family history of ASD and/or other developmental delays or learning problems.
  - Eliciting concerns from parents about development.
  - Observing the child's behavior in an unstructured way.

Forcino and Nadler (in press; Chap. 31 in this handbook)

Comprehensive Assessment

1. Parent interview.
   (a) Autism Diagnostic Interview-Revised (ADI-R).
   - Domains:
     - Language/communication.
     - Reciprocal social interactions.
     - Restricted, repetitive, and stereotyped behaviors and interests.

   (b) Autism Diagnostic Observation Schedule (ADOS-2).
   - History, course, frequency, duration/intensity, and related antecedents and consequences.
2. Collateral Reports (teachers, physicians, ABA therapists).
3. Questionnaires of ASD Symptoms.
   (a) Social Communication Questionnaire (SCQ).
   - Forms: Lifetime and Current.
   - 40-item parent-report questionnaire designed to evaluate communication skills and social functioning

   (b) Modified Checklist for Autism in Toddlers-Revised with Follow-up (M-CHAT-R/F).
   - Two-step standardized screener for ASD risk in toddlers 16–30 months.
   - 20-item questionnaire completed by parents, which generates a score that falls in a range of low, medium, or high risk for ASD

   (c) Gilliam Autism Rating Scale—Third Edition (GARS-3).
      - Parent-report of autistic behaviors.
4. Cognitive Evaluation: Intelligence.
   (a) **DSM-5 requires a specification of "with or without Intellectual Disability"
   (b) Wechsler Scales.
      - Wechsler Preschool and Primary Scale of Intelligence, Fourth Edition (WPPSI-IV).
      - Wechsler Intelligence Scale for Children, Fifth Edition (WISC-V).
   (c) Kauffman Assessment Battery for Children, Second Edition.
   (d) Stanford-Binet Intelligence Scales, Fifth Edition.
   (e) Differential Ability Scales, Second Edition (DAS-II).
5. Adaptive Behavior.
   (a) Vineland Adaptive Behavior Scales, Third Edition (Vineland-3).
      Can be administered via interview or questionnaire.
   (b) Adaptive Behavior Assessment System, Third Edition (ABAS-3).
      - Behavior rating scale.
6. Language and Communication.
   (a) ADOS-2, WPPSI, and WISC.
   (b) Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4).
   (c) Expressive Vocabulary Test, Second Edition (EVT-2).

Behavioral

- Functional Assessment.
  - Antecedents, Behaviors, Consequences (ABCs).
- Preference Assessment.
  - Open-ended questions.
  - Multiple Stimulus without Replacement.
    Many items, child chooses one.
  - Paired Stimulus.
    Items presented two at a time.
- Childhood Autism Rating Scale, Second Edition (CARS-2).
  - Two 15-item scales completed by clinician.
  - Information also added by parent (unscored).

Forcino and Nadler (in press; Chap. 31 in this handbook)

40.11.2 Conceptualization of PCIT with ASD

- Called "Play Therapy" because play is hard work for children with ASD (Burrows et al., in press; Chap. 22 in this handbook).
  - Will take a lot of patience from the parent to teach their child how to play and interact more appropriately.
  - In the beginning, play may be boring for the parent as they must join with the repetitive behavior in order to make their attention more reinforcing.
  - We will bridge to more appropriate play over the course of CDI.
- The program requires that you give this therapy to the child for 5 min every day.
- Main Goal of CDI:
  - Improve the relationship so playing with the parent becomes reinforcing to the child.
    Child learns to seek out and engage with the parent.
    Want child to become motivated by positive attention from the parent.
- Secondary Goal of CDI:
  - Develop play behaviors that will set the stage for positive social interactions with other children.
- Second half of program (PDI) is focused on compliance training.
- Authoritative balance necessary—even with children who have special needs (like ASD, trauma history, or medical concerns).
- Later in PDI, commands will be used to teach your child new behaviors to improve social interactions and to redirect the child away from repetitive behaviors.
- Later in PDI, consequences will be used to teach frustration tolerance, increase emotion regulation, teach appropriate play skills, and decrease aggressive behavior.

40.11.3 PRIDE Skills

40.11.3.1 Praise

- Children may not smile or acknowledge the praise.
  - Might even get a negative response to praise at first.

  - Maybe they just can't show that it is reinforcing (it may still help their self-esteem).
- We are training them to respond to the praise.
  - Pairing it with rewarding behaviors (e.g., hugs, tickles).
  - May take a lot of pairings of touch and positive attention to be rewarding.
- May not have immediate increase in behavior you might see in typically developing children.
- Give praise for the same skills you would focus on in PCIT with children developing normally.
- In addition, give praise for core ASD deficits (see Masse & Warner-Metzger, in press for a wide range of examples; Chap. 25 in this handbook).
  - Example:
    For children who are less verbal: Praise them when they use their words.
    Praise eye contact.

Abner, Clionsky, and Dreiling (in press; Chap. 32 in this handbook)

40.11.3.2 Reflections

- Vocalizations vs. Verbalizations.
  - Dr. Warner-Meztger's "Pig rule."
    Oink vs. "snort."
  - In verbal children, verbalizations do not count as reflections.
  - If child is nonverbal (fewer than 5 word vocabulary), vocalizations should count as reflections.
- 75% vs. 10 in 5 min (Masse & Warner-Metzger, in press; Chap. 25 in this handbook)
- If child is nonverbal, parent should practice in role play with therapist (if parent did not have chance to do 10-10-10).
- Abner et al. (in press; Chap. 32 in this handbook)
- Masse and Warner-Metzger (in press; Chap. 25 in this handbook)
- Reflection of Repetitive Verbalizations.
  - For repetitive verbalization.
    Reflect once then move on/redirect.
  - For echolalia.
    Reflect and expand the child's vernacular.

Masse and Warner-Metzger (in press; Chap. 25 in this handbook)

- Reflection/Expansion.
  - With low verbal children.
  - "…adult restates the child's utterance adding grammatical complexity" (Beverly & Zlomke, in press; Chap. 23 in this handbook)
  - Shaping their approach to language.
  - Reflection of their approximation of the word + Expansion by adding proper adult grammar/vocabulary + Labeled Praise for using words.
    Child: "Pah-pah." **Parent:** "Pah-pah. Puppy. Good Talking."

Agazzi, Knap, Tan, & Armstrong (in press); Chap. 28 in this handbook.

Beverly & Zlomke, in press; Chap. 23 in this handbook

- Reflecting sign language also with word.
  - Child signs "blue," parent should also sign "blue," while also verbalizing "blue."
  - These should count as reflections.

Abner et al., in press; Chap. 32 in this handbook.

40.11.3.3 Imitation

- Imitation is the key to learning social development (Ingersoll, 2008).
- Children with ASD have impairments in imitation.
- Imitation is necessary for social communication (e.g., play, conversation).
- Use parental imitation to encourage child imitation.
- When child learns to imitate, it can benefit them more in other services (e.g., speech therapy, occupational therapy).
- Imitate mild repetitive, self-stimulatory behaviors/play in the beginning, then fade it out.
  - Imitate only non-inappropriate play (e.g., hand shadow play, lying on the floor, lining up cars, writing numbers, spinning wheels) just to start the engagement process.

Fade out when parent becomes more reinforcing (around CDI Coach #3–4).
  - Highly inappropriate play (e.g., spinning until dizzy, running into the walls, spitting, mouthing objects) should not be imitated (Ingersoll, 2008).
- Example.
  - **Child:** Spins tinker toy.
  - **Mother:** Imitates spinning tinker toy. “You are spinning the tinker toy.”
  - **Therapist:** “Now go ahead and add some items onto your tinker toy structure.”
  - **Mother:** Adds items. “I’m making my toy into a flower.”
  - **Child:** Imitates mother by making a flower.
  - **Therapist:** “Describe that.”
  - **Mother:** “You are planting a flower in the garden.”
  - **Therapist:** “Now build a flower like his.”

Abner et al., in press; Chap. 32 in this handbook.

40.11.3.4 Behavior Descriptions

- Describe repetitive play in the beginning, then phase it out.
  - Go with it—imitate and describe the behavior.
    Example: Child only spins wheels of Thomas the Tank Engine.
  - Once parent’s verbal and play behaviors are more reinforcing, parent may only describe when the child starts trying other behaviors (even if only slightly varied).
    Example: Child pushes Thomas the Tank Engine (describe this behavior, selectively ignore spinning).

40.11.3.5 Enjoyment

- Characteristic of ASD is blunted affect.
- Parents may unknowingly mirror flat child affect.
- Parent may need to up the enthusiasm to counterbalance the constricted child affect.
- Parents may then model and exaggerate a variety of emotions.
- Give labeled praise if child imitates parent’s emotional displays.

40.11.4 Disruptive Behaviors in CDI

All children experience some level of disruptive behaviors. There are some important distinctions between typically developing children and children on the autism spectrum in regards to disruptive behaviors that we will highlight below. For a clear outline of behavioral categories for children with autism spectrum disorder and their typically developing counterparts, see Table 40.1.

40.11.4.1 Annoying/Obnoxious

Both typically developing children and children with ASD experience annoying or obnoxious behavior. This distinction includes such behaviors that are maintained and motivated by parental attention (e.g., whining, tugging on parent’s shirt, shoving a toy in the parent’s face). For children with ASD:

- Similar to traditional PCIT, ignore and redirect should be used.
  - Ignoring is only effective when parental attention is maintaining the behavior.
- Redirecting with typical, pretend play during a tantrum would be like trying to redirect a neurotypical PCIT case by drawing stock market graphs and talking about interest rates.
- Use restricted interests to our advantage when redirecting (e.g., clocks, numbers, dinosaurs).

Table 40.1 Disruptive behaviors in CDI: typically developing children vs. children with ASD

Typically developing	Autism spectrum disorder
• Annoying/obnoxious • Dangerous/destructive – Safety of child – Safety of property – Safety of parent	• Annoying/obnoxious • Dangerous destructive – Safety of child – Safety of property – Safety of parent • Restrictive interests – Not disruptive – Disruptive • Tantrums vs. meltdowns

Note. ASD = autism spectrum disorder; CDI = Child-Directed Interaction.

Table 40.2 Managing dangerous and destructive behavior in CDI sessions (with typically developing children)

Child's behavior	Parent's response
Child is doing something physically dangerous (e.g., elopement, standing on tables/chairs, climbing on furniture, self-injurious behavior)	• Coach parent to physically move the child and redirect.
Child is destroying property (e.g., throwing a chair, destroying toy, writing on the walls, breaking crayons)	• Time-out the property after warning statement, "If you write on the table again, the crayons will be taken away."
Child is aggressive toward the parent (e.g., hitting, biting, kicking, pushing)	• Time-out the parent after warning statement, "If you hit me again, I will leave the room and wait outside."

Note. At the beginning of a child's escalation, therapist can enter room loudly with new toy and a "big distract" to prevent the need for time-out of property or parent.

40.11.4.2 Dangerous/Destructive

There are three types of dangerous/destructive behavior: safety of child, safety of property, and safety of parent (see Table 40.2).

Safety of Child

1. Elopement.
   - Children on the autism spectrum often have a problem with leaving the room and/or running away from their parents.
     - Routinely require child to take parent's hand before opening door or walking down hallway.
     - Always have parent block therapy door during CDI coaching (e.g., table, chair, parent's body).
     - Let the parent know before anyone enters the room so parent can hold the child's hand or block the exit.
   - Labeled praises to prevent elopement.
     - "I like how you are staying close to me."
     - "Good job using your walking feet."
     - "Thank you for staying in the room."
2. Inanimate objects.
   - Examples: throwing, standing on furniture, jumping off of windowsills, climbing, touching outlets/removing safety plugs, putting fingers in door jam.
3. Self-injurious behavior.
   - Assessing whether a child engages in self-injurious behavior at pretreatment is important.
   - Need to work on preventing this behavior before it occurs.
   - Common reasons.
     - Communication issues.
     - Frustration.
     - Escape avoidance.
     - Sensory issues.
     - Obtain attention.
   - How to handle.
     - Coach the parent to pick the child up from behind.
     - Carry the child to another area of the room.
     - Redirect with play.
   - Physical prevention (Masse & Warner-Metzger, in press; Chap. 25 in this handbook).
     - If child throws their bodies → Have cushion or pillow available to block the behavior and soften impact.
     - Child hits head → Have child wear helmet to session.
     - Child bites arms → Have child wear heavy sweaters.
     - Child scratches himself/herself → Have parent cut child's nails as short as possible, have child wear thick clothing and/or gloves.
     - If child repetitively picks → Use fun band aides.
   - Determine **function** of the behavior.
   - Reinforce an opposite, incompatible behavior.

Have child hold squishy, sensory stimulating toy balls for each hand if child is scratching.

   - If communication issue:
     - Give child another way to communicate.
       1. Use picture system (for child to point to what they need).
   - If escape function.
     - Need a way to communicate they need a break from CDI (e.g., picture of stop sign to indicate they are done).

- If sensory.
  - Try to provide toys or objects that may provide same sensory function.
- When the behavior happens, parent needs to respond quickly.
- Need to interrupt it with as little attention as possible.
- Parent picks child up from behind (underneath the armpits).
- Move child to another area of the room with different toys.
- Parent may need to provide light physical guidance/hold child to prevent injury.
- A child experiencing sensory overload may need for the parent to provide a tight hug, soothing touch, or gentle rocking.
- Engage in redirection with preferred activities.
- If needed, have therapist come into room perhaps holding new toy as big distraction.

Safety of Property

- Throwing.
  - If you ignore throwing, it sets a precedent for child that throwing is acceptable.
  - Clinic becomes the only place in the world that child is allowed to throw toys.
  - Clinic may become conditioned stimulus for throwing.
  - **How to handle**: Time-out of the toy.
- Inanimate Objects.
  - Examples: Standing on furniture, jumping off of windowsills, climbing, touching outlets/removing safety plugs, putting fingers in door jam.
  - **How to handle**:
    Coach parent to pick the child up from behind.
    Carry the child to another area of the room.
    Redirect with play.

Safety of Parent

- Some children with ASD will tackle or choke a parent who is sitting on the floor during play.
  - If this is an issue, the parent may need to sit in a chair during CDI.
- **How to handle**:
  - Use standard PCIT "time-out the parent" technique.
  - Use warning statement.
    "If you choke me again, I will leave the room and wait outside."
  - If the child hurts the parent again, the therapist enters the room, the parent exits.
  - Therapist stands at door with back to the child to supervise.
  - After approximately 45 s, the parent reenters the room.
  - Parent redirects with child's preferred activities.
  - Parent praises child for being gentle.
    "Thank you for being gentle and safe with me. When you're gentle, I get to stay in the room with you and play."

Extreme/High Rate of Aggression and Throwing

- Role play the aggression or throwing procedure in advance with Mr. Bear or use a Social Story for a child who is known to be aggressive (Agazzi, Knap, Tan, & Armstrong, in press; Masse & Warner-Metzger, in press; See Chaps. 25 and 28 in this handbook).
- If behaviors are too extreme/frequent, or time-out toy or parent technique is not working (when standard protocol fails).
- May consider a sticker chart as last resort (e.g., continues to throw).
  - Example:
    Draw a chart with five squares.
    Every 5 min, provide a labeled praise and sticker for being gentle.
    Predetermined number of stickers associated with a special activity, edible treat, or prize box (Fig. 40.6).

40.11.4.3 Restrictive Interests

Children with ASD are characterized by restrictive interests. While these behaviors can be difficult for parents (or others) to engage with, some may be disruptive, while others are not.

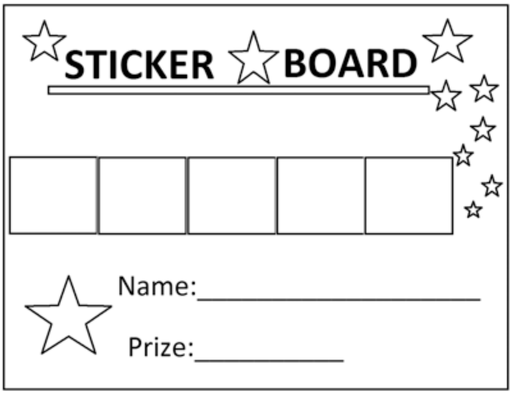


Fig. 40.6 Example sticker chart for child high rate aggressive/throwing behavior

Not Disruptive

Examples of not disruptive restricted interests include playing only with dinosaurs, lining up objects, and over-focus on numbers, calendars, calculators, animals (e.g., insects, snakes), clocks, clipboards, a particular sports team, volcanoes, a particular movie, airplanes, earthquakes, specific symbols or logos (e.g., Pepsi, caution cones), opening and closing doors, a particular cartoon character, collections (e.g., stones, milk tops, stuffed animals), a comfort object (e.g., stopwatch, blanket), or computers.

- In the beginning of CDI, parents must join with the repetitive behaviors.
- By joining with the child's interests, verbal attention and play activities from the parent will become more socially reinforcing to the child.
- Using PRIDE skills with repetitive and perseverative play requires patience from the parent and therapist.
- Once the child begins to enjoy interactive play with the parent, then the parent will bridge to new and more appropriate play behaviors.
- Parent can be reassured that repetitive play will be directly addressed in PDI using commands to develop new play repertoires.
- Ignoring and Redirection.
  - Perseverative requests and questions are usually handled with an "asked-and-answered" approach (scudder, Wong, Mendoza-Burcham, & Handen, in press).

    Parent responds once, then uses ignore and redirect.

    Child: "Where's the tow truck?"

    Parent: "There's no tow truck in this car set."

    Child: "Where's the tow truck? Where's the tow truck? Where's the tow truck?"

    Parent: Ignores because the question has been asked and answered.

    Parent: Creative redirection with new toy–Grabs dump truck and starts making car noises.
- Asked-and-Answered.
- If asked-and-answered with ignore is ineffective, then parent can explain.

  Child keeps asking about tow truck even after ignore and redirect has been used (ineffective).

  Child: "Where's the tow truck?"

  Parent: "It makes me tired to answer the question over and over. I will answer it only one more time. Then I want to talk about something else."

  Parent: "There is no tow truck in this car set."

  Child: "Where is the tow truck?"

  Parent: BIG IGNORE (e.g., turn back on child, walk away from the child).
  - Some children ask questions they know the answer to in a bid for attention or attempt to gain a sense of control through predictability.

    Parent should recognize that these questions are a way for the child to engage the parent

    Children with ASD may not know how to appropriately begin a conversation or request attention
  - In this case, parents may address the child in the following way:

    Child: "What color is the sky?"

    Parent: "I think you know that the sky is blue. It seems like you want to talk about the sky. I am here to listen. I like talking to you about the sky, the clouds, and the sun."

    Child is doing his/her best to seek attention.

Child may not have additional skills to attain parental attention aside from inappropriate behaviors.

Parents can scaffold the child to speak about more socially appropriate topics.

Disruptive

Examples of disruptive restricted interests include spitting on the one-way mirror, spinning until the child is dizzy, mouthing objects, squealing, or running into the walls.

- Ignoring and Redirection (Scudder, Wong, Mendoza-Burcham, & Handen, in press; Chap. 24 in this handbook).
  - Ignoring of restrictive, repetitive behaviors is typically ineffective until parental attention becomes more reinforcing.
  - Parent may refrain from mentioning the repetitive, self-stimulatory behavior by providing attention to more appropriate behavior.

    Child repeats one word over again ("Up! Up! Up!") while pushing elevator up.

    Behavior description of child pushing elevator up (rather than repeating "Up" or having parent ignore).
  - Creative redirection is needed to distract children from self-stimulatory behaviors.

    Use child's fixation to our advantage.

Table 40.3 Tantrums vs. meltdowns for children with ASD

Tantrums	Meltdowns
• Has to be motivated by parental attention. • Child is denied something they want. • Behavior will persist when given attention, but will subside when ignored. • Child in control of their behavior, can adjust level of tantrum based on feedback.	• Is not motivated by parental attention. • An intense response to overwhelming situations. • Child temporarily loses behavioral control (e.g., screaming, crying, lashing out). • Sensory and emotional experiences the child cannot regulate alone.

Note. (Ford-Lanza, 2017, May 30).

Redirect child into more prosocial play by utilizing the restricted interest (e.g., if a child is running around the room, parent begins to write numbers to engage the child [one of child's restricted interests]).

Parent can then bridge activities into more constructive play.

40.11.4.4 Tantrums vs. Meltdowns

It is imperative that PCIT therapists can distinguish between tantrums and meltdowns for children with ASD while delivering PCIT to families (Table 40.3).

Tantrums

- Parent response: Ignore and Redirect.
- Use restricted interests to our advantage.

Meltdowns

A common saying while working with children with ASD is: *if you've met one child with autism, you've met one child with autism.*

- A functional assessment should always be conducted to understand the reason a child is behaving a certain way.
- Response to meltdowns needs to be individualized.
- Ask the parent what might work best for the child to calm down.
- Expect to use trial-and-error when coaching.
- First, attend to child's need, as child may not be able to verbalize needs.
- For children with less language—better to err in the direction of assuming there is a need that cannot be articulated.
  - Emotional need (e.g., child who is upset by teacher criticism, child who is worried about natural disasters, anxiety over change in routine—parent labels feeling and provides reassurance).
  - Sensory need (e.g., loud noises, crowded space, strobe lights—parent helps decrease sensory stimuli).

  - Physical need (parent helps to meet the need).
    Pain.
    Hunger/Thirst.
    Wet diaper.
- Parent response: Assist.
  - Instead of enthusiastic redirection, consider decreasing sensory arousal during a meltdown during sensory overload.
- Parent could consider.
  - Rocking.
  - Silence.
  - Quiet/soothing voice.
  - Turning off lights.
  - Put away toys/clean up room.
- Provide child with safe space (e.g., allow the child to calm himself under the table).

Access-maintained Meltdowns

Access-maintained meltdowns are behaviors that are done to get attention, a tangible, an edible, an activity, or may be to maintain a self-stimulating behavior (personal communication, Mackenzie Boon).

1. Step 1: If you have not taught a communication tool, parent should help and then redirect the child.
2. Step 2: If you have taught a communication tool, meltdown signs should be caught early, the communication tool should be prompted, the parent should assist the child, and then the parent should redirect the child's behavior.
3. Step 3: Once the communication tool is mastered, the parent should only provide help when the tool is used.
   (a) Example: "When you say *'help please'*, then I will help you."

- People are not capable of learning when they are in the "rumbling," "raging," or "recovery" stages of a meltdown (McCalla, 2017).
- Skills should be practiced repeatedly and regularly prior to a meltdown so it can be handled properly when it occurs.
- Visual supports and role play may be key to help handle the situation.
- During a meltdown:
  - Reduce the amount of talking with the child. Use a quiet voice.
  - Use visual supports or model what you want the child to do.
  - Validate the child's emotions.
  - Help the child calm down by either relocating the child, allowing the child to take a walk, or bringing the child to a space to relax.
  - The parents always need to remain calm and patient and use their own coping skills (e.g., deep breathing; McCalla, 2017).
- Typical PCIT referrals are very responsive to ignore and redirect because the children seek out stimulation and attention.
- When a tantrum is precipitated by too much stimulation (i.e., sensory overload), ignore and redirect may exacerbate the meltdown.
- For meltdowns that are sensory in nature, parents may need to be coached to approach and comfort rather than ignore and redirect.

40.11.5 CDI Ancillary Skills

See Masse and Warner-Metzger (in press) for more information (Chap. 25 in this handbook).

40.11.5.1 Use Touch

- Common for children with ASD to find touch reinforcing**.**
- By pairing the PRIDE skills with touch, it can make the PRIDE skills more reinforcing.
- Sensory overload may be overcome through use of positive touch for *some* children.
  - Touch may be most effective with deep touch pressure (e.g., tight hug/rocking hugs, firm stroking, squeezing, tickles, hair stroking, back scratches, high fives).
- Difficulty identifying and expressing emotion is hallmark feature of ASD.
- During CDI, parents should:
  - Describe their own feelings.
  - Identify child's feelings.
  - Identify feelings in characters of the play.

  - Praise children for using feeling words.
  - Describe the feeling states.
  - Add feeling words to reflections.

Understanding Emotions and Identifying Feelings
Using an emotion-identifying sheet may be helpful for children to express how they are feeling (e.g., angry, worried, a little stressed, calm).

- Feeling words to emphasize:
  - Happy, sad, angry, afraid, nervous, excited, worried, surprised, frustrated.
- “I love you!”
  - We teach children to express the love they feel for their relatives.

40.11.5.2 Encourage Eye Contact

- Children with ASD have a tendency to avoid eye contact.
- Parents must model positive eye contact.
- Parents can encourage eye contact by positioning themselves.
  - Parents should reposition themselves to get into the child’s line of site.
  - Give labeled praises for eye contact.
    “You have beautiful eyes.”
    “I like when you look at me while we are talking.”
    “It makes me feel happy when you look in my eyes.”
  - Use child’s preferred activities/preferred toys to redirect the child’s eyes to the parent’s eyes (e.g., put preferred toy near parent’s face).

40.11.6 Toy Selection

See Shillingsburg, Hansen, and Frampton (in press) for greater information on how to conduct preference assessments (Chap. 26 in this handbook).

- Informal Preference Assessment.
- Review possible toys that could be used in CDI with parent.
  - Identify high preference toys that could be used for CDI coaching.
  - Make notes about what toys child enjoyed and use this information at the next session.

40.11.7 CDI Is a New Language

- In the beginning, parents need to allow some repetitive behavior breaks for child to cope with stress and anxiety about the intense verbal and play interactions.
- When child starts to escalate in CDI.
  - Examples: holding fingers over ears, yelling, “Stop talking!”
- They are communicating that frequent verbalizing in CDI is overstimulating.
- Parent may need to be quiet/slow down PRIDE skills.
- Child may need self-stimulation to self-soothe.

40.11.8 Transition Statements

- Children with ASD have more difficulty changing activities (Scudder et al., in press; Chap. 24 in this handbook).
  - Transition statements are needed to prepare the child for change.
    Coach the parent to give a transition statement before moving on to a new activity (e.g., from waiting room to therapy room, from check-in to CDI coaching, from one caregiver to the next, from end of CDI coaching to check-out, before leaving the session).

See Table 40.4 for examples.

  - Therapist should try to reduce the number of transitions during the session (e.g., doing the check-in in the waiting room rather than in the therapist’s office prior to coaching).

Table 40.4 Transition statements during PCIT sessions

Transition period	Example statements
From waiting area to the therapy session	**Parent:** "It is almost time for us to go to the playroom. I will need you to hold my hand as we walk down the hallway."
Prior to starting coaching	**Therapist:** "In about 1 min, you will get to have play time. Today, your dad will go first and your mom will come with me. Then after you play with your dad for a while, your mom will come in and play with you."
Before moving from 1 parent to the next	**Father:** "We have about 1 more minute of play time left, then your mom will come in."
Before the end of play time	**Therapist:** "Go ahead and give him a transition statement so he can get used to stopping the play time. Tell him, '*In about 2 minutes, our play time will be over. I will pick up the toys. You can help if you want. Then the therapist will come back in the room.*'"
During check-out	**Parent:** "I'm going to talk to the therapist for a few minutes while you play over there on the floor. Then it will be time to leave."
Before exiting the therapy room	**Parent:** "It is time to go. When you take my hand, then I will open the door."

  - Develop routines to increase predictability of the session (e.g., always stop at bathroom on way to coaching session, always have child take the parent's hand before opening door to exit).
  - For children with low communication skills, pictures may be used to assist with transitions.

40.11.9 CDI Skills

- Children with very poor play skills may need to do the following:
  - Bring in new toys to increase interest.
  - Shorten CDI Coach sessions to reduce likelihood of burnout.
- First few sessions, engage in repetitive behaviors.
- Ignoring only can be effective as parental attention is more enjoyable (after CDI Coach 3 or 4).
- Then work on shaping prosocial child play behaviors.

40.11.10 Targeting ASD-Specific Behaviors

1. Flexibility training.
   (a) Scaffolding (Abner et al., in press; Chap. 32 in this handbook).
   - Adults provide support to children as they learn new skills.
   - Light framework supports child as they learn to stretch beyond their current capabilities.
   - This extra support helps them achieve new goals.
   - When child can do it themselves, the support is removed.
   - Example:
     - Child always makes the toy car go around a circle track.
     - Parent describes the child's play.
     - Then, parent adds a tunnel to the circle track.
     - Parent praises the child for trying something new:
       "Thanks for letting me put the tunnel on."
       "It's fun that you are doing something different with the car."
   - Example:
     - Child repeatedly writes the numbers 1–20.
     - After using PRIDE skills while child writes numbers, parent says:
       "I will write your name on the top of the paper."
       "Good job letting me add something new to your paper."
   - Example:
     - Child repeatedly puts toy animals in a straight line.
     - After describing and reflecting, the parent says, "The fox wants to take a little run, then he'll come back in line."

   (b) Parent and therapist need to be highly aware of:
   - Accepting **change.**
   - Doing something in a **different** way.

Table 40.5 Labeled praise examples to promote flexible behaviors

Transition period	Example statements
Playing with a new toy	"Good job playing with a different train." "Great job building something new."
Interacting with a toy in a new way	"That's very creative to add a tunnel."
Letting the parent play with the toys	"Thank you for letting me add a block." "I love it when you let me touch the toys."
Breaking out of a routine	"You are smart to try it a different way." "That's neat the way you switched activities."
Trying something new	"It's pretty when you change colors." "I love it when you play in new ways." "It is fun to play with you when you try new things."
Letting the parent have an idea	"It makes me happy when you let me build it a different way."
Sharing the toys	"I like how you shared your favorite markers so I could color too."
Using a different pattern	"That's very creative to put them in a different order."
Allowing toys to be out of place	"I think it is neat how you mixed up the colors that time."

- Trying something **new.**
- **Switching** activities.
- Accepting **different ideas** from others.
- Allowing others to **uniquely contribute** to the play.

(c) Use labeled praises to promote flexible behaviors (See Table 40.5).

(d) Teach children what flexibility is by using the word within a neutral talk and during labeled praises.

"I like how you switched colors. That's being flexible. It's great to be flexible."

(e) Children can learn big words like "creative," "flexible," and "pretend" if they hear them regularly.

1. Higher-level Social Skills.
   (a) As part of the scaffolding, parents need to make a concerted effort to model pretend play and humor.
   (b) Children with ASD do not easily learn these constructs.
   (c) Praise any approximations to pretending and being funny.
   - "I like it when you pretend like they are in school."
   - "Good job making the duck act silly. You are being funny. You are making me smile and laugh when you say funny things."

   (d) Parents should notice any time a child brings them into their world by sharing, showing the parent something, or asking the parent a question.
   - "It makes me feel happy when you ask me questions."
   - "That's sweet to give me one of your trucks."
   - "I love it when you tell me what you're thinking about."
   - "I'm proud of you for showing me what you're doing."

   (e) See Fig. 40.7 for a case example.

In a case study conducted by Lieneman and colleagues (in press; see Fig. 40.7), a 5-year-old boy with autism was measured on the level of pretend play he engaged in across PCIT in a number of observations. It is important to consider that the child increased his use of pretend play after completing the treatment. For further discussion on the implications of these findings, see Chap. 39 in this handbook (Lieneman et al., in press).

1. Priming the Pump with a Social Story.
   (a) **Social Story** = a visual and storied representation of a scenario the child may find themselves in (Agazzi et al., in press; Gray, 2000; Gray, et al., 1993; Gray & Garand, 1993; Masse & Warner-Metzger, in press; see Chap. 25 and 28 in this handbook).

   Incorporates a series of tailored printed words and pictures that explain the important social cues, perspectives, and behavioral responses in that situation.

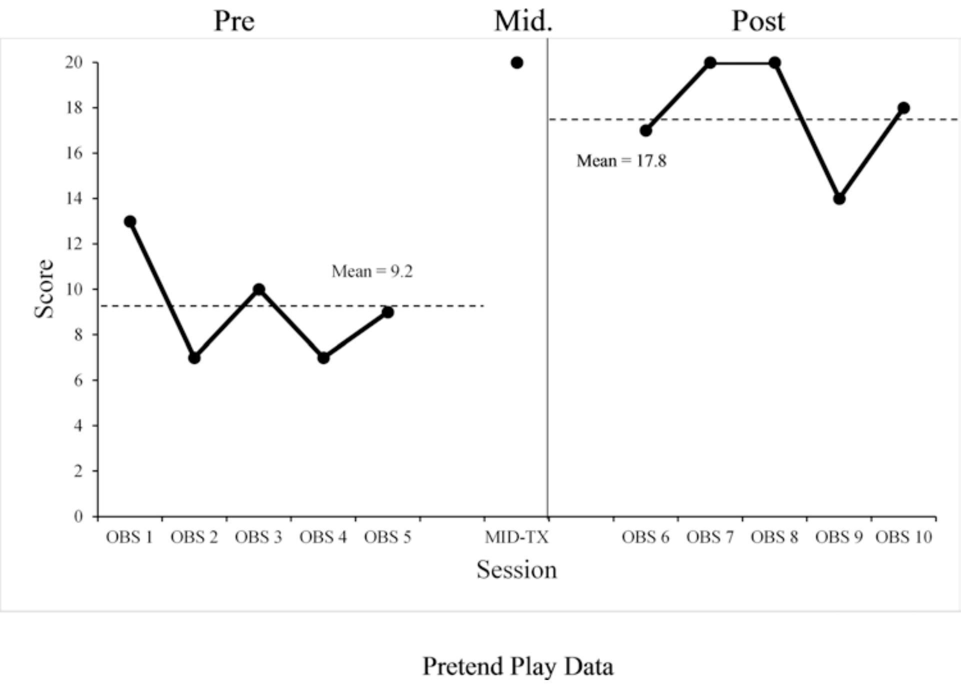
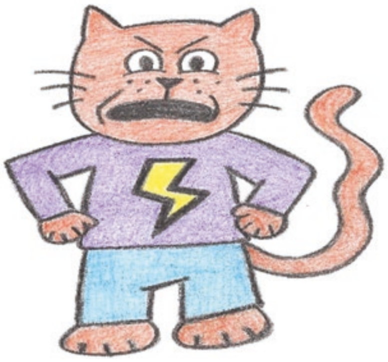


Fig. 40.7 Pretend play improvements in CDI. *CDI* Child-Directed Interaction (Lieneman, Ruckle, & McNeil, in press; Chap. 39 in this handbook)

- Example:



"Henry the Cat Learns to Say 'I'm Mad.'" Written by: Dr. Cheryl McNeil. Illustrated by: Carleigh Smith (see Appendix A for full story and illustrations)

(b) Social stories are helpful to "prime the pump" when trying to increase a child's low frequency behavior.

(c) Social stories can also be done by using Mr. Bear to demonstrate the targeted behavior.

(d) The therapist may indicate that if the child does the positive behavior like Mr. Bear, then the parent will notice it, and give the child a hug and a praise.

(e) By using Mr. Bear or a written social story, the child and parent are made aware of the goals of the session, therefore increasing the likelihood the behavior will occur.

- Example:

– Child always lines up the cars.

– **Therapist:**

"Baby Bear likes to line up the cars when he plays with Mama Bear. But Mama Bear wants to see him be creative with the cars. So Baby Bear makes the cars drive around the track, zoom down the ramp, and drive the toy animals around town. Baby Bear is learning how to play with the cars in a different way. And Mama Bear LOVES it! Mama Bear is happy and gives Baby Bear lots of praise and hugs."

   (f) Can also be used for eye contact, talking about different topics, or problem behaviors.
   (g) Managing Repetitive Behaviors in Later CDI Coach Sessions.

For children with higher verbal skills.

Goal = get child to ask before engaging in repetitive behaviors and to ask to have a break.

Have child ask to engage in replacement behavior.

Examples:

- **Child** who repetitively writes numbers learns to ask the parent to join him in writing numbers: “Can we write numbers now?”
- **Child** who impulsively jumps up, runs around the room, and spins in circles learns to ask the parent: “Can I go for a run?”
- **Child** who starts to display disruptive behavior when bored 30 min into a session learns to ask the parent: “Can I go for a walk?”
  - Parent is taught to reinforce asking behavior by giving a labeled praise and allowing the child to engage in the behavior for a period of time.

2. Encouraging Communication with Neutral Talk (Masse & Warner-Metzger, in press; Chap. 25 in this handbook).
   (a) Neutral talk can motivate a reticent but verbal child to speak.
   (b) Example:
   - Child is playing with crayons, but is not talking.
   - Parent knows child’s preferred topic is planets in the solar system.
   - **Parent:** “This crayon is the same color as the dirt on Mars.”
   - Parent can attempt to start conversation by discussing the child’s interests.
   - **Child** responds: “Mars is the fourth planet from the sun. Mars is my favorite planet.”
   - **Parent** can use reflection: “Mars *is* the fourth planet. I remember looking at the solar system exhibit with you at the museum.”
   - **Parent** can use labeled praise: “Thanks for sharing your thoughts with me.”

   (c) Use neutral talk at an appropriate pace.
   (d) Avoid rapid-fire delivery.
   (e) Example of problematic, rapid-fire neutral talks:
   - “This crayon reminds me of the color of Mars. Mars is red and brown. You learned all about Mars and the other planets at the museum. That’s the trip Uncle John took with us. You told him all about the planets. We should go back there.”
3. Use of Higher Order Statements When Coaching.
   (a) Observations about how CDI is improving ASD symptoms.
   - “Jimmy looked at you when you spoke about the calendar.”
   - “She is starting to share toys with you now.”
   - “He’s starting to actually build with the blocks, rather than just line them up.”

   (b) Parents of children with ASD do not often receive praises about their children.
   - Important to praise the child’s special abilities, loving traits, physical attractiveness, etc.

   (c) Parents of children with ASD seldom receive praises about their parenting and often have low sense of parental competence.
   (d) Give the parent credit for every success that the coach sees.
   - “She is starting to do pretend play now. It is because of all the great imitation of pretend play you are doing.”
   - “I love how he says ‘thank you.’ I can tell that you work hard to teach him manners.”
   - “Your PRIDE skills are almost at mastery. It is impressive that you find the time to practice every day.”

40.11.11 Mastering CDI Quickly

- If parents master CDI quickly, more time may be needed to foster a strong relationship and allow the child to become familiar with the new style of play (Abner et al., in press; Chap. 32 in this handbook).

40.12 Parent-Directed Interaction

- For PDI's Theory of Compliance, refer to Fig. 40.1.

40.12.1 Children with ASD Without Disruptive Behavior

- Children with ASD referred for PCIT frequently demonstrate passive noncompliance (i.e., ignoring parental directives).
  - Rather than active noncompliance (i.e., refusing to comply without negative affect).
  - Or overt defiance (i.e., defying parent with accompanying anger; Scudder et al., in press; Chap. 24 in this handbook).
- Even passive and cooperative children with ASD need help with listening skills.
- Parents of children with ASD need to learn effective commands, praising, and giving an opportunity to comply.
- BUT all children may not need time-out.

40.12.2 PDI Teach

- Children with ASD have a logical and rule-oriented personality.
  - PDI will decrease child's anxiety because it fits with their need for structure.
- Makes the world more predictable for the child.

40.12.2.1 Explaining the Rules of PDI

- Social Stories with Mr. Bear (Gray, 2000; Gray, et al., 1993; Gray & Garand, 1993).
- Visual flipbook (Masse & Girard, n.d.; available on www.pcit.org).

40.12.2.2 Giving Commands in PDI

- Limited to only a few simple concepts.
  - "Please hand me ___." "Please sit down."
- Parents should provide list of known commands.
- Only commands the child knows are worked on (e.g., children with low levels of communication should only work on 1–2 commands at a time).
- More advanced commands are not attempted until mastery of previous commands are gained.
- While delivering commands:
  - Use positive, physical touch.
- Used to gain child's attention.
- Example: Touching child's back or knee.
  - Clear, physical gestures.
    Orient child toward the items needed to comply with command.
  - Close proximity to child.
    Example: Modeling eye contact, getting on child's level.
- Perspective-taking deficits may lead to problems with pronoun reversal for some children with ASD (Masse & Warner-Metzger, in press; Chap. 25 in this handbook).
- If pronouns are used, be sure to use an accompanying gesture.
  - Example:
- **Parent:** "Please put your block on my tower."
- Instead, **Parent could say:** "Please put this block on this tower [use gestures]."

Self-stimulatory and Stereotypic Behaviors

See Masse & Warner-Metzger (in press; Chap. 25 in this handbook).

1. Can address this in PDI by issuing incompatible command.
   (a) Example:
   - **Child:** [flapping her hands].
   - **Parent:** Please make a pancake with the Play-Doh.

   (b) Example:
   - **Child:** [spinning in circles].
   - **Parent:** "Please sit down next to me."
2. Redirection/Positive opposite replacement behavior.
   (a) Example: Give a "high five" when excited rather than screeching.

    (b) Using positive and fun alternatives may be more effective and fair to the child with ASD.
3. Use Commands to Develop Play.
    (a) Example:
    - **Child:** [turning car over and spinning wheels].
    - **Parent:** "Please push the car down the ramp."
    (b) Example:
    - **Child:** [only writes numbers].
    - **Parent:** Uses commands to teach how to draw faces and animals [draw circle, draw triangles on top—he learns to draw a bunny].
    (c) Example:
    - **Child:** [only puts cups in the microwave].
    - **Parent:** "Pretend to drink your tea like this."
    (d) Use commands to increase flexibility.
    (e) Increase intensity of demand over time.
    - Flexibility training.
        - **Child:** [lines up the crayons for symmetry].
        - **Parent:** "Please put this crayon over here." [purposely making the crayon go out of order].
    - Increase frequency of incompatible commands over the course of sessions.
        - First PDI session: Only deliver one incompatible command to address the child's flapping behavior.
        - Fourth PDI session: Deliver incompatible command every time the child engages in flapping behavior.

40.12.3 First PDI Coach

See Scudder, Wagner, & Shawler, in press; Chap. 33 in this handbook

- Children with ASD have perseverative behaviors.
- Prepare to have a long time-out for at least the first and second PDI Coach.
    - Make sure the parent and child go to the bathroom before coaching begins.
    - Make sure family eats before the session.
- Schedule the session for 2 h (90 min minimum) to have adequate time to follow-through with the compliance procedure.
- Child language skills, child self-regulation skills, and parent distress often determine PDI pacing.
    - May need to repeat a PDI session once or twice following difficult time-outs.

40.12.4 Roll-out of PDI

- PDI roll-out is likely to take longer than five sessions to get up the staircase.
- During the all-day command and the house-rules steps, parents may want to continue play command practice to maintain the focus on compliance training.
    - It may otherwise be easy for parents to slip into inconsistency with the high level of behavior concerns they are managing.
    - This helps a delayed and disengaged child maintain the habit of listening to the parent.

40.12.4.1 House Rules

- Use Social Stories to teach children about the house rule prior to implementation.
- Have the house rule hanging up where it can be easily seen by the family and the child.
- House rules may take longer to roll out with ASD than for typically developing children.
- Highly oppositional children and highly rigid children may question the term "house" rule.
- Taking a literal interpretation that house rules only pertain to the household or within the physical structure of the home.

  Using the term "family rules" may be more appropriate.

  Masse & Warner-Metzger, in press (Chap. 25).

40.12.4.2 Sibling Session

- Devote part of this session to working with the sibling alone to help prepare the sibling for the session.
  - Review the time-out procedure.
  - Practice commands.
  - Explain the goals of the session.
- It is suggested that more than one session is dedicated to siblings.
- Child with ASD also needs good preparation for the sibling session.
  - Give the rationale for sibling's presence.
  - Explain the goals of the session.

40.12.4.3 Public Behavior

- Safety is the most important concern!
- Child with ASD may meet the prerequisites to a public outing, but experience greater difficulties with the transition of PDI from the clinic and home settings to the public setting.
- Children with ASD have a harder time generalizing to other settings.
- May take five weeks or more.
- Some children with ASD may be particularly sensitive to certain types of sensory stimuli.
  - Example: Fluorescent lighting, overstimulation in crowded stores.
- Clinicians should develop a list of public locations (e.g., contained parks, safe playgrounds) that are more public-outing friendly than others and recommend these places to families.
- Want to make sure to set children up for success.
- Micro-outings may be necessary:
  - The clinic environment.
    Example: Taking a tour within the clinic, taking the elevator to a different floor in the clinic building.
  - The home environment.
- Example: Applying PDI principles when other adults and children visit the home, when the child has a playdate with a neighbor, or when visiting family members.
- Pairing/visibly placing the public outing time-out placeholder (i.e., towel, placemat, cloth napkin, or handkerchief) with the time-out chair at home and in clinic for a few weeks before using the placeholder as the time-out marker in public.
- Other options:
  - Purposely vary the route taken to familiar locations.
  - Practice the process of greeting others in a varied (rather than ritualistic) manner.
  - Promote flexibility in outings.

Masse & Warner-Metzger, in press (Chap. 25).

Sensory Sensitivity

- Important to remember that children with ASD often have sensitivity to sensory stimuli.
  - Mild, moderate, or extreme sensitivity to noise, crowds, bright lights, strong tastes, smells, and touch.
- This means that a person who is bright, verbal, and capable may be unable to walk into a crowded restaurant, attend a movie, or cope with the sensory assaults associated with malls, stadiums, or other venues.
- Sensory meltdowns can cause elopement.
  - Be aware of the places you plan to take children and the stimuli the child might experience.

Elopement Training

Approximately 49% of autistic children engage in elopement behavior which may put the children at risk for harm (Anderson et al., 2012).

- Children with serious elopement issues may need to wear a GPS tracking device.
  - Police stations may have anklets available.
  - Can also purchase trackers online.
- Use a Social Story.
  - To teach about the dangers of running away.
- Getting lost.
- Getting hit by a car.
  - Detail expectations of elopement.
- Parent instructs child to stay within the parent's wingspan (~5–6 feet).
- The parent's wingspan is called the "Safety Zone."

- Walk the halls of the agency.
- Give commands.
  - "Take my hand."
  - "Come back here."
  - "Stay close."
- Go to warning statement (NOT a house-rule) and time-out if child does not return to within the parent's wingspan.
- Children with ASD may not understand "stranger danger" or the concept of getting lost.
- Children have to be taught about how far is a safe distance away from parents.
- Work with parents to teach children they must ask before leaving a close proximity.
  - **Child:** "Can I go over there and look at the claw game?"
  - **Child:** "Can I play on the swings over there?"

40.13 Time-out Readiness Phase

The time-out readiness phase involves teaching effective commands, praising compliance, and using physical prompting to prepare children for the time-out component of PDI. Specifically, this phase is an intermediate step before the time-out procedure (Agazzi et al., in press; Miltenberger, 2001; Shillingsburg et al., in press; see Chaps. 26 and 28 in this handbook). It is used to:

- Assess child's cognitive capabilities.
  - Child's comprehension of simple commands.
  - Child's comprehension of the "if, then" conditionals in the time-out procedure.
- Prepare the child for time-out.
  - Increases child compliance rate to reduce the frequency of time-outs later in PDI.
- Prepare the parent for time-out.
  - Allows parent to master the command and praise skills before being exposed to the complicated time-out procedure.

    Decreases amount of information for discipline procedure.

    Emotionally prepares parents for setting limits with a child who has special needs.

40.13.1 Case Example (L. Zee, PCIT Listserv/Personal Communication, February 14, 2018)

- 5-year-old boy with ASD
- Extremely gifted.
- Externalizes feelings and behaviors with hitting, biting of others, and throwing things.
- Decreased those behaviors as a result of CDI but has resorted to self-harm behaviors.
- Self-harm behaviors intensified in the last 2 months.
- He bites himself making deep marks and hits himself on the head.
- He is doing this more frequently when told to do something he does not want to do.
- In PDI Coach #1, but parents have not started PDI homework yet.
- Mother often cries when the child hurts himself.
- Mother is able to gently take his arm down and help him with breathing and validating his emotions.
- Mother asks what she should do.

40.13.2 Who Needs Time-out Readiness Phase?

1. Children with low receptive abilities.
   - Concerns about whether they comprehend simple commands.
   - May not understand conditionals (i.e., "if, then" process) of warning statement, time-out chair, and backup room.
   - Examples:

Younger children with developmental delays.
Children with intellectual disabilities.

2. Parents who have strong hesitation about using time-out with children with ASD.
   - Worried that child might not understand why they are undergoing time-out.
   - Parent has philosophical opposition to time-out due to child's special needs.
   - Parent is afraid of child's possible reaction to time-out.
3. Children with extreme behaviors that may be too challenging for a time-out procedure.
   - Extreme aggression.
   - Self-injurious behavior.
   - Extremely disruptive behavior.
   – Example: Throwing toys and chairs.

40.13.3 3-Step Compliance Training: Point-Model-Prompt

1. Command with a Point (Gesture).
2. Command with a Model.
3. Command with a Physical Prompt.

See also Agazzi et al. (in press; Miltenberger, 2001; Shillingsburg et al., in press; Chaps. 26 and 28 in this handbook).

- Example:
  1. "Please hand me the car" [wait 5 s and point]→
  2. "Please hand me the car like this" [parent puts car in own hand, then places it back on the table]→
  3. "Please hand me the car like this" [parent physically guides child's hand and car to parent's own hand].

40.13.4 Benefits of Using Time-out for Children with ASD

- Time-out is only one component of a larger treatment package.
- Motivates children to follow directions.
- Teaches children to accept consequences.
- Helps children with emotion regulation and self-control.
- Teaches children to sit in a chair for longer periods of time.
- Addresses behaviors that function for escape.

40.13.5 Sensory Sensitivity in PDI

- If a child seems to be having difficulty with sensory overload, it is recommended that CDI skills are used to calm the child before administering a command (Masse & Warner-Metzger, in press; Chap. 25 in this handbook).
  – If a child becomes overstimulated by an activity and begins to flap his/her hands, squeal, and bounce off walls, the parent should use soothing PRIDE skills and touch (e.g., back rub, rocking cuddle) to center the child before continuing with PDI.
  – If in PDI and the parents switch in the clinic room, child engages in self-injurious behavior (e.g., scratching their arms), use CDI calming techniques rather than an incompatible command to set child up for success.

40.13.6 Adaptations for Extreme Situations

40.13.6.1 Shaping Sitting Behavior in the Time-out Chair

- Children with **extreme difficulty** sitting during CDI (developmental delays, hyperkinesis).
- If child cannot sit for 3 min at a time in CDI, cannot expect children to sit in chair for that long during time-out.
- Try to time how long child can sit at one time.
  – Can start with 1 min.
  – If parent goes over to child at 1 min and the child is ready, this might be an appropriate amount of time (powerful enough) for that child to comply with the command (attained the desired response).
  – If the child is not ready, consider increasing

  the amount of time on the chair (length of time was not potent enough) 1 min → 90 s → 2 min etc.
- Ultimate goal is to shape up to a 3 min time-out.
  - Children learn an important skill (how to sit).
  - 1 min may not stay powerful enough for children over time.

40.13.6.2 Child Runs to Backup Room

- Children with ASD might immediately find backup room to be reinforcing.
  - Provides break from stressful interaction.
- If child seeking out the time-out room, if having long episodes in time-out room, if the parent is having difficulty carrying the child, or if the child is aggressive in the carries:
  - Have parent ask at the door: **Parent:** "Are you ready to sit on the time-out chair now?"
  - Reduce the physical reinforcement of the carries.
- May need to increase 1 min +5 s of silence for these children.
  - Start with 1 min +5 s.
  - Move to 2 min +5 s.
  - 3 min +5 s
  - 4 min +5 s
  - 5 min +5 s (But no longer than that).

Big Red Stop Button

The time-out sequence is halted with the use of physical guidance when there are significant complications during time-out.

When to Use the Big Red Stop Button

- Ethical concerns.
  - Excessively long time-out (time-out procedure implemented for an hour or longer).
- Safety issues.
  - Child safety.
- Self-injurious behavior in backup room or time-out chair.
  - Parent safety.
- Physical.
- When parent can no longer handle the physical demands of carrying child back and forth to backup room.
- Psychological.
- Parent may be emotionally exhausted and incapable of continuing.
- Anger management/emotion regulation concerns.
- Developmental concerns.
  - If overestimated child functioning (it seems the child does not understand).
- Therapist or parent must leave for another commitment, as PDI has far exceeded the allotted time.
- Unusual and extreme behaviors occur during time-out (e.g., stripping clothes off, eating feces),

How to Conduct the Big Red Stop Button Situation

For a visual outline, see Fig. 40.8.

- When child is out of time-out chair or backup room.
  - Parent will guide child to time-out chair.
  - Parent keeps child in chair for 5 s.
  - **Parent:** "You are sitting on the chair. Now you will [original command]."
  - Parent carries child to original object.
  - Hand-over-hand of command.
  - Give labeled praise for guide**.**
  - **Parent:** "Thank you for listening. Because you listened, we can keep playing."
  - NO follow-up command.
  - Use CDI to bring child's emotional levels down.
- If child is already on the time-out chair, use same procedure starting at parent walking over to chair "You are sitting on the chair…."

Dysregulation Following Time-out

See Masse & Warner-Metzger (in press) for more information (Chap. 25 in this handbook).

- If child has significant difficulty with perseveration following an extended time-out or shows significant difficulty down-regulating.
  - After praise of the follow-up command, say, "Because you listened, you don't have to go back to time-out. You can play."

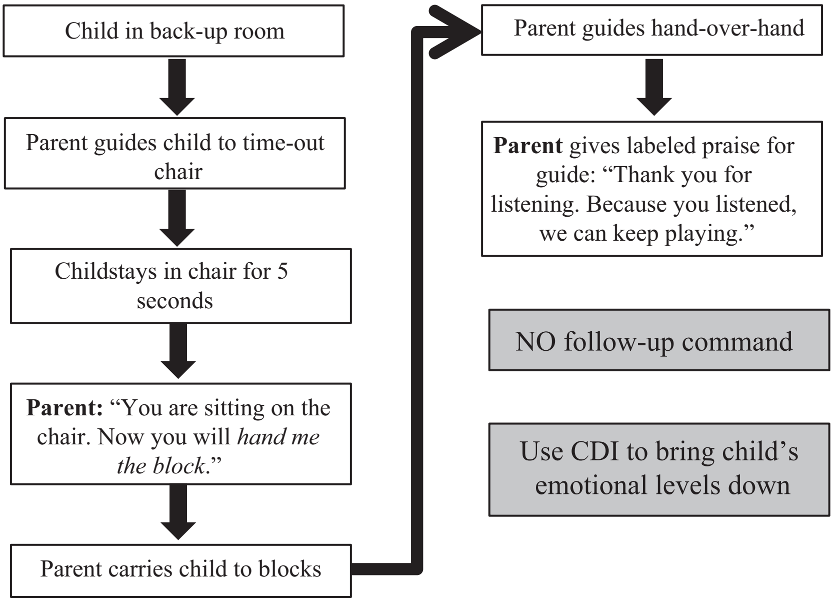


Fig. 40.8 The big red stop button procedure

  - If child finds it reinforcing, use a tight hug and possibly soothe them with rocking.
  - Consider bringing in a snack, juice/water (helps with depletion after a long time-out).
  - Possibly take a break to let the child get out of the triggering setting (e.g., walk), then end on CDI after they return.
  - Therapist brings in a new toy, perhaps a preferred object.
  - Parent can bring a child's comforting object that can be brought in as needed (e.g., stuffed animal, blanket).

40.13.7 Continuing to Build Social Skills

- Encourage play dates and sports training.
  - Parents should coach child during these social activities.

40.14 Social-Directed Interaction

40.14.1 Purpose of SDI

- Build socially acceptable behaviors.
- Expand the child's potential.
- Use the parent to transfer these skills to the child.

(Dogan et al., 2017; Stewart, Carr, & LeBlanc, 2007)

40.14.2 Why Add SDI?

- When we do CDI and PDI, social skill development is an indirect benefit.
- In CDI and PDI, parents are taught to be highly attuned to times when social skills are used appropriately (e.g., asking appropriate questions, playing pretend).
- Yet, CDI and PDI are not comprehensive and direct social skills training approaches, so they do not completely build social repertoires (e.g., answering questions, engaging with other children's play).

40.14.3 Components of SDI

There are two components of SDI: Communication-focused SDI and Social-focused SDI (see Table 40.6). Implementation of the particular component is dependent on the child's skill level.

Table 40.6 Social-directed interaction phase: breakdown of the communication-focused and social-focused components

Communication-focused SDI	Social-focused SDI
• For children with low verbal abilities. – Train parents to use language motivation. Mand training. "When, then" training – Communication targets: Eye contact. Greetings. "Hello" and "Goodbye"	• For children with high verbal abilities. – Train parents to use key social skills. – Social skill targets: Child PRIDE skills. Menu of additional social skills. Example: Ask a question.

40.14.4 Communication-Focused SDI (for Children with Low Verbal Abilities)

- Language Motivation.
  - – Language motivation work (Mand Training; Shillingsburg et al., in press; Chap. 26 in this handbook).
- 6 Steps.

40.14.4.1 Mand Training

- The child wants something but is not using appropriate language (e.g., grabbing for a toy, making noises to be picked up).

1. Step 1: Parent withholds desired object or activity.
2. Step 2: Parent prompts child to use words on child's level of language.
   (a) Examples.
   - Low verbal: "Say *truck*."*.
   - Medium verbal: "Say *truck please*."
   - High verbal: "Say *can I play with the truck?*"
   - Parent then waits 5 s for the child to comply.
   - *When child begins using words spontaneously or uses more verbal skills, the "say" prompt can be faded out
3. Step 3: Parent repeats exact words and waits 5 s for the child to comply.
4. Step 4: Parent repeats exact words and waits 5 s for the child to comply.
5. Step 5: If child complies, provide desired object/activity and give a labeled praise for using words.
   (a) Example:
   - "Good job asking for the truck. I like it when you use your words."
6. Step 6: If child does not comply after the third prompt, give the child the object or activity using a neutral talk.
   (a) Example:
   - "This is a truck."

- See Fig. 40.9 for a visual of the procedure.

- Example:
  - – Child reaches for apple sauce.
  - – **Parent:** [holds apple sauce] "Say *apple sauce.*" [waits 5 s for child to respond].
  - – **Parent:** "Say *apple sauce.*" [waits 5 s].
  - – **Parent:** "Say *apple sauce.*" [waits 5 s].
  - – **Child:** "Apple sauce."
  - – **Parent:** "Thank you for using your words. Because you said *apple sauce* so nicely, I'm happy to give it to you."
- If child cannot have a requested item but used their words, praise the child's use of words and give them a substitute if possible.
  - – Example:
- **Child:** "Outside."
- **Parent:** "I love how you used your words to ask to go outside. It is raining right now. We can play with your toys downstairs if you want."
- Mastery criteria:
  - – Reflecting PDI procedures, during a 5 min period, parents should practice delivering at least 4 mands with 75% effective mands and 75% correct follow-through.
  - – Over time, as child language improves, parents can increase their use of mands throughout the day.
- Remember to use simple phrases to encourage child comprehension.

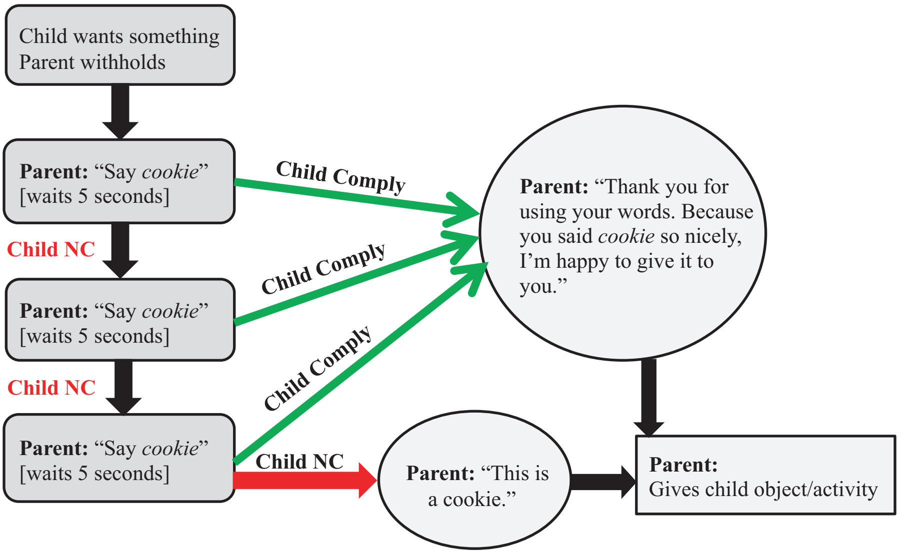


Fig. 40.9 Language motivation using mand training in communication-focused SDI

- Also provide positive physical touch as reinforcement for appropriate child verbalizations.

40.14.4.2 "When, Then" Training

- Praise children when they use their words (Agazzi et al., in press; Chap. 28 in this handbook).
- "When, then" used in language motivation
  - Restriction of immediate privilege.
  - "When *X*" → "Then *Y*"
  - This procedure is a simplified approach to mand training.
- Throughout the day, parents are giving away hundreds of privileges for free.
- Many privileges can be delayed to motivate the child to speak.
  - Example:
- **Child:** [looking/pointing at chocolate milk] "Eh, eh, eh."
- **Parent:** "When you say *milk*, then I will give you a glass of chocolate milk."
  - Example:
- **Child:** [looking at door to go outside].
- **Parent:** [holds door shut] "When you say *open the door*, then I will open the door."
  - Example:
- **Child:** [holding her hands up at a balloon on the ceiling].
- **Parent:** "When you say *help please*, then I will get you the balloon."
- It takes a lot of energy for a child with ASD to use words.
- It is often more efficient to scream or grunt.
- By developing the "when, then" habit, the parent could increase the child's language usage by hundreds of words per day.

40.14.4.3 Communication Targets

- Children with low verbal skills need basic social skills.
  - Eye contact and greetings are important for basic communication functioning.

Eye Contact

- Praise eye contact.
  - Put preferred activities near the face to prompt eye contact (e.g., if child wants cookie, the cookie should be placed near the parent's eyes).
- Can use some "Look at me" commands with a physical guide for noncompliance (then follow up with labeled praise).

Greetings

- Use commands to encourage child use of greetings (e.g., "hello," "goodbye").
  - Parent models appropriate greeting (e.g., **Parent:** [waves hand] "Say *bye bye*.")
  - Then follow up with labeled praise for compliance.
- Parents make it a routine to greet everyone they meet (e.g., cashier at grocery store, teacher, bus driver).
- Over-practice with trusted individuals (e.g., practice 20 times with grandma).

40.14.4.4 Homework

- **"**Talking Time"
- Toys and activities that child is highly motivated to obtain.
  - Edibles (e.g., grapes, goldfish crackers, juice).
  - Preferred toys (e.g., stuffed animal, cars).
  - Preferred objects (e.g., blanket, clock).
  - Preferred activities (e.g., tickles, peek-a-boo, hide-and-seek, throw on the bed).
- Mr. Bear primes the pump.
  - Example:
- **Parent:** "Mr. Bear is learning how to use his words. Mr. Bear wants to be tickled. Mama Bear won't do it unless Mr. Bear says "tickle." Mr. Bear says "*tickle*." Mama Bear tickles Mr. Bear.
- Parent spend 5 min practicing the manding or "when, then" procedure to encourage children to use their words to get what they want.

40.14.5 Social-Focused SDI (for Children with High Verbal Abilities)

40.14.5.1 Structure of Social-Focused SDI

- "Friend Time."
- Focus on one key skill at a time selected from a menu of options.
- Prime the pump with Mr. Bear (show child how Mr. Bear learns to use the social skill).
- Practice SDI skill for 5 min a day.
- Have child practice skill with sibling, grandparent, other parent, family friend, or peer.
- Train parent in methods for coaching child.
- Parent provides in-room feedback and coaching.
  - Commands/Prompts.
  - Praise.
  - Pull out.
- Pull the child out, explain to the child what she needs to do, then send the child back into the social situation.
- Then have practice during play dates.
- Coach child in one skill until mastery, then move to another skill.
- Because the children are in the learning process for these social skills, time-out is not used during SDI.
- However, if the child defies the pull-out command (i.e., "Come to me"), then a warning statement and time-out can be used.
- A menu of social-focused skills include:
  - Praise.
  - Reflect.
  - Imitate.
  - Describe.
  - Enjoy/Enthusiasm.
  - Make eye contact.
  - Ask a question.
  - Answer a question.
  - Use a greeting (e.g., "hello," "goodbye").
  - Play pretend.
  - Play with a toy the "right way."
  - Share toys.
  - Wait for your turn.

40.14.5.2 Coaching

- Could also use siblings for purpose of social skills training.
  - Encourage siblings to play together while parent coaches from a distance.
  - Use labeled praises for social skills.
  - Pull child out [may need to use command], provide feedback, then send child back in to the play situation.
- SDI coaching differs from PDI sibling coaching because it is focused on a targeted social skill.

  - Standard PDI sibling coaching is focused on behavior management—specifically noncompliance and aggression.
- Example:
  - Parent and therapist select skill the child needs to work on.
    For example, they select imitation.
  - Child is playing with 12-year-old sibling, Sally.
  - Parent is stationed off to the side coaching the child with ASD.
  - Practice begins with Mr. Bear.
- **Parent:** "Mr. Bear is learning how to play with his friends. Mr. Bear has a friend over. Friends love it when Mr. Bear plays like them. Mr. Bear learns to play just like his friends."
- *Mom then explains that today the child is going to practice imitating his sister Sally's play.*
- **Parent:** "When Sally does something, try to do it too. When Sally builds a tower, try building one like hers. If Sally draws a circle, you can draw a circle too. That's called imitation."

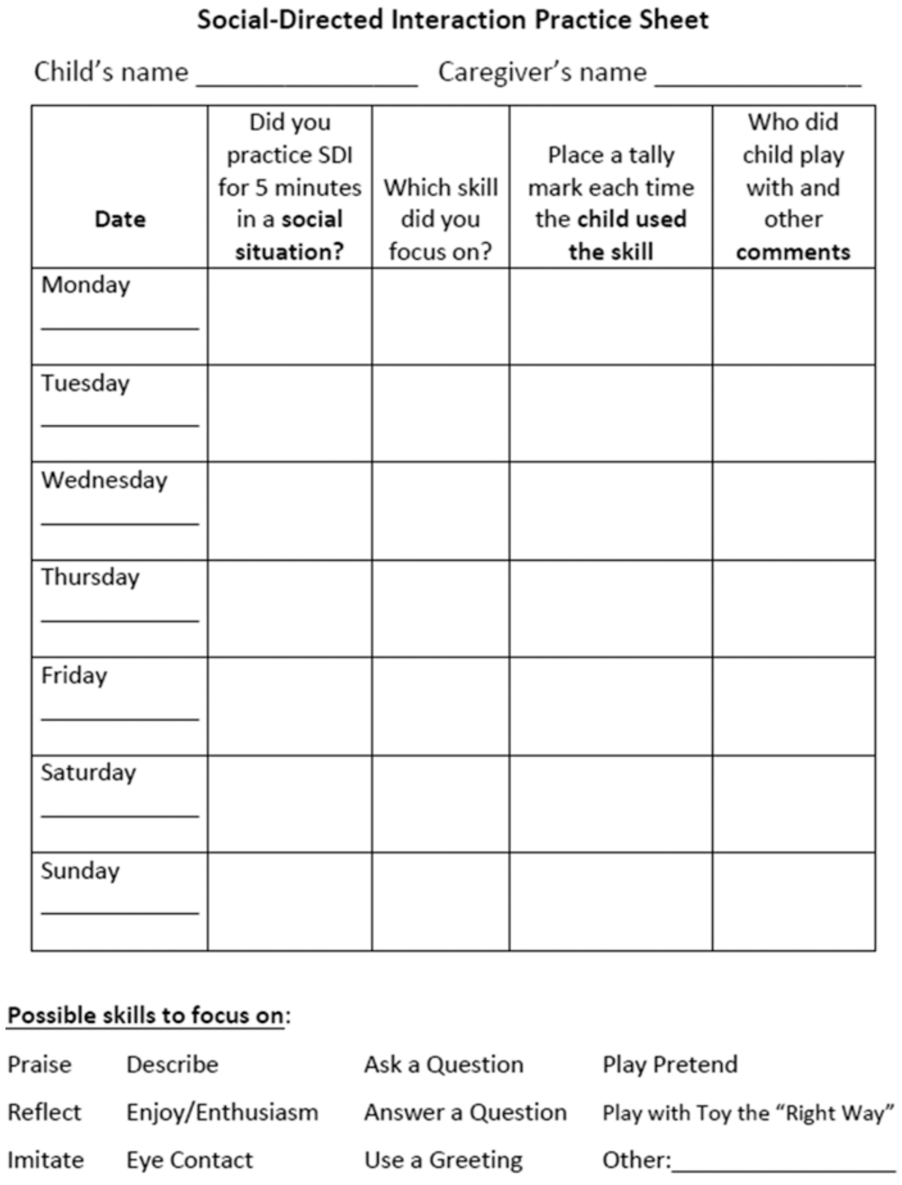
Additional Coaching Tips

- For the first few sessions following the Mr. Bear teach, the therapist models the how to coach the child (with parent acting as the child) for a few minutes before the parent begins.
  - This will help the parent see that it is okay to sit on the sidelines → a foreign concept since everything up until now has been just the opposite.
  - Will also help the child see more of the skill being modeled by the parent (C. Lieneman & M. Ruckle, personal communication, April 15, 2018).
- **Parent:** [imitates].
- **Therapist:** "Nice job playing what Timmy is playing, Mom!"
- The therapist should also reiterate and coach the parent to disengage from play.
  - Don't use other PRIDE skills.
  - Act as an observer, not a participant.
- This situation should be explained to the child (Lieneman et al., in press; Chap. 39 in this handbook).
  - **Therapist:** "You and I will play together. Mom won't be playing with you right now. She will be your coach, helping you learn how to imitate my play. If you try to play with her, she will ignore. Her job is to teach you to imitate my play so that you can imitate the play of your friends. Other children like to play with you when you imitate their play."
- Parent praises the child for good social skills during the play → with special emphasis on any times the child does targeted skill (e.g., imitates).
- The parent keeps a tally of each time the child uses the targeted skill.
- If the child is not using the skill, the parent will give commands and prompts to help the child initiate the skill.
- If child masters the skill during the coaching period, a new skill could be introduced during the coaching session.

Lieneman & Ruckle, personal communication, April 15, 2018.

40.14.5.3 Homework

- 5 min per day.
- Child plays with another person while parent coaches the child in a selected social skill.
- The other person can be: other primary caregiver, grandparent, sibling, friend, cousin.
- Use Mr. Bear to prime the pump for the selected social skill.
- During the 5 min, the parent provides commands, prompts, and praises to help the child use the targeted social skill.
- Parent keeps tally on homework sheet for how many times the child used the skill.
- See Fig. 40.10 for a sample homework sheet.



Social-Directed Interaction Practice Sheet

Child's name ________________ Caregiver's name _______________

Date	Did you practice SDI for 5 minutes in a **social situation?**	Which skill did you focus on?	Place a tally mark each time the **child used the skill**	Who did child play with and other **comments**
Monday ____________				
Tuesday ____________				
Wednesday ____________				
Thursday ____________				
Friday ____________				
Saturday ____________				
Sunday ____________				

Possible skills to focus on:

Praise
Reflect
Imitate
Describe
Enjoy/Enthusiasm
Eye Contact
Ask a Question
Answer a Question
Use a Greeting
Play Pretend
Play with Toy the "Right Way"
Other:_________________

Fig. 40.10 Sample social-focused SDI homework sheet

40.15 Conclusion

PCIT has a strong literature base supporting its efficacy with families of children with ASD (see Chap. 16 for a detailed background). The editors of the present handbook used the collective knowledge of the researchers and clinicians conducting PCIT with this population to create bullet points on CDI and PDI for interested therapists to explore the possibility of implementing PCIT with ASD populations. Moreover, the editors of this book also created two optional phases of treatment (time-out readiness phase, and Social Directed Interaction phase) to enhance PCIT's effectiveness and promote skills beyond compliance training. While further research is needed to test the strength of conducting the time-out readiness and SDI phases in addition to standard CDI and PDI, the editors believe these components will aid therapists in their clinical efforts. Lastly, this book serves as a major stepping stone to solidifying PCIT as a viable option for families of children with ASD.

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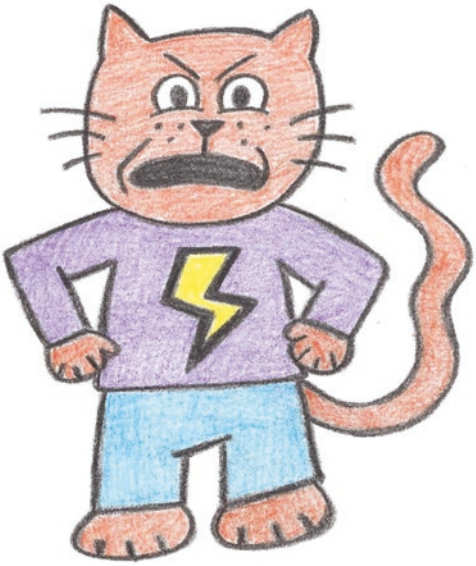
Appendix A

Henry the Cat Learns to Say "I'm Mad"



Written by: Dr. Cheryl McNeil

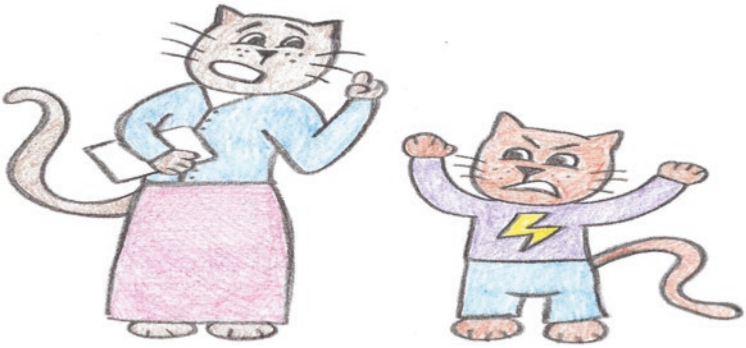
Illustrated by: Carleigh Smith

C. B. McNeil et al. (eds.), *Handbook of Parent-Child Interaction Therapy for Children on the Autism Spectrum*, https://doi.org/10.1007/978-3-030-03213-5

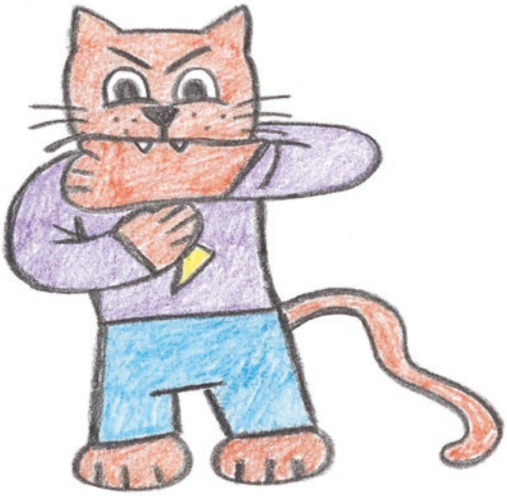
Henry the Cat could not wait to get to school. His teacher said that there would be a giant ball on the playground today.

Henry really wanted to play with the giant ball. He hoped that the giant ball would look like a soccer ball. Henry loves soccer!

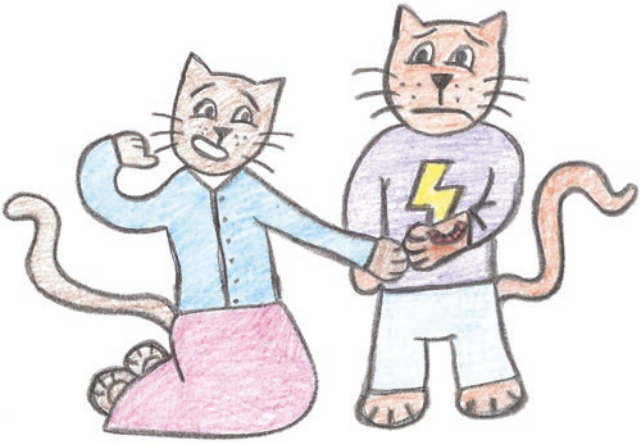
Henry ran toward the playground. But, his teacher said, “No, Henry. You can’t play now. You have to wait until after lunch.”



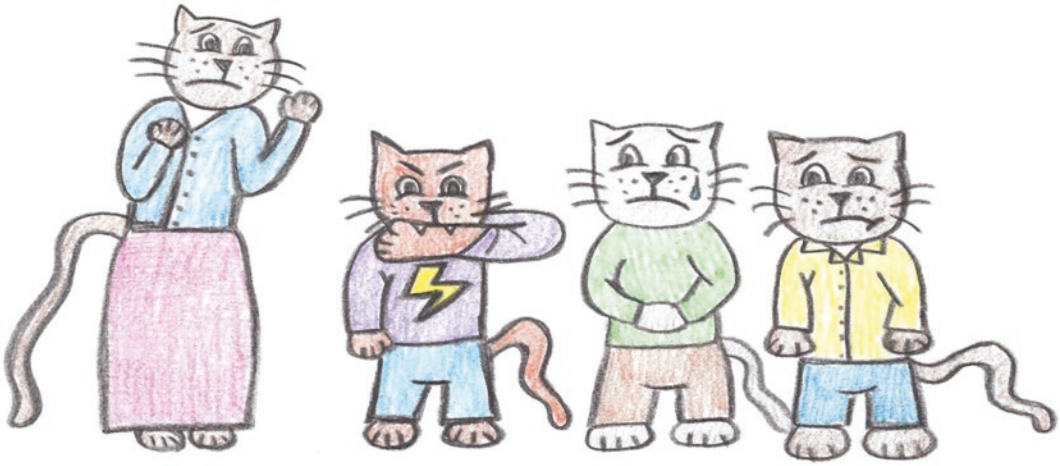
Henry got mad. He got very, very mad. He got so mad that he bit his paw. He bit his paw so hard that it hurt, and it made a big ugly mark.



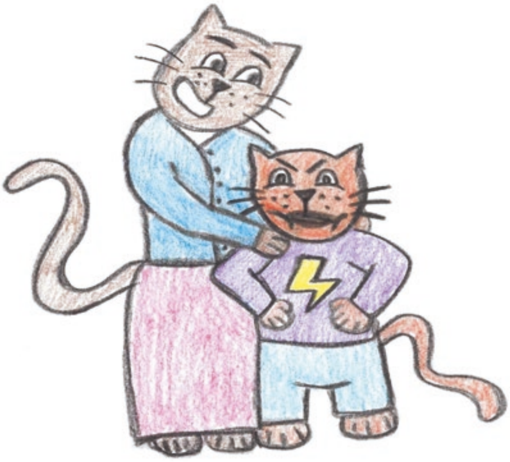
Henry’s teacher said, “When you are mad, you should say… **I’m mad!**”



The teacher said, “Biting yourself is not okay. It hurts you and it makes everyone feel bad. If you use your words, though, everyone will be happy.”



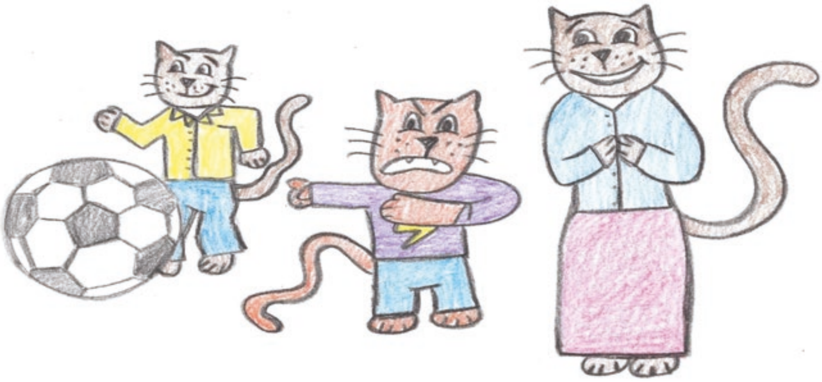
Henry said, “I’m mad!”
The teacher smiled and hugged Henry. Then he said it again, “I’m mad!”
The teacher said she was proud of Henry for using his words and not biting himself.



On the playground, Henry got to play with the big ball. He was very happy.

Then something bad happened. A little boy came and kicked the ball away from Henry. Henry was very mad. He started to bite himself.

But, he stopped. He looked at the teacher and said, “I’m mad!”



The teacher was proud of Henry for using his words. He did not bite himself. Yeah! Henry did the right thing. Because he used his words, the teacher gave Henry a reward. Henry got to take the ball home that night. Hooray for Henry!

Henry learned to say, “I’m mad!” He did not bite himself. Everyone is happy! Hooray for Henry!

The End

Index

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