Parent Implementation Interventions

16

Sarely Licona, Lauren Bush, Victoria Chavez,
Emily Dillon, and Allison L. Wainer

16.1 Introduction

Autism spectrum disorder (ASD) is a life-long developmental disorder characterized by core deficits in communication, social abilities, and the presence of restricted and repetitive behaviors that can be observed within the first 3 years of life (American Psychiatric Association, 2013). Individuals with ASD often require intensive and comprehensive intervention in core symptom domains, as well as in additional areas of functioning (e.g., adaptive skills, behavior management), starting as early as toddlerhood when a reliable diagnosis of ASD can be made (Kim et al., 2013). In fact, there is increasing research to suggest that ASD-specific early intervention can have a significant impact on brain development and later adult outcomes (Dawson, 2008; Dawson et al., 2012). As a result, the last several decades have seen the development and dissemination of intervention programs aimed at decreasing core symptoms and improving daily functioning in individuals with ASD. In addition, recent years have seen scoping efforts to quantify and interpret the mounting scientific data on these intervention approaches and outcomes, culminating in the most recent National

Clearinghouse on Autism Evidence and Practice (NCAEP) Review classifying sets of practices that have clear evidence of positive outcomes for children, youth, and young adults with ASD (Steinbrenner et al., 2020).

One of the areas of research that has seen dramatic growth over the last several decades is that of parent/caregiver training. Importantly, parent involvement in intervention has a long history in the ASD-intervention field, with Lovaas and colleagues' (Lovaas, 1987; Lovaas et al., 1973) seminal findings supporting a better response to intervention for children whose parents were trained in intervention strategies relative to children whose parents did not receive this training. These findings were soon replicated and expanded upon with further formative studies, including those showing that parents could learn to use basic behavioral strategies with high levels of fidelity (Anderson et al., 1987; Baker, 1984; Harris, 1984). These studies from the 1970s and 1980s underscored the need for collaboration between home and the educational environment and active partnership with parents for successful programming, and set the foundation for what has become known as ASD parent training or parent-mediated intervention research (Lovaas et al., 1973; Schopler & Reichler, 1971). Building from this strong foundation, efforts over the last three decades have interrogated complimentary questions such as (1) how do parent learning and use of different intervention techniques impact

S. Licona · L. Bush · V. Chavez · E. Dillon ·
A. L. Wainer (✉)
Department of Psychiatry and Behavioral Sciences,
Rush University Medical Center, Chicago, IL, USA
e-mail: Allison_Wainer@rush.edu

child and family-level outcomes? (2) what are effective strategies for supporting parent learning and use of intervention techniques? and (3) which intervention techniques and programs are best suited for parent learning and use? While the field still seeks answers to these nuanced questions, data accumulated over the last 50 years offer a strong rationale for continued investment in the development, study, and dissemination of parent and caregiver training to optimize interventions and maximize positive outcomes for children with ASD and their families (Bearss, Johnson, et al., 2013; Bearss, Lecavalier, et al., 2013; Gerow et al., 2018; Mahoney et al., 1999; Oono et al., 2013).

There are several theoretical reasons for the long-standing support for parent involvement in ASD intervention. First, child learning occurs largely through daily routines and, as parents are often at the center of creating and enacting these routines, they have the opportunity to maximize developmental learning in everyday activities. As parents are also often the most consistent presence in a child's life, they have numerous opportunities throughout the day to implement the intervention techniques. In addition, increased parental knowledge and skills for engaging their child with complex neurodevelopmental difficulties allows for continued opportunities for the child to learn in a range of different situations and environments (Mahoney & Wiggers, 2007).

Importantly, parent involvement in intervention tends to be acceptable and desirable to families. For example, almost three-quarters of parents reported parent training to be the most effective contributor to their child's growth relative to other types of interventions, such as occupational, speech, and physical therapy (Hume et al., 2005). Parent training is favored for positively influencing a child's development and reducing the risk of severe ASD-related symptoms (Maglione et al., 2012). It also rates highly among parents for carrying out its intended purpose and providing relevant and useful information (Thomson & Carlson, 2017). Additionally, parent training expands the availability of intervention services to children with autism by making it more accessible for families (Bryson et al.,

2007). It requires fewer resources and is less expensive to deliver compared to other types of early intervention (Matson et al., 2009).

Research indicates that parents can be taught to successfully use ASD-specific intervention strategies. Parent participation in ASD-specific intervention programs has been associated with improvements in child language skills (Charlop & Trasowech, 1991; Rogers et al., 2006), imitation (Ingersoll & Gergans, 2007), joint attention and joint engagement (Drew et al., 2002), and play skills (Stahmer, 1995), as well as a decrease in problem behavior (Moes & Frea, 2002). In addition, children whose parents receive training show increased generalization and maintenance of targeted skills across settings (Remington et al., 2007).

The benefits of parent training extend beyond the target child with ASD. For example, Koegel et al. (1996) found that parent training resulted in decreased parent stress and overall increases in positive family communication (Koegel et al., 1996). Similarly, parent training is associated with improvements in family functioning, specifically in marital, parent–child, and sibling relationships (Dunlap & Fox, 1999). Further, parent training provides psychoeducational opportunities for parents to increase their ASD-related knowledge, which can result in improved confidence when raising a child with ASD (Karst & van Hecke, 2012). Additional positive parental outcomes include a decrease in parent mental health concerns and enhanced parent understanding of their child's developmental strengths and weaknesses (Matson et al., 2009).

Taken together, there is a compelling theoretical and empirical rationale for continued investment in parent implementation interventions for ASD. Indeed, parent involvement in ASD intervention was identified by the most recent NCAEP Review as one of the 28 evidence-based practices for children, youth, and young adults with ASD (Steinbrenner et al., 2020). From 1990 to 2017, there were 55 empirical demonstrations of the efficacy of parent implementation interventions in high-quality, peer-reviewed journals, conducted by several independent research groups.

While the rapidly growing literature base in this area has resulted in an expanded and more sophisticated understanding of parent involvement in intervention, it has also created a landscape where multiple terms and definitions are used across different studies and stages of research. This, in turn, can complicate the interpretation of research findings and slow the process of translation from research to clinical practice. Fortunately, Bearss et al. (2015) offer a taxonomy of parent training to help define different models of parent involvement in intervention and better interpret findings from this diverse literature (Bearss et al., 2015). Within this framework, there are two broad categories of parent involvement in intervention: (1) parent support and (2) parent implementation. *Parent support* includes psychoeducation to increase parental understanding of the ASD diagnosis and associated needs. *Parent implementation* involves the parent as an active participant in the treatment, such that parents learn to use intervention strategies directly with their child.

Parent implementation interventions can further be divided into those that target skill building with the child and those that target behavior reduction with the child. Parent implementation interventions that focus on skill-building are referred to as *parent-mediated interventions* for core symptoms. Such parent-mediated interventions target core deficits in ASD with the goal of increasing pivotal behaviors such as social communication, imitation, and play, as these early skills are fundamental to long-term social communication development (Greenslade et al., 2019). Parent implementation interventions focused on behavior reduction are referred to as *parent training interventions* for maladaptive behaviors. Such approaches aim to minimize undesired or challenging behaviors such as aggression, non-compliance, and task avoidance, as well as problematic behaviors related to feeding, sleeping, and toileting, as these behaviors can be disruptive to learning for children with ASD. The above terms and definitions put forward by Bearss et al. (2015) will be used throughout the remainder of this chapter to organize and discuss various approaches to parent implementation interventions in ASD.

The goal of the current chapter is to provide an overview of parent-mediated and parent training intervention programs designed for use with children with ASD. For each type of parent implementation intervention, we first provide the theoretical rationale for treatment targets and offer a brief historical context. With an eye toward supporting the deployment of parent implementation within clinical practice, we selected several exemplar manualized programs within each parent implementation approach and offer a description and brief overview of the evidence base for these specific interventions. We will then discuss the nascent, but growing, research base for improving access to parent implementation interventions via telehealth and related technology. Finally, we end with a discussion of the clinical implications of this literature and recommendations for continuing to advance research in this area. It is important to reiterate that parents as active participants in ASD intervention have served as a longstanding keystone for the field. While a comprehensive review of all parent implementation interventions is beyond the scope of this chapter, it seeks to offer important context by describing the evolution and current state of the field with respect to actively engaging parents as a way to optimize and maximize ASD intervention outcomes.

16.2 Parent-Mediated Interventions: Improving Social Communication in ASD

As noted above, there is a long history of parent involvement in intervention for children with ASD, particularly those emphasizing supporting the development of core deficits as the treatment targets, such as social communication. Indeed, difficulties with social communication are observed across the entirety of the autism spectrum, regardless of intelligence and co-occurring disorders, making them a critical target for intervention. Social communication skills are com-

posed of verbal (e.g., language, tone) and nonverbal (e.g., eye contact, gestures) abilities, with the goal of enabling clear and effective communication with others (Swineford et al., 2014). The process of successful communication, while innate in typical development, is very complex, involving a unification of multiple neural networks involved in language production, social understanding, language comprehension, and others (Catani & Bambini, 2014; Landa et al., 1992). Early social communication skills, such as the use of a point, or following another person's eye contact to find something of interest, predict social and language development in later childhood, suggesting that early interventions in these core social communication skills can set the foundation for social communication development later in life (Greenslade et al., 2019).

Indeed, given the well-documented and lifelong nature of social communication impairments in ASD, research aimed at identifying evidence-based strategies to improve social communication early in development has been longstanding, with parent-mediated interventions representing a promising approach. Published reports of parents learning and implementing strategies to support their child's social communication functioning date back to the 1970s (Schopler & Reichler, 1971), yet structured and widely available curricula for evidence-based, parent-mediated ASD interventions historically had been lacking. As a result, recent efforts have seen an active shift toward standardized and manualized parent-mediation interventions (Matson et al., 2009), in part driven by the recognition that parents are the *agent of change* in parent-mediated approaches. Given the central role of parent learning in parent-mediated intervention, the majority of research has been on programs that involve parents working closely with a therapist (or "coach") to learn and use the intervention strategies in their everyday lives.

In this regard, the last two decades have seen the emergence of a growing evidence base for parent-mediated interventions falling under the category of *naturalistic developmental behavioral interventions* (NDBIs; Schreibman et al., 2015). NDBI is an umbrella term used to describe intervention approaches that combine best practices from developmental science and the science of applied behavior analysis (ABA). Such approaches emphasize strategies from developmental sciences to promote engagement, social motivation, and synchrony between the parent and child, and utilize operant learning strategies from ABA to teach specific new skills. Individualized and developmentally appropriate treatment goals are guided by developmental sequences, with a strong emphasis on embedding teaching within natural routine and play interactions to enhance generalizability and maintenance of skills. NDBI treatment targets often include early pivotal social communication skills such as joint attention, pointing, imitation, and social routines. Common elements among NDBIs are described in detail by Schriebman and colleagues (2015) and include a three-part contingency (antecedent–response–consequence) fundamental to all ABA therapies, manualized practice, the fidelity of implementation criteria, individualized treatment goals, ongoing measurement of progress, child-initiated teaching episodes (e.g., using the child's focus or interests to teach concepts), environmental arrangement (e.g., placing items in sight but out of reach to prompt requesting and child initiation), natural reinforcement, use of prompting and prompt fading, balanced turns (which allows for some access control to materials, maintains engagement, and teaches social interactions), modeling (demonstrating the desired behavior), adult imitation, and broadening the attentional focus of the child. Naturalistic Interventions, including NDBIs, are considered evidence-based practice categories by the NCAEP, with 75 high-quality efficacy and effectiveness studies showing positive outcomes for children with ASD between 1990 and 2017 (Steinbrenner et al., 2020). While there are many similarities across parent-mediated NDBIs, the methods of intervention development, implementation, and evaluation have varied across these studies. To highlight work being done with different parent-mediated NDBIs, we describe and review the evidence base of three of these programs below.

16.2.1 Pivotal Response Treatment

Pivotal Response Treatment (PRT; Koegel et al., 1989) is one NDBI approach that was developed to address deficits in core "pivotal" skills for children with ASD and has been adapted for a parent-mediated approach. PRT is recognized as a comprehensive teaching model for children with autism (Lord & McGee, 2001). The goals of PRT are to build social and educational skills that will allow children to engage with others and thereby increase opportunities for learning (Koegel et al., 1999). Indeed, the authors define the "pivotal" areas that their interventions address as domains, "that, when changed, generally produce large collateral improvements in other areas" (Koegel et al., 1999, pg. 174), such as responsivity to cues, motivation to initiate (with others), environmental responsivity, and self-regulation. In this way, the intervention targets a few core areas of development, with the understanding that these core areas have cascading influences to improve other domains, or prevent future delays, not directly targeted in the intervention. Additionally, the PRT model addresses an entire domain at a time (e.g., motivation to initiate), rather than focusing on singular behaviors. PRT has emerged as an evidence-based practice in its own right, under the larger category of Naturalistic Interventions, and is considered by the NCAEP to be a Manualized Intervention Meeting Criteria (MIMC) for Evidence-Based Practice (Steinbrenner et al., 2020). This means that PRT is manualized, has a unique "intervention identity," and shares common features with other approaches in the Naturalistic Intervention category, yet also has sufficient data from high-quality studies and replications to be considered its own evidence-based practice.

Parent-mediated PRT has been successfully delivered in both individual and group formats (e.g., Bradshaw et al., 2017; Coolican et al., 2010; Hardan et al., 2015; Randolph et al., 2011). Most research on individual parent-mediated PRT involved weekly (e.g., 45 min to 1 h) parent coaching sessions over the course of 12–24 weeks. A handful of studies have explored "brief" models of parent-mediated PRT (e.g., three 2-h training sessions for parents; Coolican et al., 2010). Some studies of parent-mediated PRT used a general curriculum based on a standard set of PRT-specific technical materials (e.g., handouts and video examples; Hardan et al., 2015), while other studies took a more individualized approach based on the specific needs of the parent and the child (Bradshaw et al., 2017). However, across the majority of studies, active parent coaching (e.g., parents receiving feedback on their use of PRT strategies with their child) was a central component of the intervention. Parent-mediated PRT has also been delivered in a variety of group formats: Minjarez et al. (2011) delivered a 10-week, group-based program consisting of 90 min sessions, while Hardan et al. (2015) delivered eight 90-min group sessions and four 60-min individual parent-child dyad sessions over the course of 12 weeks.

There is empirical support for the efficacy of parent-mediated PRT, with some data even suggesting longer-term social communication improvements (Koegel et al., 1996, 2003, 2010). For example, a 12-week randomized control trial demonstrated that children whose parents participated in group-based PRT demonstrated greater improvements in language and adaptive communication relative to children whose parents were in a psychoeducation group. In addition, 3-month follow-up data from families who completed the parent-mediated PRT program indicated maintenance of these language and adaptive communication gains, as well as additional gains in early cognition after treatment (Hardan et al., 2015). Importantly, the benefits of parent-mediated PRT appear to extend beyond child outcomes. Research suggests that parents trained to use PRT demonstrate significant increases in family empowerment and decreases in parenting stress—most notably reductions in stress related to parent–child interactions—as a result of a group-based parent-mediated PRT program (Minjarez et al., 2011). There has also been an emphasis on determining the best way to integrate parent-mediated PRT into more comprehensive programs and community settings. For example, a 24-week randomized control trial examined a combination of parent-mediated and

clinician-delivered PRT with data suggesting that children in the PRT group showed greater improvements in social communication skills and language, as well as improvements on a clinical global impressions rating scale (Gengoux et al., 2019). Preliminary data also indicate that less intensive formats of parent-mediated PRT, with greater potential for dissemination to community settings, may be effective for teaching parents to use PRT and enhancing child language and communication skills (Coolican et al., 2010). Together, the literature supports a parent-mediated model of PRT for teaching parents to use intervention strategies that bolster language and social communication development in young children with ASD.

16.2.2 The Early Start Denver Model

The Early Start Denver Model (ESDM) is an intervention model developed for toddlers with ASD and designed to be implemented in the home setting (Rogers & Dawson, 2010). Specifically, ESDM utilizes the routines built into a child's day for opportunities for social learning and engagement. The ESDM model considers development as a whole, and therefore has a broad focus to improve functioning across all child domains: motor, cognitive, language, play, and self-care skills. It aims to reduce autism symptoms and address delays in development (e.g., social communication). However, considering the developmental level of the intervention and the particular needs of children with ASD, there is a greater focus on improving child outcomes in imitation, nonverbal communication (joint attention), verbal communication, social development, and pretend play (Rogers & Talbott, 2016). Although ESDM itself was not yet considered a MIMC in the NCAEP review as a unique evidence-based practice, it falls under the category of Naturalistic Interventions, and studies examining ESDM are pivotal to the Naturalistic Intervention evidence base.

Initially, ESDM was delivered by providers trained in the model, with parents serving a supporting role by incorporating the model's strategies into their daily interactions (Dawson et al., 2010). More recent adaptations of the intervention have seen parents as the main intervention providers, and research has explored a number of different formats and structures to support parent learning and the use of ESDM (Ryberg, 2015; Zhou et al., 2018). Indeed, research on parent-mediated ESDM has been at the forefront of determining the optimal delivery of the parent-mediated intervention in the United States and globally (Zhou et al., 2018; Rogers et al., 2019). For example, investigators in China trialed a 6-month, high-intensity, parent-mediated ESDM model, consisting of initial self-directed learning via a parent manual, followed by an 8-hr group parent-training course, and then a 90-min individual parent coaching session each week over a period of 26 weeks (Zhou et al., 2018). Researchers in the United States have typically studied parent-mediated ESDM delivered in 90-min, clinic-based individual parent coaching sessions across 12 weeks (Rogers et al., 2019). Efforts have also been made to identify an "enhanced" parent-mediated ESDM model that builds on the traditional format by adding motivational interviewing, multimodal learning tools (e.g., web-based learning), and an additional 90-min home-based individual parent coaching session each week for 12 weeks (Rogers et al., 2019).

The majority of research on ESDM has focused on therapist-implemented ESDM or a combination of parent-mediated and therapist-implemented ESDM. The growing body of high-quality research indicates that such approaches increase a child's spontaneous language use, imitation skills, social initiations, and scores on standardized developmental measures (Dawson et al., 2010, 2012; Estes et al., 2015; Rogers et al., 2019). There is also promising data indicating normalization of brain activity in response to this model of ESDM (Dawson et al., 2012), with additional longitudinal findings supporting improved child outcomes up to the age of 6 years and after 2 years from the end of the intervention (Dawson et al., 2010).

Beyond this, data suggests that parents can effectively learn the ESDM strategies and that

children show improvements in social communication and cognition as families engage in these programs (e.g., Rogers et al., 2012, 2019; Waddington et al., 2019; Zhou et al., 2018). Initial single-subject design studies showed that parents increased the number of ESDM strategies used as they progressed through the parent coaching curriculum and that their use of ESDM strategies was associated with improvements in child functioning, including child engagement and expressive language use (Waddington et al., 2019). While the first randomized control trial of parent-mediated ESDM compared to community-treatment as usual failed to find differences on child outcomes after 12 weeks of intervention, children in the community group received significantly more hours of intervention, suggesting that lower intensity (e.g., fewer hours) parent-mediated ESDM may be an efficient alternative to higher intensity community-based treatment approaches (Rogers et al., 2012). A follow-up comparative efficacy trial indicated that relative to the traditional parent-mediated ESDM format, an "enhanced" version (as described above) produced greater improvement in parent skills, although improvements in child social communication, cognition, and adaptive outcomes were comparable across formats (Rogers et al., 2019). Another randomized control trial of Chinese toddlers found that 6 months of high-intensity, parent-mediated ESDM was associated with greater improvement in language, social communication, and play relative to a community comparison condition (Zhou et al., 2018). Taken together, these findings offer strong support for a parent-mediated ESDM intervention for improving cognitive, language, and adaptive skills in young children with ASD.

16.2.3 Project ImPACT

Like the previously discussed interventions, Project ImPACT (Improving Parents as Communication Teachers) is a parent-mediated intervention targeting social communication outcomes for young children with ASD or a high risk of developing ASD (i.e., younger siblings of children with ASD). Specifically, the intervention targets child social engagement, language, imitation, and play by encouraging parents to use strategies during daily routines and play (Stadnick et al., 2015).

Project ImPACT was developed through an iterative process using the insights of parents, teachers, and service providers for use within the community setting (Ingersoll & Dvortcsak, 2010). This close collaboration with stakeholders led to the development of both an individual and group-based Project ImPACT model, which included materials and supports for parents (e.g., PowerPoint slides) and providers (e.g., tutorial videos to assist providers as they train and coach parents). The individual and group models are both delivered over a 12-week period. The individual Project ImPACT format includes 45–60 min parent coaching sessions once or twice per week across the 12 weeks. The Project ImPACT group format alternates between 1 week of group (2 h) and 1 week of individual parent coaching sessions (1 h). Additional academic-community partnerships have adapted the traditional Project ImPACT curriculum for use within specific community settings. For example, Project ImPACT for Toddlers is an adaptation that retained the traditional 12-week structure of Project ImPACT but made enhancements to the intervention and training materials to better align with the Part C Early Intervention systems' values and structures (Stahmer et al., 2019).

Project ImPACT is one of only two interventions within the NCAEP Parent-Implemented Intervention category to be considered its own MIMC as an evidence-based practice (Steinbrenner et al., 2020). There have been a handful of lab-based efficacy studies examining outcomes from Project ImPACT, with results indicating parents can learn the ImPACT strategies successfully and that their children demonstrate improvements in social communication in response to the intervention (Ingersoll & Wainer, 2013; Yoder et al., 2020). For example, a recent randomized control trial (RCT) comparing individual Project ImPACT to treatment as usual in

high-risk younger siblings of children with ASD found that parent use of Project ImPACT strategies improved children's imitation and social communication skills, which in turn, improved overall expressive language abilities (Yoder et al., 2020). Although the only lab-based RCT of Project ImPACT, Yoder and colleagues' research meets a high threshold of methodological rigor with a relatively large sample size, multi-method assessment approach, and research staff and outcome evaluators blind to participant status.

Although the research base for Project ImPACT includes relatively less efficacy data, most of its evidence base comes from effectiveness trials which is critical that this program was specifically designed for delivery within the community. Ingersoll and Wainer (2013) worked with 13 teachers representing three intermediated school districts to implement the group-based Project ImPACT curriculum; results from this pilot study indicated children showed improvements in parent and teacher reports of child social communication skills and parents reported decreased stress after participation (Ingersoll & Wainer, 2013). Another community trial of the group format found that children whose parents learned and implemented Project ImPACT strategies from three community providers showed greater improvements in child social communication skills relative to those children in treatment as a usual control condition (Stadnick et al., 2015). Recently, Project ImPACT for toddlers was delivered within the Part C Early Intervention system with preliminary data suggesting that children who received Project ImPACT demonstrated greater improvements in positive parent–child interactions relative to treatment as usual families (Stahmer et al., 2019). While a relatively newer intervention model, Project ImPACT has been shown to be effective for improving child expressive language, imitation skills, and social communication outcomes, including when implemented within community settings where such programs will be most accessible to young children with ASD.

16.2.4 Summary

Research on these three NDBI parent-mediated intervention models demonstrates the breadth and depth of study in this area. For example, research on parent-mediated PRT has focused heavily on understanding outcomes at both the parent and child level; a critical area of further work as parents are truly integral to such intervention approaches. Research on parent-mediated ESDM has focused on high-quality and well-controlled randomized trials, as well as identifying the optimal structure, format, and dose of such intervention approaches. Project ImPACT, on the other hand, has been evaluated in a variety of community settings with an eye toward understanding adaptation, implementation, and sustainability of parent-mediated NDBIs in real-world practice settings. It is critical that researchers continue to approach the study of parent-mediated NDBIs in such complimentary fashions, as together this work provides different, but equally important, types of evidence to support the rationale for engaging parents to use NDBI strategies with children with or at risk for ASD. Important future directions for this work include longitudinal studies to examine longer-term intervention outcomes, a better understanding of family and child-level variables that may influence treatment engagement and outcomes, and continued exploration of strategies to best support parent learning and use of NDBI approaches.

16.3 Parent Training Interventions: Reducing Disruptive Behaviors in ASD

Disruptive behaviors occur in approximately 50–70% of children with ASD and significantly interfere with aspects of daily functioning (Bearss, Lecavalier, et al., 2013; Gadow et al., 2004; Lecavalier, 2006), peer socialization (Koegel, Koegel, Hurley, & Frea, 1992), and learning (Koegel, Koegel, & Surratt, 1992), making the treatment of co-occurring disruptive

behaviors of high clinical significance for the family and the child. These behaviors often consist of concerns such as irritability, anger outbursts, tantrums, oppositionality, noncompliance, property destruction, self-injury, and aggression (Burke et al., 2002; Hartley et al., 2008). Importantly, disruptive behaviors may operate through motivating functions by which a child can escape a challenging situation (e.g., learning, sensory overload) or communicate a want or need (Kaat & Lecavalier, 2013; Koegel, Koegel, Hurley, & Frea, 1992; Yang et al., 2017). Despite this, if left untreated, challenging or problematic behaviors have the tendency to persist across settings and impair the child's ability to regulate once the behavior is established (Oliver et al., 2012), which can significantly impact functioning across domains (Bearss et al., 2015).

As with the descriptions of NDBIs above, it has not been until recently that more formalized and manualized parent training interventions have been developed to reduce and improve co-occurring maladaptive and disruptive behaviors (e.g., aggression, tantrum behaviors, noncompliance, self-injury; Burrell et al., 2020; Edwards, 2018; Edwards et al., 2019; Scahill et al., 2016). Historically, parents and clinicians were provided with a series of self-guided resources to target maladaptive behaviors in children with ASD (e.g., *No More Meltdowns;* Baker, 2008) and research on the efficacy or effectiveness of these specific self-guided approaches was limited (Bearss et al., 2015).

Moreover, the earliest research on parent-training programs was limited by inconsistent use of standardized manuals, individualized treatment approaches that lacked generalizability, and small sample sizes (Anderson & McMillan, 2001; Bearss et al., 2015; Ducharme & Drain, 2004; Moes & Frea, 2002; Wahler et al., 2004). Despite these methodological weaknesses, these early studies were important in establishing foundational efficacy for specific parent training techniques in treating disruptive behaviors for children with ASD (Bearss et al., 2015). Fortunately, researchers within the ASD field were able to pull from a longstanding and strong evidence base for parent training interventions that reduce challeng-

ing behaviors with children and adolescents with disruptive behaviors without ASD to inform the development of ASD-specific programs and protocols (Brestan & Eyberg, 1998; Briegel, 2016; Costin & Chambers, 2007; Dretzke et al., 2009; Postorino et al., 2017; Urquiza & Timmer, 2012), making it an important and efficacious treatment for disruptive behavior disorders in children with ASD (Kaat & Lecavalier, 2013).

Thus, in the more recent past, a series of parent training programs based on ABA principles have been developed to address disruptive behaviors for children with ASD. These programs provide parents with important behavioral management strategies and emphasize the parent as the primary agent of change for the child (Postorino et al., 2017). Consistent with an ABA approach, functional assessment/analysis is a core component of these interventions, such that clinicians have the opportunity to help parents understand antecedents and consequences that may drive their child's behaviors (Hanley et al., 2003). In this framework, intervention models often consist of psychoeducation, didactic instruction, direct modeling, observation, and interactive coaching techniques.

Below, we highlight a few of the current evidence-based parent training programs designed specifically for children with ASD, recognizing the ongoing need for continued clinical and research investigation in this area.

16.3.1 Functional Communication Training

Functional communication training (FCT) is a well-established behavioral approach designed to reduce problematic behaviors with children, such as aggressive and destructive behaviors, self-harm, and tantrums (Falcomata & Wacker, 2013; Gerow et al., 2018; Tiger et al., 2008). While FCT is thought to be most effective in early childhood and during the elementary years, there is reason to suspect that it is appropriate even for older children (Franzone, 2009). Additionally, FCT can be used with children regardless of their cognitive and/or expressive language abilities

(Franzone, 2009). Importantly, FCT was identified as a broad category evidence-based practice in the most recent NCAEP review, with 31 high-quality efficacy and effectiveness studies demonstrating positive effects on behavior and communication for children with ASD from 1990 to 2017 (Steinbrenner et al., 2020).

The overarching goals of FCT are to (1) identify the functions of challenging behaviors, (2) teach the child replacement behaviors that include more effective, communicative responses, and (3) provide reinforcement for the replacement response (Gerow et al., 2018; Mancil & Boman, 2010; Muharib & Wood, 2018; Tiger et al., 2008). Additionally, reinforcement in the context of challenging behaviors is withheld (Gerow et al., 2018; Mancil & Boman, 2010; Tiger et al., 2008). To accomplish this, functional behavior assessments (FBAs), a key component of FCT, are conducted. Indeed, FBAs are used to identify the variables that maintain or reinforce challenging behaviors (e.g., attention, escape) and help guide the intervention plan (Muharib & Wood, 2018). Following this, replacement behaviors can be taught to the child that produce the same individual end-goal (Muharib & Wood, 2018). Notably, given the significant relationship between impairments in communication and disruptive behaviors (Kaiser et al., 2002; Park et al., 2012), interventions such as FCT are particularly useful in improving communication skills, and subsequent behavioral problems, among children with ASD with severe language deficits. Historically, FCT has been most commonly delivered by clinicians with training in behavioral principles. In the more recent past, however, there has been an attempt to increase parental involvement in FCT interventions, adapting a parent training approach to this intervention.

Reports regarding training models for parents in FCT have varied across research studies, with different methods described for instructional procedures and performance feedback (Barton & Fettig, 2013; Gerow et al., 2018; Ward-Horner & Sturmey, 2012). In a study by Gerow et al. (2018), verbal and written instructions for parents, alongside performative feedback regarding their ability to effectively deliver the FCT strategies, were found to generate an accurate implementation of the FCT intervention during a trained routine. The findings for these methods during novel routines (i.e., generalization of the skill from trained routine to other settings/contexts) were less consistent, although notably the study was limited by a small sample size ($n = 3$; Gerow et al., 2018). Thus, ongoing studies to determine the best training models and/or development of a more standardized, manualized treatment approach to training parents in FCT would be warranted to support these findings.

Concerns that parent-implemented, compared to therapist-implemented, FCT may produce different outcomes in child behavior and have varied implementation fidelity have been expressed (Gerow et al., 2018). For example, there may be increased rates of challenging child behaviors during parent-implemented sessions (English & Anderson, 2004; Hanley et al., 2003; Huete & Kurtz, 2010; Ringdahl & Sellers, 2000). Individual parent differences, such as differences in training approaches, time restrictions, and types of reinforcement (Gerow et al., 2018), may also interfere with parent FCT sessions (Feldman et al., 2004; Moes & Frea, 2000, 2002; Sloman et al., 2005).

Despite these concerns, Gerow et al. (2018) conducted a systematic review of the existing literature on parent training in FCT. Across peer-reviewed studies, FCT conducted by parents was indeed effective in reducing challenging behaviors of children (Gerow et al., 2018). For example, a single-subject design study by Mancil et al. (2006) revealed a clinically significant reduction in challenging behaviors for a young boy following the completion of FCT with his mother. Furthermore, gains in spontaneous communication were also reported. Parent-implemented FCT intervention outcomes have also been shown to, on average, maintain over time and generalize across new environments (Gerow et al., 2018). Parents were described as active participants in the FBA process and often implemented all of the required FCT intervention sessions, which were relative strengths of the current literature in this area and suggest that parent-implemented FCT represents a promising intervention approach

(Gerow et al., 2018). However, this comprehensive review also suggested that parents were inconsistently involved in the development of the FCT intervention planning process (such that this was typically conducted by the therapist), despite the fact that this could help improve parent sustainability of the intervention (Moes & Frea, 2002) and address important individual-level variables (e.g., contextual family variables; culturally and linguistically sensitive intervention plans; Gerow et al., 2018; Koegel, 2000; Moes & Frea, 2000, 2002).

Taken together, there remains an ongoing need for future research to examine ways to more effectively include parents in the development of FCT and examine the impacts of this on both child and parent outcomes. Identifying individual and dyadic-specific variables, environmental factors, and adequate supports that can better support parent learning and implementation to potentially increase overall effectiveness and acceptability of parent-implemented FCT are important next steps. In particular, future work clarifying how, when, and via which methods to include parents as FCT interventionists is warranted to enhance outcomes and support clinical decision-making in the practice settings (Gerow et al., 2018).

16.3.2 Research Units in Behavioral Intervention (RUBI) Autism Network

Similar to FCT, the Research Units in Behavioral Intervention (RUBI) parent training intervention is based on an ABA framework and recognizes that problematic behaviors (e.g., disruptive, noncompliant, aggressive behaviors) serve an important function for the child. Like FCT, the RUBI program aims to address these behaviors in the context of the child's daily activities (e.g., getting dressed, preparing for bed, managing trips to the store), which generally represent a significant source of the daily struggle for families of children with ASD (Bearss et al., 2015).

The RUBI program follows a manualized intervention approach, consisting of 11 core sessions, seven supplemental sessions, a home visit, and follow-up telephone booster sessions as needed (Bearss et al., 2018; Edwards et al., 2019). The program is designed for children aged three to ten and typically spans a six-month intervention period (Bearss et al., 2015). Clinicians are provided with scripts for each session, as well as parent activity sheets and handouts (Bearss et al., 2018). The content of early RUBI sessions focuses on teaching parents the different functions of behavior, such as understanding behavioral antecedents (i.e., the situation or action that precedes problem behavior) and consequences (Bearss et al., 2018). For example, if a parent identifies that problem behaviors predictably occur following times of transition, especially away from preferred activities (i.e., antecedent), yet after the behavior happens the parent does not require the child to transition (the child stays on the preferred activity; i.e., consequence), they are unintentionally or unknowingly reinforcing the problematic behavior that successfully functions as an escape or avoidance mechanism. In this intervention, parents would subsequently learn new strategies for preventing these behaviors and better preparing the child for transitions.

Parents are provided with support from the therapist as they learn to better identify the antecedents of the problem behavior and develop a series of preventative strategies. Early sessions also introduce parents to the use of daily visual schedules that are aimed at decreasing their child's behavior problems. Parents learn the concept of reinforcers as a way to increase compliance and prosocial behaviors. There is also an emphasis on helping parents teach play and social skills through child-directed play, particularly in the context of providing positive reinforcement. Toward the latter half of the intervention, sessions begin to emphasize compliance training (e.g., increasing effective parental requests and commands), functional communication training, task analysis and chaining, prompting procedures, and generalization of skills. Supplemental sessions are also available and may include topics such as token economy systems, imitation skills, time out, sleep and/or feeding problems, toilet training, and crisis management.

Although RUBI itself was not yet considered a MIMC in the NCAEP review as a unique evidence-based practice, it falls under the evidence-based category of Parent-Implemented Interventions, and studies examining RUBI are pivotal to the Parent-Implemented Interventions evidence base (Steinbrenner et al., 2020). Indeed, research examining the effectiveness of the RUBI parent program has found that it reduces problematic behaviors in children based on parent and clinician reports (Bearss, Johnson, et al., 2013). Indeed, initial studies examining the effectiveness of the RUBI model found significant reductions across problematic behaviors, including irritability, hyperactivity, stereotypy, social withdrawal, and inappropriate speech (Bearss, Johnson, et al., 2013). Improvements in aspects of daily functioning were also reported (Bearss, Johnson, et al., 2013). Follow-up studies have continued to support the efficacy of this program, with more recent research indicating significant gains relative to a parent education program (e.g., sessions aimed at providing parents with information about ASD without behavior management strategies; Bearss et al., 2015). When compared to parent education programs, the RUBI model remains effective at increasing activities of daily living, with the most notable gains in daily living skills among children with higher baseline cognition (Scahill et al., 2016). There is also additional benefit when RUBI is paired with pharmacological intervention (Aman et al., 2009; Bearss et al., 2015; Bearss, Lecavalier, et al., 2013; Scahill et al., 2016). Notably, although the RUBI program was designed to be delivered to parents on an individual basis during weekly outpatient sessions, a recent community study adapted the RUBI program to be applied in a group-based format, finding preliminary support for the delivery of RUBI to parent groups (Edwards, 2018; Edwards et al., 2019). While continued studies remain warranted, this preliminary work suggests a potentially cost-effective approach that could maximize the availability of this intervention.

16.3.3 Parent–Child Interaction Therapy (PCIT)

Parent–Child Interaction Therapy (PCIT) is a parent–child intervention originally developed for children aged two to seven with disruptive behaviors without ASD (Funderburk & Eyberg, 2011). In this population, it is highly effective in reducing disruptive and oppositional behaviors and strengthening parent–child relationships (Briegel, 2016; Funderburk et al., 1998; García & Velasco, 2014; Urquiza & Timmer, 2012; Zisser & Eyberg, 2010). While PCIT has not yet been validated for individuals with ASD, there is emerging literature highlighting the potential effectiveness of PCIT for individuals with ASD (Lesack et al., 2014; Masse et al., 2016; Solomon et al., 2008), particularly when adaptations to the intervention are made (Lesack et al., 2014).

Broadly, PCIT for children without ASD consists of two treatment phases: (1) child-directed interaction (CDI) and (2) parent-directed interaction (PDI). The CDI phase is considered relationship enhancement and emphasizes parents engaging in playtime with their child and learning to follow their child's lead. In this phase, the therapist's focus is to help the parent master *positive* skills such as labeled praises, reflections, behavior descriptions, and imitation, while simultaneously avoiding *negative* talk, such as commands, questions, and criticism. The PDI phase extends on CDI by teaching parents how to use effective commands and to implement structured timeout sequences in response to noncompliance. Across both phases, PCIT sessions incorporate 1-h, weekly sessions and include a combination of didactics and live coaching.

Studies have recently started to examine whether PCIT is effective for children with disruptive behaviors with ASD. Masse et al. (2016) found that PCIT was able to increase child compliance, reduce disruptive behavior, and improve parenting skills in a small sample ($n = 3$) of children with ASD. Ginn et al. (2017) similarly found that among a larger group of children with ASD ($n = 30$), eight sessions of the CDI phase of treatment were effective in reducing disruptive behavior and increasing child social awareness. There

were also reported reductions in maternal distress, and parents learned new strategies for providing positive attention to appropriate social and play behaviors in their children (Ginn et al., 2017). Other studies have similarly started to replicate findings that PCIT is effective in improving disruptive behaviors of children with ASD and across language and developmental levels (Scudder et al., 2018; Scudder et al., 2019), although specific findings related to changes in parental stress and autism severity have been inconsistent, with some studies reporting improvements in these areas (Agazzi et al., 2017; Ginn et al., 2017) and others suggesting no significant differences (Scudder et al., 2019). While ongoing research remains warranted, early research suggests that PCIT represents a promising and important intervention for children with ASD and co-morbid disruptive behaviors, with a need for continued studies to focus on identifying the effectiveness across samples and the specific types of clinical adaptations needed to best accommodate the unique needs of children with ASD.

16.3.4 Summary of Parent Training Interventions for Disruptive Behaviors in ASD

The programs and data reviewed above offer evidence that parent training interventions targeting co-occurring behavioral difficulties are also highly effective at reducing disruptive behaviors, non-compliance, and aggression. It is promising that even across these different parent training approaches (i.e., FCT, RUBI, PCIT), parents appear able to learn the intervention strategies and their children show corresponding behavioral improvements. There is a continued need for research to understand which programs will fit best in a given service delivery setting and be most effective and for which children and families. For example, PCIT and FCT are transdiagnostic, meaning that they are appropriate for use with children with ASD, as well as children with other clinical presentations. Transdiagnostic interventions allow for efficient training and

implementation procedures and may facilitate community providers' deployment of evidence-based approaches across the myriad of patients who walk in their doors, including children with ASD. This is particularly important when considering that many youths with ASD receive services across usual care settings (e.g., community mental and behavioral health clinics) from non-specialist providers with diverse training and educational backgrounds (Christon et al., 2015; Cidav et al., 2013; McLennan et al., 2008). Further, a focus on training and implementation of transdiagnostic behavioral approaches across service settings could help reduce long waitlists for families who are referred to ASD-specialist services due to significant behavioral needs (Kanne & Bishop, 2021). On the other hand, a program like RUBI that includes a formal therapist training protocol and technical supports may offer a structured way for generalist providers to become proficient in the delivery of ASD-specific intervention. Overall, there has been tremendous development in parent training programs over the last two decades; however, this remains a highly relevant area of clinical and research investigation (e.g., determining individual factors that may predict best treatment outcomes and subsequently triage families into these services accordingly).

16.4 Telehealth

As highlighted in the previous sections, there is an already robust and growing body of literature indicating that parents can be successfully trained in strategies to support social communication and behavioral functioning in their children with autism. Unfortunately, long-standing and significant barriers impede on the dissemination of these evidence-based intervention programs, including a shortage of trained professionals, limited financial resources and transportation, lack of childcare, geographic isolation, lengthy waitlists, and extensive time commitments (Stahmer & Gist, 2001; Symon, 2001; Taylor et al., 2008). As a result, autism intervention researchers, informed by innovative health ser-

vices work and dissemination and implementation sciences, have started to examine non-traditional strategies, such as telehealth, for delivery of parent implementation interventions.

Telehealth, or providing health care remotely through a variety of telecommunication tools (e.g., video conferencing platforms), is a rapidly growing service delivery method for health care workers (Dorsey & Topol, 2016). Telehealth technology has been utilized to provide training and coaching to parents with children diagnosed with ASD and other neurodevelopmental disorders (Benson et al., 2018; Falcomata & Wacker, 2013). The use of telehealth technology has research supporting its effectiveness to help parents teach their children imitation skills, play, and social communication skills, and to support parents as they mitigate problem behavior. Aside from telehealth's promising effectiveness, it further provides benefits to those parents with significant barriers in their environment that limit their ability to access early intervention and behavior support services.

The literature generally describes three different types of telehealth approaches used for parent implementation interventions in ASD. *Self-guided* telehealth programs give parents an online platform, allowing them to access lessons and modules to undertake at their own pace. *Therapist-assisted* telehealth programs provide parents with consultation, feedback, and support from trained clinicians. Finally, *hybrid* telehealth programs often integrate a self-directed component with opportunities for feedback and support from a therapist. Research has utilized all three of these methods to remotely deliver the different types of parent implementation interventions previously discussed in this chapter, although it is important to note that research on the efficacy, effectiveness, and sustainability of these programs is just beginning. Below is a presentation of the evidence supporting the use of telehealth technology to successfully implement parent-mediated interventions for skill-building and parent training interventions for maladaptive behaviors.

16.4.1 Telehealth for Parent-Mediated Interventions

There is a burgeoning body of literature examining the effectiveness of telehealth-delivered parent-mediated NDBIs, including the three specific programs discussed earlier in the chapter, for enhancing core social communication skills in children with ASD.

PRT has been delivered via telehealth using a primarily self-guided program; researchers used DVDs to educate and train parents through self-directed modules focusing on specific PRT strategies (Nefdt et al., 2010). An initial study on this approach found that the majority of parents completed the program and demonstrated the ability to use PRT strategies effectively during interactions with their children. Additional results showed that the children increased their functional communication/utterances, and parents rated the program highly satisfactory (Nefdt et al., 2010).

Vismara et al. (2012) examined the remote delivery of parent-mediated ESDM via a hybrid approach. They provided parents with learning modules on DVD and remote coaching over video conferencing. The parents in this study achieved fidelity in the ESDM intervention skills and maintained these gains across a six-week follow-up period. The children demonstrated corresponding increases in social communication and social engagement with their parents (Vismara et al., 2012). An additional study examined the effectiveness of a hybrid telehealth program, with online modules and therapist coaching, in the ESDM intervention across 12 weeks, and the results suggested that parents were able to learn ESDM strategies and then use them effectively in interactions with their children (Vismara et al., 2013). A larger randomized control trial compared this hybrid telehealth ESDM approach to treatment as usual; social communication improved in both groups, although larger gains were observed for those in the telehealth ESDM condition (Vismara et al., 2018).

Project ImPACT has also been adapted for both a self-guided and hybrid telehealth approach,

referred to as ImPACT Online (Ingersoll et al., 2016). An initial randomized control trial of ImPACT Online compared the self-guided to a hybrid (additional parent coaching from a therapist) model and found that while parents in both groups improved in their overall use of Project ImPACT strategies, those in the hybrid condition showed greater improvements in the fidelity of implementation. Furthermore, parents in the hybrid condition reported that support from parent coaching was an essential part of their ability to learn the material (Pickard et al., 2016).

One of the latest updates in telehealth technology is the use of mobile apps to deliver evidence-based practices, which has been applied to interventions for parents of children with ASD. Map4speech, a mobile application based on an adaptation of Project ImPACT, has been piloted with promising results (Law et al., 2018). Parents in this study had the opportunity to access a hybrid model on their personal cell phones. In addition to accessing learning modules, parents had the ability to upload videos of their interactions and receive feedback from trained therapists. Even through the use of mobile apps, parents maintained high fidelity and built up their skills based on the intervention. Furthermore, the children's functional communication increased compared to baseline (Law et al., 2018).

Overall, these smaller-scale studies of telehealth-delivered, parent-mediated NDBIs have provided initial evidence that parents can learn and use intervention strategies in response to telehealth programs and that children demonstrate corresponding increases in key social communication skills as their parents participate in these interventions.

16.4.2 Telehealth for Parent Training Interventions

There is also evidence for the delivery of parent training approaches for ASD via telehealth, including some of those reviewed in this chapter. Indeed, there is a quickly evolving literature examining telehealth delivered FCT to address challenging behaviors of children with ASD. The majority of these studies tend to involve a therapist-assisted approach to supporting parents as they learn and implement functional assessments necessary for the appropriate application of FCT (e.g., understanding the function of the behavior and creating meaningful behavior and communication targets within that context) with their children with autism. Initial single-subject designs found that, with guidance from a therapist, parents were able to learn how to engage in a functional behavior assessment and implement FCT to increase their children's communication and decrease challenging or maladaptive behaviors including self-injury (e.g., Benson et al., 2018; Machalicek et al., 2016; Simacek et al., 2017). A 12-week randomized control trial comparing telehealth-delivered FCT to a waitlist control group for children with ASD and moderate to severe behavior problems found that FCT led to greater overall reductions in challenging behavior (Lindgren et al., 2020). Importantly, comparisons between in-person and remote coaching for functional assessment and FCT found no significant differences between their effectiveness to reduce problem behavior (Lindgren et al., 2016).

The RUBI program has also been adapted to a therapist-assisted telehealth delivery format that closely mirrors the standard, in-person RUBI parent training model (Bearss et al., 2018). In an initial feasibility trial, parents were provided with a RUBI treatment manual and met virtually with a therapist over 16 weeks to learn 11 "core" strategies and up to two "supplemental" strategies depending on the needs of the family and child (Bearss et al., 2018). Session attendance and satisfaction with the telehealth delivery were high, with all parents who completed the program endorsing that they would recommend this approach to others. Further, parents reported increases in confidence to manage their child's current and future challenging behaviors, and children showed decreases in parent-reported noncompliance and irritability over the course of the study (Bearss et al., 2018).

Lastly, while Parent–Child Interaction Therapy (PCIT) has emerging literature to suggest that it is effective in the treatment for children with ASD, there has not been any literature

examining the effectiveness of PCIT for children with ASD conducted via telehealth. However, there is promising research to suggest that Internet-delivered PCIT (I-PCIT) can be effectively administered, in a feasible and cost-effective manner (Comer et al., 2015; Elkins & Comer, 2014). In the studies where I-PCIT was being used, parents completed sessions in their homes and received direct coaching from the therapist via a Bluetooth headset (Comer et al., 2015, 2017). There has been one RCT comparing I-PCIT versus the standard PCIT with 40 children with disruptive behavior disorder between the ages of 3 and 5 years. The results demonstrated that I-PCIT was relatively well received and the children showed treatment response; furthermore, the children in the I-PCIT group showed an excellent response posttreatment (Comer et al., 2017), suggesting a future need to assess this model within ASD.

16.4.3 Barriers and Limitations of Telehealth Services

While telehealth has shown immense promise over the past decade or so in terms of its effectiveness and feasibility for families to use, implement, and learn, it is not without limitations. Barriers to accessing telehealth services for families and practitioners often include not having a reliable Internet connection in the home to have consistent conversations and sessions (De Los Rios Perez, 2018; Lerman et al., 2020; Reese et al., 2012). Difficulty finding a reliable Internet connection can lead to audio and video issues, which can limit the quality of service that practitioners are able to provide (Reese et al., 2012).

Additional barriers include the parents' comfort and capability of accessing telehealth services and technology (Salomone & Maurizio Arduino, 2017). Further, when telehealth sessions are provided within the context of the home, there are environmental variables that can impact the sessions, including limited control of the environment, the child having access to toys and reinforcers within the home that would be limited within a clinic setting (Lerman et al., 2020), as

well as the lack of privacy and/or the presence of other siblings or family members. If the behaviors that are the target of the intervention are physically dangerous, the practitioner is not able to be physically present to help mitigate the behaviors (Lerman et al., 2020).

Importantly, not all parents may benefit equally from telehealth. For example, initial data have revealed that certain family characteristics such as self-report parental depressive symptoms are negatively correlated with success (Ingersoll & Berger, 2015). Concurrently, it has been suggested that a subgroup of parents may require more support than online video conferencing is able to provide, in which case they may not benefit as greatly from telehealth (Schieltz et al., 2018). Additionally, problem behavior maintained by automatic reinforcement may be difficult to address fully over telehealth, as well as behaviors that change in function over time (Schieltz et al., 2018).

Overall, individual studies, randomized controlled trials, and systematic reviews of telehealth practice for parents of children with ASD suggest that across parent implementation approaches (e.g., parent-mediated NDBIs, FCT, RUBI) and formats (self-guided, therapist-assisted, or a hybrid model), telehealth delivery can be an effective and promising approach for disseminating evidence-based practices (Boisvert et al., 2010; Ferguson et al., 2019; Johnsson et al., 2016; Knutsen et al., 2016; Neely et al., 2017; Parsons et al., 2017; Sutherland et al., 2018; Tomlinson et al., 2018; Unholz-Bowden et al., 2020). Indeed, the use of telehealth has the potential to decrease barriers typically faced by rural and underserved areas by increasing the ability to access evidence-based services (Ashburner et al., 2016; Dorsey & Topol, 2016; Mello et al., 2016; Murphy & Ruble, 2012) at reduced costs (Horn et al., 2016; Jennett et al., 2003; Knutsen et al., 2016) and without placing an undue burden on these families to travel to centers far away from their homes (Heitzman-Powell et al., 2014; Mello et al., 2016). Importantly, the COVID-19 global pandemic has led to the rapid and wide-scale adoption and implementation of telehealth programs, including parent implementation inter-

ventions for ASD. It is expected that data collected from both research and practice settings during this time will be critical for increasing the understanding of the effectiveness of these approaches, as well as the larger public health significance of telehealth interventions including, but not limited to, the extent to which these programs address or potentially contribute to disparities in care.

16.5 Conclusions

The delivery of parent implementation interventions is associated with a number of important clinical outcomes for children, both in terms of reducing the severity of core deficits in ASD and improving co-occurring behavioral challenges. Parent-mediated interventions targeting core symptoms of ASD such as PRT, ESDM, and Project ImPACT are associated with increases in child's spontaneous language, imitation, and communication skills (Dawson et al., 2010; Duifhuis et al., 2017; Minjarez et al., 2011). Similarly, parent training programs focusing on behavior reduction such as FCT, RUBI Autism Network, and PCIT report an overall reduction in challenging behaviors, increase in child compliance, and improvements in parent training skills (Bearss, Johnson, et al., 2013; Bearss, Lecavalier, et al., 2013; Gerow et al., 2018; Masse et al., 2016).

16.5.1 Clinical Implications

Given these promising outcomes, it is imperative for caregivers and providers to be able to find and access parent implementation interventions within community settings. Providers and organizations are encouraged to seek out formal training in evidence-based parent implementation approaches and to work with program trainers and developers to consider how best to deploy these programs within their unique practice settings. Fortunately, the formalization and manualization of parent implementation interventions have resulted in the development of prescribed provider training protocols that support the dissemination of parent implementation interventions in practice and community settings.

Notably, as with any clinical decision-making process, it is important for clinicians to carefully weigh the pros and cons of when to deliver such parent implementation models, considering program type and delivery structure in the context of each family and the child's particular needs (Siller & Morgan, 2018). For example, despite the fact that families often indicate an urgent need to start comprehensive intervention programs, including parent-mediated NDBIs, recent evidence suggests that the timing of when a family starts a parent-mediated intervention may impact participation and attrition rates (Pickard et al., 2016). Further, there are data to suggest that previous experiences with services can drive interest in enrolling in these programs and staying engaged throughout (McCurdy & Daro, 2001). As a result, it may be important for clinicians to first establish rapport and trust with a family, prior to offering a parent implementation intervention in order to set up families to be as successful as possible. Finally, while one of the most important strengths of parent-implemented interventions is the role of the parents and their ability to incorporate evidence-based strategies in the context of their child's day-to-day life and routines, this may not always be feasible for parents given other demands in their personal lives (e.g., professional obligations, other caregiving responsibilities; McConnell & Savage, 2015). This may be particularly true for families from underrepresented, lower-income communities who are more likely to face additional challenges with financial stability, transportation, and childcare (Stahmer & Gist, 2001; Symon, 2001; Taylor et al., 2008). Importantly, this does not mean that families with competing priorities should not be offered opportunities to engage in parent implementation interventions; rather, it is critical to consider how best to structure programs so that it is easier for families to participate and be successful considering these barriers (e.g., offering childcare during sessions, offering evening and weekend sessions). In summary, providers must use careful clinical judgment to determine when

and what parent implementation intervention is most appropriate on an individual basis, with a need to consider child's unique profile of strengths and weaknesses, family's goals for intervention, and individual family factors (e.g., dynamics of parent home, family stressors, cultural factors that may impact participation or outcomes, etc.).

16.5.2 Limitations & Future Directions

Despite the important promise of parent implementation interventions for ASD, there are limitations worth discussing and important directions for future research. Indeed, while there is clear data that parent implementation approaches work on average for improving functioning for children and families, the field's understanding of how, why, and for whom these interventions work is still limited. There are several future directions that can be explored concurrently to help build a more sophisticated and nuanced understanding of parent implementation approaches for children with ASD.

To date, very few studies have explored individual family/parent/child variables that may best predict family involvement and response to intervention (Gerow et al., 2018; Tarver et al., 2019; Wade et al., 2008). However, identification of such variables could support clinical decision-making processes that can often be challenging for providers given the availability of many parallel therapies. Having more predictive data in terms of which families will respond best to specific intervention types would thus help clinicians maximize limited resources and better support children and their families. Additionally, a better understanding of the optimal sequence of interventions (e.g., which should be first: parent training to address challenging behaviors or parent-mediated intervention to improve communication?) would further enhance the efficiency and effectiveness of service delivery. In addition, it is critical that research continues to expand the understanding of outcomes beyond parent fidelity and child-level functioning (Wainer et al.,

2016). Given that parents take on a large responsibility by assuming the role of "therapist" in these interventions, a better understanding of outcomes such as parental stress, parental competence, and family quality of life is necessary (Estes et al., 2015; Ginn et al., 2017; Schwichtenberg & Poehlmann, 2007; Stainbrook et al., 2019).

Relatedly, research has started to examine how certain interventions might work to produce observed changes in child functioning. One line of research has focused on identifying active ingredients and mechanisms of change in parent implementation interventions. For example, initial research found that increases in parent use of Project ImPACT strategies were directly associated with improvements in child language (Ingersoll & Wainer, 2013); later work supported this contention by demonstrating that parent use of Project ImPACT strategies improved children's later language abilities via improvement motor imitation and intentional social communication (Yoder et al., 2020). Another approach to understanding how interventions work has been to examine objective and neurobiological measures in response to treatment (e.g., Dawson et al., 2012; Voos et al., 2013). Research on clinician-administered ESDM demonstrated that, in addition to improvements in social communication, adaptive functioning, and cognition, children in the ESDM group showed increased EEG activation in brain areas associated with social behavior (Dawson et al., 2012). However, research has yet to apply these innovative outcome measurement approaches to parent implementation interventions in ASD. Additional data related to mechanisms of change, as well as neurobiological outcomes, of parent implementation interventions is a critical next step.

Questions about the long-term impact of parent implementation on child developmental trajectories also remain. Additional longitudinal research is necessary to determine the effect of parent implementation interventions on child social communication, behavior, and adaptive functioning in later childhood and adulthood as improvements in pivotal developmental skills, such as those that comprise social communica-

tion, have long-term developmental implications (Greenslade et al., 2019). Further research should establish the cost-effectiveness and public health significance of parent implementation approaches over time.

Finally, the majority of research on parent implementation interventions for ASD continues to include families from similar cultural and socio-economic backgrounds. Frequently, families coming from underrepresented communities face challenges that not only impact participation in the intervention but also impact interest and ability to participate in research studies (Carr & Lord, 2016). Active efforts are underway to engage underrepresented populations in research and study parent implementation for ASD intervention in more diverse populations (e.g., Carr & Lord, 2016; Carr et al., 2015; Pickard et al., 2017). Pickard et al. (2017) note that it is critical to engage underrepresented families in the development and adaptation of parent implementation interventions in order to improve the fit and increase the likelihood of sustainability and effectiveness of such programs. Overall, while it is encouraging that current work in this area is underway, there remains a long way to go in the field to develop a more representative and equitable research base for parent implementation interventions in ASD.

16.5.3 Summary

Over the last several decades, parent-mediated and parent training interventions have come to the forefront of intervention research in ASD, particularly for young children and families. These treatment approaches are extremely promising and are gaining a strong evidence base. Indeed, as described in this chapter, studies have consistently documented that the inclusion of parents in the treatment of their child, particularly when provided with appropriate in-person or telehealth support from trained therapists with experience in ASD, has the potential to significantly improve and maximize a child's outcomes across critical developmental and behavioral domains, making parent interventions highly rel-

evant and important to both clinical practice and research in autism spectrum disorders.

References

Agazzi, H., Tan, S. Y., Ogg, J., Armstrong, K., & Kirby, R. S. (2017). Does parent-child interaction therapy reduce maternal stress, anxiety, and depression among mothers of children with autism spectrum disorder? *Child and Family Behavior Therapy*. https://doi.org/10.1080/07317107.2017.1375622

Aman, M. G., Mcdougle, C. J., Scahill, L., Handen, B., Arnold, L. E., Johnson, C., Stigler, K. A., Bearss, K., Butter, E., Swiezy, N. B., Sukhodolsky, D. D., Ramadan, Y., Pozdol, S. L., Nikolov, R., Lecavalier, L., Kohn, A. E., Koenig, K., Hollway, J. A., Korzekwa, P., … Wagner, A. (2009). Medication and parent training in children with pervasive developmental disorders and serious behavior problems: Results from a randomized clinical trial. *Journal of the American Academy of Child and Adolescent Psychiatry*. https://doi.org/10.1097/CHI.0b013e3181bfd669

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders*. American Psychiatric Association. https://doi.org/10.1176/appi.books.9780890425596

Anderson, C. M., & McMillan, K. (2001). Parental use of escape extinction and differential reinforcement to treat food selectivity. *Journal of Applied Behavior Analysis*. https://doi.org/10.1901/jaba.2001.34-511

Anderson, S. R., Avery, D. L., DiPietro, E. K., & Edwards, G. L. (1987). Intensive home-based early intervention with autistic children. *Education and Treatment of Children, 10*(4), 352–366.

Ashburner, J., Vickerstaff, S., Beetge, J., & Copley, J. (2016). Remote versus face-to-face delivery of early intervention programs for children with autism spectrum disorders: Perceptions of rural families and service providers. *Research in Autism Spectrum Disorders, 23*. https://doi.org/10.1016/j.rasd.2015.11.011

Baker, B. L. (1984). *Steps to independence: A skills training guide for parents and teachers of children with special needs*. Brookes Publishers.

Baker, J. (2008). *No more meltdowns: Positive strategies for managing and preventing out-of-control behavior*. Future Horizons.

Barton, E. E., & Fettig, A. (2013). Parent-implemented interventions for young children with disabilities: A review of fidelity features. *Journal of Early Intervention*. https://doi.org/10.1177/1053815113504625

Bearss, K., Burrell, T. L., Stewart, L., & Scahill, L. (2015). Parent training in autism spectrum disorder: What's in a name? In *Clinical child and family psychology review*. (Vol. 18, Issue 2, pp. 170–182).

Springer New York LLC. https://doi.org/10.1007/s10567-015-0179-5

Bearss, K., Johnson, C., Handen, B., Smith, T., & Scahill, L. (2013). A pilot study of parent training in young children with autism spectrum disorders and disruptive behavior. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-012-1624-7

Bearss, K., Johnson, C. R., Handen, B. L., Butter, E., Lecavalier, L., Smith, T., & Scahill, L. (2018). *Parent training for disruptive behavior: The RUBI Autism Network, clinician manual*.

Bearss, K., Lecavalier, L., Minshawi, N., Johnson, C., Smith, T., Handen, B., Sukhodolsky, D. G., Aman, M. G., Swiezy, N., Butter, E., & Scahill, L. (2013). Toward an exportable parent training program for disruptive behaviors in autism spectrum disorder. *Neuropsychiatry*. https://doi.org/10.2217/npy.13.14

Benson, S. S., Dimian, A. F., Elmquist, M., Simacek, J., McComas, J. J., & Symons, F. J. (2018). Coaching parents to assess and treat self-injurious behaviour via telehealth. *Journal of Intellectual Disability Research, 62*(12). https://doi.org/10.1111/jir.12456

Boisvert, M., Lang, R., Andrianopoulos, M., & Boscardin, M. L. (2010). Telepractice in the assessment and treatment of individuals with autism spectrum disorders: A systematic review. *Developmental Neurorehabilitation, 13*(6). https://doi.org/10.3109/17518423.2010.499889

Bradshaw, J., Koegel, L. K., & Koegel, R. L. (2017). Improving functional language and social motivation with a parent-mediated intervention for toddlers with autism spectrum disorder. *Journal of Autism and Developmental Disorders, 47*(8), 2443–2458. https://doi.org/10.1007/s10803-017-3155-8

Brestan, E. V., & Eyberg, S. M. (1998). Effective psychosocial treatments of conduct-disordered children and adolescents: 29 years, 82 studies, and 5,272 kids. *Journal of Clinical Child Psychology*. https://doi.org/10.1207/s15374424jccp2702_5

Briegel, W. (2016). Parent-child interaction therapy. *Zeitschrift fur Kinder- und Jugendpsychiatrie und Psychotherapie*. https://doi.org/10.1024/1422-4917/a000453

Bryson, S. E., Zwaigenbaum, L., Brian, J., Roberts, W., Szatmari, P., Rombough, V., & McDermott, C. (2007). A prospective case series of high-risk infants who developed autism. *Journal of Autism and Developmental Disorders, 37*(1), 12–24. https://doi.org/10.1007/s10803-006-0328-2

Burke, J. D., Loeber, R., & Birmaher, B. (2002). Oppositional defiant disorder and conduct disorder: A review of the past 10 years, part II. *Journal of the American Academy of Child and Adolescent Psychiatry*. https://doi.org/10.1097/00004583-200211000-00009

Burrell, T. L., Postorino, V., Scahill, L., Rea, H. M., Gillespie, S., Evans, A. N., & Bearss, K. (2020). Feasibility of group parent training for children with autism spectrum disorder and disruptive behavior: A demonstration pilot. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-020-04427-1

Carr, T., & Lord, C. (2016). A pilot study promoting participation of families with limited resources in early autism intervention. *Research in Autism Spectrum Disorders, 25*. https://doi.org/10.1016/j.rasd.2016.02.003

Carr, T., Shih, W., Lawton, K., Lord, C., King, B., & Kasari, C. (2015). The relationship between treatment attendance, adherence, and outcome in a caregiver-mediated intervention for low-resourced families of young children with autism spectrum disorder. *Autism, 20*(6), 643–652. https://doi.org/10.1177/1362361315598634

Catani, M., & Bambini, V. (2014). A model for social communication and language evolution and development. *Current Opinion in Neurobiology, 28*, 165–171. https://doi.org/10.1016/j.conb.2014.07.018

Charlop, M. H., & Trasowech, J. E. (1991). Increasing autistic children's daily spontaneous speech. *Journal of Applied Behavior Analysis, 24*(4), 747–761. https://doi.org/10.1901/jaba.1991.24-747

Christon, L. M., Arnold, C. C., & Myers, B. J. (2015). Professionals' reported provision and recommendation of psychosocial interventions for youth with autism spectrum disorder. *Behavior Therapy, 46*(1). https://doi.org/10.1016/j.beth.2014.02.002

Cidav, Z., Lawer, L., Marcus, S. C., & Mandell, D. S. (2013). Age-related variation in health service use and associated expenditures among children with autism. *Journal of Autism and Developmental Disorders, 43*(4). https://doi.org/10.1007/s10803-012-1637-2

Comer, J. S., Furr, J. M., Miguel, E. M., Cooper-Vince, C. E., Carpenter, A. L., Elkins, R. M., Kerns, C. E., Cornacchio, D., Chou, T., Coxe, S., DeSerisy, M., Sanchez, A. L., Golik, A., Martin, J., Myers, K. M., & Chase, R. (2017). Remotely delivering real-time parent training to the home: An initial randomized trial of Internet-delivered parent–child interaction therapy (I-PCIT). *Journal of Consulting and Clinical Psychology, 89*(9), 909–917.

Comer, J. S., Furr, J. M., Cooper-Vince, C., Madigan, R. J., Chow, C., Chan, P. T., Idrobo, F., Chase, R. M., McNeil, C. B., & Eyberg, S. M. (2015). Rationale and considerations for the Internet-based delivery of parent–child interaction therapy. *Cognitive and Behavioral Practice, 22*(3). https://doi.org/10.1016/j.cbpra.2014.07.003

Coolican, J., Smith, I. M., & Bryson, S. E. (2010). Brief parent training in pivotal response treatment for preschoolers with autism. *Journal of Child Psychology and Psychiatry, 51*(12), 1321–1330. https://doi.org/10.1111/j.1469-7610.2010.02326.x

Costin, J., & Chambers, S. M. (2007). Parent management training as a treatment for children with oppositional defiant disorder referred to a mental health clinic. *Clinical Child Psychology and Psychiatry*. https://doi.org/10.1177/1359104507080979

Dawson, G. (2008). Early behavioral intervention, brain plasticity, and the prevention of autism spectrum disorder. *Development and Psychopathology, 20*(3), 775–803. https://doi.org/10.1017/S0954579408000370

Dawson, G., Jones, E. J. H., Merkle, K., Venema, K., Lowy, R., Faja, S., Kamara, D., Murias, M., Greenson, J., Winter, J., Smith, M., Rogers, S. J., & Webb, S. J. (2012). Early behavioral intervention is associated with normalized brain activity in young children with autism. *Journal of the American Acadamy of Child Adolescence Psychiatry, 51*(11) www.jaacap.org. www.jaacap.org

Dawson, G., Rogers, S., Munson, J., Smith, M., Winter, J., Greenson, J., Donaldson, A., & Varley, J. (2010). Randomized, controlled trial of an intervention for toddlers with autism: The early start Denver model. *Pediatrics, 125*(1). https://doi.org/10.1542/peds.2009-0958

De Los Rios Perez, C. (2018). Adaptable user interfaces for people with autism: A transportation example. *Proceedings of the Internet of Accessible Things, 12*, 1–2. https://doi.org/10.1145/3192714.3196318

Dorsey, E. R., & Topol, E. J. (2016). State of telehealth. *New England Journal of Medicine, 375*(2), 154–161. https://doi.org/10.1056/nejmra1601705

Dretzke, J., Davenport, C., Frew, E., Barlow, J., Stewart-Brown, S., Bayliss, S., Taylor, R. S., Sandercock, J., & Hyde, C. (2009). The clinical effectiveness of different parenting programmes for children with conduct problems: A systematic review of randomised controlled trials. *Child and Adolescent Psychiatry and Mental Health, 3*(7). https://doi.org/10.1186/1753-2000-3-7

Drew, A., Baird, G., Baron-Cohen, S., Cox, A., Slonims, V., Wheelwright, S., Swettenham, J., Berry, B., & Charman, T. (2002). A pilot randomised control trial of a parent training intervention for pre-school children with autism: Preliminary findings and methodological challenges. *European Child and Adolescent Psychiatry, 11*(6), 266–272. https://doi.org/10.1007/s00787-002-0299-6

Ducharme, J. M., & Drain, T. L. (2004). Errorless academic compliance training: Improving generalized cooperation with parental requests in children with autism. *Journal of the American Academy of Child and Adolescent Psychiatry, 43*(2), 163–171. https://doi.org/10.1097/00004583-200402000-00011

Duifhuis, E. A., den Boer, J. C., Doornbos, A., Buitelaar, J. K., Oosterling, I. J., & Klip, H. (2017). The effect of pivotal response treatment in children with autism spectrum disorders: A non-randomized study with a blinded outcome measure. *Journal of Autism and Developmental Disorders, 47*(2), 231–242. https://doi.org/10.1007/s10803-016-2916-0

Dunlap, G., & Fox, L. (1999). A demonstration of behavioral support for young children with autism. *Journal of Positive Behavior Interventions, 1*(2), 77–87. https://doi.org/10.1177/109830079900100202

Edwards, G. (2018). Behavioral parent training in children with autism: Feasibility and effectiveness of a group intervention. *Dissertation Abstracts International: Section B: The Sciences and Engineering*.

Edwards, G. S., Zlomke, K. R., & Greathouse, A. D. (2019). RUBI parent training as a group intervention for children with autism: A community pilot study. *Research in Autism Spectrum Disorders, 66.* https://doi.org/10.1016/j.rasd.2019.101409

Elkins, R. M., & Comer, J. S. (2014). Internet-based implementation: Broadening the reach of parent-child interaction therapy for early child behavior problems. In R. S. Beidas & E. S. Kendell (Eds.), *Dissemination and implementation of evidence-based practices in child and adolescent mental health* (pp. 336–355). Oxford University Press.

English, C. L., & Anderson, C. M. (2004). Effects of familiar versus unfamiliar therapists on responding in the analog functional analysis. *Research in Developmental Disabilities*. https://doi.org/10.1016/j.ridd.2003.04.002

Estes, A., Munson, J., Rogers, S. J., Greenson, J., Winter, J., & Dawson, G. (2015). Long-term outcomes of early intervention in 6-year-old children with autism spectrum disorder. *Journal of the American Academy of Child and Adolescent Psychiatry, 54*(7), 580–587. https://doi.org/10.1016/j.jaac.2015.04.005

Falcomata, T. S., & Wacker, D. P. (2013). On the use of strategies for programming generalization during functional communication training: A review of the literature. *Journal of Developmental and Physical Disabilities, 25*, 5–15. https://doi.org/10.1007/s10882-012-9311-3

Feldman, M. A., Atkinson, L., Foti-Gervais, L., & Condillac, R. (2004). Formal versus informal interventions for challenging behaviour in persons with intellectual disabilities. *Journal of Intellectual Disability Research, 48*(1), 60–68. https://doi.org/10.1111/j.1365-2788.2004.00578.x

Ferguson, J., Craig, E. A., & Dounavi, K. (2019). Telehealth as a model for providing behaviour analytic interventions to individuals with autism spectrum disorder: A systematic review. *Journal of Autism and Developmental Disorders, 49*(2) Springer US. https://doi.org/10.1007/s10803-018-3724-5

Franzone, E. (2009). *Overview of functional communication training (FCT)*. National Professional Development Center on Autism Spectrum Disorders, Waisman Center, University of Wisconsin.

Funderburk, B. W., & Eyberg, S. (2011). Parent–child interaction therapy. In *History of psychotherapy: Continuity and change* (2nd ed.). https://doi.org/10.1037/12353-021

Funderburk, B. W., Eyberg, S. M., Newcomb, K., McNeil, C. B., Hembree-Kigin, T., & Capage, L. (1998). Parent-child interaction therapy with behavior problem children: Maintenance of treatment effects in the school setting. *Child and Family Behavior Therapy*, 17–38. https://doi.org/10.1300/J019v20n02_02

Gadow, K. D., Devincent, C. J., Pomeroy, J., & Azizian, A. (2004). Psychiatric symptoms in pre-

school children with PDD and clinic and comparison samples. *Journal of Autism and Developmental Disorders, 34*, 379–393. https://doi.org/10.1023/B:JADD.0000037415.21458.93

García, R. F., & Velasco, L. A. (2014). Parent-child interaction therapy (PCIT). *Papeles Del Psicologo*. https://doi.org/10.1002/9781118625392.wbecp115

Gengoux, G. W., Schapp, S., Burton, S., Ardel, C. M., Libove, R. A., Baldi, G., Berquist, K. L., Phillips, J. M., & Hardan, A. Y. (2019). Effects of a parent-implemented developmental reciprocity treatment program for children with autism spectrum disorder. *Autism, 23*(3), 713–725. https://doi.org/10.1177/1362361318775538

Gerow, S., Hagan-Burke, S., Rispoli, M., Gregori, E., Mason, R., & Ninci, J. (2018). A systematic review of parent-implemented functional communication training for children with ASD. *Behavior Modification*. https://doi.org/10.1177/0145445517740872

Ginn, N. C., Clionsky, L. N., Eyberg, S. M., Warner-Metzger, C., & Abner, J. P. (2017). Child-directed interaction training for young children with autism spectrum disorders: Parent and child outcomes. *Journal of Clinical Child and Adolescent Psychology, 46*(1), 101–109. https://doi.org/10.1080/15374416.2015.1015135

Greenslade, K. J., Utter, E. A., & Landa, R. J. (2019). Predictors of pragmatic communication in school-age siblings of children with ASD and low-risk controls. *Journal of Autism and Developmental Disorders, 49*(4), 1352–1365. https://doi.org/10.1007/s10803-018-3837-x

Hanley, G., Iwata, B., & McCord, B. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*, 147–185. https://doi.org/10.1901/jaba.2003.36-147

Hardan, A. Y., Gengoux, G. W., Berquist, K. L., Libove, R. A., Ardel, C. M., Phillips, J., Frazier, T. W., & Minjarez, M. B. (2015). A randomized controlled trial of Pivotal Response Treatment Group for parents of children with autism. *Journal of Child Psychology and Psychiatry, 56*(8), 884–892. https://doi.org/10.1111/jcpp.12354

Harris, S. L. (1984). The family of the autistic child: A behavioral-systems view. *Clinical Psychology Review, 4*(3), 227–239. https://doi.org/10.1016/0272-7358(84)90001-1

Hartley, S. L., Sikora, D. M., & McCoy, R. (2008). Prevalence and risk factors of maladaptive behaviour in young children with autistic disorder. *Journal of Intellectual Disability Research, 52*(10), 819–829. https://doi.org/10.1111/j.1365-2788.2008.01065.x

Heitzman-Powell, L. S., Buzhardt, J., Rusinko, L. C., & Miller, T. M. (2014). Formative evaluation of an ABA outreach training program for parents of children with autism in remote areas. *Focus on Autism and Other Developmental Disabilities, 29*(1), 23–38. https://doi.org/10.1177/1088357613504992

Horn, B. P., Barragan, G. N., Fore, C., & Bonham, C. A. (2016). A cost comparison of travel models and behavioural telemedicine for rural, Native American populations in New Mexico. *Journal of Telemedicine and Telecare, 22*(1), 47–55. https://doi.org/10.1177/1357633X15587171

Huete, J. M., & Kurtz, P. F. (2010). Therapist effects on functional analysis outcomes with young children. *Research in Developmental Disabilities, 31*(3), 804–810. https://doi.org/10.1016/j.ridd.2010.02.005

Hume, K., Bellin, S., & Pratt, C. (2005). The usage and perceived outcomes of early intervention and early childhood programs for young children with autism spectrum disorder. *Topics in Early Childhood Special Education, 25*(4), 195–207. https://doi.org/10.1177/02711214050250040101

Ingersoll, B., & Dvortcsak, A. (2010). *Teaching social communication: A practitioner's guide to parent training for children with autism*. The Guilford Press.

Ingersoll, B., & Berger, N. I. (2015). Parent engagement with a telehealth-based parent-mediated intervention program for children with autism spectrum disorders: Predictors of program use and parent outcomes. *Journal of Medical Internet Research, 17*(10). https://doi.org/10.2196/jmir.4913

Ingersoll, B., & Gergans, S. (2007). The effect of a parent-implemented imitation intervention on spontaneous imitation skills in young children with autism. *Research in Developmental Disabilities, 28*(2), 163–175. https://doi.org/10.1016/j.ridd.2006.02.004

Ingersoll, B., & Wainer, A. (2013). Initial efficacy of project ImPACT: A parent-mediated social communication intervention for young children with ASD. *Journal of Autism and Developmental Disorders, 43*(12), 2943–2952. https://doi.org/10.1007/s10803-013-1840-9

Ingersoll, B., Wainer, A. L., Berger, N. I., Pickard, K. E., & Bonter, N. (2016). Comparison of a self-directed and therapist-assisted telehealth parent-mediated intervention for children with ASD: A pilot RCT. *Journal of Autism and Developmental Disorders, 46*(7), 2275–2284. https://doi.org/10.1007/s10803-016-2755-z

Jennett, P. A., Hall, L. A., Hailey, D., Ohinmaa, A., Anderson, C., Thomas, R., Young, B., Lorenzetti, D., & Scott, R. E. (2003). The socio-economic impact of telehealth: A systematic review. *Journal of Telemedicine and Telecare, 9*(6), 311–320. https://doi.org/10.1258/135763303771005207

Johnsson, G., Lincoln, M., Bundy, A., & Costley, D. (2016). A systematic review of technology-delivered disability training and support for service providers: Implications for rural and remote communities. *Review Journal of Autism and Developmental Disorders, 3*(4), 387–398. https://doi.org/10.1007/s40489-016-0091-z

Kaat, A. J., & Lecavalier, L. (2013). Disruptive behavior disorders in children and adolescents with autism spectrum disorders: A review of the prevalence, presentation, and treatment. *Research in Autism Spectrum Disorders*. https://doi.org/10.1016/j.rasd.2013.08.012

Kaiser, A. P., Cai, X., Hancock, T. B., & Foster, E. M. (2002). Teacher-reported behavior problems and language delays in boys and girls enrolled in head

start. *Behavioral Disorders, 28*(1), 23–39. https://doi.org/10.1177/019874290202800103

Kanne, S. M., & Bishop, S. L. (2021). Editorial perspective: The autism waitlist crisis and remembering what families need. *Journal of Child Psychology and Psychiatry, 62*(2). https://doi.org/10.1111/jcpp.13254

Karst, J. S., & van Hecke, A. V. (2012). Parent and family impact of autism spectrum disorders: A review and proposed model for intervention evaluation. *Clinical Child and Family Psychology Review, 15*(3), 247–277. https://doi.org/10.1007/s10567-012-0119-6

Kim, S. H., Thurm, A., Shumway, S., & Lord, C. (2013). Multisite study of new autism diagnostic interview-revised (ADI-R) Algorithms for toddlers and young preschoolers. *Journal of Autism and Developmental Disorders, 43*(7), 1527–1538. https://doi.org/10.1007/s10803-012-1696-4

Knutsen, J., Wolfe, A., Burke, B. L., Hepburn, S., Lindgren, S., & Coury, D. (2016). A systematic review of telemedicine in autism spectrum disorders. *Review Journal of Autism and Developmental Disorders, 3*(4), 330–344. https://doi.org/10.1007/s40489-016-0086-9

Koegel, L. K. (2000). Interventions to facilitate communication in autism. *Journal of Autism and Developmental Disorders, 30*, 383–391. https://doi.org/10.1023/A:1005539220932

Koegel, L. K., Koegel, R. L., Harrower, J. K., & Carter, C. M. (1999). Pivotal response intervention I: Overview of approach. *Journal of the Association for Persons with Severe Handicaps, 24*(3), 174–185.

Koegel, L. K., Koegel, R. L., Hurley, C., & Frea, W. D. (1992). Improving social skills and disruptive behavior in children with autism through self-management. *Journal of Applied Behavior Analysis, 25*(2), 341–353. https://doi.org/10.1901/jaba.1992.25-341

Koegel, R. L., Schreibman, L., Good, A., Cerniglia, L., Murphy, C., & Koegel, L. K. (1989). *How to teach pivotal behaviors to children with autism: A training manual*. University of California Press.

Koegel, R. L., Koegel, L. K., & Surratt, A. (1992). Language intervention and disruptive behavior in preschool children with autism. *Journal of Autism and Developmental Disorders, 22*, 141–153. https://doi.org/10.1007/BF01058147

Koegel, R. L., Bimbela, A., & Schreibman, L. (1996). Collateral effects of parent training on family interactions. *Journal of Autism and Developmental Disorders, 26*(3), 347–359. https://doi.org/10.1007/BF02172479

Koegel, R. L., Koegel, L. K., & Brookman, L. I. (2003). Empirically supported pivotal response interventions for children with autism. In *Evidence-based psychotherapies for children and adolescents* (pp. 341–357). The Guilford Press.

Koegel, R. L., Koegel, L. K., Vernon, T. W., & Brookman-Frazee, L. I. (2010). Empirically supported pivotal response treatment for children with autism spectrum disorders. In *Evidence-based psychotherapies for children and adolescents* (2nd ed., pp. 327–344). The Guilford Press.

Landa, R., Piven, J., Wzorek, M. M., Gayle, J. O., Chase, G. A., & Folstein, S. E. (1992). Social language use in parents of autistic individuals. *Psychological Medicine, 22*(1), 245–254. https://doi.org/10.1017/S0033291700032918

Law, G. C., Neihart, M., & Dutt, A. (2018). The use of behavior modeling training in a mobile app parent training program to improve functional communication of young children with autism spectrum disorder. *Autism, 22*(4). https://doi.org/10.1177/1362361316683887

Lecavalier, L. (2006). Behavioral and emotional problems in young people with pervasive developmental disorders: Relative prevalence, effects of subject characteristics, and empirical classification. *Journal of Autism and Developmental Disorders, 36*, 1101–1114. https://doi.org/10.1007/s10803-006-0147-5

Lerman, D. C., O'Brien, M. J., Neely, L., Call, N. A., Tsami, L., Schieltz, K. M., Berg, W. K., Graber, J., Huang, P., Kopelman, T., & Cooper-Brown, L. J. (2020). Remote coaching of caregivers via telehealth: Challenges and potential solutions. *Journal of Behavioral Education, 29*(2). https://doi.org/10.1007/s10864-020-09378-2

Lesack, R., Bearss, K., Celano, M., & Sharp, W. G. (2014). Parent-child interaction therapy and autism spectrum disorder: Adaptations with a child with severe developmental delays. *Clinical Practice in Pediatric Psychology, 2*(1), 68–82. https://doi.org/10.1037/cpp0000047

Lindgren, S., Wacker, D., Suess, A., Schieltz, K., Pelzel, K., Kopelman, T., Lee, J., Romani, P., & Waldron, D. (2016). Telehealth and autism: Treating challenging behavior at lower cost. *Pediatrics, 137*(Supplement). https://doi.org/10.1542/peds.2015-2851O

Lindgren, S., Wacker, D., Schieltz, K., Suess, A., Pelzel, K., Kopelman, T., Lee, J., Romani, P., & O'Brien, M. (2020). A randomized controlled trial of functional communication training via telehealth for young children with autism Spectrum disorder. *Journal of Autism and Developmental Disorders, 50*(12). https://doi.org/10.1007/s10803-020-04451-1

Lord, C., & McGee, J. P. (2001). *Educating children with autism*. Committee on Educational Interventions for Children with Autism. Division of Behavioural and Social Sciences and Education.

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology, 55*(1). https://doi.org/10.1037/0022-006X.55.1.3

Lovaas, O. I., Koegel, R., Simmons, J. Q., & Long, J. S. (1973). Some generalization and follow-up measures on autistic children in behavior therapy. *Journal of Applied Behavior Analysis, 6*(1), 131–165. https://doi.org/10.1901/jaba.1973.6-131

Machalicek, W., Lequia, J., Pinkelman, S., Knowles, C., Raulston, T., Davis, T., & Alresheed, F. (2016). Behavioral telehealth consultation with families of children with autism spectrum disorder. *Behavioral*

Interventions, 31(3), 223–250. https://doi.org/10.1002/bin.1450

Maglione, M. A., Gans, D., Das, L., Timbie, J., & Kasari, C. (2012). Nonmedical interventions for children with ASD: Recommended guidelines and further research needs. *Pediatrics, 130*(2). https://doi.org/10.1542/peds.2012-0900O

Mahoney, G., Kaiser, A., Girolametto, L., Macdonald, J., Robinson, C., Safford, P., & Spiker, D. (1999). Parent education in early intervention: A call for a renewed focus. *Topics in Early Childhood Special Education, 19*(3), 131–140. https://doi.org/10.1177/027112149901900301

Mahoney, G., & Wiggers, B. (2007). The role of parents in early intervention: Implications for social work. *Children and Schools, 29*(1), 7–15. https://doi.org/10.1093/cs/29.1.7

Mancil, G. R., & Boman, M. (2010). Functional communication training in the classroom: A guide for success. *Preventing School Failure: Alternative Education for Children and Youth, 54*(4), 238–246. https://doi.org/10.1080/10459881003745195

Mancil, G. R., Conroy, M. A., Nakao, T., & Alter, P. J. (2006). Functional communication training in the natural environment: A pilot investigation with a young child with autism spectrum disorder. *Education and Treatment of Children, 29*(4), 615–633. http://www.jstor.org/stable/42900556

Masse, J. J., McNeil, C. B., Wagner, S., & Quetsch, L. B. (2016). Examining the efficacy of parent–child interaction therapy with children on the autism spectrum. *Journal of Child and Family Studies, 25*, 2508–2525. https://doi.org/10.1007/s10826-016-0424-7

Matson, M. L., Mahan, S., & Matson, J. L. (2009). Parent training: A review of methods for children with autism spectrum disorders. *Research in Autism Spectrum Disorders, 3*(4), 868–875. https://doi.org/10.1016/j.rasd.2009.02.003

McConnell, D., & Savage, A. (2015). Stress and resilience among families caring for children with intellectual disability: Expanding the research agenda. *Current Developmental Disorders Reports, 2*(2), 100–109. https://doi.org/10.1007/s40474-015-0040-z

McCurdy, K., & Daro, D. (2001). Parent involvement in family support programs: An integrated theory. *Family Relations: An Interdisciplinary Journal of Applied Family Studies, 50*(2), 113–121. https://doi.org/10.1111/j.1741-3729.2001.00113.x

McLennan, J. D., Huculak, S., & Sheehan, D. (2008). Brief report: Pilot investigation of service receipt by young children with autistic spectrum disorders. *Journal of Autism and Developmental Disorders, 38*(6). https://doi.org/10.1007/s10803-007-0535-5

Mello, M., Goldman, S., Urbano, R., & Hodapp, R. (2016). Services for children with autism spectrum disorder: Comparing rural and non-rural communities. *Education and Training in Autism and Developmental Disabilities, 51*(4), 355–365.

Minjarez, M. B., Williams, S. E., Mercier, E. M., & Hardan, A. Y. (2011). Pivotal response group treatment program for parents of children with autism. *Journal of Autism and Developmental Disorders, 41*(1), 92–101. https://doi.org/10.1007/s10803-010-1027-6

Moes, D. R., & Frea, W. D. (2000). Using family context to inform intervention planning for the treatment of a child with autism. *Journal of Positive Behavior Interventions, 2*(1), 40–46. https://doi.org/10.1177/109830070000200106

Moes, D. R., & Frea, W. D. (2002). Contextualized behavioral support in early intervention for children with autism and their families. *Journal of Autism and Developmental Disorders, 32*, 519–533. https://doi.org/10.1023/A:1021298729297

Muharib, R., & Wood, C. L. (2018). Evaluation of the empirical support of functional communication training for children with autism spectrum disorders. *Review Journal of Autism and Developmental Disorders, 5*, 360–369. https://doi.org/10.1007/s40489-018-0145-5

Murphy, M. A., & Ruble, L. A. (2012). A comparative study of rurality and urbanicity on access to and satisfaction with services for children with autism spectrum disorders. *Rural Special Education Quarterly, 31*(3). https://doi.org/10.1177/875687051203100302

Neely, L., Rispoli, M., Gerow, S., Hong, E. R., & Hagan-Burke, S. (2017). Fidelity outcomes for autism-focused interventionists coached via telepractice: A systematic literature review. *Journal of Developmental and Physical Disabilities, 29*(6). https://doi.org/10.1007/s10882-017-9550-4

Nefdt, N., Koegel, R., Singer, G., & Gerber, M. (2010). The use of a self-directed learning program to provide introductory training in pivotal response treatment to parents of children with autism. *Journal of Positive Behavior Interventions, 12*(1). https://doi.org/10.1177/1098300709334796

Oliver, C., Petty, J., Ruddick, L., & Bacarese-Hamilton, M. (2012). The association between repetitive, self-injurious and aggressive behavior in children with severe intellectual disability. *Journal of Autism and Developmental Disorders, 42*(6). https://doi.org/10.1007/s10803-011-1320-z

Oono, I. P., Honey, E. J., & McConachie, H. (2013). Parent-mediated early intervention for young children with autism spectrum disorders (ASD). *Evidence-Based Child Health: A Cochrane Review Journal, 8*(6). https://doi.org/10.1002/ebch.1952

Park, C. J., Yelland, G. W., Taffe, J. R., & Gray, K. M. (2012). Brief report: The relationship between language skills, adaptive behavior, and emotional and behavior problems in pre-schoolers with autism. *Journal of Autism and Developmental Disorders, 42*, 2761–2766. https://doi.org/10.1007/s10803-012-1534-8

Parsons, D., Cordier, R., Vaz, S., & Lee, H. C. (2017). Parent-mediated intervention training delivered remotely for children with autism spectrum disorder living outside of urban areas: Systematic review. *Journal of Medical Internet Research, 19*(8). https://doi.org/10.2196/jmir.6651

Pickard, K. E., Wainer, A. L., Bailey, K. M., & Ingersoll, B. R. (2016). A mixed-method evaluation of the feasibility and acceptability of a telehealth-based parent-mediated intervention for children with autism spectrum disorder. *Autism*. https://doi.org/10.1177/1362361315614496

Pickard, K., Rowless, S., & Ingersoll, B. (2017). Understanding the impact of adaptations to a parent-mediated intervention on parents' ratings of perceived barriers, program attributes, and intent to use. *Autism, 23*(2), 338–349. https://doi.org/10.1177/1362361317744078

Postorino, V., Sharp, W. G., McCracken, C. E., Bearss, K., Burrell, T. L., Evans, A. N., & Scahill, L. (2017). A systematic review and meta-analysis of parent training for disruptive behavior in children with autism spectrum disorder. In *Clinical child and family psychology review*. (Vol. 20, Issue 4, pp. 391–402). Springer New York LLC. https://doi.org/10.1007/s10567-017-0237-2

Randolph, J. K., Stichter, J. P., Schmidt, C. T., & O'Connor, K. V. (2011). Fidelity and effectiveness of PRT implemented by caregivers without college degrees. *Focus on Autism and Other Developmental Disabilities, 26*(4), 230–238. https://doi.org/10.1177/1088357611421503

Reese, R. J., Slone, N. C., Soares, N., & Sprang, R. (2012). Telehealth for underserved families: An evidence-based parenting program. *Psychological Services, 9*(3), 320–322. https://doi.org/10.1037/a0026193

Remington, B., Hastings, R. P., Kovshoff, H., Degli Espinosa, F., Jahr, E., Brown, T., Alsford, P., Lemaic, M., & Ward, N. (2007). Early intensive behavioral intervention: Outcomes for children with autism and their parents after two years. *American Journal on Mental Retardation, 112*(6), 418–438. https://doi.org/10.1352/0895-8017(2007)112[418:EIBIOF]2.0.CO;2

Ringdahl, J. E., & Sellers, J. A. (2000). The effects of different adults as therapists during functional analyses. *Journal of Applied Behavior Analysis, 33*(2), 247–250. https://doi.org/10.1901/jaba.2000.33-247

Rogers, S. J., & Dawson, G. (2010). *Early start Denver model for Young children with autism: Promoting language, learning, and engagement*. The Guilford Press.

Rogers, S. J., Estes, A., Vismara, L., Munson, J., Zierhut, C., Greenson, J., Dawson, G., Rocha, M., Sugar, C., Senturk, D., Whelan, F., & Talbott, M. (2019). Enhancing low-intensity coaching in parent implemented early start Denver model intervention for early autism: A randomized comparison treatment trial. *Journal of Autism and Developmental Disorders, 49*(2), 632–646. https://doi.org/10.1007/s10803-018-3740-5

Rogers, S. J., & Talbott, M. R. (2016). Early identification and early treatment of autism spectrum disorder. In R. M. Hodapp & D. J. Fidler (Eds.), *International review of research in developmental disabilities* (International review of research in developmental disabilities: Fifty years of research in intellectual and developmental disabilities) (Vol. 50, pp. 233–275).

Elsevier Academic Press. https://doi.org/10.1016/bs.irrdd.2016.05.0044

Rogers, S. J., Estes, A., Lord, C., Vismara, L., Winter, J., Fitzpatrick, A., Guo, M., & Dawson, G. (2012). Effects of a brief early start Denver model (ESDM)-based parent intervention on toddlers at risk for autism spectrum disorders: A randomized controlled trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 51*(10), 1052–1065. https://doi.org/10.1016/j.jaac.2012.08.003

Rogers, S. J., Hayden, D., Hepburn, S., Charlifue-Smith, R., Hall, T., & Hayes, A. (2006). Teaching young nonverbal children with autism useful speech: A pilot study of the Denver model and PROMPT interventions. *Journal of Autism and Developmental Disorders, 36*(8), 1007–1024. https://doi.org/10.1007/s10803-006-0142-x

Ryberg, K. (2015). Evidence for the implementation of the early start Denver model for young children with autism spectrum disorder. *Journal of the American Psychiatric Nurses Association, 21*, 327–337. https://doi.org/10.1177/1078390315608165

Salomone, E., & Maurizio Arduino, G. (2017). Parental attitudes to a telehealth parent coaching intervention for autism spectrum disorder. *Journal of Telemedicine and Telecare, 23*(3). https://doi.org/10.1177/1357633X16642067

Scahill, L., Bearss, K., Lecavalier, L., Smith, T., Swiezy, N., Aman, M. G., Sukhodolsky, D. G., McCracken, C., Minshawi, N., Turner, K., Levato, L., Saulnier, C., Dziura, J., & Johnson, C. (2016). Effect of parent training on adaptive behavior in children with autism spectrum disorder and disruptive behavior: Results of a randomized trial. *Journal of the American Academy of Child and Adolescent Psychiatry, 55*(7), 602–609. https://doi.org/10.1016/j.jaac.2016.05.001

Schieltz, K. M., Romani, P. W., Wacker, D. P., Suess, A. N., Huang, P., Berg, W. K., Lindgren, S. D., & Kopelman, T. G. (2018). Single-case analysis to determine reasons for failure of behavioral treatment via telehealth. *Remedial and Special Education, 39*(2), 95–105. https://doi.org/10.1177/0741932517743791

Schopler, E., & Reichler, R. J. (1971). Parents as cotherapists in the treatment of psychotic children. *Journal of Autism and Childhood Schizophrenia, 1*(1), 87–102. https://doi.org/10.1007/BF01537746

Schreibman, L., Dawson, G., Stahmer, A. C., Landa, R., Rogers, S. J., McGee, G. G., Kasari, C., Ingersoll, B., Kaiser, A. P., Bruinsma, Y., McNerney, E., Wetherby, A., & Halladay, A. (2015). Naturalistic developmental behavioral interventions: Empirically validated treatments for autism spectrum disorder. *Journal of Autism and Developmental Disorders, 45*(8), 2411–2428. https://doi.org/10.1007/s10803-015-2407-8

Schwichtenberg, A. J., & Poehlmann, J. (2007). Applied behaviour analysis: Does intervention intensity relate to family stressors and maternal well-being? *Journal of Intellectual Disability Research, 51*(8), 598–605. https://doi.org/10.1111/j.1365-2788.2006.00940.x

Scudder, A. T., Wong, C. B., Mendoza-Burcham, M., & Handen, B. (2018). 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. In C. B. McNeil, L. B. Quetsch, & C. M. Anderson (Eds.), *Handbook of parent-child interaction therapy for children on the autism spectrum* (pp. 443–456). Springer International Publishing. https://doi.org/10.1007/978-3-030-03213-5_24

Scudder, A., Wong, C., Ober, N., Hoffman, M., Toscolani, J., & Handen, B. L. (2019). Parent–child interaction therapy (PCIT) in young children with autism spectrum disorder. *Child and Family Behavior Therapy.* https://doi.org/10.1080/07317107.2019.1659542

Siller, M., & Morgan, L. (2018). In M. Siller & L. Morgan (Eds.), *Handbook of parent-implemented interventions for very young children with autism.* Springer International Publishing. https://doi.org/10.1007/978-3-319-90994-3

Simacek, J., Dimian, A. F., & McComas, J. J. (2017). Communication intervention for young children with severe neurodevelopmental disabilities via telehealth. *Journal of Autism and Developmental Disorders, 47*(3), 744–767. https://doi.org/10.1007/s10803-016-3006-z

Sloman, K. N., Vollmer, T. R., Cotnoir, N. M., Borrero, C. S. W., Borrero, J. C., Samaha, A. L., Peter, C. C., & St. (2005). Descriptive analyses of caregiver reprimands. *Journal of Applied Behavior Analysis.* https://doi.org/10.1901/jaba.2005.118-04

Solomon, M., Ono, M., Timmer, S., & Goodlin-Jones, B. (2008). The effectiveness of parent-child interaction therapy for families of children on the autism spectrum. *Journal of Autism and Developmental Disorders, 38*, 1767–1776. https://doi.org/10.1007/s10803-008-0567-5

Stadnick, N. A., Stahmer, A., & Brookman-Frazee, L. (2015). Preliminary effectiveness of project ImPACT: A parent-mediated intervention for children with autism spectrum disorder delivered in a community program. *Journal of Autism and Developmental Disorders, 45*(7), 2092–2104. https://doi.org/10.1007/s10803-015-2376-y

Stahmer, A. C. (1995). Teaching symbolic play skills to children with autism using Pivotal Response Training. *Journal of Autism and Developmental Disorders, 25*(2), 123–141. https://doi.org/10.1007/BF02178500

Stahmer, A. C., & Gist, K. (2001). The effects of an accelerated parent education program on technique mastery and child outcome. *Journal of Positive Behavior Interventions, 3*(2), 75–82. https://doi.org/10.1177/109830070100300203

Stahmer, A. C., Rieth, S. R., Dickson, K. S., Feder, J., Burgeson, M., Searcy, K., & Brookman-Frazee, L. (2019). Project ImPACT for toddlers: Pilot outcomes of a community adaptation of an intervention for autism risk. *Autism, 24*(3), 617–632. https://doi.org/10.1177/1362361319878080

Stainbrook, J. A., Weitlauf, A. S., Juárez, A. P., Taylor, J. L., Hine, J., Broderick, N., Nicholson, A., & Warren, Z. (2019). Measuring the service system impact of a novel telediagnostic service program for young children with autism spectrum disorder. *Autism, 23*(4), 1051–1056. https://doi.org/10.1177/1362361318787797

Steinbrenner, J. R., Hume, K., Odom, S. L., Morin, K. L., Nowell, S. W., Tomaszewski, B., Szendrey, S., Mcintyre, N. S., Yücesoy-Özkan, S., & Savage, M. N. (2020). *Evidence-based practices for children, youth, and young adults with autism children, youth, and young adults with autism evidence-based practices for national clearinghouse on autism evidence and practice review team 2 evidence-based practices for children, youth, and young adults with autism evidence-based practices for children, youth, and young adults with autism spectrum disorder ©2020 Evidence-Based Practices for Children, Youth, and Young Adults with Autism.*

Sutherland, R., Trembath, D., & Roberts, J. (2018). Telehealth and autism: A systematic search and review of the literature. *International Journal of Speech-Language Pathology, 20*(3). https://doi.org/10.1080/17549507.2018.1465123

Swineford, L. B., Thurm, A., Baird, G., Wetherby, A. M., & Swedo, S. (2014). Social (pragmatic) communication disorder: A research review of this new DSM-5 diagnostic category. *Journal of Neurodevelopmental Disorders, 6*(1), 1–8. https://doi.org/10.1186/1866-1955-6-41

Symon, J. B. (2001). Parent education for autism: Issues in providing services at a distance. *Journal of Positive Behavior Interventions, 3*(3), 160–174. https://doi.org/10.1177/109830070100300304

Tarver, J., Palmer, M., Webb, S., Scott, S., Slonims, V., Simonoff, E., & Charman, T. (2019). Child and parent outcomes following parent interventions for child emotional and behavioral problems in autism spectrum disorders: A systematic review and meta-analysis. *Autism, 23*(7), 1630–1644. https://doi.org/10.1177/1362361319830042

Taylor, T. K., Webster-Stratton, C., Feil, E. G., Broadbent, B., Widdop, C. S., & Severson, H. H. (2008). Computer-based intervention with coaching: An example using the incredible years program. *Cognitive Behaviour Therapy, 37*(4), 233–246. https://doi.org/10.1080/16506070802364511

Thomson, R. N., & Carlson, J. S. (2017). A pilot study of a self-administered parent training intervention for building preschoolers' social–emotional competence. *Early Childhood Education Journal, 45*(3), 419–426. https://doi.org/10.1007/s10643-016-0798-6

Tiger, J. H., Hanley, G. P., & Bruzek, J. (2008). Functional communication training: A review and practical guide. *Behavior Analysis in Practice, 1*, 16–23. https://doi.org/10.1007/bf03391716

Tomlinson, S. R. L., Gore, N., & McGill, P. (2018). Training individuals to implement applied behavior analytic procedures via telehealth: A systematic review of the literature. *Journal of Behavioral Education, 27*(2). https://doi.org/10.1007/s10864-018-9292-0

Unholz-Bowden, E., McComas, J. J., McMaster, K. L., Girtler, S. N., Kolb, R. L., & Shipchandler, A. (2020). Caregiver training via telehealth on behavioral procedures: A systematic review. *Journal of Behavioral Education, 29*(2), 246–281. https://doi.org/10.1007/s10864-020-09381-7

Urquiza, A. J., & Timmer, S. (2012). Parent-child interaction therapy: Enhancing parent-child relationships. *Psychosocial Intervention, 21*(2), 145–156. https://doi.org/10.5093/in2012a16

Vismara, L. A., McCormick, C. E. B., Wagner, A. L., Monlux, K., Nadhan, A., & Young, G. S. (2018). Telehealth parent training in the early start Denver model: Results from a randomized controlled study. *Focus on Autism and Other Developmental Disabilities, 33*(2), 67–79. https://doi.org/10.1177/1088357616651064

Vismara, L. A., McCormick, C., Young, G. S., Nadhan, A., & Monlux, K. (2013). Preliminary findings of a telehealth approach to parent training in Autism. *Journal of Autism and Developmental Disorders, 43*(12), 2953–2969. https://doi.org/10.1007/s10803-013-1841-8

Vismara, L. A., Young, G. S., & Rogers, S. J. (2012). Telehealth for expanding the reach of early autism training to parents. *Autism Research and Treatment, 2012*, 12. https://doi.org/10.1155/2012/121878

Voos, A. C., Pelphrey, K. A., & Kaiser, M. D. (2013). Autistic traits are associated with diminished neural response to affective touch. *Social Cognitive and Affective Neuroscience, 8*(4), 378–386. https://doi.org/10.1093/scan/nss009

Waddington, H., van der Meer, L., Sigafoos, J., & Whitehouse, A. (2019). Examining parent use of specific intervention techniques during a 12-week training program based on the Early Start Denver Model. *Autism, 24*(2), 484–498. https://doi.org/10.1177/1362361319876495

Wade, C., Llewellyn, G., & Matthews, J. (2008). Review of parent training interventions for parents with intellectual disability. *Journal of Applied Research in Intellectual Disabilities, 21*(4), 351–366. https://doi.org/10.1111/j.1468-3148.2008.00449.x

Wahler, R. G., Vigilante, V. A., & Strand, P. S. (2004). Generalization in a child's oppositional behavior across home and school settings. *Journal of Applied Behavior Analysis, 37*(1), 43–51. https://doi.org/10.1901/jaba.2004.37-43

Wainer, A. L., Hepburn, S., & McMahon Griffith, E. (2016). Remembering parents in parent-mediated early intervention: An approach to examining impact on parents and families. *Autism, 21*(1), 5–17. https://doi.org/10.1177/1362361315622411

Ward-Horner, J., & Sturmey, P. (2012). Component analysis of behavior skills training in functional analysis. *Behavioral Interventions, 27*(2), 75–92. https://doi.org/10.1002/bin.1339

Yang, Y. J. D., Sukhodolsky, D. G., Lei, J., Dayan, E., Pelphrey, K. A., & Ventola, P. (2017). Distinct neural bases of disruptive behavior and autism symptom severity in boys with autism spectrum disorder. *Journal of Neurodevelopmental Disorders, 9*(1). https://doi.org/10.1186/s11689-017-9183-z

Yoder, P. J., Stone, W. L., & Edmunds, S. R. (2020). Parent utilization of ImPACT intervention strategies is a mediator of proximal then distal social communication outcomes in younger siblings of children with ASD. *Autism, 25*(1), 44–57. https://doi.org/10.1177/1362361320946883

Zhou, B., Xu, Q., Li, H., Zhang, Y., Wang, Y., Rogers, S. J., & Xu, X. (2018). Effects of parent-implemented early start Denver model intervention on Chinese toddlers with autism spectrum disorder: A non-randomized controlled trial. *Autism Research, 11*(4), 654–666. https://doi.org/10.1002/aur.1917

Zisser, A., & Eyberg, S. M. (2010). Parent-child interaction therapy and the treatment of disruptive behavior disorders. In *Evidence-based psychotherapies for children and adolescents* (2nd ed.).