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Handbook of Social Behavior and Skills in Children

Springer

Autism and Child Psychopathology Series

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History of Social Skills

Johnny L. Matson and Claire O. Burns

The development of modern approaches to social skills training dates to the 1970s (McFall & Twentyman, 1973). Initially, research was carried out using discrete behaviors considered to be components of appropriate assertiveness training. These early papers largely focused on typically developing adults (McFall & Lillesaud, 1971). These efforts helped to establish a methodology for training and to demonstrate the efficacy of learning-based methods to improve these skills.

Special Populations

Soon after these early efforts, the focus of social skills shifted largely to special populations. For example, Bradlyn, Himadi, Crimmins, Graves, and Kelly (1983) taught conversational skills to five adolescents (14–18 years old) who were functioning in the severe to profound range of intellectual disabilities. Training for this study occurred in a therapy room of a large developmental center. Two trainers worked with each of the five adolescents separately. Among the skills trained were (1) reinforcing or acknowledging comments, (2) making self-disclosure statements, and (3) making high-interest statements with respect to movies, school, friends, social events, and TV shows. Training followed the template of assertive skills training for typically developing adults. Instructions, modeling, behavioral rehearsal, feedback, and reinforcement were included in the learning trials. Raters noted client responses on a 7-point scale from 1 (very poor) to 7 (very good). The authors reported marked improvements that were maintained at a 5-month follow-up. These methods and findings were similar to Kelly, Furmna, Philips, Hathorn, and Wilson (1979) who taught two adolescents with intellectual disabilities and to a study by Kelly, Wildman, Very, and Thurman (1979). The latter paper added an additional twist to the treatment by using a group format.

Social skills training packages have also been applied to emotionally disturbed children (Matson et al., 1980). These authors worked with four children 9–11 years of age who were frequently engaging in fights, provoking others, being noncompliant, and verbalizing psychosomatic complaints. The learning-based training package proved to be highly effective in assisting these children with acquiring relevant adaptive behaviors.

Furman, Geller, Simon, and Kelly (1979) used the socials skills training package to enhance these behaviors for three adults. One person was diagnosed with chronic schizophrenia, another person

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had been diagnosed with hysterical personality disorder, and the third had evinced depression. The focus of training was on teaching job interviewing skills. Particular focus was placed on volunteering relevant information and showing initiative. Other skills trained included describing work experience and asking the interviewer questions. The intervention, which emphasized brief behavioral rehearsal, proved useful in teaching these relevant skills.

Schizophrenia is another handicapping condition that has marked profound deficits (Bellack, Brown, & Thomas-Lohtman, 2006). Hayes, Halford, and Varghese (1995) studied 63 people with chronic schizophrenia. Participants were assigned randomly to either a social skills group or a placebo group (i.e., discussion group but with no specific focus on techniques or treatment methods). Social skills were taught using manuals that focused on interpersonal skills, social problem-solving, and how to manage one's time more effectively. The social skills group proved to be superior for teaching social skills. These data replicate and extend data obtained in other studies with similar populations (Beidel, Bellack, Turner, Hersen, & Luber, 1981; Curran, Graves, & Cirelli, 1982). However, this limited form of training may not be sufficient to produce large global changes. Liberman (1992) suggested a more broad-based approach for persons with schizophrenia. Recreational and leisure skills were mentioned. At the time these behaviors were not conceptualized as social skills. This approach has changed over time so that these behaviors and related social contacts, such as play skills, are now subsumed under the social skills moniker.

Another of these behavior sets that adults formally hospitalized in psychiatric inpatient units received training on was job interviewing skills (Furman et al., 1979). Specific target behaviors addressed were positive comments about previous educational experience, hand and arm gestures used along with verbalizations, showing enthusiasm and/or interest, asking the interviewer questions, and providing facts about one's family or job experience. Staff successfully used coaching, praise, and feedback to enhance this skill set.

Shy, unassertive adults were among the first social skills groups to be targeted and effectively trained in the research literature. One interesting study on this topic was published by Azrin and Hayes (1984). They focused on teaching social sensitivity to 89 males between 17 and 29 years of age. The focus was on identifying nonverbal cues to assist with respect to identifying interest a female had in a male. Half of the individuals were then provided feedback based on the actual level of interest the female felt she was displaying. This feedback proved helpful in determining interest level and generalized to real-life social situations.

Another social skills study that focused on shy males was reported by Christoff et al. (1985). Their participants were four girls and two boys 12–14 years of age. Target behaviors included academic performance, social adjustment, conversational ability, number of friends, ease in interacting with others, and range of activities and interests. A two-phase treatment approach was used. First, a problem-solving program was implemented over four sessions. Training was in a group format (most of these early studies involved training one person at a time). Using worksheets and a social problem of their choosing, each child defined their problem, generated multiple solutions, discussed possible positive and negative outcomes, chose what they considered to be the best solutions, and made a plan to implement it. The next four sessions involved improving conversational skills. Behaviors that were targeted included listening, talking about oneself, making requests, and starting conversations. This program proved effective. Also, this study was one of the first to use an educational model versus more traditional behavior therapy strategies to train skills. Given that children are familiar with these school-focused strategies, an educational approach has proven to be very popular. With time, entire curriculums and learning-based didactic programs using this educational approach have emerged.

Populations

A broad range of different populations have continued to be treated with social skills treatments. Foxx, Faw, and Weber (1991) treated 9–15-year-olds with borderline intellectual functioning and a host of mental health problems such as conduct disorder, aggression, and adjustment disorder. Group training was used along with modeling by the therapist. Clients were trained to state rules and provide responses to social vignettes and received feedback and praise from the therapist. The treatment was effective and promoted generalization to novel individuals in naturalistic settings. Similarly, Franco, Christoff, Crimmins, and Kelly (1983) treated an adolescent. In this case, the focus was on conversational skills of an extremely shy male. Eye contact, affect, speech acknowledgments, and conversational questions were all improved.

Sacks and Gaylord-Ross (1989) worked with 15 visually handicapped children who were 7–12 years of age. Training occurred in school and involved a four-week social skills training program. Five nonhandicapped peers were also enlisted to provide peer training. This group of children received weekly training from a psychologist and teacher. Treatment was successful in increasing initiations, joining group activities, joining a group, sharing, gaze, and posture.

Another handicapped group that has received attention with respect to social skills are people with intellectual disabilities. Matson and Senatore (1981) compared traditional psychotherapy to a social skills package of role-play, modeling, performance feedback, and reinforcement. Adult outpatients with mild and moderate intellectual disabilities received training on social appropriateness and socially inappropriate statements using the social skills package. Similarly, in a related study with adults who display intellectual disabilities, a behavioral package was used that included active practice, which was found to be more effective than when role-play, modeling, instructions, and performance feedback alone were used (Senatore, Matson, & Kazdin, 1982).

Griffiths, Feldman, and Tough (1997) also described a treatment study with adults who evinced intellectual disabilities. Treatment conditions consisted of a game condition where participants moved a board. A die was tossed to determine which of 72 cards should be selected. These cards were structured to provide social skills instruction. Social situations were described, which the client had to determine as appropriate or inappropriate. Correct responses were praised by the therapist. Tangible reinforcers were given at the end of the game based on "game money." A second strategy was labeled as a "social life package." This treatment used the game method described, and add-on generalization strategies were also included. A group discussion of game cards to teach problem-solving skills was also part of the training. Direct care staff were directed to provide opportunities to implement these social skills in naturalistic settings. The social life condition was more effective and remained so at a 3-month follow-up.

Psychiatric inpatient children have also been effectively trained on social skills (Kazdin, Esveldt-Dawson, & Matson, 1983). These authors treated 34 children, 7–13 years of age, who evinced conduct disorders, depression, ADHD, adjustment disorder, or anxiety disorders. These children were asked to demonstrate good or poor social skills in response to predetermined role-play scenes. Using this strategy, marked improvements were made on eye contact, number of words spoken, facial expression, motor movements, verbal content, and intonation. Also, broader social behaviors were evaluated including overall positive and negative situation ratings as well as overall total skills.

Heiby (1986) treated four adult women with depression for social skills deficits. Treatment consisted of 12 one-hour individual sessions. The focus of treatment was on self-monitoring, self-evaluation, and self-reinforcement. Homework assignments were also used, and these assignments were received weekly during therapy sessions. Marked improvements were noted in general assertiveness and self-reinforcement. Hersen, Bellack, Himmelhoch, and Thase (1984) also treated women with depression for social skills deficits. They added the interesting twist of using role-play, reinforcement, and performance feedback with amitriptyline. They found that this treatment was no more effective than social skills treatment alone.

Another form of psychopathology treated for social skills deficits was social phobia (Hoffart, Borge, & Clark, 2009). These authors compared two forms of psychotherapy with 80 adults to treat social phobias. The authors used two standardized scales that measured interaction styles. Residential cognitive therapy (RCT) consisted of specific exercises, procedures, and homework to teach new skills in the areas of beliefs, images, and safe behaviors using instruction, videotapes, and performance feedback. The second treatment was residential interpersonal psychotherapy (RIPT) . This latter intervention targeted patterns of social role insecurity. The focus of treatment was on social behaviors such as showing empathy, appreciation, and acceptance. Both interventions produced positive, similar effects.

Another problem addressed through social skills training has been social anxiety (Ledley et al., 2009). Participants were 38 adults. Their immediate treatment was 16 sessions of 1–1½ h. Components included psychoeducation using a workbook, gradual exposure to social situations, cognitive restructuring, evaluating, and, where appropriate, modifying of core beliefs. Finally, relapse prevention and termination of intervention were included. The treatment resulted in improvement in a variety of social behaviors.

Cervantes et al. (2013) evaluated the effects of ADHD on social skills in 6–16-year-olds. Children with ASD and comorbid ADHD had more socialization impairments than children with ASD only. Additionally, the former group became more socially impaired over time as assessed using the MESSY-II.

Another study designed to identify social anxiety in female college students was described by Greenwald (1977). Participants role-played three 1-min social situations. Behaviors targeted included talk time, number of seconds the person spoke, and initiating speech. Specific differences between students who were successful at dating and those who were not were described.

Greco and Morris (2005) addressed social anxiety as well. Peer acceptance was addressed among middle school children, and participants were 333, 8–12-year-olds. Teachers rated the children on the social skills rating system. The focus was on determining the relationship between social anxiety and peer acceptance. Social skills proficiency served as a mediator between these two factors.

Social skills training can also serve as an add-on therapy. Herbert et al. (2005) used cognitive behavioral therapy (CBT) to treat social anxiety. Participants were 38 males and 37 females who had been assessed using the social phobia anxiety inventory. CBT was provided to one group, while a second group's treatment involved CBT plus social skills training. The latter strategy included education modeling of target behaviors such as speech content, voice volume, tone of speech, timing of speech, eye contact, and facial expressions. Treatment involved practicing the skills in session, provision of feedback, and practicing in the natural environment. Those receiving the add-on social skills intervention developed better coping skills than individuals in the CBT-only group.

Another area focused on in social skills research is children with ADHD in a sports setting. In a study by O'Callaghan, Reitman, Northup, Hupp, and Murphy (2003), two boys and two girls were taught good sportsmanship such as praising other players and being attentive. A token economy system was used to reinforce positive target behaviors. Feedback and praise for the children was also provided by the trainers. Another approach to teaching prosocial behaviors in children is described by Sukhodolsky, Golub, Stone, and Orban (2005). Two manualized treatments were compared over ten therapy sessions. Behaviors targeted included social cognitive deficits and social skills deficits. One intervention focused on cognitive restructuring such as attention retraining, consequential thinking, and helping the participants generate solutions. Conversely, the social skills manual focused on the more traditional methods in the research literature such as rehearsal, performance feedback, modeling, and social reinforcement. Both treatments resulted in improvements for over half of the children with treatment gains maintained at a 3-month follow-up.

Autism Spectrum Disorder

Autism spectrum disorder (ASD) has been a major area for research on social skills assessment and training in recent years. Flynn and

Healy (2012), for example, found 22 studies that looked at problems with social skills and self-help skills. Similarly, Cappadocia and Weiss (2011) found multiple studies that studied social skills training groups for children and adolescents who evinced either Asperger syndrome or high-functioning autism. Wang, Cui, and Parilla (2011) in another review of social skills and autism found 64 papers. Thirteen of these met criteria for peer-mediated and video-modeling treatments. Finally, Matson and Wilkins (2007) reported on a substantial number of studies that laid out specific excesses and deficits that are common among persons with autism. Language and recognition of emotions had particular idiosyncrasies specific to ASD.

Within the context of autism, a number of intervention strategies have been used successfully. One notable intervention of this type is described by Celiberti and Harris (1993). The participants were three dyads, an older typically developing sister and a young brother or sister aged 4, 4, and 2 years. A curriculum was used to teach the older sisters to be peer trainers. Peer-related commands involved modeling and specific neutral prompts. Target behaviors included eye contact, attention to tasks, and appropriate play. The children with ASD improved on these important social skills. These children were able to generalize social skills in a play situation with a novel boy and were maintained at a 16-week follow-up.

Brim, Buffington Townsend, DeQuinzio, and Poulson (2009) focused on social referencing among children with ASD. Four children were treated for impaired eye contact and not responding to their names being called. Training occurred in a therapy room with a table, chairs, a TV, and a VCR. A token board was placed on the table. Graduated guidance, manual prompts, and reinforcement were among the training procedures that were employed. Children were able to learn to evince socially appropriate behaviors to standard materials. They were also able to use these new social skills in the context of ambiguous stimuli which the authors called social referencing.

Another group of authors who used peer-mediated intervention was Bambara, Cole, Kunsch, Tsai, and Ayad (2016). For this study, however, high school students ($n = 3$) served as participants. The focus was on social conversations in the school cafeteria. Participants were provided with two cue cards which focused on asking a question, telling something, or starting a conversation. Training sessions occurred for 30 min before lunch. These three participants then began conversations with some of the approximately 200 students who were at lunch. As with the other studies reviewed in this chapter, the intervention was effective.

Hill, Varela, Kamps, and Niditch (2014) speculated on the role of anxiety and cognitive functioning on social skills of 102 children with ASD. They found that lower intellectual functioning and greater anxiety were directly related to poorer social skills. Other factors associated with social skills excesses and deficits have also been evaluated with children who have been diagnosed with ASD.

Another interesting assessment of children with ASD involved cultural difference in social skills. Comparing children from South Korea and the USA on the MESSY-II, no major social differences were noted (Matson et al., 2012). The MESSY was considered to be an appropriate measure for these analyses, since it had been normed on children with ASD in earlier research (Matson, Horovitz, Mahan, & Fodstad, 2013).

Following the theme of using various interventions to treat social deficits and excesses among children with ASD, a few examples will be mentioned. Koning, Magill-Evans, Voldem, and Dick (2013) described a 15-week program to teach social skills to boys with ASD who were 10–12 years of age. A curriculum was used following a CBT model. General skill areas targeted involved social aspects of motivation, initiation, perception, responding, and problem-solving. A manual and worksheets were used to monitor weekly goals. Training strategies involved a focus on cooperation during group activities. Therapists focused on verbal praise, prompts, and problem-solving skills. Marked improvements in the target skills were noted during the course of the intervention.

Using group teaching methods has been described by Leaf, Dotson, Oppenheim, Sheldon, and Sherman (2010). They taught five children, ages 4–6 years, who had been diagnosed with ASD. The intervention consisted of two 1½ h group meetings per week for 7 months. Structured and unstructured games were used to work on specific social tasks such as saying “thank you,” “that’s cool,” and stating their name. Other targeted skills included appropriate tone of voice and facing the person that you are talking to. In addition to the above, the teacher used praise, tokens, performance feedback, and re-practicing situations where social skills errors had been made. All of the children showed marked improvement in the skills trained. Leaf et al. (2009) also describe a teaching package for social skills for three children 5–7 years of age who had been diagnosed with ASD. Skills taught included play skills, language, and emotional skills. Finally, there was a focus on choosing a friend. First, the teacher stated the goal for the session. This goal was followed by a provision on why the behavior would help the child. The teacher then asked the child the steps needed to meet the social skills goals. Incorrect answers were followed with performance feedback from the teacher. A second focus on generalization involved “friendship tickets” for using the appropriate social behaviors with peers. This approach also proved successful.

Radley et al. (2014) also described a program that focused on generalization of social skills to three children 10–14 years of age who had ASD. Skills focused on were perspective-taking, participation, conversations, and problem-solving. These authors provided ten 1½-h-long treatment sessions over 5 weeks. The superheroes DVD served as a major focus of training. Participants viewed the DVD and then the therapist modeled correct as well as incorrect skill usage. Next, participants were taught to self-monitor performance during the role-play scenes. Finally, therapists provided feedback on how the children performed. This methodology proved to be successful.

Lydon, Healy, and Leader (2011) also used technology to promote social skills via video modeling. Five children with ASD who were 3–6 years of age participated. Each child was presented with two separate interventions: video modeling and pivotal response training. Video modeling involved a child engaging in social behaviors and practicing social skills in two sessions daily. They continued to practice the social skills until they reached criteria. For pivotal response training, each child had three preferred toys that they could play with. Symbolic toy play was the target skill. Specific behaviors such as eye gaze, touching, and verbal requests were priorities. The trainer played with the toy and also modeled appropriate responses. Marked improvement was noted for both treatments, although the pivotal response training was more effective than the video modeling approach.

Another classroom-based intervention is described by Banda, Hart, and Liu-Gitz (2010). Their study included two children with ASD and three typically developing peers who were 6 years of age. The focus of training was on asking and answering questions. Prompts, modeling, and reinforcement were used to teach these skills. Increased responding and more social initiations resulted from the intervention. In a broader context, underscoring the technology studies first reviewed, DiGennaro Reed, Hyman, and Hirst (2011) used a social skills intervention that used DVDs and videos. They noted that conversational skills were most frequently taught, followed by play skills.

Conclusions

The focus of this chapter has been on tracing the development of social skills trainings, with particular emphasis on children and adolescents. Initial efforts were geared toward college-aged people with failures in assertiveness. However, the field has shifted dramatically since that time with respect to the populations served. A good deal of focus on social skills training has occurred. However, the greatest focus at this writing is on special needs populations, particularly individuals with neurodevelopmental disorders such as ASD and intellectual disabilities.

The types of behaviors targeted for intervention have remained fairly stable. However, the focus of intervention has gone from one-to-one therapist to client interventions to methods that are less trainer intensive. Among these trends are group teaching, the use of teaching methods, and curriculums and technology such as DVDs and videotape feedback and training.

This volume is geared toward providing an in-depth discussion of social skills for children. The topic is now a well-established focus of assessment and training, since these behaviors have important implications for a range of problems. How social skills are defined and assessed are topics that are covered as well as theoretical and developmental issues. A range of treatment strategies are covered such as behavior analytic methods, social learning, and parent training. As noted in this chapter, special populations are also discussed. Different neurodevelopmental and mental health issues require some modifications to assessment and treatment. Various topics are covered and the available research on these topics are discussed in-depth. The hope is that this volume will aid the reader in better understanding the breadth of available methods available to aid in the improvement of social behavior and skills in children.

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Defining Social Skills

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As a psychologist who works primarily with children and youth, it is clear that parents and teachers frequently identify "social skills" as a primary concern. The variability in what they mean by "social skills" is tremendous however. It could be a simple as not making consistent eye contact when conversing with someone, to interrupting others, to aggression, and other maladaptive behaviors. While there may be no one accepted definition of social skills, our understanding of social skills has come a long way since Libet and Lewinsohn (1973, p. 311) defined social skills as the "complex ability to maximize the rate of positive reinforcement and to minimize the strength of punishment elicited from others." This chapter will present a number of definitions and methods of assessing social deficits and excesses with a focus on translating these definitions into an understanding of common disorders involving social skills and methods of operationalizing social skill/competence.

To illustrate the wide variety of definitions of social skills, an internet search yielded these definitions. "These are the skills that allow a person to interact and to act appropriately in given social contexts" (http://psychologydictionary.org/social-skills/). "Social skills are ways of dealing with others that create healthy and positive interactions" (http://study.com/academy/lesson/what-are-social-skills-in-children-development-definition-teaching-techniques.html). "The personal skills needed for successful social communication and interaction" (http://www.dictionary.com/browse/social-skills). "Social skills are the skills we use to communicate and interact with each other, both verbally and non-verbally, through gestures, body language and our personal appearance" (http://www.skillsyouneed.com/ips/social-skills.html). "The skills that are necessary in order to communicate and interact with others" (http://www.collinsdictionary.com/dictionary/english/social-skills). "A level of interpersonal savvy, which often determines future social adjustment and success" (http://medical-dictionary.thefreedictionary.com/Social+skills). "Social skill is any skill facilitating interaction and communication with others" (https://en.wikipedia.org/wiki/Social_skills).

The two most common threads throughout these definitions involve communication and interaction with others, and while these definitions are outside the confines of traditional scholarly literature, they reflect the consensus within

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scholarly writing. For example, Gresham and Elliott (1984) defined social skills as socially acceptable learned behaviors that enable a person to interact with others in ways that elicit positive responses and assist in avoiding negative responses. Phillips (1978) defined social skills as the interaction between a person and his/her environment and the ability to begin and sustain interpersonal relationships. Cook, Gresham, Barreras, Thornton, and Crews (2008) described social skills as involving learned behaviors that involve interactions with others which enable individuals to function competently at social tasks. Ladd (2005) identified culturally associated learned behaviors exhibited during interactions between a child and peers and adults as comprising social skills. While social skills definitions may vary somewhat, there is some basic agreement as to how social skills are developed. Specifically, social skills involve specific learned behaviors, are comprised of both initiation and response behaviors, and entail interactions with others. These skills are also socially reinforced and denote skills that are context specific. Simply put, social skills are those skills that enable individuals to function competently at social tasks (Cook et al., 2008).

Related to social skills is the term social competence. Social competence, however, is believed to reflect social judgment about the quality of an individual's performance, while social skills consist of specific skills that form the basis for socially competent behavior (Hops, 1983). Social skills are considered to be the "most malleable of the components of social competence" (Elliott & Busse, 1991, p. 64). Semrud-Clikeman (2007) described social competence as consisting of social, emotional, cognitive, and behavioral components needed for successful social adaptation. Social skills can be thought of as the behavioral component of Semrud-Clikeman's definition. Greenspan (1981) provided an interesting analogy that helps clarify the distinction between social skills and social competence. Competence as a golfer is usually defined by the outcome, the final score. This is analogous to social competence. The golf score, however, tells us nothing about the skills (e.g., driving, approach shots, putting) and how these contributed to the final score. These are analogous to social skills. The remainder of this chapter will focus on social skills.

Gresham (1986, 1997) categorized social skills into three definitional areas: peer acceptance, behavioral, and social validity. The peer acceptance definition uses peer acceptance or popularity to define social skills (Oden & Asher, 1977). In other words, children accepted and thought of as popular by their peers are considered socially skilled via peer-referenced assessment procedures such as sociometric assessment (Frick, Barry, & Kamphaus, 2010; Gresham & Little, 1992). However, this definition defines social skills by their outcome and fails to identify the specific behaviors which lead to peer acceptance. The behavioral definition, however, focuses on situation-specific behaviors that maximize the probability of reinforcement while decreasing the probability of punishment (Foster & Ritchey, 1979; Libet & Lewinsohn, 1973). This definition allows social behavior to be specified and operationalized for measurement and intervention. However, it does not ensure that the identified social behaviors are socially significant or socially relevant. The social validity definition defines social skills as exhibiting behaviors that predict important social outcomes in particular situations (Gresham, 1983; Kazdin, 1977; Wolf, 1978). Gresham (1986) sees this definition as a hybrid of the peer acceptance and behavioral definitions.

Gresham (1986) goes on to discuss social skills difficulty as categorized into four types: skill deficits, performance deficits, self-control skill deficits, and self-control performance deficits. Skill deficits are present when the individual lacks the skills needed for appropriate social interaction. It is this definition of social skills deficit that some have used when advocating for social skills deficits as a specific learning disability (Gresham & Elliott, 1989). Performance deficits categorize children who possess the capability of performing the behavior but do not perform these behaviors at an acceptable level due to factors such as motivation or lack of opportunity. If you observe situation-specific performance of the behavior (e.g., at home but not at school), it is most likely a performance deficit. Self-control skill deficits are identified when an individual has not learned a social skill due to some sort of emotional arousal. For example, anxiety interferes with learning the social skill. Finally, self-control performance deficits also involve interference from emotional arousal, but in this case it has not interfered with the acquisition of the behavior but rather with its performance.

Constantino, Przybeck, Friesen, and Todd (2000) defined social skills in part through five components: social awareness, social cognition, social communication, social motivation, and autistic mannerisms. Social awareness involves the ability to recognize social cues and represents the sensory aspects of reciprocal behavior. Social cognition is the ability to interpret social cues once they are identified and represents the cognitive-interpretive aspect of reciprocal behavior. Social communication includes behaviors such as expressive social communication and represents the motoric aspect of reciprocal behavior. Social motivation incorporates factors such as social anxiety, inhibition, and empathic orientation that influence the individual's motivation to respond in a socially responsive manner. Finally, autistic mannerisms include aspects of ASD such as stereotyped behaviors and highly restricted interests that, while idiosyncratic, need to be addressed in any intervention designed to improve social functioning.

Operationalizing Social Skills

In practice social skills are most likely going to be defined based on the measure used to assess the construct. There are a number of norm-referenced measures that either focus primarily on social skills or have a social skills dimension. These include comprehensive measures of social skills (e.g., social skills improvement system rating scales, SSIS; Gresham & Elliott, 2008), adaptive behavior measures (e.g., *Vineland Adaptive Behavior Scales*, Third Edition; Sparrow, Cicchetti, & Saulnier, 2016), behavior rating scales (e.g., *Behavior Assessment System for Children*, Third Edition; BASC-3; Reynolds & Kampaus, 2015; Achenbach system of empirically based assessment; Achenbach et al., 2004), and autism rating scales (*Childhood Autism Rating Scale*, Second Edition; CARS-2; Schopler, Van Bourgondien, Wellman, & Love, 2010: Gilliam Autism Rating Scale; GARS-3, Gilliam, 2014). In addition, sociometric ratings such as peer nominations are also frequently used. The following section will review various measures and describe the dimensions of the social skills defined and assessed in each.

Social Skills Improvement System Rating Scales (SSIS). The SSIS (Gresham & Elliott, 2008) is probably the most comprehensive norm-referenced measure to screen and classify children and youth suspected of having significant social skills deficits. With an age range of 3–18, the SSIS consists of four components. The main measure, the social skills scale, measures positive social behaviors while interacting with others. The behavior problems scale focuses on negative behaviors that compete with social competence and may be needed to be addressed in intervention planning. The autism spectrum subscale provides a screen of ASD symptomology, and the academic competence scale consists of a teacher's rating of academic performance relative to classmates. Social skills, as defined by the social skills scale, consist of seven domains of social behavior (Table 1) that the test authors identify as important: communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. The communication subscale includes behaviors such as making eye contact when talking and saying "please" and "thank you." The cooperation subscale includes behaviors such as following rules and completing tasks without bothering others. The assertion subscale includes behaviors such as asks for help when needed and says when there's a problem. The responsibility subscale includes behaviors such as respects the property of others and is well behaved when unsupervised. The empathy subscale includes behaviors such as tries to comfort others and feels bad when others are sad. The engagement subscale includes behaviors such as invites others to join in activities, makes friends

Table 1 Operationalization of social skills on common norm-referenced assessments

SSIS	Vineland-3	GARS-3	CARS	BASC-3	ASEBA/CBCL
Communication	Interpersonal relationships	Social interaction,	Relating to people	Social skills	Social competence
Cooperation	Play and leisure time	Social communication	Imitation		
Assertion	Coping skills		Emotional response		
Responsibility	Communication		Social-emotional understanding		
Empathy					
Engagement					
Engagement					
Self-control					

easily, and introduces himself to others. Finally, the self-control subscale includes behaviors such as stays calm when teased and uses appropriate behavior when upset.

Vineland Adaptive Behavior Scales, Third Edition. The Vineland (Sparrow et al., 2016) is an individually administered measure of adaptive behavior. The publisher describes the purpose of the Vineland as aiding in diagnosing and classifying intellectual and developmental disabilities and other disorders, such as autism. It is organized using the three domains of adaptive functioning specified by the American Association on Intellectual and Developmental Disabilities and by DSM-5: communication, daily living skills, and socialization. Social skills are assessed in both the communication and socialization domains (Table 1). Communication is broken down into expressive, receptive, and written subdomains with the expressive and receptive subdomains most related to social skills. Receptive communication is the process of receiving and understanding a message, while expressive communication involves the way one conveys the message to others. The socialization domain is broken down into three subdomains: interpersonal relationships, play and leisure, and coping skills. Interpersonal relationships cover social interaction, dating, and friendship skills. Play and leisure consists of behaviors such as going to clubs, playing games, hobbies, and leisure activities. Lastly coping skills includes factors such as awareness of manners, social sensitivity, and following social rules.

Behavior Assessment System for Children, Third Edition (BASC-3). The BASC-3 (Reynolds & Kampaus, 2015) is a comprehensive set of rating scales which include the teacher rating scales (TRS), parent rating scales (PRS), self-report of personality (SRP), student observation system (SOS), and structured developmental history (SDH), the purpose of which is to provide a complete picture of a child's behavior. Both the TRS and PRS include a social skills scale which is defined as "the skills necessary for interacting successfully with peers and adults in home, school, and community settings" (Pearson Education, 2016, p. 4). In addition, both the TRS and PRS include a functional communication scale which is also related to social skills. It is defined as "the ability to express ideas and communicate in a way others can easily understand" (Pearson Education, 2016, p. 4) (Table 1).

Achenbach System of Empirically Based Assessment (ASEBS). The ASEBA (Achenbach et al., 2004) provides a comprehensive approach to assessing adaptive and maladaptive functioning in children and youth. The child behavior checklist (CBCL) is the primary behavior rating scale component of the ASEBA and consists of the CBCL/1½–5 and C-TRF for preschoolers and the CBCL, teacher report form (TRF), and youth self-report (YSR) for school age children. All versions of the CBCL are completed by parents or surrogates, while the TRF is completed by teachers or other school staff. In addition, the preschool CBCL contains a language development survey (LDS) which assesses a child's vocabulary and word combinations relative to norms for ages 18–35 months. Social skills is defined primarily by the social competence scale and social problems syndrome scale of the CBCL (Table 1).

The social competence scale on the CBCL, TRF, and YSR assesses participation in group activities and social relationships. Informants are asked to list the number of clubs/teams organizations in which the child participates, involvement in jobs/chores, the number of friends the child has, and number of times he/she interacts with friends. In addition, informants are asked to rate how well or how frequently the child performs these actions compared to same age peers. This scale is believed to be a positive indicator of social functioning. The social problems scale on the CBCL, TRF, and YSR assesses immature social behaviors and difficulties in peer relationships. Examples of items from this scale include "clings to adults or too dependent," "gets teased," "not liked," "too dependent," "prefers being with younger children," and "lonely." This scale is believed to be a negative indicator of social functioning.

Childhood Autism Rating Scale, Second Edition (CARS-2). The CARS-2 (Schopler et al., 2010) is designed to identify behavioral symptoms of autism. The standard version (CARS-2-ST) is used with children below ages 6 and those with communication deficits or an estimated IQ of 79 or below. The high-functioning version (CARS-2-HF) is designed for children age 6 and up with estimated IQ above 80. The standard version is designed to be completed by parents or caregivers and provides scores on 16 dimensions. Included in these dimensions are relating to people, imitation, emotional response, and social-emotional understanding all of which relate to social skills and aid in assessing the DSM-5 ASD diagnostic criteria for "persistent deficits in social communication and social interaction across multiple contexts" (American Psychiatric Association, 2013, p. 50) (Table 1). An example of an item from the imitation dimension is "appropriate imitation. The child can imitate sounds, words, and movements that are appropriate for his or her skill set" (Perry, Condillac, Freeman, Dunn-Geier, & Belair, 2005, p. 629). A second example is "mildly abnormal imitation. The child imitates simple behaviors" (Perry et al., 2005, p. 629).

Gilliam Autism Rating Scale (GARS-3). The GARS-3 (Gilliam, 2014) is a norm-referenced screening instrument used to "identify persons [ages 3–22 years] who have autism spectrum disorders [ASD]" (manual, p. 1). Based on the diagnostic criteria of the DSM-5, the GARS-3 is composed of six subscales, two descriptive of the DSM-5 domain of deficits in social communication and interaction and four descriptive of the repetitive behavior domain, yielding six standard scores and an autism index. Social skills is defined based on the social interaction and social communication subscales (Table 1). Social interaction is defined as a child's ability to relate appropriately to people, events, and objects. Examples of behaviors assessed on this subscale include behaviors such as making eye contact, recognizing the presence of others, and laughs, giggles, and cries appropriately. Social communication involves behaviors of social reciprocity (social interaction, social skills) and the behaviors of communication and language that result in one's ability to communicate socially. Examples of behaviors assessed on this subscale include initiating conversations with peers or adults, using "yes" and "no" appropriately, using pronouns appropriately, and using the word "I" appropriately.

Sociometric Ratings. Sociometric assessment involves the measurement of interpersonal relationships in the context of a social group such as a classroom with the goal of gaining information about an individual's social competence and standing within a peer group. This includes dimensions such as social popularity, peer acceptance, peer rejection, and reputation (Merrell, 1999). The most widely used sociometric rating technique is peer nomination which involves individuals in a group (e.g., classroom) are asked to nominate peers he or she likes most or likes least (Gresham & Little, 1992; Poulin & Dishion, 2008). The nominations received are tallied and used to create sociometric categories (rejected, popular, controversial, neglected, and average) or a continuous index of peer status (acceptance, rejection, social preference) (Coie, Dodge, & Coppotelli, 1982). Peer ratings are involved providing a list of children's names in the social group along with a rating for social acceptance items such as "The most fun to play with" on a three- or five-point Likert scale. Sociometric ratings can also be completed by adults (e.g., a teacher) who have had opportunities to observe children in the group in multiple contexts. The ratings can be on any social dimension but tend to be similar to those used with children in peer ratings. While these techniques have been used more in research than in practice (McClelland & Scalzo, 2006), they do provide an interesting manner in which to operationalize social skills.

Social Skills and Disability

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM 5, American Psychiatric Association, 2013) contains only one disorder in which social skill-related behavior is included in the title, social (pragmatic) communication disorder. Social skills, however, contribute greatly to the diagnostic criteria of a number of other disorders including autism spectrum disorder, intellectual disability, attention-deficit/hyperactivity disorder, and social anxiety disorder.

Social (Pragmatic) Communication Disorder. Social (pragmatic) communication disorder (SCD) encompasses problems with social interaction, social understanding, and pragmatics (using language in proper context). SCD is differentiated from autism spectrum disorder (ASD) in that ASD includes the presence of restrictive/repetitive patterns of behavior, interests, and activities which are not present in SCD. Both verbal and nonverbal social communication skills define the social skills deficits associated with SCD, including using gestures, reciprocal talking or playing, maintaining focus on the topic being discussed, adjusting speech to conform to changes in people (e.g., child to adult) or situations (e.g., outside to inside), and making and keeping friends. According to the DSM-5 (American Psychiatric Association, 2013, p. 48), "the deficits result in functional limitations in effective communication, social participation, social relationships, academic achievement, or occupational performance, individually or in combination."

Autism spectrum disorder. Social skills deficits comprise one of the essential features of autism spectrum disorder (ASD). This is defined as "persistent deficits in social communication and social interaction across multiple contexts" (American Psychiatric Association, 2013, p. 50) and is composed of three specific areas of deficit: (a) social emotional reciprocity (e.g., failure of normal back and forth conversation), (b) nonverbal communication used in social interactions (e.g., abnormalities in eye contact), and (c) "developing, maintaining, and understanding relationships" (p. 50) (e.g., difficulty in making friends). The DSM-5 also specifies that these deficits are "pervasive and sustained" and are present from early development.

Social Anxiety Disorder (Social Phobia). Unlike SCD or ASD which tends to be diagnosed relatively early in child development, social anxiety disorder (SAD) typically develops in later childhood and early adolescence with a median age of onset of 13 years (American Psychiatric Association, 2013). SAD also differs from the social skills deficits essential to SCD and ASD as the etiology is thought to be due more to behavioral inhibition, as opposed to an actual deficit in social skills (Angélico, Crippa, & Loureiro, 2013). SAD is defined by timidity, distress, and avoidance in/of social settings (Beidel, Rao, Scharfstein, Wong, & Alfano, 2010), and it may be best described as an impairment in social skills rather than a deficit. DSM-5 diagnostic criteria describe these impairments as marked by fear and anxiety of social situations in which the individual is exposed to possible scrutiny from others which in turn impairs social interactions (American Psychiatric Association, 2013).

Intellectual Disability. The DSM-5 (American Psychiatric Association, 2013) describes intellectual disability (ID) as impairment of general mental abilities that impact adaptive functioning in three domains. The conceptual domain consists of functioning in areas such as language, reading, writing, math, reasoning, knowledge, and memory. The social domain refers to empathy, social judgment, interpersonal communication skills, the ability to make and retain friendships, and similar capacities. The practical domain centers on self-management in areas such as personal care, job responsibilities, money management, recreation, and organizing school and work tasks.

Attention-Deficit Hyperactivity Disorder. The DSM-5 (American Psychiatric Association, 2013) defines attention-deficit hyperactivity disorder (ADHD) as being characterized by symptoms of hyperactivity, inattention, and impulsivity that interfere with daily and occupational functioning. While social skills deficits are not specifically identified in the ADHD diagnostic criteria, behaviors common to ADHD such as inattention and impulsivity may interfere with the development or expression of positive social skills (Bunford, Evans, Becker, & Langberg, 2015). For example, children with ADHD may not recognize how their behavior is affecting others. Behaviors such as interrupting or making inappropriate comments may interfere with their making or maintaining friends.

Summary

Social skills are a common concern for both parents and teachers. There are, however, many ways to define and operationalize the construct. While definitions may vary on the specific behaviors, almost all involve aspects of social communication and interaction with others in a social context. While published more than 30 years ago, Gresham and Elliott's (1984) definition of social skills as socially acceptable learned behaviors that enable a person to interact with others in ways that elicit positive responses and assist in avoiding negative responses probably best sums up the thinking of those involved in social skills research over the past few decades. Social skills, however, is not a unitary construct. Some define it using a more social competence definition, but by using this definition, you may inadvertently ignore the requisite component behaviors that contribute to an individual being considered socially skilled/competent. There is also a social validity component to social skills which defines social skills as exhibiting behaviors that predict important social outcomes in particular situations (Gresham, 1983; Kazdin, 1977; Wolf, 1978) which cannot be ignored.

In practice social skills are most likely going to be defined based on the measure used to assess the construct. There are a number of norm-referenced measures that either focus primarily on social skills or have a social skills dimension. These include comprehensive measures of social skills, adaptive behavior measures, behavior rating scales, and autism rating scales as well as sociometric ratings (e.g., peer nominations) that are used to assess an individual's social standing with a social group (e.g., a classroom). The most comprehensive of these measures is the social skills improvement system rating scale (SSIS; Gresham & Elliott, 2008) which assesses the areas of communication, cooperation, assertion, responsibility, empathy, engagement, and self-control.

Finally, it is important to understand social skills not only in the context of the normal range of behavior. Social skills deficits contribute a large component to many childhood disorders. While social skills deficits are a core component of an autism spectrum diagnosis, it also plays an important role in many other disorders including social (pragmatic) communication disorder, intellectual disability, attention-deficit/hyperactivity disorder, and social anxiety disorder.

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Challenging Behavior

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Challenging Behavior and Social Skills

Although challenging behavior is seen in children without disabilities, its prevalence is greater in children with disabilities (Didden, Korzilius, van Oorsouw, & Sturmey, 2006; Emerson, 2003; Whitaker & Read, 2006). Holden and Gitlesen (2006) report that approximately 10–15% of individuals with intellectual disabilities engage in challenging behavior. Other estimates place that percentage much higher (e.g., Atkinson et al., 1994; Tonge & Einfeld, 2003). Children with intellectual and developmental disabilities are also more likely to also experience social deficits (Odom, McConnell, & Brown, 2008). In fact, some disorders are characterized by the presence of social deficits. For example, autism spectrum disorder's (ASD) diagnostic criteria include both social and communication impairments (American Psychiatric Association, 2013; McPartland, Reichow, & Volkmar, 2012). Although age, sex, and level of intellectual disability are not predictive of challenging behavior (Murphy, Healy, & Leader, 2009), a lack of adequate social skills is a risk factor for the development of challenging behavior (Didden et al., 2006).

When children, whether or not they have a disability, do not have the social skill repertoire required to get what they want in a particular situation, they may engage in other behavior in an attempt to get their needs met. This other behavior may be shaped into severe topographies like aggression or self-injury, or it may remain in milder forms, like tantrums or flopping. Regardless, challenging behavior can result in placement in restrictive settings or result in the use of restrictive or punishment-based procedures (Borkwick-Duffy, Eyman, & White, 1987; Lerman & Vorndran, 2002) and can result in serious harm (Kahng, Iwata, & Lewin, 2002; Symons, Harper, McGrath, Breau, & Bodfish, 2009).

Addressing challenging behavior often involves teaching a response related to social skills. Later in this chapter, we will describe specific interventions based on functions of problem behavior, but one common general approach is to determine what the child is attempting to change in his or her environment (e.g., access adult attention, escape from a particular task) and to teach them other, more socially acceptable, ways to make that change happen. Thus, the challenging behavior is replaced with a socially appropriate behavior.

This approach is one of many approaches that can be used after the challenging behavior has already been established. However, challenging behavior can presumably be prevented from developing by targeting social deficits and providing interventions to strengthen social skills

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(Hanley, Heal, Tiger, & Ingvarsson, 2007; Luczynski & Hanley, 2013). This way, situations in which a child does not have the social repertoire to obtain what they need are avoided, and challenging behavior does not fill the gap left by the social skill deficit. Developing social skills, and the resulting social relationships, are suggestive of positive social and educational outcomes (National Research Council and Institute of Medicine, 2000). Strategies to teach social and play skills can be found in early childhood special education curriculum (e.g., Sandall & Schwartz, 2008). Social competence, or the degree to which a child can achieve social goals in ways appropriate for their environments (Wright, 1980), can be measured using a variety of approaches (Odom et al., 2008), and particular deficits can be addressed using a variety of interventions (Terpstra & Tamura, 2008). This chapter examines assessment and intervention for challenging behavior related to social skill deficits.

We will first review strategies for assessing the function of challenging behavior. This will include both indirect and direct forms of assessment. Particular attention will be paid to functional analysis and variations on functional analysis that may be useful in different situations. Next, we will review a number of different social skills assessments and provide suggestions for how to select and use particular assessments. Then we will examine interventions, both those that target social skill deficits directly and those that are oriented to the function of challenging behavior, but also may incorporate social skill support or may be used in conjunction with social skills training. Finally, we will discuss a particular instance in which challenging behavior may not be directly addressed with social skills training.

Assessment of Challenging Behavior

Indirect Assessment

An indirect assessment is often the initial step in identifying the function of a problem behavior. Indirect assessments typically involve a questionnaire, rating scale, or interview that is completed by caregivers, staff, or teachers with the assistance of a behavior analyst, to gather information about the settings and environmental contingencies that are associated with the problem behavior. There are several practical indirect assessment tools that are available for behavior analysts to use; some of these include the Functional Analysis Screening Tool (FAST; Iwata, DeLeon, & Roscoe, 2013), Functional Assessment Interview (FAI; O'Neill, Albin, Storey, Horner, & Sprague, 2014), and the Questions About Behavioral Function (QABF; Matson, Bamburg, Cherry, & Paclawskyj, 1999; Matson & Vollmer, 1995). Moreover, some indirect assessments are also used to obtain information about the topography, intensity, and frequency of the problem behavior (e.g., the FAST and the FAI). In general, indirect assessments are useful because they identify a hypothetical function of the problem behavior and may provide more information about the topography. This information could be used to modify or select the most appropriate functional analysis (e.g., typical functional analysis, precursor functional analysis, trial-based functional analysis) to be conducted. However, indirect assessments should only be used as an initial step in the functional assessment process. An appropriate functional analysis must be conducted before an accurate function of a problem behavior can be identified.

Direct Assessment

Direct assessments involve the observation of the individuals, typically in their natural environment (Bijou, Peterson, & Ault, 1968). Direct assessments are often conducted in the setting in which the problem behavior is most likely to occur. For example, for a child who engages in tantrums at school, a direct assessment would be conducted in his or her classroom during the times in which the problem behavior is more likely to occur (e.g., mathematics class). In cases in which the problem behavior happens in all settings (e.g., school, home, grocery store), the behavior analyst may observe the behavior in two or more settings.

In the simplest version of this type of assessment, behavior analysts record all the antecedents (stimuli that precede the target problem behavior) and the consequences (stimuli that follow the target problem behavior) that occur during the observation. This type of direct assessment is called A-B-C recording (Cooper, Heron, & Heward, 2007). For example, if a child engages in crying in the classroom after the teacher asks the child to complete an assignment and teacher provides the child with a break, the behavior analyst will record that the teacher asked the child to complete an assignment (antecedent), the child engaged in crying (problem behavior), and the teacher provided the child with a break from work (consequence). These recorded data could be used to identify a hypothetical function of the problem behavior (e.g., escape from academic tasks) as well as to identify the current strategies being used to address challenging behavior.

Another type of direct assessment is the structured descriptive assessment (Freeman, Anderson, & Scotti, 2000). Structured descriptive assessments include the arrangement and manipulation of antecedent variables to assess how caregivers typically respond to problem behavior. In this assessment, consequences are not manipulated. Although this type of assessment relies heavily on antecedent control, it can be a more efficient approach to more naturalistic observation because it necessitates the presentation of antecedents that might otherwise not be observed or that might take a great deal of observation to capture.

Finally, scatterplots are another type of descriptive assessment (Touchette, MacDonald, & Langer, 1985). They are commonly used to identify whether challenging behavior is more likely during specific periods of time. If the challenging behavior is correlated to a specific period of time, the child's schedule can be examined to identify whether certain activities are associated with those periods of time and, hence, with problem behavior. This may suggest an environmental-behavior relationship, but because antecedents and consequences are not manipulated (and specific instances of potential antecedents and consequences are not recorded), the scatterplot is not designed to identify function of problem behavior.

Functional Analysis

After conducting either an indirect assessment, a direct assessment, or both, a functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) should be completed to identify the actual function(s) of the challenging behavior. A functional analysis involves the experimental manipulation of antecedents and consequences during tests and control conditions. The completion of a functional analysis is considered best practice in applied behavior analysis (ABA) when individuals engage in challenging behavior (Beavers, Iwata, & Lerman, 2013) because the results can be used to design function-based treatments (see below for examples of function-based treatments). The conditions included in the functional analysis typically depend on the information gathered from the indirect and direct assessments. For example, if the target problem behavior is aggression, defined as biting, hitting, or grabbing another individual, the functional analysis is likely to exclude an alone condition (will be described in the following section) as the behavior requires the presence of another person by definition.

In general, the typical conditions included in a standard functional analysis as outlined by Iwata et al. (1982/1994) are the following: alone or ignore, attention, demand (sometimes called escape), and play. Additional conditions (e.g., tangible) or variations of the abovementioned conditions could be included as well. Sessions typically last 10 min (although variations include 5-min sessions, Thomason-Sassi, Iwata, Neidert, & Roscoe, 2011, and 15-min sessions, Wallace & Iwata, 1999) and conditions are best conducted in a fixed sequence (Hammond, Iwata, Rooker, Fritz, & Bloom, 2013).

Attention. The attention condition is used to identify if the challenging behavior is maintained by social positive reinforcement in the form of adult attention. During the attention condition, the behavior analyst and the participant are together in a room. The participant has free access to a moderately preferred item, and the behavior analyst begins the session by letting the participant know that he or she will be busy (e.g., "I will be reading a magazine"). Therefore, if the target problem behavior is maintained by attention, the establishing operation to request for attention will be present. If the participant engages in the target problem behavior during the session, the behavior analyst provides appropriate attention to the participant. The type of attention provided depends on the attention that is typically provided by the individuals in the natural environment of the participant. For example, if the participant receives attention in the form of verbal reprimands (e.g., "do not hit me, hitting is not nice," "stop biting your arm"), the behavior analyst should provide similar verbal reprimands contingent on the target challenging behavior. If the form of attention typically provided by the caregivers in the natural environment is different, such as hugs or statements of concerns (e.g., "please stop, you are hurting yourself"), the behavior analyst would provide the same kind of attention. Furthermore, the behavior analyst should ignore all appropriate behavior or nontargeted challenging behavior.

Demand/Escape. The escape, also called demand, condition is conducted to identify if the challenging behavior is maintained by social negative reinforcement in the form of escape from demands. During the escape condition, the behavior analyst and participant are together in a room, and the behavior analyst presents demands to the participant. The demands presented are selected based on previous indirect or direct assessments. The demands should be requests that are unlikely to be completed without problem behavior by the participant. Some examples of typical demands used in this condition include academic tasks (e.g., writing letters, adding numbers), gross motor activities (e.g., clapping hands), and daily living chores (e.g., folding towels). These demands are typically presented using a three-step prompting procedure (Horner & Keilitz, 1975) consisting of sequential verbal, model, and physical prompts. Contingent on the completion of a request, no verbal praise should be provided; instead a new request should be presented. If the participant engages in the targeted challenging behavior at any time during the session, the behavior analyst removes all materials (e.g., pen and paper used to write name) and provides the participant a 30-s break from tasks. If the participant does not engage in problem behavior or engages in nontargeted behavior, the behavior analyst continues to present demands until the session is over.

Tangible. The tangible condition is conducted to identify if the challenging behavior is maintained by positive reinforcement in the form of access to tangibles (e.g., toys, food). The tangible condition is typically conducted if the indirect or descriptive assessments (or both) have suggested that problem behavior frequently results in access to items or food or if the behavior is most likely when the items or food is removed or not provided to the participant. If indirect or descriptive assessments do not suggest that problem behavior might be maintained by positive reinforcement in the form of tangibles, it might not be appropriate to conduct a tangible condition as this might increase the likelihood of a false-positive function (Beavers et al., 2013). During a tangible condition, the behavior analyst and the participant are together in a room and the tangible(s) are available to the participant. Immediately after the session begins, the behavior analyst removes the items from the participant and tells the participant that the items are no longer available (e.g., "no more toys"). If the participant engages in the target challenging behavior, the items are provided to the participant for 30 s. The behavior analyst ignores all other behavior including appropriate requests for the items and nontargeted challenging behavior during the session.

Alone/Ignore. The alone and ignore conditions are two different test conditions that are conducted to identify if challenging behavior is maintained by automatic reinforcement. If an alone condition is conducted, an ignore condition is not necessary, and the inverse is also true. Whether to use the alone or ignore condition is based on the setting in which the functional analysis is conducted. For example, if the functional analysis is conducted in a controlled environment in which a one-way mirror might be available (e.g., clinic room), an alone condition might be feasible. However, if the functional analysis is conducted in a more natural setting (e.g., home) in which observing the participant's behavior might not be feasible unless the behavior analyst is in the room with the participant, an ignore condition might be more appropriate to conduct. An alone condition involves having the participant be alone in a room, while the behavior analyst observes the participant's behavior from a different room. No programed consequences are provided for any behavior. An ignore condition involves having the participant and the behavior analyst in the same room. The behavior analyst does not provide any attention to the participant and does not engage in eye contact with the participant. The behavior analyst also ignores all participant behavior including the target problem behavior.

Play. The play condition is the control condition. Responding in all conditions is compared to the play condition. During the play condition, the participant has free access to preferred items, frequent attention from the behavior analyst (e.g., attention approximately every 30 s), and no presentation of demands. During this condition, the behavior analyst ignores all targeted or nontargeted challenging behavior. If the participant engages in appropriate behavior (e.g., requests for an item), the behavior analyst provides the item and interacts with the participant as much or as little as the participant requests.

Variation of Functional Analysis

Functional analyses have been evaluated and replicated in hundreds of published studies. They have been conducted in a variety of settings, on many different topographies of behavior, and with various populations. However, there are certain conditions in which conducting a traditional functional analysis could be difficult or, in some cases, not feasible. Therefore, researchers have developed several variations of functional analysis to target these conditions.

Brief Functional Analysis. The brief functional analysis (Northup et al., 1991) was developed to decrease the duration of the functional analysis. Northup et al. (1991) conducted brief functional analyses to assess problem behavior within restricted time (i.e., 90 min) in an outpatient setting. The brief functional analyses consisted of the limited replication (e.g., single presentation) of each test condition and a brief contingency reversal. The results from this study suggest that brief functional analyses may reveal maintaining variables of challenging behavior when time is restricted (e.g., one 90-min visit). However, due to the limited repetition of the assessment, which often results in one data point of problem behavior per condition, additional assessment may be necessary to clarify results. Therefore, even though it might be beneficial to start with a brief functional analysis if the time for assessment and treatment is very limited, a traditional functional analysis (Iwata et al., 1982/1994) may be required to identify the maintaining variables of problem behavior in some cases.

Precursor Functional Analysis. Conducting functional analysis for individuals who engage in very dangerous challenging behavior (e.g., high-intensity head banging) could be problematic. However, not having a clear function of the challenging behavior could result in ineffective intervention, which also poses risk of harm. Therefore, Smith and Churchill (2002) developed the precursor functional analysis, a variation of the functional analysis that can be used in these cases. In a precursor functional analysis, contingencies are placed on the precursors or responses that happen prior to the target behavior. For example, if the target challenging behavior is head banging, a precursor might be screaming and programed consequences would be provided on the precursor so that the more dangerous response does not happen. By identifying the function of a precursor to the target challenging behavior, the risks associated with the more dangerous challenging behavior are decreased. However, identifying precursor behaviors that are part of the same response class as the target behavior might not be simple for all individuals.

Furthermore, precursor functional analyses are not useful when the challenging behavior is maintained by automatic reinforcement because (a) precursors to automatically maintained problem behavior may not exist, and (b) if they do exist, the behavior analyst is faced with logistical challenges reinforcing the precursor if it is automatically maintained. Therefore, the establishing operation elimination that occurs in a precursor functional analysis that is responsible for the elimination of the targeted challenging behavior is unlikely to occur.

Trial-Based Functional Analysis. Another variation of the traditional functional analysis is the trial-based functional analysis (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011). This variation was developed to assess challenging behavior in naturalistic environments (e.g., schools) when controlled settings (e.g., clinic) are not available. Furthermore, trial-based functional analyses have also been conducted by teachers (Bloom, Lambert, Dayton, & Samaha, 2013) and group home staff (Lambert, Bloom, Kunnavatana, Collins, & Clay, 2013), which reduces the resources required to conduct a functional analysis. Trial-based functional analyses consist of control and test segments used to identify the variables maintaining the challenging behavior (e.g., attention, tangibles, escape from demands). Trials are embedded into ongoing activities, and trial segments last 2 min or until challenging behavior takes place in each segment, which terminates the segment. Even though the length of the trials is shorter than traditional functional analysis sessions (i.e., 2–4 min vs. 10 min), the duration of the trial-based functional analysis is not necessarily shorter compared to the traditional functional analysis. However, research suggests (Lambert, Bloom, & Irvin, 2012; LaRue et al., 2010) that this variation can successfully identify the maintaining consequences of problem behavior, even though it may not be suitable when longer exposure to contingencies is needed. In those cases, a traditional functional analysis should be conducted.

Latency Functional Analysis. Traditional functional analyses typically use repetition of a response as a measure of behavior (Thomason-Sassi et al., 2011). When behavior happens in one test condition (e.g., attention) at higher rates than in the control condition (e.g., play), it suggests that the target behavior is maintained by that contingency (e.g., social positive). However, when the target behavior is very severe and it is desirable to limit its occurrence, it might be practical to use a latency functional analysis (Thomason-Sassi et al., 2011). Also, when the behavior may not be repeatable in a session because of its topography (e.g., eloping or enuresis), it might be beneficial to use latency functional analysis. Latency functional analyses consist of the same test and control conditions used in the traditional functional analysis. Sessions last up to 5 min and terminate when the first target response takes place. The time from the beginning of the session to the first instance of problem behavior is graphed and analyzed. Short latencies in a condition, meaning, responses that occur quickly after the sessions begin, suggest that behavior is maintained by the contingency tested in that condition. For example, if the target challenging behavior for a child is elopement and a latency functional analysis is conducted, the faster in the session the child elopes (e.g., 4 s in attention), compared to the control condition, the stronger the contingency we can demonstrate. In this case, 4 s is a short latency, especially compared to a long latency (e.g., 240 s in control) or no occurrence in the control condition, and if similar results continue for several sessions, we can say that challenging behavior is maintained by attention.

Extended Alone Condition Sessions or Functional Analysis Screening. When challenging behavior is likely to happen in the absence of social contingencies or when other individuals do not have to be present for the behavior to occur (e.g., rumination), it is sometimes possible and efficient to run extended alone conditions or a functional analysis screening (Querim et al., 2013) to confirm that the problem behavior is maintained by automatic reinforcement prior to commencing a functional analysis consisting of multiple test conditions and a control condition. Extended alones consist of several alone conditions ran consecutively (lasting 5 or 10 min each). If challenging behavior consistently occurs during the alone condition, the data suggest that challenging behavior is automatically maintained, and the process is considered sufficient as a screening procedure for automatically maintained behavior.

Social Skill Assessment

As noted earlier many individuals with disabilities, including ASD, have deficits in social skills. Therefore, it is important to ensure that programming addresses these deficits. However, in order to select specific objectives for the child, one must first evaluate the child's repertoire. An assessment should allow determination of the child's current repertoire and perhaps help identify variables that may impede learning such as lack of motivation and prompt dependency. It is also necessary to determine whether lack of performance is due to a skill deficit or a performance deficit. In the case of a skill deficit, the child does not emit the response because the child has never learned the response. Meaning, it is not in the child's repertoire. In the case of a performance deficit, the child can emit the response but does not do it consistently likely because of a lack in motivation. Meaning, the skill is in the child's repertoire but the child does not perform the skill. Different interventions will be necessary depending on whether the skills are not performed due to a skill or performance deficit.

Types of Assessments

A variety of assessment tools are currently available to assess social skills and related skills such as communication. These may include interviews, observations, direct testing, or a combination of these methods. In fact, Schumaker and Hazel (1984) described four general approach for assessments: behavioral observation codes, behavioral checklists, sociometric assessment, and behavioral rating scales.

Behavior Observation Codes. This approach requires that the target behaviors be categorized so that an observation code can be used to track the occurrence of the target responses. Once the code is developed, clinicians then observe the individual and collect data on the occurrence of each behavior. An example of this method is the Peer Social Behavior Code (Walker & Severson, 1992). This behavioral code includes five categories: social engagement, participation, parallel play, alone, and no codable response. In addition, the form is broken into 10-s intervals so that data may be collected on the occurrence of each of these responses per interval. Although this method can yield some helpful information such as the likelihood of the behavior occurring in the natural environment, one issue is that the target response may not actually occur during the scheduled observation. Therefore, this type of assessment can be time consuming as multiple observations may be necessary to capture a representative sample of the individual's repertoire. In addition, behavioral observational codes usually are used to collect data only on the occurrence of the target responses without considering the quality of the response.

Observational Checklists. This approach involves developing a list of all behavior of interest. Once the checklist is developed, the individual is observed during naturally occurring or contrived situations and record data on the individual's performance, occurrence, and/or quality, of the target responses. This method of evaluation is fairly simple and can be used across observations and potentially across individuals. However, as was the case with behavioral observation codes, target behaviors may not occur during naturalistic observations. In addition, if a behavior occurs that it is not included in the checklist, the observers will likely not record that behavior unless specific instructions are given to note responses that are not included in the checklist.

Sociometric Assessment. This method usually consists of using a scale (Likert-type) to evaluate whether an individual is liked and/or socially accepted. The scale is usually completed by individuals who know the person such as classmates and colleagues. In some cases, a group of individuals may complete the scale for all members of the group, whereas in others the scale is completed by all members of the group but only for a subset of individuals. This technique may be most helpful in identifying individuals who may benefit from social skills training although a further assessment would be required to identify skill deficits. This approach is quick and easy; however, reactivity may be an issue if the rating scale is completed frequently (Gresham, 1981).

Behavioral Rating Scales. This method involves the use of a rating scale (usually Likert-type) that is completed by persons who are familiar with the individual. The scale usually includes a list of target responses or descriptive items, and information is collected on whether the individual emits certain behaviors and, if so, how well and/or how often. This approach can also be quick and simple but rating scales may be unreliable.

Specific Assessment Tools and How to Select Among Them

In this section, we provide a brief description of assessments tools commonly employed in clinical settings, research, or both. We will also provide a brief overview of variables to be considered when selecting an assessment tool.

Vineland Adaptive Behavior Scales, Second Edition (Vineland ™-II; Sparrow, Cicchetti, & Balla, 2005). The Vineland™-II includes a caregiver interview form, a caregiver rating form, an expanded interview form, and a teacher rating form. These forms evaluate the same skills. Thus, selection is usually based on the amount of time available to complete the assessment and the primary context of interest (i.e., school vs. home). For instance, the teacher rating form evaluates the individual's performance in an educational setting, so it is only appropriate for individuals attending school. Approximately 20–95 min is necessary to complete the assessment, depending on which form is selected. This assessment evaluates adaptive behavior in the domains of communication, daily living, and socialization. A scoring manual is used to summarize the results although a scoring software, ASSIST™, is also available. The final report includes a lot of information such as domains and adaptive behavior composite standard scores, adaptive levels, and age equivalence. Finally, the results of the assessment can be used to determine eligibility for services, guide intervention, and track progress.

The Assessment of Basic Language and Learning Skills – Revised (ABLLS-R; Partington, 2006). This assessment consists of direct observation of the child although caregiver interview may be necessary to evaluate skills that were not seen during the observation. This is a criterion-referenced assessment. It assesses a variety of skills such as language, academic, self-help, and motor skills. In addition, the language assessment is based on Skinner's analysis of verbal behavior (1957). This assessment is usually implemented with children with disabilities. A curriculum guide and skills tracking system with visual display accompany the assessment, and these can be used to facilitate decision making about programming and to evaluate progress. The amount of time needed to complete the assessment varies and is related to the repertoire of the individual being evaluated, but it typically requires a few hours. ABBLS-R has been translated to Spanish, French, and Norwegian and an electronic version (WebABLLS) is also available.

The Verbal Behavior Milestone Assessment and Placement Program, Second Edition (VB-Mapp; Sundberg, 2014). This assessment consists of direct testing and/or observation (some of which are timed) of the child. It is developmentally sequenced and a criterion-referenced assessment that compares the child to typically developing peers. The assessment evaluates learning, language, and social skills, and it includes transition as well as barriers assessments. The results of the transition assessment are helpful in guiding placement of the child, whereas the barriers assessment identifies factors that may be impeding learning (e.g., prompt dependency). The Early Echoic Skills Assessment (EESA) developed by Esch is also included. In addition, the guide includes placement and program objectives. The assessment is appropriate for children of any age, diagnosis, and language ability and it has three developmental levels (0–18, 18–30, 30–48 months). The amount of time required to complete the assessment varies based on the child, but it typically takes several hours. The VB-MAPP App is also available which offers among other feature electronic scoring and automatic charts.

MESSY: Matson Evaluation of Social Skills with Youngsters (Matson, 1988; Matson et al., 2010; Matson, Rotatori, & Helsel, 1983). This assessment includes self-report (62 items) and teacher report (64 items) scales. The scales are usually completed in an interview format, with the individual or caregiver, and items are answered using a Likert-type of scale ranging from 1 ("not at all") to 5 ("very much). This assessment was originally developed for children ages 4–18 years although the newer version, MESSY-II, is intended for use with individuals between the ages of 2 and16 years. Administration of the scale is fairly simple and quick. The MESSY has been used with a variety of populations such as typically developing children and individuals with ASD, and it also has been adapted for use with visually impaired and deaf individuals (see Matson & Wilkins, 2007). It has also been translated to several languages including Spanish, Japanese, Slovakian, etc.

MESSIER: The Matson Evaluation of Social Skills for Individuals with Severe Retardation (Matson, 1995; Matson, LeBlanc, & Weinheimer, 1999). This assessment consists of an 85-item rating scale completed by caregivers. The items are scored using a 3-point scale to indicate the frequency at which each item occurs. The scale includes two subscales, one for positive and another for negative skills, and these are further divided into six dimensions: positive verbal, positive nonverbal, general positive, negative verbal, negative nonverbal, and general negative. This rating scale was developed to assess social skills of adults with disabilities. Finally, the assessment is quick and it is usually completed in a semi-structured format.

FISH: Functional Independence Skills Handbook (Killian, 2008; http://www.proedinc.com/customer/productView.aspx?ID=1392). This handbook includes both assessment booklets and curriculum for seven domains, adaptive behavior, affective, cognitive, sensorimotor, social, speech and language, and vocational skills. The handbook was developed to be used with individuals with developmental disabilities of various ages although it may also be appropriate for individuals with cognitive deficits and typically developing children. The assessment is criterion-referenced. The assessment is completed by interviewing a caregiver although direct interaction with the individual, either before or after the assessment is recommended to verify some of the information obtained from the caregiver. It is unclear how much time is required to complete the assessment although it will likely vary based on the individual's repertoire. Once the initial assessment is completed, that information can be used to select appropriate lessons for that individual. The assessment can be repeated to evaluate progress.

Bayley Scales of Infant and Toddler Development – Third Edition (Bayley-III; Bayley, 2006a, 2006b; http://images.pearsonclinical.com/images/PDF/Bayley-III_Webinar.pdf; http://www.pearsonclinical.com/childhood/products/100000123/bayley-scales-of-infant-and-toddler-development-third-edition-bayley-iii.html#tab-details). This assessment consists of play interaction with the child and caregiver questionnaires that are used to evaluate social-emotional and adaptive behavior. It is a norm-referenced assessment comparing the child to typically developing children of the same age, and it assesses five developmental domains, cognition, language, motor, social-emotional, and adaptive behavior. The adaptive behavior scale, ABAS-II, was developed by Patti L. Harrison and Thomas Oakland. It is intended to evaluate development delays and facilitate intervention, and it is appropriate for children between ages 1 and 42 months. It can be used to identify developmental delays, and it also guides intervention and can be used to track progress. Administration time varies depending on the age of the child, but it usually requires 30–90 min.

Social Skills Improvement System (SSIS; Crosby, 2011; Gresham & Elliott, 2008; http://www.pearsonclinical.com/education/products/100000322/social-skills-improvement-system-ssis-rating-scales.html). This assessment includes caregiver questionnaires (parent and teacher) as well as a questionnaire for the child. It can be used to evaluate the child's skills across home and educational settings. It assesses social skills, academic competence, and problem behavior and it was developed for individuals between the ages of 3 and 18 years. The test includes subcales such as bullying and autism spectrum. The assessment is quick, requiring about 10–25 min per form, and it is linked to interventions tools. The parent and student questionnaires are available in Spanish, and software to facilitate scoring and reporting is available from the publisher.

The Social Responsiveness Scale II (SRS; Constantino & Gruber, 2012; Bölte, Poustka, & Constantino, 2008) http://www.wpspublish.com/store/p/2994/social-responsiveness-scale-second-edition-srs-2). This assessment consists of a 65-item questionnaire that is completed by a parent or teacher. It evaluates the child's social impairments and it can be used as a screening tool for autism or to aid in an autism diagnosis. Items are scored using a 3-point Likert scale corresponding to severity level, and the items are summarized as a total score with higher scores indicating more deficits in social skills. Although the SRS was developed for individuals ages 4–18 years, different forms are available for specific ages (e.g., adult, school aged, preschool). In addition, the Social Responsiveness Scale II was published in 2012.

Do-Watch-Listen-Say Assessment and Curriculum (Quill, 2000; http://products.brookespublishing.com/DO-WATCH-LISTEN-SAY-P18.aspx). This is an assessment and intervention guide that combines a developmental and behavioral approach. The assessment, which includes the Social Skills Checklist, consists of questionnaires and checklists and it evaluates core, social, and communication skills. It combines developmental and behavioral approach to assessment. It is intended for children with an ASD who communicate vocally or with an augmentative alternative communication (AAC). It includes, among other things, datasheets, guide for designing intervention, as well as curriculum for social skills, core skills, and communication skills. The time required to administer the assessment is not provided, but given that it consists of questionnaires and checklists, it is likely no more than 2 h.

Profile of Social Difficulty (POSD; Coucouvanis, 2005). This assessment consists a questionnaire scored using a Likert scale ranging from "very difficult" to "very easy." Anyone familiar with the individual, parent, teacher, sibling, or the individual himself (self-report version) can complete the questionnaire. It evaluates a variety of skills and these are categorized into subscales: fundamental skills, social initiation skills, social response skills, and getting along with others. It is quick (15–20 min) and it is intended for children ages 6–11 years.

The Autism Social Skills Profile (ASSP; Bellini, 2006). It consists of a rating scale and items are separated into three scales, social reciprocity, social participation/avoidance, and detrimental social behaviors. Results of the subscales can be summarized as a total score of the individual's overall social functioning. This assessment is appropriate for individuals between 6 and 17 years old and it only requires about 15–20 min to complete.

The Children's Communication Checklist (CCC; Bishop, 1998; 2006 http://www.pearsonclinical.com/language/products/100000193/childrens-communication-checklist2-us-edition-ccc-2.html#tab-details). It consists of a rating scale that can be completed by a teacher or caregiver. It assesses language impairments in the areas of pragmatics, syntax, morphology, semantics, and speech. The second edition of the checklist was published in 2006. It is intended for children between 4 and 16 years old who communicate in full sentences and primarily in English. It is quick and can be completed in 5–10 min.

Triad Social Skills Assessment, Second Edition (TSSA©; Stone et al., 2010). This assessment consists of teacher and parent reports as well as observation and direct interaction with the child. Additional information is obtained through activity-based evaluation and a questionnaire that are completed with the child. This is a criterion-based assessment of a child's ability to take another's perspective, initiate and maintain interactions, respond to others, and understand emotions, respectively. The test was developed for children ages 6–12 years, and it requires that the child can read at or above a first-grade level. The test is fairly easy to administer and the manual includes a list of potential objectives for each area.

Guide for Selecting an Assessment Tool

When selecting the most appropriate assessment tool, here are some variables to be considered:

(a) Time available to conduct the assessment. Some assessments can be completed very quickly whereas others require multiple hours. The brief assessments may provide enough information to identify general deficit areas, but the more lengthy assessments will allow clinicians to gain information about very specific skills that the child can or cannot perform.

(b) Purpose of the assessment. Some assessment tools have multiple purposes and can be used to evaluate the child's current repertoire as well as assess progress. If the child is making appropriate progress, it is presumed that the intervention is effective; limited progress, on the other hand, would suggest that the intervention is not appropriate and thus needs to be modified. In addition, some of the tools described below include program recommendations thus allowing clinicians to make data-based decisions about programming for their clients.

(c) Experience conducting assessments. In general, assessment tools include instructions for the implementation and scoring of the assessment. In addition, trainings may be available online or in workshops. Before purchasing an assessment tool, it is important to consider whether individuals are qualified to implement and interpret the assessment and whether additional training is necessary. Indirect assessments such as interviews and rating scales are likely easier to complete thus may be an alternative until training is received on the implementation of the other assessments methods.

(d) Available sources of information. It is also important to consider which sources of information are available. In most cases the person whose repertoire is being evaluated will be the primary source of information. Information may also be obtained from caregivers, including siblings, and teachers. At times the type of assessment selected will be related to accessibility. For instance, if information is needed on the child's performance at school yet direct evaluation of the child in the school setting is not possible, then an interview of the teacher may be a good alternative.

(e) Ease of implementation. As noted above, some assessments may be easier than others. Therefore, if differing assessment tools yield similar information, one might select the one that is easier to complete. In addition to implementation, it is also important to consider the steps involved summarizing and interpreting the results. Some assessment tools have scoring software or applications available that can decrease the time required to summarize the results.

(f) Cost. Another variable to consider is the cost of the assessment tool. Although this should not be the main variable affecting all decisions, choosing a cheaper (or free) option that provides similar information on the child's repertoire is likely a good option.

Social Skills Interventions

Deficits in social and/or communication skills are defining characteristics of autism spectrum disorders (ASD; DSM 5). Elliot and Gresham (1993) defined social skills as "socially acceptable learned behaviors that enable a person to interact with others in ways that elicit positive responses and assist in avoiding negative responses" (p. 287). Thus, social skill refers to a class of responses that when emitted in a specific context is likely to result in reinforcers. As noted by Bellini and Peters (2008), programs designed to teach social skills usually attempt to establish new skills or improve skills already in the child's repertoire. Social skills training (SST) programs may therefore focus on increasing the frequency of certain responses, ensure that responses occur in the appropriate context, or that responses are performed with fluency. Several reviews of the literature on social skills interventions are currently available (e.g., Bellini, 2008; Matson, Matson, & Rivet, 2007; McConnell, 2002; Rao, Beidel, & Murray, 2008; Rogers, 2000; Weiss & Harris, 2001; White, Keonig, & Scahill, 2007). Therefore, we will focus here on a general description of some of these interventions and related research.

Coaching

Coaching, according to Elliott and Gresham (1993), involves a review of the rules or expectation, practice of the skills, and feedback that it delivered during rehearsal. Thus, coaching includes verbal instruction provided by a "coach." Although the term "coach" seems to imply someone with expertise in the topic, the coach can be a parent, teacher, or even a peer.

In addition, coaching may include modeling; it is not a necessary component. Research on social skills coaching dates back to 1977 when Oden and Asher (1977) completed a study comparing the effects of coaching, peer pairing, and a control condition on the children's sociometric ratings. Children were instructed to complete three questionnaires in regard to other children in the classroom, and these questionnaires yielded ratings for each of the children. Following intervention, coaching was associated with higher rating following the intervention. Additional studies have also evaluated coaching, alone (e.g., Gresham & Nagle, 1980) or in combination with other interventions (e.g., Cooke & Appoloni, 1976), and these studies have been successful at improving social skills.

Modeling

Modeling of a response may be considered a type of instruction or perhaps a type of prompt, and this type of instruction seems to have its origins back to Bandura (1977) who demonstrated that children might learn new skills simply by observing other individuals engaging in them. This is referred to as observational learning. Bandura also showed that individuals engage in the same response as demonstrated by the model even in cases when reinforcers are not delivered for imitation. Thus, one potential procedure for teaching novel skills to individuals with disabilities is modeling. Research on the use of modeling has included in vivo modeling, when another person is emitting the responses in the presence of the target individual and video modeling. In the case of video modeling, the model (individual, peer, or adult) is recorded emitting the target responses. In addition, one adaptation of modeling includes demonstration of the skills from a first person perspective (e.g., Nishizawa, Kimura, & Goh, 2015). Previous research has found that modeling may be effective in teaching a variety of skills to individuals with disabilities such as social initiations (e.g., Nikopoulos & Keenan, 2004), communication skills (e.g., Charlop-Christy, Le, & Freeman, 2000), play skills (e.g., Dupere, MacDonald, & Ahearn, 2013), and daily living skills (e.g., Shipley-Benamou, Lutzker, &

Taubman, 2002), and it may result in a decrease in problem behavior (e.g., Buggey, 2005). Research has highlighted some advantages of video modeling (VM) including faster acquisition than in vivo modeling (e.g., Charlop-Christy et al., 2000), consistent modeling of the target skills across instructional sessions, and being less resource intensive because it does not require continuous presence of a model. Video modeling programs currently available include Model Me Kids and Watch Me Learn.

In a research review of the literature, Bellini and Akullian (2007) identified 23 articles investigating the effects of either VM or video self-modeling (VSM) with individuals with an ASD ages 3–21 years. The authors used percentage of nonoverlapping data points (PND) scores to evaluate the effectiveness of each intervention and utilized the criteria described by Mastropieri and Scruggs (2001) to categorize interventions. By aggregating the PND scores across studies on VM and VSM, moderate effects were identified for intervention and maintenance of VM and VSM as well as generalization of VM. These data led the authors to conclude that VM and VSM meet the criteria for evidence-based practice. Additional things to be considered include the fact that individuals may acquire skills faster with VM and in vivo modeling (e.g., Charlop-Christy et al., 2000) and that VM may be easier and more cost-effective because the materials can be used for multiple sessions as a second person, the model, is not necessary other than when developing the videos.

It is also important to consider prerequisite skills. Bandura (1977) suggested that one potential prerequisite for learning through observation is attending to a model. In a study completed by MacDonald, Dickson, Martineau, and Ahearn (2015), several potential prerequisites for learning through VM were evaluated, and the results of this study suggested that attending to model was not sufficient. Acquisition was correlated with the participants' performance in delayed imitation of actions with objects and in delayed match to sample tasks.

Technology-Based Instruction

As technology has progressed, a number of technology-based instructions have emerged including video modeling (see above section), virtual reality (VR), instructional software, and robotics. Virtual reality is an interactive space that allows the user to learn about and practice a variety of skills (see review by Muscott & Gifford, 1994). It includes 3D learning environments (e.g., Kandalaft, Didehbani, Krawczyk, Allen, & Chapman, 2013) and immersive virtual environment (e.g., Lorenzo, Pomares, & Lledo, 2013), and it can be set up for individual use or collaborative learning. VR systems require both hardware (computer) and software to create the simulated environment. Usually, the user is exposed to the virtual world via interfaces that may include head-mounted sticks, joysticks, headphones, and even gesture-recognizing gloves. VR systems can simulate a variety of environments such as classrooms, grocery stores, etc. According to Parsons and Mitchell (2002), virtual reality should allow for repetition, allow for fading, and promote generalization. Muscott and Gifford note that potential advantages of VRS include the fact that the virtual world can be easily adapted to meet the needs of the learner (easier or more challenging levels), and it can also be set up so that the learner has to display specific responses. Software for virtual reality may also be developed in a manner that it presents a range of potential responses to the learner and allows the learner to experience a "natural" consequence by being exposed to differing contexts based on their answers. Finally, virtual reality has been found to be effective in increasing a variety of skills such as conversations skills and theory of mind (e.g., Kandalaft et al., 2013).

Instructional software may also allow for individual or collaborative learning, and a number of software, targeting different skills, are currently available. For instance, Hopkins et al. (2011) addressed joint attention and emotional and facial recognition; Bernard-Opitz, Sriram, and Nakhoda-Sapuan (2001) addressed social problem solving. Finally, robotics has been found to be effective in increasing joint attention (e.g., Robins, Dickerson, Stribling, & Dautenhahn, 2004) and body awareness (Costa, Lehmann, Dautenhahn, Robins, & Soares, 2015).

Pivotal Response Treatment

Pivotal response treatment (PRT) (also described as pivotal response training) was described in detail by Koegel, Koegel, Harrower, and Carter in 1999. The emphasis of this manualized program is to teach children "pivotal" responses, meaning responses that, once acquired, will impact a variety of other responses. Thus, this intervention model may be more cost and time efficient. Pivotal responses identified include responding to multiple cues, motivation, self-management, and child initiations. In the pivotal response model, teaching occurs in the natural environment and usually includes the use of stimuli that are present in the child's environment such as toys. During intervention, maintenance trials are interspersed with acquisition trials, natural reinforcers are delivered contingently on the response and for attempts, the child is given several opportunities to choose reinforcers, and the child is taught to respond to multiple cues (e.g., conditional discrimination). Another important aspect of the pivotal response model is that intervention occurs in the most inclusive setting and with a lot of support and intervention is delivered by multiple agents (family members, school personnel, consultants). Therefore, the intervention should facilitate generalization. Various studies have found that pivotal response training is an effective procedure for increasing social and communicative responses (e.g., Ingersoll & Schreibman, 2006; Whalen & Schreibman, 2003). For instance, Whalen and Schreibman (2003) evaluated the effects of PRT combined with component of discrete trial teaching (DTT) on the acquisition of joint attention responses by young children with and without ASD. In this study, all participants acquired responses to joint attention initiated by the therapist (e.g., following a gaze or point cue), and most of the participants also learned to initiate a joint attention interaction (e.g., shifting a gaze from a toy to the experimenter, pointing to an item).

Prompting Procedures

Prompts are added stimuli that assist the child engage in a target response. These are typically used when a new skill is introduced to allow the child to practice the skills but then should be faded so that the child eventually performs the skills without assistance. Several types of prompts and prompt fading procedures are currently available such as physical, verbal, model, gestural, textual prompts (e.g., scripts) and tactile prompts. The type of prompt needed will depend on the skill being targeted as well as the child. In regard to prompt fading procedures, these may include progressive increase of the delay of a prompt delivery or fading the prompt itself, such as in most-to-least prompt. Prompts may be faded within or across sessions. Here are some examples of prompts:

Script. In this case usually a written script of the target skill is provided and then systematically faded. For instance, Ganz and Flores (2008) used scripts in the context of group play sessions. Participants included typically developing children and children with ASD. The script presented to the typically developing children provided instructions for interacting with the children with ASD. The scripts presented to the children with ASD consisted of phrases the child could state during an interaction with the other children. This study found that the intervention resulted in an increase in verbal comments that included scripted and unscripted statements. Similarly, Krantz and McClannahan (1998) used scripts to teach children with autism to gain an adult's attention, and performance remained high even after the scripts were completely faded.

Tactile Prompts. Tactile prompts usually consist of vibrating pagers that are programed to deliver a prompt at specified intervals. This type of prompt may be less intrusive than other prompts because it can be hidden under the clothing of the participant (e.g., in a pocket). A few studies have evaluated the effects of tactile prompts. For instance, Shabani et al. (2002) used a vibrating pager to prompt social initiations with three children with ASD. The prompt was effective in increasing target response, but they were unsuccessful in fading the prompt with two of the children. Taylor and Levin (1998) compared verbal prompt, delivered by an adult, and tactile prompt, the gentle reminder, to assess their effects on initiation toward an adult. They found that the tactile prompt was more effective than the verbal prompt.

Echoic Prompts. Echoic prompts consist of a vocal model of the target response. It is therefore appropriate when teaching vocal responses to individuals that have a vocal verbal repertoire. Taylor and Hoch (2008) use echoic prompts as well as gesture and physical prompts to teach children to respond and initiate bids for joint attention. In a more recent study, Vedora, Meunier, and Mackay (2009) compared textual and echoic prompts on the acquisition of intraverbal behavior and found that textual prompts were more effective.

Social Stories

Social stories consist of a brief story describing social skills that should be displayed given a specific social context (e.g., social cues; Gray, 2002). According to Gray, social stories may include descriptive, perspective, affirmative, directive, control, and cooperative sentences, and for every directive sentence, 2–5 descriptive, perspective, and affirmative sentences should be included (2002). Although social stories are usually written (e.g., Delona & Snell, 2006), they may include or be paired with pictures that represent different items (e.g., Crozier & Tincani, 2007) or even self-pictures of the individuals engaging in the target responses (e.g., Ozdemir, 2008), or accompanied by comprehension questions as well as other visual cues such as drawings and diagrams (e.g., Klett & Turan, 2012). Previous research has also added a modeling component (e.g., Chan & O'Reilly, 2008), and social stories may be presented using computers or other electronics such as Ipads (e.g., Vandermeer, Beamish, Milford, & Lang, 2013) or even be made into a storybook with audible dialogue (e.g., Murdock, Ganz, & Crittendon, 2013). In addition, social stories are easy to construct and require few resources to implement (e.g., Kokina & Kern, 2010); therefore, they may be welcomed by caregivers and other service providers.

In a recent review of social stories as an intervention for social skills in children with ASD, Sani Bozkurt and Vuran (2014) reviewed 32 research articles. Their review included a descriptive analysis of all of the articles identified as well as a meta-analysis of 22 of these articles (those that include single-subject design and figures showing the baseline and intervention data). In the meta-analysis, the authors calculated percentage of nonoverlapping data (PND), and they used the recommendations made by Mastropieri and Scruggs (2001) to analyze the data: if scores above 90, very effective; 70–90, effective; 50–70, questionable; and below 50, ineffective. Participants in these studies ranged in age from 0 to 15 years, and intervention was implemented in a variety of environments including school settings, health center, institutions, and home. In addition, the intervention was implemented by a variety of people including researchers, teachers, parents, and paraprofessionals. In the majority of the studies (56.25%), social stories were used to teach the participants to initiate communication and social interaction skills, but in general the rationale for selection social stories was vague. For the studies that included information, 68.75% consisted of the fact that either the participant and/or the teacher noted that the current repertoire of the individual was not appropriate. Thus, social stories were selected due to the need to establish specific responses in the participant's repertoire and not necessary due to the type of intervention. In regard to the PND analysis, when implemented alone, social stories were effective in 13.63% of the studies but were never very effective. If looking at social stories alone or combined with another intervention, these were effective in 31.81% of the studies. The authors concluded that social stories are a promising intervention but not yet evidence-based practice. Thus, in considering the use of social stories, based on this review, it seems that in clinical application social stories should be combined with other interventions.

Social Skills Groups

These usually consist of a group of children (with and/or without disabilities) that meet for multiple weeks at least once a week. The session itself usually includes a structured lesson on a specific topic/skill, demonstration of the skill (e.g., in vivo or video modeling), practice opportunities, and feedback. In fact, in a review completed by Reichow, Steiner, and Volkmar (2013), social skills groups lasted between 5 and 20 weeks and sessions were 60–90 min in length. Potential benefits of social skills groups include the fact you can deliver the intervention to multiple children at once thus decreasing the cost of the intervention, opportunities for incidental teaching may arise, and it should facilitate generalization since instruction includes multiple individuals. A few authors have reviewed the literature on social skills groups. Reichow and colleagues reviewed five randomized controlled trials and concluded that social skills groups improved social competence and friendship quality; however, additional research on the efficacy of social skills groups is warranted. White et al. (2007) and Reichow and Volkmar (2010), in reviews of interventions for establishing social skills, concluded that the outcome of the available research supports the implementation of social skills groups, but given that usually social skills groups are combined with other interventions, additional research on the use of social skills groups alone is needed.

Reichow and Volkmar (2010) identified two studies that evaluated social skills groups alone (Kroeger, Schultz, & Newsome, 2007; Owens, Granader, Humphrey, & Baron-Cohen, 2008). Kroeger, Schultz, and Newsom compared two social skills groups; one included direct teaching and the other consisted of unstructured play activities. In the direct teaching group, video modeling was implemented to teach children play and social skills, and children received edible reinforcers during video modeling. Everything else was the same across both groups. Groups met for 5 weeks. Prosocial behaviors increased in both groups; however, the direct teaching group had a greater increase in social skills. Owens, Granader, Humphrey, and Baron-Cohen evaluated two types of social skills groups. LEGO™ therapy (LeGoff, 2004) is a social skill intervention in which children work together to construct a LEGO™ structure. Usually the group consists of three children and each person is assigned role, the engineer, the supplies, and the builder. Thus, the children must work together to accomplish the activity. The Social Use of Language Program (SULP; Rinaldi, 2004) is a structured curriculum for teaching social and communication skills. It includes social stories, adult modeling, child practice, and group games. Results of the study showed the social interaction scores of the children in the LEGO™ therapy group improved more than that of the children in the SULP group, but problem behavior decreased in both groups in comparison to the control group.

Priming Procedures

In general terms, in a priming procedure (Zanolli & Daggett, 1998), a stimulus (e.g., a model of the target response) is provided and removed prior to evaluating the individual's performance. It is presumed that the delivery of this prompt will affect the individual's performance when, at another time, it is assessed. Thus, priming is different than prompt procedures which usually delivers a prompt whenever the target behavior should be occurring. The effects of priming on social initiations were evaluated by Zanolli and Daggett (1998). In this study, during the priming session, echoic prompts were provided to occasion the target responses and correct responding resulted in preferred activities. Then, during subsequent activity sessions, the participants had access to activities, but no prompts were delivered, and initiations resulted in highly preferred items which were delivered either continuous or a VI schedule. The results of this study showed that priming led to an increase in social initiations and that responding was higher when preferred items were according to a denser schedule of reinforcement.

Behavioral Rehearsal and Behavior Skills Training

In behavioral rehearsal (Elliott & Gresham, 1993), the child is given an opportunity to practice the skills in a structured environment and skills can be practiced covertly, overtly, or verbally (Elliott & Gresham, 1993). Behavior skills training (BST; Miltenberger et al., 2004) includes rehearsal as well as instruction, modeling by, and feedback from an expert. In a recent research project evaluating the effects of BST, Peters and Thompson (2015) taught children with ASD to respond appropriately to nonvocal behavior of others. In this study children were first taught to tact the nonvocal behavior of their listener as either interested or uninterested. Then they were taught to respond appropriately to uninterested behavior by trying to engage the listener either by asking a question, changing the topic of the conversation, or shifting to another topic again if the first change was not effective. Another example of a package intervention that incorporates a BST approach is the preschool life skills (PLS). PLS incorporates 13 skills for preschoolers designed to reduce the likelihood of problem behavior in the preschool classroom (Hanley, Fahmie, & Heal, 2014).

Peer-Mediated Interventions

In peer-mediated interventions (Rogers, 2000; Schmidt & Stichter, 2012), usually a typically developing child is taught to prompt and/or respond to (e.g., reinforce) response from the learner. Odom and Strain (1984) noted, however, that peer-mediated procedures may consist of placing a peer near a learner to facilitate learner through interaction or modeling, teaching a peer to initiate interactions with the learner to promote learning by encouraging the learner to engage in social interaction, and teaching a peer to prompt specific responses and provide consequences. In a recent study evaluating peer-mediated procedures, Schmidt and Stichter (2012) evaluated the effects of a peer-mediated proximity and peer-mediated initiation interventions on generalization of social skills. The learners first received instruction on social competence through the SCI-A curriculum developed by Stichter et al. (2010). This curriculum addresses facial expressions, sharing ideas, turn taking, recognition of feelings and emotions, and problem solving. Then during the generalization phase, either the two peer procedures were implemented. During the peer-mediated proximity intervention, the peers were instructed to seat near or across the learner and to only respond (no initiate) interactions with the learner. During the peer-mediated initiation intervention, the peers also sat near the learner, but in addition to responding to the learner, peers were instructed to gain the learner's attention and initiate social interaction using topic starters or by commenting on activities or the conversation. This study found that the peer-mediated initiation intervention led to greater increases in the target social skills than did the peer-mediated proximity intervention. Despite a lot of research supporting the implementation of peer-mediated procedures, some of the drawbacks include the need to have peers available and willing to participate and the time required to train the peers. However, peer-mediated interventions may perhaps benefit the peers by teaching them valuable skills.

General Interventions for Performance Deficits

Bellini, Benner, and Peters-Myszak (2009) provide a guide for teaching socials skills to individuals with ASD. They highlight the importance of differentiating between skill deficits and performance deficits, and they propose one method for identification of performance deficits which consists of answering the questions below (pp 30). If you answer "yes" to any of these questions, then you have identified a performance deficit:

(a) "Can the child perform the skill across multiple settings or peers?"
(b) "Can the child perform the skill without support or assistance?"
(c) "Does the child perform the skill if reinforcement is provided?"
(d) "Does the child perform the skill if environmental modifications are made?"

If you have identified a performance deficit, you then need to select interventions that are appropriate. As suggested by Bellini and colleagues, these may include the use of reinforcement (intrinsic and extrinsic), environmental modifications, additional practice opportunities, priming and prompting strategies, and peer training, among others.

Functioned-Based Interventions

After conducting a functional assessment (e.g., functional analysis) in which the antecedents and consequences that maintain problem behavior have been identified, a function-based intervention can be implemented to target the specific contingencies that maintain behavior. Function-based interventions address the antecedents and consequences identified by the functional assessments. For example, if a functional analysis determines that a child engages in problem behavior to receive adult attention, a function-based intervention will target the antecedent events (e.g., establishing operation and discriminate stimulus) that increase the likelihood of the problem behavior and will address the consequences that currently maintain the problem behavior (e.g., receiving attention). Function-based interventions include differential reinforcement, extinction, and antecedent manipulations (Cooper, Heron, & Heward, Chapter 21).

Differential Reinforcement. Differential reinforcement consists of providing the functional reinforcer contingent on an alternative appropriate behavior (e.g., differential reinforcement of alternative behavior, DRA) or, in some cases, the absence of the problem behavior (i.e., differential reinforcement of other behaviors, DRO) while providing no consequences for the problem behavior. The most relevant type of differential reinforcement to social skills is functional communication training (FCT; Carr & Durand, 1985). Functional communication training consists of teaching the individual to request for the functional reinforcer using a functional communication response (FCR). For example, if the problem behavior is maintained by negative reinforcement in the form of task removal, FCT is used to teach the individual to request for a break from work. Functional communication responses may consist of vocal requests, picture or word cards, or functional communication devices that assist individuals to communicate appropriately. During FCT, the individual receives the functional reinforcer (e.g., break, attention, toy) contingent on the FCR, while all problem behavior is placed on extinction (see Extinction section below).

Extinction. Extinction is one of the most used interventions to decrease problem behavior (e.g., Iwata, Pace, Cowdery, & Miltenberger, 1994). Typically, extinction is used in combination with another intervention (e.g., reinforcement) for the individual to engage in another (hopefully, appropriate) response to receive the functional reinforcer. If the individual is not taught how to access the reinforcer appropriately, another inappropriate response could be shaped. To implement extinction, the functional reinforcer is withheld for the problem behavior. This way, the contingency between the occurrence of the problem behavior and the delivery of the reinforcer is broken. For example, if a child consistently engages in crying for chocolate and the parent reinforces the child's crying with the chocolate, there is a functional relationship between crying and receiving chocolate. To break this relationship, extinction is implemented. Meaning, when the child cries for chocolate, the parent does not provide the chocolate to the child. If another intervention is implemented with extinction (e.g., FCT), the child learns how to request for chocolate using a communication response, and the parent is taught to reinforce that response with the functional reinforcer, in this case, the chocolate.

Antecedent Manipulations. Antecedent manipulations involve the altering of the establishing operations (EOs; Keller & Schoenfeld, 1950) and discriminative stimuli (SDs) to decrease the likelihood of problem behavior. When an EO is present, a behavior is more likely to occur and a reinforcer is more potent. Similarly, when an SD is present, it signals to the individual that reinforcement is available for a behavior that, in the past, has been reinforced in the presence of that SD. For example, if a child has not eaten cookies for 1 month (EO) and his grandma who typically reinforcers the child's behavior of asking for cookies is home and has brought cookies, the child might engage in the behavior of asking for cookies because this has being reinforced by his grandmother under similar conditions in the past. In this example, the time since his last cookie would be the EO and the presence of grandmother and the cookies would be the SD. Putting them together increases the likelihood of the child to request for cookies. Now, if we change the example, if the child engages in self-biting to receive cookies when he has not had cookies for some time and grandma and the cookies are present, altering the EO would result in providing the child with cookies prior to engaging in the behavior, and altering the SD would result in having grandma come visit without cookies. When consequent-based treatments are not feasible or safe to implement, antecedent manipulations could be very effective in decreasing problem behavior.

Practicality of Function-Based Interventions

Implementing treatments such as FCT successfully reduces problem behavior (e.g., Carr & Durand, 1985; Horner, Day, Sprague, O'Brien, & Heathfield, 1991; Lalli, Casey, & Kates, 1995). However, one of the biggest limitations of FCT, and other treatments of problem behavior, is the schedule in which the new alternative response is reinforced and the possible impracticality of providing reinforcement in the natural environment. It is not always feasible for staff, parents, and caregivers to reinforce all FCRs a child emits (Hagopian, Boelter, & Jarmolowicz, 2011). For example, if the responses are close together in proximity (e.g., child requests for attention every 10 s), the reinforcer is not available (e.g., iPad without battery), or the reinforcer cannot be provided (e.g., break from medical care), it may become very difficult for the individuals to receive immediate reinforcement after emitting the FCRs. Therefore, problem behavior may reemerge and the FCRs and reinforcement contingencies may be weaken (Fisher, Thompson, Hagopian, Bowman, & Krug, 2000). Meaning, after attempting to request for the desired item (e.g., toy) without receiving reinforcement, a child may engage in the previous problem behavior for which delay to reinforcement was shorter. Therefore, to increase the practicality and effectiveness over time of FCT and other treatments, it is very important to thin the schedule of reinforcement (Hagopian, Fisher, Sullivan, Acquisto, & LeBlanc, 1998) or increase the delay to reinforcement (Fisher et al., 2000).

Schedule Thinning and Delay to Reinforcement. Hagopian et al. (2011) identified the four most used schedule arrangements in the literature after implementing FCT: (a) delay schedules, (b) chain schedules or demand fading, (c) multiple schedules, and (d) response restriction.

Delay Schedules. Delay schedules consist of delaying the functional reinforcer (e.g., toy) contingent on the functional communication response (e.g., "toy please") after the response has been reinforced on a continuous schedule (e.g., immediately after every response). During the implementation of delays, a verbal prompt (e.g., "wait") is provided immediately after the functional communication response, and the individual has to "wait" until the delay duration is complete. The duration of delays typically increases across sessions (e.g., Fisher et al., 1993).

Chain Schedules or Demand Fading. Chain schedules, also called demand fading, are used when the functional analysis suggests that the target behavior is maintained by negative reinforcement in the form of escape from task demands. Chain schedules consist of the presentation of consecutive demands that increase systematically before the functional reinforcer (i.e., break) is provided for the FCR (e.g., Lalli et al., 1995).

Multiple Schedules. Multiple schedules consist of two or more signaled components that alternate. Each signal corresponds to a reinforcement or extinction component. The duration of the reinforcement component is systematically decreased, while the duration of the extinction component systematically increases. During the reinforcement component, all FCRs are reinforced on a continuous schedule, and during the extinction component, all FCRs are placed on extinction, meaning no reinforcement is provided. Some of the signals that have been used for multiple schedules in the literature include colored cards (e.g., Hanley, Iwata, & Thompson, 2001), colored lights (e.g., Campos, Leon, Sleiman, & Urcuyo, 2016), and colored bracelets (e.g., Betz, Fisher, Roane, Mintz, & Owen, 2013).

Response Restriction. Response restriction consists of the restriction of the functional communication response by removing the card or device used to engage in the verbal response. During this schedule thinning procedure, the restrictions are progressively increased over time (e.g., Roane, Fisher, Sgro, Falcomata, & Pabico, 2004).

Waiting. Waiting is the time between the presentation of a stimulus and the opportunity to access a reinforcer. Children must learn to wait to have access to a variety of reinforcers. In a school setting, children must wait in line to go to the playground, wait for their turn to participate in activity, or wait for their names to be called to receive teachers' attention. Moreover, waiting is a prerequisite skill for more difficult tasks (Newquist, Dozier, & Neidert, 2012). For example, if a child is working on increasing social skills, the child must know how to wait for his or her turn to talk in a conversation.

Children who engage in challenging behavior typically lack waiting skills. Therefore, placing these children in situations (e.g., first time at an amusement park) in which they must wait to receive reinforcement (e.g., get on rides) may evoke challenging behavior. Previous research has identified different procedures that can be used to teach waiting in children. Some of these procedures include engaging in another activity while waiting (e.g., repeating rules; Hanley et al., 2007; having access to preferred items; Newquist et al., 2012) or using delay fading (e.g., Vollmer, Borrero, Lalli, & Daniel, 1999). These interventions are important because teaching children with challenging behavior to wait may result in higher access to reinforcement and social interactions (Newquist et al., 2012).

Taking Turns. Closely related to waiting is taking turns. Turning-taking skills are a necessary foundation for cooperative play and other successful peer social interactions (Schneider & Goldstein, 2008). Like waiting, taking turns involves a delay between when a child may wish to respond and when a response is socially desirable. In the case of taking turns, a child must learn to respond only after their partner has completed their response. This may involve visual cues for conversational turn taking (Spohn, Timko, & Sainato, 1999; Terpstra & Tamura, 2008) or in the context of play (Brok & Barakova, 2010; Stanton-Chapman & Snell, 2011). One approach to teaching turn taking is a "plan-do-review" sequence used in a preschool curriculum in which conversational turn taking skills are presented in the context of a dramatic play theme using social stories, children have the opportunity to interact with one another in the dramatic play activity, and then their performance during the play activity using the skills is reviewed with them (Stanton-Chapman, Denning, & Roorbach Jamison, 2012).

Situations in Which Social Skills May Not Be Relevant to Challenging Behavior

One potential function for challenging behavior is what is called "automatic reinforcement" (Vaughan & Michael, 1982). Because automatically reinforced behavior produces its own reinforcer (i.e., pleasurable sensation or escape from an aversive stimulus), social skills are not as relevant as they are with socially mediated behavior. See Shore and Iwata (1999) and Vollmer (1994) for discussion of assessment and treatment challenges posed by automatically reinforced behavior. For the most part, approaches to treating challenging behavior maintained by automatic reinforcement will not focus on training social skills. However, there are potential exceptions. Some automatically reinforced behavior can be replaced with the development of socially appropriate independent play skills. This is relevant to automatically reinforced behavior that is thought to produce pleasurable sensations (automatic-positive reinforcement). There is another category of automatically reinforced behavior that is thought to alleviate pain or aversive stimulation (automatic-negative reinforcement; Shore & Iwata, 1999). Treating this category of challenging behavior may involve teaching individuals to signal the presence of pain, asking for medical intervention to reduce aversive stimulation (e.g., asking for an over-the-counter pain reliever in the context of a headache), or both (Iwata, Vollmer, & Zarcone, 1990). This type of approach involves a social skill, in the form of asking for assistance. However, in most cases, if the functional behavioral assessment indicates automatically reinforced behavior, approaches to intervention will not default to treatments related to social skills.

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Developmental Issues

Patricia Soto-Icaza and Pablo Billeke

Introduction

Social development has been a subject of interest for social sciences and neuroscience during the past decades. The aim of this chapter is to integrate a vast range of scientific evidence in order to comprehend how human beings are able to develop the ability to understand others and properly interact in a complex and dynamic social world.

Social development involves an ever-increasing refinement of social behaviors, cognition, and brain during the entire life span. Even though social cognition is the most commonly used concept in scientific literature, social analysis includes several elements that interact with each other, such as social brain, cognition, behavior, and functioning (Kennedy & Adolphs, 2012). While social brain refers to several brain areas that sustain social processing, social cognition involves all kind of cognitive processing that allow us to interact with others and understand other people's intentions, feelings, emotions, and behaviors (Billeke & Aboitiz, 2013). Furthermore, social behavior refers to the ability to interact with others. Social functioning, in turn, refers to social behavior when it is integrated in different contexts and over time (Kennedy & Adolphs, 2012) (for a summary of key social concepts, see Table 1).

The analysis of social skill development should consider all the factors described above in a developmental perspective. The comprehension of such perspective should consider dynamic environmental changes across life span, cerebral functioning specialization, and skill learning. In this context, an interesting approach that includes these aspects of analysis is Johnson's perspective about interactive specialization (Johnson, 2011). This perspective includes two core elements: localization and specialization. While localization refers to the association of an ability or function with a brain area or network, specialization refers to the degree of refinement of this function. Regarding the development of social skills, this approach might explain why certain behaviors that appear as rudimentary abilities during the first years of life acquire an undeniable social value years later. In this sense, social development should not be understood as a mere linear trajectory of behaviors that are maturing. In fact, to achieve a better understanding of the development of social functioning, it is crucial to attend

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Table 1 Social concepts (based on Soto-Icaza et al., 2015)

Concept	Definition	Level involved		
		Neural	Cognitive	Behavioral
Social brain	Brain network whose function is associated with social processing. It could be described as structures operating in a network that could enable an accurately social performance.	■		
Social cognition	All kind of cognitive processes that can allow us to interact with others and to understand other people's intentions, feelings, emotions and behaviors.		▒	
Social behavior	The ability to interact with others.			░
Social skills	A wide group of abilities that emerges from the appropriate execution of social cognition processing. This adequate performance allows us to interact and communicate with others, by predicting and understanding other people's intentions, feelings, emotions and behaviors.		▒	░
Social functioning	Social behavior when it is integrated over time and context.		▒	░
Social precursors	A group of inborn or early abilities readily observable in newborns or early infancy such as eye-like sensitivity, biological motion preference and imitation.	■		░

The level that each social concept involves is represented by the shaded area in the three columns on the right. From left to right, neural level is shown in the dark gray, cognitive level is shown in the medium gray and behavioral level is shown in the light grey. Note that one concept can encompass more than one level

the temporal dimension of the onset of social behaviors together with the constraints imposed by neural and behavioral evidence (Soto-Icaza, Aboitiz, & Billeke, 2015).

While it is true that development could be described in chronological terms, this approach can reduce it to a mere number of actions disregarding the notion that all those behaviors are interconnected. Adult social skills are developed from childhood abilities, which aim to handle basic social signs coming from others. Thus, these adult skills come from simpler skills present in the early development, such as imitation, detection of biological motion, and sensitivity to eyelike stimulus. In this context, abilities that arise during infancy can be understood as precursors, not only because they appear first in human life but also because they are required for the acquisition of further social abilities, such as the ability to interpret other's feelings and thoughts

(Charman et al., 2000; Happé & Frith, 2014; Soto-Icaza et al., 2015). Indeed, social capacities that appear later in childhood allows us to deal with more complex social information. For example, in experimental paradigms of social games, the ability to interpret other's intentions enables children to predict their partner's behavior and modulate their own behavior in order to achieve a successful interaction (Axelrod & Hamilton, 1981; Billeke et al., 2014; Gonzalez-Gadea et al., 2016; Steinbeis, Bernhardt, & Singer, 2012).

Following this development perspective, we will describe the main evidence related to typically social functioning both at behavioral and neural levels, highlighting both cerebral events that have been associated with social behaviors and the role of specific skills in social functioning. We will first focus on the infancy development of behaviors that are closely related to the visual sensory system. Here we will analyze how these behaviors can be understood as social building blocks from which more refine behaviors are developed. Secondly, we will address behavior and neural evidence of social development during preschool years focusing on mentalizing skills. In both parts we will review how comprehension of conditions such as blindness, deafness, and autism can contribute for a better understanding of social development. Finally, we will analyze the impact of these abilities in the development of more complex social skills during school years such as egocentric and altruistic actions trough the review of social game paradigm.

Social Skill Development During Infancy: An Essentially Sensory World?

Social development has a strong relationship with sensory systems specialization. Several studies have shown that social development is closely related to maturation of visual system and especially with its capacity to recognize a particular feature of social agents (i.e., eyes, face configuration, etc.). Thus, most of the social behaviors of adults are associated with a specialization process of visual attention and visual orientation that begins early in life (Johnson & de Haan, 2015). Indeed, the early development of several visual abilities such as detection of biological motion, preference for eyes, face perception, face discrimination, mutual gaze, gaze following, directing one's gaze, and joint attention is crucial for the development of social functioning. The early presence of these visual abilities contributes to the detection of the social agent and allows the child to communicate with others in order to obtain what is needed (Soto-Icaza et al., 2015).

The processing of biological motion has been a topic of interest to researchers for decades as it sheds light about the mechanisms through which humans are able to interpret and imitate complex sequences of action performed by other humans (Johnson, 2006; Bertenthal, Proffitt, & Cutting, 1984; Johansson, 1973; Pavlova & Sokolov, 2000; Simion, Regolin, & Bulf, 2008). A landmark study by Meltzoff and Moore (1977) revealed that infants only 12 days old have a mimicry behavior. They investigated imitation in both facial and manual gestures in 12- to 21-day-old infants. Results showed that the imitation behavior of the infants occurred for all four assessed gestures: lip protrusion, mouth opening, tongue protrusion, and sequential finger movement.

The ability to imitate and discriminate motion directions both in humans and animals seems to reflect our social orientation. In fact, evidence showed that human beings are able to discriminate between a biological and a non-biological motion animation since birth (Bertenthal, Proffitt, & Cutting, 1984; Pavlova & Sokolov, 2000; Simion et al., 2008). An interesting study revealed that newborns prefer biological motion over non-biological motion only if the stimulus is upright (Simion et al., 2008). Moreover, this early ability to discriminate between moving and static stimulus was also observed in infants of 3 and 5 months of age, regardless of whether the stimulus was face up or face down (Bertenthal et al., 1984).

The ability of infants to identify upright and upside-down features is not restricted solely to complete body images. In fact, infants are capable of identifying upright and upside-down faces. Evidence demonstrated that 3-month-olds display a spontaneous visual preference for an upright image of a real face over an upside-down version of the same face (Turati, Valenza, Leo, & Simion, 2005). This evidence shows that eyes are not enough on their own to attract the gaze of infants of this age, because their interest is modulated by the context in which the eyes are located, in this case, the upright face configuration. In addition, typically developing children 2–6 months old look more at eyes than mouths and bodies (Jones & Klin, 2013). Moreover, the trajectory for sensitivity to stimulus that resembles eyes displays an accentuated increase from 2 to 24 months of age. This evidence concludes that human social engagement may be related to visual capacity that is present early in development. Nevertheless, there is evidence that demonstrated that newborns and infants not only show special sensitivity to eyes or stimuli similar to eyes but also display special sensitivity to direct eye contact since birth. Newborns 2–5 days old looked significantly longer at a face that displayed a direct gaze rather than an averted gaze (Farroni, Csibra, Simion, & Johnson, 2002). More interestingly, the ability to recognize human faces reveals a specialization influence (Di Giorgio, Méary, Pascalis, & Simion, 2013; Johnson, 2011; Macchi Cassia, Bulf, Quadrelli, & Proietti, 2014; Zieber et al., 2013). Kelly et al. (2005) showed that newborns did not exhibit a preference for neither ethnic group nor gender when they looked at faces. This can be explained by the lack of exposure to faces in general, since 3-month-old infants demonstrate ethnic (but not gender) preference. Caucasian infants attended more to their own ethnic faces than any other, evidencing that environmental experience during the first 3 months could prompt a visual preference. In addition, Quinn, Yahr, Kuhn, Slater, and Pascalis (2002) tested the representation of gender of human faces in 3- and 4-month-old infants using colored photographs of the head and face of men and women. They proved that infants were able to discriminate between female and male faces. They observed that infants that were reared by a female primary caregiver and familiarized with male photographs preferred the novel female stimulus. Meanwhile, those infants who were familiarized with female photographs did not prefer novel male stimulus. Also, and consistently with the evidence mentioned above, they found that this female preference occurred only when the face was upright. On the other hand, when infants are reared by a male primary caregiver, this female preference was reverted. This evidence is in accordance with the skill learning perspective on human functional brain development, in which expertise (training or frequency of exposure) seems to be the factor that leads to specialization (Gauthier, Tarr, Anderson, Skudlarski, & Gore, 1999).

Cerebral evidence of social development in infants derived mostly from electroencephalographic (EEG) studies. The EEG technique is a noninvasive and temporally accurate measurement of electrical brain activity (Billeci et al., 2013; de Haan, Pascalis, & Johnson, 2002). As this technique measures the electrical brain activity from scalp electrodes at any age, it becomes a particularly useful methodological tool to study infants and children (de Haan, Johnson, & Halit, 2007).

An important part of the EEG analysis comes from the electrical brain activity phase locked to stimulus presentation. This brain response is called event-related potentials (ERPs; Tallon-Baudry & Bertrand, 1999). Several ERPs have been related to social development. For example, the N170 component, which is modulated specifically by human faces in adults (Courchesne, Ganz, & Norcia, 1981; Csibra, Kushnerenko, & Grossmann, 2008; Dawson, Webb, & McPartland, 2005; de Haan & Nelson, 1999; de Haan et al., 2007; Elsabbagh et al., 2009; Hileman, Henderson, Mundy, Newell, & Jaime, 2011; Itier, 2004; Johnson et al., 2005). The N170 component is a negative deflection that peaks between 140 and 170 ms after stimulus, and it is most prominent over posterior temporal sites (Courchesne et al., 1981; Csibra et al., 2008; Dawson et al., 2005; de Haan & Nelson, 1999; de Haan et al., 2002, 2007; Elsabbagh et al., 2009; Hileman et al., 2011; Itier, 2004; Johnson et al., 2005).

In infants, neuroscience evidence has suggested that the P400 component could be a precursor of the N170 component (Luyster, Powell, Tager-Flusberg, & Nelson, 2014). The P400 component is a positive deflection observed predominantly on lateral electrodes of the right hemisphere. The infant P400 has been observed over occipitotemporal electrodes elicited by upright and inverted human and monkey faces (de Haan et al., 2007). More interestingly, it has been suggested that the human face specificity may experience a cortical specialization during childhood. De Haan et al. (2002) examined this hypothesis in adults and 6-month-old infants. In adults, they observed that upright and inverted human and monkey faces evoked a N170 component over occipitotemporal electrodes, but the N170 elicited by upright human faces was smaller than that of the other faces. They also found that the amplitude and the latency of the N170 only increase for inverted human faces and not for those of monkey. Moreover, they observed that the N170 latency was slower for human faces compared to monkeys, regardless of face orientation. On the other hand, in 6-month-old infants, although the amplitude of the N170 (P400) component was larger for human faces than for monkey, orientation did not have significant effects over both amplitude and latency. This orientation modulation of the N170 component shows that the specificity of the N170 depends on a cortical specialization during the childhood.

Balas et al. (2010) examined a different level regarding the ability to discriminate faces. They assessed the brain activity in 6-month-old infants while they were watching face pictures of their mother or an unknown person. They observed that the amplitude of P400 was larger to the inverted faces only in the case of their mother, revealing a specific selection process present as early in life as 6 months of age. In addition, Farroni et al. (2002) measured 4-month-old infants' brain electric activity to assess neural processing of faces with direct and averted gaze. They observed that infants showed an enhanced neural processing of faces with direct gaze in comparison to averted gaze. These evidences are showing that face specificity is developed during childhood from a basic level of face versus non-face discrimination to a level in which faces are grouped by categories like race and species and finally individual categories. These changes might be revealing a trajectory of neural and behavioral specialization (Johnson, 2011).

All the studies reviewed above indicate that human beings display a group of sensorial sensitivities early in life that facilitate the detection of social agents and ensure the construction of relationships with other human beings. Indeed, around 6–9 months of age, another visual ability is possible to be observed: the ability of joint attention (JA). This ability has been described as the capacity to alternate the gaze in order to coordinate the interest in an object and in another person (Charman, 2003; Charman et al., 2000; Hopkins & Taglialatela, 2013; Lachat, Hugueville, Lemaréchal, Conty, & George, 2012; Morgan, Maybery, & Durkin, 2003; Mundy, Card, & Fox, 2000; Striano, Reid, & Hoehl, 2006). At the age of 6 months old, children are able to follow the gaze of another person in order to perceive a common object, known as responding JA (Mundy & Jarrold, 2010; Mundy, Sullivan, & Mastergeorge, 2009; Mundy et al., 2000). Around the age of 9 months old, children are able to initiate this kind of behavior in a spontaneous manner (initiating JA; Mundy & Jarrold, 2010; Mundy et al., 2009, Mundy et al., 2000). The ability of JA has proved to be crucial for several capacities such as social synchronization, development of language (Hopkins & Taglialatela, 2013; Lachat et al., 2012; Morgan et al., 2003; Mundy et al., 2000; Striano et al., 2006), and development of the mentalizing capacity, also known as theory of mind (ToM; Sodian & Kristen-Antonow, 2015; Mundy et al., 2000; Charman et al., 2000; Charman, 2003; Morgan et al., 2003; Striano et al., 2006; Lachat et al., 2012; Hopkins & Taglialatela, 2013; Happé & Frith, 2014; Baron-Cohen, Leslie, & Frith, 1985; Oberwelland et al., 2016).

Several studies have shown that patients with neurodevelopment disorders, for example, autism spectrum disorder (ASD), show early JA and ToM impairments (Caruana, Brock, &

Woolgar, 2015; Charman et al., 2000; Jones & Klin, 2013; Mundy, Kim, McIntyre, Lerro, & Jarrold, 2016; O'Nions et al., 2014). Indeed, there are evidences that demonstrate that infants with ASD show alterations in attending social stimuli (Chawarska, Ye, Shic, & Chen, 2016; Jones & Klin, 2013; Klin, Jones, Schultz, Volkmar, & Cohen, 2002). Moreover, ASD children exhibit impairments in both social communication and social interaction, as well as restricted and repetitive patterns of interests, activities, or behavior that interfere in their global social functioning (APA, 2013). In fact, it is well known that alterations in the development of social skills is a key feature of ASD (Caruana et al., 2015; Charman et al., 2000; Jones & Klin, 2013; Mundy et al., 2016; O'Nions et al., 2014).

Neuroscience studies have illustrated EEG correlates of JA before 1 year of age (Kopp & Lindenberger, 2011; Mundy et al., 2000; Striano et al., 2006). One of this is the Nc component, which is a negative deflection that occurs around 300–850 ms after stimulus onset (Kopp & Lindenberger, 2011; Luyster et al., 2014; Striano et al., 2006; Webb, Long, & Nelson, 2005). Nelson and McCleery (2008) argue that the Nc component seems to be the first ERP to emerge in development (present at birth). In 9-month-old infants, this component has a higher amplitude in the midline channels in JA contexts (Kopp & Lindenberger, 2011; Striano et al., 2006), suggesting that children increase their attention to environmental stimuli that are more salient (Striano et al., 2006). The Nc component has shown a right-side lateralization, which is consistent with the role of the right hemisphere in the processing of faces (de Haan et al., 2007; Webb et al., 2005) and attention (Corbetta, Pate, & Schulman, 2008; Courchesne et al., 1981; Pelphrey et al., 2002; Striano et al., 2006).

Since the evidence revised above indicates that the visual system is essential for the development of social skills, we then should find evidence supporting the idea that people who are born blind should show difficulties in their social development. Hobson and Bishop (2003) observed that 4- to 8-year-old children who were blind from birth evidenced similar difficulties in social development as sighted ASD children. In their study, Hobson and Bishop (2003) observed that some of the blind children exhibit autistic-like behaviors such as a tendency to be more socially isolated in playground, less propensity to express pleasure, and less disposition to play or be involved in reciprocal play, manifesting a certain lack of reciprocal interpersonal engagement. However, they observed that there were some blind children who were less socially impaired. The authors concluded that these findings might highlight the importance of vision in linking children with other people but that ASD is a specific neurodevelopment disorder that is not necessarily related to blindness.

In sum, social functioning and social skills are the result of a complex interaction of several sensory abilities that are present in human life from birth. All verbal and nonverbal abilities that form social skills like smiling and eye contact depend on widespread brain networks whose neurobiology is only recently being studied. The following paragraphs describe how the abilities mentioned in this part are combined in order to develop the next human social ability: the capacity to be "mind readers."

Perspective Taking and Mentalization Development

Are human beings mind readers? How can humans know what other people are thinking, feeling, or planning without uttering a word? The ability to predict how other human being is going to act is a capacity that is built from the basic behaviors that we described above. Sensitivity to eyelike stimuli, discrimination of biological motion, preference for faces, etc. are the foundations on which mentalization ability rests. The mentalization ability or ToM has been described as the capacity to represent and interpret a person's beliefs, intentions, and feelings (Wimmer & Perner, 1983). This ability can be first observed around 4-year-olds, and it becomes firmly established around 4–6 years of age (Wimmer & Perner, 1983).

Several studies state that the ability to share the perception of a common object with another person (i.e., JA; see above) is a necessary step for the development of the capacity to figure out another person's perspective (i.e., mentalization; Sodian & Kristen-Antonow, 2015; Mundy et al., 2000; Charman et al., 2000; Charman, 2003; Morgan et al., 2003; Striano et al., 2006; Lachat et al., 2012; Hopkins & Taglialatela, 2013; Soto-Icaza et al., 2015; Happé & Frith, 2014; Baron-Cohen et al., 1985; Oberwelland et al., 2016). However, Moll and Kadipasaoglu (2013) argue that there is an intermediate ability between the development of JA and mentalization. These authors describe it as a level of partial comprehension of other's purposes, objectives, and preferences, called perspective taking. This includes taking into account the manner in which the other person perceives and understands a stimulus, particularly the visual aspect of such stimulus (visual perspective taking, VPT). Around 24 months of age, the first signs of this skill may appear as the child is able to identify if another person can see an object or not (Level 1 VPT; Hamilton, Brindley, & Frith, 2009). Nevertheless, there is a more complex level of VPT, commonly achieved at 4 or 5 years of age, in which children display the ability to identify other's references and perspectives (Hamilton et al., 2009; Moll & Kadipasaoglu, 2013; Perner & Roessler, 2012). As a result, Level 2 VPT allows the child to understand that objects can be seen in different ways, depending on form of presentation and point of view (Moll & Meltzoff, 2011). Thus, children can identify that if he/she is seeing the front hood of a car, another person in front of him/her is seeing the rear hood of the same car. Interestingly, Level 2 VPT correlates with the development of mentalization ability (Hamilton et al., 2009).

The development of mentalization ability was not without controversy. There is a line of research that has found evidence about the existence of what the authors called an implicit ToM. This ability has been described during a preverbal stage of development before the average 4–5 years of age in which explicit mentalization appears (Baillargeon, Scott, & He, 2010; Moll & Kadipasaoglu, 2013; Southgate, Senju, & Csibra, 2007; Surian, Caldi, & Sperber, 2007). These evidences reveal that social development is a dynamic and progressive process of specialization (Johnson, 2011) far from being an "all or nothing" type.

Social abilities such as VPT and ToM have been also a topic of interest for social neuroscience. Most of these findings are based on imaging techniques which usually come from magnetic resonance imaging (MRI) methods, specifically, the functional MRI (fMRI). This is a technique that measures changes in the hemodynamic brain response related to neural activity (blood oxygen level-dependent signal; Auer, 2008). fMRI reveals the organization, distribution, and relationship of neural networks which may be anatomically distant but linked in order to perform a specific function (Rogers, Morgan, Newton, & Gore, 2007). Using this method, several studies have shown that a specific brain region is involved in VPT and mentalization abilities, i.e., temporoparietal junction (TPJ) (Carter & Huettel, 2013; Krall et al., 2016; Oberwelland et al., 2016; Saxe, Whitfield-gabrieli, Scholz, & Pelphrey, 2009; Schurz, Aichhorn, Martin, & Perner, 2013; Schurz et al., 2015). TPJ is a region of the cerebral cortex along the boundaries of temporal and parietal lobes (Carter & Huettel, 2013). It includes areas of supramarginal gyrus and angular gyrus, and it has been related to a variety of studies in social neuroscience (Billeke et al., 2015). A meta-analysis of the evidence of social function revealed that left TPJ was activated in perspective tasks (Arora et al., 2015; Schurz & Tholen, 2016). The precuneus and left middle occipital gyrus were also related to VPT, revealing that mental imagery and body representation are necessary to consider different points of view (Schurz & Tholen, 2016). Regarding the mentalization ability, Saxe et al. (2009) showed in a fMRI study that in children between 6 and 11 years old, the brain regions involved in perceiving and reasoning about other people were the bilateral TPJ and the precuneus. An interesting finding was the fact that the medial prefrontal cortex (MPFC) was also active but in a lower threshold than the other brain regions (Saxe et al., 2009). According to the authors, this evidence reflected a developmental change. In fact, they examined changes in the response patterns related to age, which showed that only the right TPJ displayed a significant correlation with age, revealing a maturational selectivity for social information. Moreover, they observed that the brain regions that were involved in ToM processing did not overlap with brain regions devoted to the perception of biological motion. In fact, they found that the perception of biological motion was related to the recruitment of the right posterior superior temporal sulcus (pSTS), which should not be confused with the right TPJ. The authors concluded that this is a remarkable finding for a full understanding of the social phenomena as a developmental outcome, because it suggests that ToM comprehension may rely on a distinct and later developed neural substrate.

Interestingly, Carter and Huettel (2013) state that TPJ could be related to mentalizing abilities as well as being responsible for encoding social information. This encoding involves thinking about another person's beliefs, the interpretation of the physical actions of the social agent like gazing, biological motion or facial expressions, and the perception of bodies. They described a nexus model of TPJ, in which this brain region works precisely as a linkage between social, attention, memory, and language processing networks. Specifically, their fMRI meta-analysis showed that the brain area near the occipital-temporal border, called EBA (extra-striate body area), encodes static biological stimulus, while a more dorsal and anterior area (the superior temporal sulcus) encodes biological motion, gaze detection, and identification of facial expressions. Thus, following this dorsal-anterior axis, the angular gyrus is activated in tasks related to mentalization and interpretation of intentions. This model is in accordance with the notion that the development of social skills encompasses a trajectory of specialization of several abilities from a basic to a more complex level of expertise and integration.

In addition, mentalization ability also has been related to language development. In this context, an important source of evidence comes from studies in children with language impairments, deafness, and ASD. These three development conditions have demonstrated delays and alterations in the development of mentalization ability, confirming that mentalization is related to development of language skills (Peterson, Slaughter, Moore, & Wellman, 2016; Schick, De Villiers, De Villiers, & Hoffmeister, 2007; Shield, Pyers, Martin, & Tager-Flusberg, 2016; Spanoudis, 2016). On one hand, ToM impairments are one of the most reported deficits in ASD patients (Baron-Cohen et al., 1985; Caruana et al., 2015; Charman et al., 2000; Hamilton et al., 2009; Kana, Libero, Hu, Deshpande, & Colburn, 2014; Mundy et al., 2016; O'Nions et al., 2014). Furthermore, neuroimaging studies with adults, adolescents, and children have shown that ASD subjects evidence a reduced neural response in TPJ and medial prefrontal cortex during social tasks (Castelli, Frith, Happé, & Frith, 2002; Kana et al., 2014; Lombardo et al., 2011; O'Nions et al., 2014). On the other hand, evidence in school-age children with specific language impairments showed poorer results on ToM tasks compared to typically developing children (Spanoudis, 2016). This result led the author to conclude that syntax/pragmatic aspects of language impact on ToM understanding in children with specific language impairment. On the other hand, studies in deaf children have shown elusive findings. Evidence in native signer children (deaf children with deaf parents) showed no differences in the age of ToM apparition compared to neurotypical children (Peterson et al., 2016; Schick et al., 2007). On the contrary, studies in late signers (deaf children with hearing parents) have shown a significant delay in the age of development of ToM ability (Peterson et al., 2016; Schick et al., 2007). In addition, other findings have shown that deaf children have problems in social functioning such as social maturity, peer relations, and lower popularity in their peer group than typical children (Peterson et al., 2016; for a review see Peterson, 2009). However, although late signer children achieve the same sequence of development and proficiency in mentalization ability as typically developing children, they do so later in childhood, thus showing that late signers make a slower but sustained progress in their mentalization understanding as they get older (Wellman, Fang, & Peterson, 2011).

An interesting study of Shield et al. (2016) found that native signer children with a confirmed diagnosis of ASD (two of them were typically hearing children with deaf parents) compared to well-matched typically developing deaf native signer children fall behind in false-belief understanding tasks. Also, these ASD children scored significantly lower than typically developing native signers in visual perspective taking tasks and in American Sign Language (ASL) comprehension. However, this difference does not occur in spatial cognition tasks. Regarding mentalization ability, these results illustrate that language is strongly correlated with ToM ability. Moreover, they found that mental rotation was unrelated to either VPT task or language and is only weakly related to ToM task. They observed that the strongest relationship is present among ASL comprehension, ToM, and VPT tasks, even when VPT and ToM were assessed with minimal language.

These findings could indicate that not only auditory system impairment per se is related to difficulties in social development but also that the environment in which children are born is crucial to a proper development of social skills (Bedny, Pascual-Leone, & Saxe, 2009; Peterson et al., 2016; Shield et al., 2016).

Lessons from the Economic World: Social Decision-Making

The development of mentalization abilities allows children to adapt their behavior according to their partner's intentions in order to accomplish their objectives. By means of mentalization ability, children have the capacity to figure out other's thoughts, feelings, and purposes in order to plan strategies to secure need. The study of choices that children and adults take in games has been useful to the comprehension of egocentric and altruistic behaviors. In general terms, the participant's choice during economic experiments can be used to infer the subjective value of his/her choice, following some assumptions (e.g., maximization of the monetary earning; Camerer, 2013; Lee, 2005). Interestingly, in the case of social decision-making, it is also necessary to consider the other persons' earnings or preferences. Thus, using social games, it is possible to infer the subjective value of another person's preference. In this context, economic games that involve other people can be understood as a stylized model of a social exchange. Specifically, these games recreate social dilemmas where different interests tend to clash. Therefore, several social actions and attitudes, such as altruism, prosocial behavior, cooperation, and selfishness, are more prone to emerge (Axelrod & Hamilton, 1981; Billeke et al., 2014; Gonzalez-Gadea et al., 2016; Steinbeis et al., 2012). An example of these games is the ultimatum game. In this experimental paradigm, two players, the proposer and the responder, have to share an amount of money. The proposer has to make an offer about how the money should be divided between both players. Only if the responder accepts the proposer's offer can the money be distributed between the participants. But, if the responder rejects the offer, both players receive no money (Axelrod & Hamilton, 1981).

Regarding the development of social decision-making process, there is evidence that shows that social strategy changes across ages (Steinbeis et al., 2012). An interesting study assessed both behavioral and neural trajectory during childhood using the "ultimatum game" and the "dictator game" (in which the responder must always accept the offer made by the proposer; Steinbeis et al., 2012). Children from 6 to 14 years old evidence behavioral differences in their bargaining strategies in the two games. Proposers were more willing to give money in the ultimatum game, i.e., only in the case that the proposer's behavior could be punished by the responder if he/she is unsatisfied with the offer. These results evidenced that children are able to adapt their behaviors according to their partners' preferences. Furthermore, the authors found that older children offer greater amounts in comparison to younger children. Astonishingly, younger children were more willing to accept unfair offers than older children. These findings are showing the existence of a strategic social behavior that integrates both personal interests and the interest of others. In addition, fMRI results evince that age is also positively correlated with the activity and thickness of the dorsolateral prefrontal cortex (DLPFC). Since DLPFC has been associated with self-control and strategic decisions, the authors concluded that self-centered decisions might be related to difficulties in self-control rather than the ability to distinguish social norm (e.g., fairness).

Conditions such as ASD and attention deficit hyperactivity disorder (ADHD) could also be informative about process of social decision-making. A recent study of cerebral activity during both a monetary decision and a social decision task showed interesting differences among typically developing children, ASD children, and ADHD children between 8 and 15 years old (Gonzalez-Gadea et al., 2016). While typically developing children showed similar cerebral functioning compared to ASD children in the monetary decision task, ADHD children evidenced an atypical cerebral activity. More interestingly, in the social decision task, typically developing children evince a modulation of their brain error monitoring signals, showing a greater cerebral response to betrayal behaviors than to cooperative behaviors. This modulation was absent in the ADHD group of children, evincing no differences of their brain error monitoring signals between betrayal and cooperative behaviors. Remarkably, ASD children showed a reverse pattern of cerebral modulation in this type of tasks. They exhibited a greater cerebral response to cooperative behaviors than to betrayal behaviors. These results become more interesting if it is considered that betrayal behaviors in social decision task generated more monetary gains to the participant. Thus, the authors concluded that these findings show that typically developing children evince greater neural monitoring signals for non-prosocial options such as betrayal although these behaviors bring them a greater monetary gain. On the contrary, ASD children showed a cerebral modulation given by their monetary gain rather than their social motivation, while ADHD children did not evidence any brain error monitoring signal cerebral modulation.

These findings emphasize the fact that sensitivity to social cues is just as important as material cues. Since 1959 Harlow and Zimmerman's work about affective responses in infant monkeys to Brazelton, Tronick, Adamson, Als, and Wise's (1975) study about early mother-infant reciprocity, psychology and nowadays neuroscience have highlighted the role of social functioning to human development. Decades of research have demonstrated that the construction of attachment, bonding, and affiliation are beyond purely material profits. Behavioral and neural evidence show that social cues give meaningful signs to human beings, providing valuable information to effective functioning in society.

Conclusions

A Specialized Social Brain

Social skills are built since the beginning of life. All the behaviors described above contribute to ensure the interaction with another person from a very early age. The ability to discriminate biological motion, the ability to imitate, the preference for eyelike stimuli, etc. seem to be coordinated to guarantee, first, that the partner is actually a living being; secondly, that he/she is a human being; and, finally, that the infant could draw the interlocutor's attention to him/her. Thereby, infants are able to assure their own survival. For instance, mutual gaze preference is important because it informs us that another living specie could help us or harm us (Emery, 2000). If we take into account that all of those behaviors are aiming to modify other's actions in order to get what infants need to survive, those actions are actually extremely challenging, even if they seem to be quite simple.

The evidence reviewed in this chapter allows us to consider that the complexity of social development encompasses both a specialization and an awareness of social functioning. In this context, specialization refers to the refinement of the brain networks that might be directly related to increasingly complex behaviors, whereas awareness refers to both the capacity of identifying one's own thoughts and feelings and the voluntarily control of one's own behavior. We argue that both specialization and awareness lead to the construction of one's self-identity and the identity of the social partner. Over their lifetime, human beings have to deal with gradually more complex social interactions, because social exchanges require the capacity to coordinate one's own needs with the needs of others. Take, for example, the ultimatum game (Axelrod & Hamilton, 1981). This social dilemma demands that the proposer must figure out the responder's outcome. How does he/she predict this? The proposer, in a very short period of time, has to not only identify his/her own desires but responder's interests as well. He/she must then presume and predict the responder's possible decision and inhibit his/her impulse to keep all the money. This process is not so simple. While it requires the refinement of the mentalization capacity, it also entails the coordination of all the abilities previously developed. Social abilities ranging from preference to biological motion to social perspective taking are necessary to solve a dilemma such as an ultimatum game.

Moreover, the increasingly specialized social behaviors are correlated with a refinement of brain networks. There is evidence that reveals a segregation of local connectivity together with an increase in the connectivity between distant brain regions during development (Fair et al., 2009), showing increases in the brain network organization (Betzel et al., 2014; Smit et al., 2012; Tymofiyeva, Hess, Xu, & Barkovich, 2014). Therefore, developmental changes at both behavioral and cerebral levels might evince a process of brain functioning specialization aimed to decode social relevant stimuli in order to adapt the behavior to a complex social environment (Fair et al., 2009; Johnson, 2011). This decoding process could be understood as a construction process of an internal representation from an external social agent. As we described before (Soto-Icaza et al., 2015), the human ability to be "mind readers" might be built upon an internal representation of others, primarily established by means of identification of the social agent and the social environment. These identifications are drawn from sensory and motor abilities ("S" and "M," respectively, in Fig. 1). Therefore, sensory abilities enable the identification of meaningful social signs such as biological motion, stimuli similar to eyes, upright faces, familiar faces, and mutual or averted gaze. Likewise, motor abilities make it possible for the child to communicate and interact with the surrounding environment by means of significant social behaviors such as imitating, smiling, crying, responding and initiating JA, pointing, and gaze following.

Thus, the increasing complexity of social development might reflect a specialization process where these sensory and motor capacities are coordinated to predict other's behaviors. For instance, at a behavioral level, the process of face detection during infancy might be the result of a social specialization that begins with detection of biological versus non-biological motion; then with the identification of eyes, upright versus upside-down faces, and mutual versus averted gaze; and, finally, with familiar versus unfamiliar face. Indeed, at a neural level, EEG evidence also describes that human face sensitivity might experience a cortical specialization during childhood (e.g., de Haan et al., 2002; Kuefner, de Heering, Jacques, Palmero-Soler, & Rossion, 2010). Moreover, there is evidence that brain structures also experienced changes in gray matter volume and cortical thickness that can reflect this process of specialization (Mills, Lalonde, Clasen, Giedd, & Blakemore, 2014).

Neurodevelopment dysfunctions such as ASD provide valuable evidence for the analysis of brain specialization trajectory. Specifically, there are studies that argue that ASD can be understood as a specialization disturbance (Courchesne & Pierce, 2005), showing a reduced long-range functional brain connectivity and an increased local functional brain connectivity (Courchesne & Pierce, 2005; Happé & Frith, 2006). In addition, alterations in early visual ERPs in ASD (Baruth, Casanova, Sears, & Sokhadze, 2010; Hileman et al., 2011) could also reveal a deviation in the trajectory of the local circuit specialization.

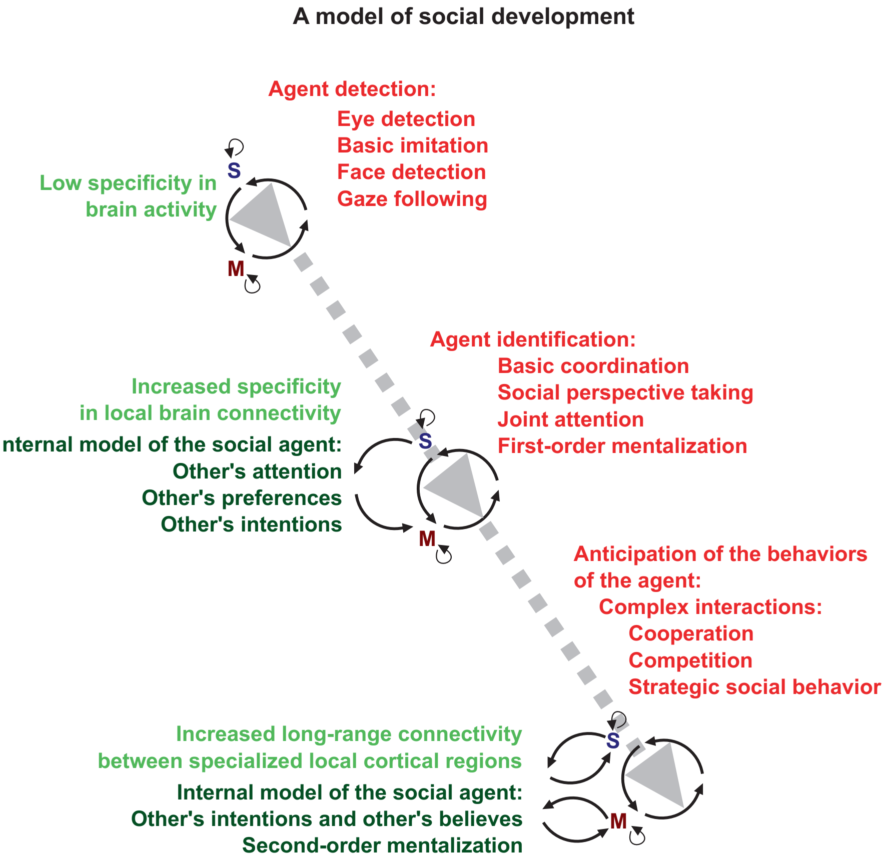
A model of social development
Agent detection:
Eye detection
Basic imitation
Face detection
Gaze following
Low specificity in brain activity
S
M
Agent identification:
Basic coordination
Social perspective taking
Joint attention
First-order mentalization
Increased specificity in local brain connectivity
nternal model of the social agent:
Other's attention
Other's preferences
Other's intentions
S
M
Anticipation of the behaviors of the agent:
Complex interactions:
Cooperation
Competition
Strategic social behavior
Increased long-range connectivity between specialized local cortical regions
Internal model of the social agent:
Other's intentions and other's believes
Second-order mentalization
S
M

Fig. 1 A model of social development. *Dotted line* represents the interaction between neural and behavioral development. Note that the *gray arrow* shows an increasing complexity of such interaction through ages. On the *left*, the trajectory of the internal cognitive model of the social agent is shown. On the *right*, the increasing complexity of the development of social behaviors is shown. *Black lines* illustrate the relationship between sensory (S), motor systems (M), and cognitive systems (based on Soto-Icaza et al. 2015)

In summary, social development should be understood as a neurodevelopmental phenomenon that is modulated by both maturation and environmental constraints. Furthermore, social development should take into account which is dependent on a developing brain that determines its specialization process. Conditions like ASD show that social neurodevelopment is an extremely delicate process and that it sets out vast possibilities but also offers major challenges.

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Social Competence: Consideration of Behavioral, Cognitive, and Emotional Factors

Karen Milligan, Annabel Sibalis, Ashley Morgan, and Marjory Phillips

Social Competence

Social competence is considered an important resilience factor that increases positive developmental outcomes, even in the face of risk (Reich, 2016). Friendships are thought to enhance knowledge about social situations, as well as provide emotional support, instrumental aid, affection, self-validation, companionship, and opportunities to learn conflict resolution skills in a supportive environment (Rose-Krasner, 1997).

The ability to form and maintain friendships and social relationships is associated with long-term positive outcomes (Rose & Asher, 2017). For example, a positive relationship has been found between social competence and academic achievement in school-aged children (Del Prette, Del Prette, de Oliviera, Gresham, & Vance, 2012; Elias & Haynes, 2008; Shek & Yeung, 2016). For example positive relationships with peers may promote better problem-solving and peer collaboration which may positively influence academic outcomes (Del Prette et al. (2012). Along the same line of reasoning, higher levels of social competence have also been associated with better career success in the long term (Amdurer, Boyatzis, Saatcioglu, Smith, & Taylor, 2014).

Social competence is also identified as a protective factor for good mental health (Alduncin, Huffman, Feldman, & Loe, 2014). It helps us to develop strong social supports and to work effectively with others. More and more, we live in a complex and connected world, and the ways in which we connect are increasingly fast paced and fragmented. The challenges of social media, living away from extended relatives and familiar communities, having to form new social supports, and having to work with groups of people, all add to the need for high levels of social competence. Social competence mitigates the impact of adverse events, such as maltreatment (Schultz, Tharp-Taylor, Haviland, & Jaycox, 2009). Conversely, low social competence is associated with negative outcomes, including school failure and dropout, alcohol and substance use, social rejection, and delinquency (Parker & Asher, 1987). Social competence deficits are associated with lower social supports and higher risk factor for physical disease (Repetti, Taylor, & Seeman, 2002).

What Is Social Competence?

While there is agreement about the importance of social competence, what constitutes social

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competence is less clear, with an abundant array of operational definitions used in the extant literature (Rantanen, Eriksson, & Nieminen, 2012; Rose-Krasner, 1997). For example, in her review of the use of term social competence, Rose-Krasner (1997) concluded that the key emphasis is on positive social outcomes and effectiveness. Social competence is defined as "the ability to achieve personal goals in social interaction while simultaneously maintaining positive relationships over time and across situations" (Rubin & Rose-Krasnor, 1992, p. 4). Arthur, Bocher, and Butterfield (1999), in contrast, took a developmental approach to the construct and defined social competence as reflecting the evolving understanding of self and other and the ability to form meaningful relationships with peers. Gresham (2001) defined social competence as the degree to which children and youth are able to establish and maintain satisfactory interpersonal relationships, gain peer acceptance, make friendships, and terminate negative or pernicious interpersonal relationships. The importance of perceiving and responding appropriately to the emotional components of social interactions was highlighted by Halberstadt, Denham, and Dunsmore (2001) in their understanding of social competence. More recently, the ability to regulate emotions is considered to be an important component of social competence (Blair & Raver, 2015).

Examining all of these definitions suggests that there is general agreement that social competence reflects more than just learning and carrying out social skills. Rather, the emphasis is on the performance of complex and interconnected skills within interpersonal environments (Lillvist, Sandberg, Bjorck-Akesson, & Granlund, 2009). Attempts have been made to disentangle and identify the complex and interconnected set of skills that enables us to navigate social interactions and initiate and maintain relationships with others (Stichter, O'Connor, Herzog, Lierheimer, & McGhee, 2012). These skills are thought to include: communication (making eye contact, taking turns, appropriate tone of voice), cooperation (helping others, sharing materials, following directions), assertion (requesting information from others, introducing oneself, responding to the actions of others), empathy (showing concern for another, taking the perspective of another), engagement (joining ongoing activities, making friends, interacting with others), and self-control (taking turns, compromising, responding appropriately to conflict; Lyons, Huber, Carter, Chen, & Asmus, 2016). To be considered socially competent, one needs to use social skills in a way that adheres to social conventions and that responds appropriately to others' emotions and thoughts (Stichter et al., 2012).

Each of these social skills can be seen at a behavioral level. Social interactions, however, are complex and rarely is one enacting a single social behavior in isolation. One must attend to and process context cues, as well as verbal and nonverbal cues from social partners. This information must then be integrated and compared with previous experiences and knowledge. The child must decide what information is key to responding, make a plan, draw on their verbal and behavioral skill repertoire, and implement. This complex cognitive and behavioral process is further complicated in the context of strong emotion (e.g., fear, anger, excitement), which is often present in human interactions. Emotions can hijack cognitive processes, making it harder to perspective-take, problem-solve, and behave in a manner that takes into account all the complex cues of social situations (Zelazo & Lyons, 2012).

As such, there has been movement within the social competence field away from a social skills perspective that focuses on behavior to an integrative perspective that accounts for the complex interaction of cognitive and emotional processes that support social competence at a behavioral level (Beauchamp & Anderson, 2010; Milligan, Phillips, & Morgan, 2016) (see Fig. 1).

Cognitive Factors and Social Competence

Cognitive factors involved in social competence can be viewed from two inter-related perspectives. At one level, cognition reflects thoughts, including one's knowledge of social situations (e.g.,

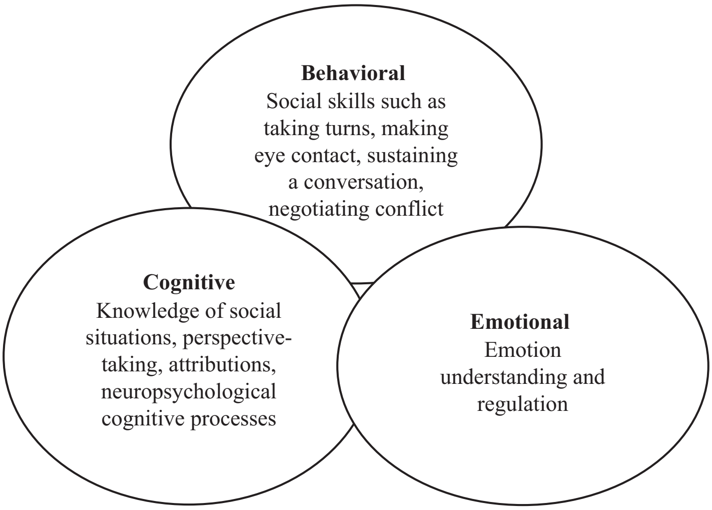
Behavioral
Social skills such as taking turns, making eye contact, sustaining a conversation, negotiating conflict
Cognitive
Knowledge of social situations, perspective-taking, attributions, neuropsychological cognitive processes
Emotional
Emotion understanding and regulation

Fig. 1 Behavioral, cognitive, and emotional factors interact to support development and enactment of social competence

what is expected in terms of behavior, content, and different roles) and one's interpretation of situations (e.g., perspective-taking and attributions about the cause of events or behaviors). At a more basic level, cognition also embodies neuropsychological cognitive abilities, including but not limited to attention, executive functions, processing speed, and visual-spatial processing. Importantly, these two levels of cognition are not independent, but rather, they interact in a transactional manner to support social competence (Crick & Dodge, 1994; Dodge, 1986; Galway & Metsala, 2011; Gifford-Smith & Rabiner, 2004; Lemerise & Arsenio, 2000).

Cognition: Thought Processes Related to Social Competence

Three areas of cognition that are related to social competence are schemas, attributions, and theory of mind (ToM). Schemas reflect knowledge about the rules/expectations of social situations. They may be developed based on a child or adolescent's personal experience or the observation or experiences of others and essentially help children (and adults) in predicting what will occur in a given social situation so that they don't have to experience a situation as novel every time it is encountered (Kendall, 1985). An example of this would include a child knowing broadly what is expected when they play a board game (e.g., sit down, take turns, follow rules, etc.).

Related to schemas are attributions, cognitive processes that reflect a child's perception of the cause or intent of another's behavior (Weiner, 1985). Most of the research on attributions and social behavior has focused on hostile attributions (i.e., the tendency to attribute negative intent in a benign situation). Hostile attributions are explained within the context of the social information processing model (SIP; Crick & Dodge, 1994). SIP breaks social problem-solving down in to a series of steps which include interpreting cues, clarifying goals, generating alternative responses, selecting and implementing a specific response, and evaluating the outcome. These steps are executed rapidly in a non-linear manner that includes numerous feedback loops. Importantly, information is processed within a child social schema, which includes her social experience, as well as her beliefs and expectations about social situations. (e.g., Crick & Dodge, 1994; Dodge, 1986; Gifford-Smith & Rabiner, 2004; Lemerise & Arsenio, 2000). Research has consistently shown that children who are socially rejected and/or engage in heightened levels of aggression are more likely to attribute hostile or negative intent in benign social situations. Further, they are more likely to experience challenge in understanding and/or performing the

SIP steps (Dodge & Coie, 1987; Dodge & Feldman, 1990; Dodge, Murphy, & Buchsbaum, 1984; Dodge & Newman, 1981; Dodge & Tomlin, 1987).

Theory of mind (ToM) is another area of cognitive understanding that has been linked with social competence. ToM reflects the ability to infer beliefs, thoughts, and desires (i.e., mental states) to another person and to recognize that other's mental states may differ from one's own (Milligan, Astington, & Dack, 2007). The relation between ToM and social competence is well established (for a review, see Astington, 2003). The false-belief task is the gold standard task for assessing ToM in the preschool period. This task, passed by most children by age 5, assesses a child's ability to reason about the behavioral consequences of holding a mistaken belief. Thus, by age 5 most children can act in a way that acknowledges that mental representations impact on what a person says or does, even in cases where they are mistaken about the situation in reality (Milligan et al., 2007). To become socially skilled, children must understand that desires and beliefs held by peers influence their behavioral and emotional responses (Slomkowski & Dunn, 1996). This knowledge assists children in understanding the social behavior and verbal communications of their peers and guides their behavior in social interactions, thereby enabling them to regulate and coordinate their interactions (Astington & Gopnik, 1991; Lalonde & Chandler, 1994). One of the first studies to examine this relation, completed by Astington and Jenkins (1995), found that children who passed false-belief tasks were more likely to make joint proposals and to assign roles for themselves and their playmates when engaged in pretend play. Understanding of others' beliefs has also been related to connectedness of communications between friends (Slomkowski & Dunn, 1996) and successful communication bids and cooperative play (Dunn & Cutting, 1999).

The studies reviewed examine the relation between ToM and social competence in the preschool period. Most typically developing children have developed false-belief understanding by middle childhood, and as such there is less variation found in social competence by false-belief understanding. However, it is possible that individual differences in the flexible and appropriate implementation of ToM may play a role in social competence during this period as well. While less commonly examined, advanced ToM tasks that are passed later in childhood (e.g., Liddle & Nettle, 2006) have been associated with social competence outcomes, including the number of friends in a child's social network (Stiller & Dunbar, 2007) and teacher-rated social competence (e.g., Little & Nettle, 2006). This suggests a continued role of ToM for school-aged social competence. This is an area in need of further exploration, particularly with neurodevelopmental samples who may present with more challenges with ToM.

Neuropsychological Processing Abilities

Disorders associated with neuropsychological or cognitive-executive weaknesses, such as schizophrenia, specific and nonverbal learning disabilities (Galway & Metsala, 2011; Milligan et al., 2016), autism spectrum disorder (Gates, Kang, & Lerner, 2017), and traumatic brain injury (Tlustos et al., 2016), have been associated with greater social competence challenge. Within these disorders, research has highlighted the key role of processing deficits in social competence challenge. While an exhaustive review of all neuropsychological cognitive processes involved in social competence is beyond the scope of this chapter, we will explore the impact of attention control and executive functions, processing speed and visual-spatial processing to exemplify the impact of processing on social competence.

Attention Control

Attentional control reflects the ability to orient and sustain attention while filtering out irrelevant stimuli (Derekshan & Eysenck, 2009). Challenges with attention have been associated with behavioral challenges in social interactions (Andrade, Brodeur, Waschbusch, Stewart, & McGee, 2009). Challenges with attentional control can impact on learning social skills and developing one's knowledge of social situations and situational norms. Attentional deficits are also intricately involved in the relation between attributions and social competence. For example, research suggests that children who exhibit aggressive behavior exhibit biased attention toward threat cues. For example, aggressive children have difficulty attending to and remembering all important aspects of a social interaction and encode fewer social cues (with preference for those that may be most recent) before making causal attributions about the hostile intent of another person (Milich & Dodge, 1984).

Research examining social competence in ADHD populations (where deficits in attention control are considered central) exemplifies the role of attention in social competence. Children and adolescents with ADHD have fewer friends and experience higher rates of rejection and lower levels of social support compared to non-ADHD peers (Humphreys, Galán, Tottenham, & Lee, 2016).

In addition to improving indices of attention control, stimulant medication has been associated with improvements in social functioning at home and school, with notable medium to large effect sizes (van der Oord, Prins, Oosterlaan, & Emmelkamp, 2008). Importantly, challenges with social competence are seen in both those with ADHD-inattentive and ADHD-combined (inattentive and hyperactive-impulsive) subtypes, suggesting that the variance in social competence is related to inattention and not solely due to challenges with hyperactivity/impulsivity. In fact, research suggests that children with ADHD-inattentive subtype are more likely to show deficits in the performance of social competent behavior (similar to combined type) but experience even more challenge in the acquisition of social skills, possibly due to the critical role attention plays in learning (Wheeler & Carlson, 1994).

Executive Functions

Closely associated with attention control are executive functions (EF), which are the higher-order cognitive processes that support purposeful and effortful goal-directed behaviors (Pennington & Ozonoff, 1996). The model of EF proposed by Miyake, Friedman, Emerson, Witzki, and Howerter (2000) suggests that the ability to control impulses, respond flexibly (or adjust one's approach, behavior, attention, or thinking based on feedback from the environment), and keep information in mind while working with that information (i.e., working memory) are the primary processes within the broad EF construct. These EF assist with problem-solving in everyday life and as such are considered pivotal to successful social interaction. Children and adolescents with weaknesses in EF experience challenge with knowing what social information to focus on, developing plans for social interactions, executing their plans, controlling their behavior in keeping with the social/situational demands, monitoring the success of their behavior, and flexibly shifting their behavioral approach based on feedback from peers and the broader environment (Clark, Prior, & Kinsella, 2002; Dennis, Brotman, Huang, & Gouley, 2007; Nigg, Quamma, Greenberg, & Kusche, 1999; Riggs, Greenberg, Kusché, & Pentz, 2006).

Similar to attention, EF is related to thought processes, such as ToM and hostile attibutions. There is a small to moderate association between ToM and EF ($d = 0.38$, Devine & Hughes, 2016). It is possible that EF enables children to attend to and reflect upon the mental states of others, thereby improving social competence.

Within typically developing samples, the association between EF and social competence appears to decrease as children age (small effect size, Devine, White, Ensor, & Hughes, 2016). For example, Harms, Zayas, Metzloff, and Carlson (2014) found that EF at 8 and 12 years was not significantly related to social competence as rated by teachers at age 12. However, within populations of children with significant EF deficits (e.g., traumatic brain injury, disruptive behavior disorder), the association appears to be maintained across developmental periods. For example, in adolescents who have experienced a traumatic brain injury, parent ratings of EF were significantly negatively associated with social competence

(Tlustos et al., 2016). Further, ratings of EF were found to moderate the impact of a social competence intervention, suggesting that EF may be a resilience factor that supports learning and performance of socially competent behaviors (Tlustos et al., 2016).

EF deficits also appear to moderate the impact of hostile attributions. For example, in their study of 83 boys, Ellis, Weiss, and Lochman (2009) found that boys who presented with both hostile attributions and EF challenges in planning and inhibition exhibited higher rates of reactive aggression but that EF challenges alone did not lead to increased rates of reactive aggression. This underscores the importance of examining the interaction of thought processes and neuropsychological cognitive factors on social competence, rather than each in isolation.

Processing Speed

The speed at which children and adolescents process visual and verbal information also has important implications for social competence (Anderson, 2008). If it takes a child longer to take in, process, and respond in a social context, this may impact on their ability to follow conversations, formulate responses, and be able to deliver responses in a timely manner. Further, slowed processing may ultimately result in children having to narrow the field of perception in order to successfully process information, resulting in information loss and heightened possibility of social errors.

Certainly, research with clinical populations with marked processing speed challenges highlights the relation between processing speed and social competence (e.g., schizophrenia; Bowie et al., 2008; traumatic brain injury, Rassovsky et al., 2006). Backenson et al. (2015) have highlighted that LDs marked by significant processing speed challenges have a greater impact on adaptive functioning (including social) than LDs associated with working memory or executive functions. Similarly, adolescents with ADHD marked by sluggish cognitive tempo, which reflects symptoms such as drowsiness, daydreaming, lethargy, and slowed processing speed (e.g., Becker & Langberg, 2014), also have been shown to have lower levels of social competence challenge than those without these symptoms (Becker & Langberg, 2014). These researches suggest the sluggish cognitive tempo accounts for challenges in the initiation and working memory (EF), and this may be one pathway by which processing speed influences social competence.

Visual-Spatial Processing

Children and adolescents with visual-spatial processing deficits may also be more likely to experience challenges with social competence (Galway & Metsala, 2011; Petti, Voelker, Shore, & Hayman-Abello, 2003). Effective social interactions depend upon the ability to attend to and rapidly process and integrate multiple, often subtle, nonverbal social cues, as well as determine their relative salience. This information assists individuals in understanding emotional states and intentions of others (Nowicki & Duke, 1994). Research examining children with nonverbal learning disabilities (NLD) who present with core weaknesses in visual-spatial processing has highlighted that in comparison to a typically developing control group, children with NLD encode fewer social cues and have more difficulty detecting and inferring emotion based on nonverbal social cues. As such, it is possible that children and adolescents with visual processing challenges may become overwhelmed by the amount/type of social information to encode, leading to a narrowed focus that may distort understanding of a social situation. This may result in challenges in understanding the emotional aspects of a situation that require more inference and integration of information. Researchers suggest that children with NLD are able to generate competent/assertive responses to social challenges at levels that are commensurate with typically developing peers; however, they are less likely to believe that enactment of these responses will lead to positive outcomes (Galway & Metsala, 2011). It is possible that the generation responses, while potentially accurate or competent, may be associated with a sense of overload or anxiety. This in turn may impact on performance of the response and/or attributions of success. Further research is needed into what specific aspects of visual-spatial processing (vs. a broad diagnosis such as NLD) impact on the different components of the social interaction process, and how these challenges combine with other neuropsychological cognitive processes to impact social behavior.

Emotion Regulation

Social competence is not just a cognitive and behavioral process. Social interactions are emotional by nature, and emotion has the potential to impact on learning social skills, perspective-taking and problem-solving, and performance of behaviors. Children who are better able to regulate their emotions are more likely to experience positive social outcomes, including positive engagement with peers, greater acceptance by peers, and a higher quality of friendships (Blair & Raver 2015). As such, a comprehensive understanding of social competence must include factors relating to emotion understanding and emotion regulation, given the central role of emotion in social interaction.

Emotion understanding is a broad multidimensional construct that reflects emotion recognition and emotional knowledge (i.e., the ability to attribute emotions to oneself and others based on knowledge about emotion-eliciting situations), as well as the integration across the skill areas (Castro, Halberstadt, & Garrett-Peters, 2016). Emotion understanding develops across childhood with emotion recognition skills developing in the preschool years and emotion knowledge developing in the school-age years. More complex emotion understanding (e.g., mixed emotions) also develops during the school-age years as developing cognitive abilities facilitate the ability to analyze, interpret, and integrate emotional information (see Castro et al., 2016 for review). A well-established base of research support exists for the relation between emotion understanding and social competence (e.g., Heinze, Miller, Seifer, Dickstein, & Locke, 2015; Miller et al., 2005; Ornaghi, Grazzani, Cherubin, Conte, & Piralli, 2015). For example, Castro et al. (2016) found that emotional knowledge about the experience of emotion across situations supported positive social competence outcomes in Grade 3 students.

While understanding emotions in self and other provides essential information for social problem-solving, enacting behaviors and thought processes associated with social competence is dependent, in part, on emotion regulation. Emotion regulation is defined as the "extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially in their intensive and temporal features, to accomplish one's goals" (Thompson, 1994, pp. 27–28). Emotion regulation is associated with both cognitive processes related to attributions and perspective-taking, as well as neuropsychological cognitive factors.

Emotion regulation is a significant contributor to effective social information processing. In a study of 100 Grade 4–6 boys, Bauminger and Kimhi-Kind (2008) found that children with LD experienced significant challenge with social information processing, including hostile attributions. Moreover, emotion regulation was found to moderate the strength of this relation, with those with emotion regulation challenges experiencing more social information processing deficits.

Emotional regulation is also significantly associated with neuropsychological cognitive processes (e.g., attention, language, flexibility, processing speed, inhibition; see Diamond, 2013 for review). Certainly, children and adolescents with neurodevelopmental disorders, such as LDs, are at increased risk for emotion regulation deficits (Bauminger & Kimhi-Kind, 2008) and associated co-occurring mental disorders (Milligan, Badali, & Spiroiu, 2015). From a neurobiological perspective, the presence of a strong emotional response limits a child's ability to fully engage their cognitive processes and behavioral skills (e.g., impulse control, cognitive flexibility, social knowledge, perspective-taking abilities, social skills; Zelazo & Lyons, 2012). For children and adolescents who already present with challenges in these areas, emotion may serve to magnify these challenges. As such, many children and adolescents may cope with social challenge by engaging in fight (e.g., aggression) or flight (e.g., avoidance) behaviors to regulate strong emotions (Milligan et al., 2015). Further research is needed to better understand the interaction between cognitive, behavioral, and emotional factors and the manner in which they impact on the trajectory of the social interaction process

Social Competence Interventions

Given that social competence develops and is further refined over the course of childhood and adolescence, and its well-documented contribution to resilience, a number of universal social competence programs have been developed, schools being the primary setting in which these interventions have been implemented and evaluated.

In this next section of the chapter, we take a critical look at the extent to which the social competence programs in the extant literature tailor their content or delivery of the program to behavioral, cognitive, and emotional processes. First, we examine interventions for typically developing children and adolescents, followed by an examination of programs for clinical populations with specific challenges in behavioral, cognitive, and emotional processes.

Social Competence Interventions for Typically Developing Populations

Numerous universal social competence interventions have been developed for children and adolescents without specific cognitive, emotional, or behavioral challenges. The content and delivery characteristic of programs in the extant literature appear to be moderated by age. Social competence interventions designed for children ages 10 and under (including those for preschool-age and kindergarten-age children) nearly exclusively focus content at a behavioral level, highlighting simple, physical social actions such as sharing toys, initiating conversations, listening quietly when others speak, and promoting helping behavior (e.g., Battistich, Solomon, Watson, Solomon, & Schaps, 1989; Boyle et al., 1999; Ialongo, Poduska, Werthamer, & Kellam, 2001; Stanton-Chapman, Walker, & Jamison, 2014; Stevahn, Johnson, Johnson, Oberle, & Wahl, 2000). As children age, the content of social competence programs mirrors the advances they are making in terms of cognitive and emotional processes (Beelmann, Pfingsten, & Losel, 1994), as well as the growing complexity and prominent importance of social interactions (Brown & Larson, 2009). More specifically, interventions designed for youth in Grades 5 and higher begin to incorporate emotional facets of social competence. The focus appears to shift from behavioral aspects of social skills to understanding the feelings experienced by oneself as well as others. In fact, the majority of interventions targeting middle school- and high school-aged youth in the extant literature contain some component reflecting socio-emotional understanding and self-presentation, for example, emotion regulation (stress management, calming down when frustrated, expressing anger appropriately), communicating feelings and desires to others, social assertiveness and resisting peer pressure, and empathy and perspective-taking (e.g., Caplan et al., 1992; Holsen, Smith, & Frey, 2008; Kimber, Sandell, & Bremberg, 2008; O'Hearn & Gatz, 1999; Sarason & Sarason, 1981; Taylor, Liang, Tracy, Williams, & Seigle, 2002).

One example of a social competence program for typically developing children is the Second Step program (Committee for Children, 1997), an in-class, manualized program presented by classroom teachers; the program is adjustable for three different age groups: early learning (preschool), elementary (Kindergarten to Grade 5), and middle school (Grades 6–8). Depending on participant age, the program is 22–28 weeks in length, with 20–40 min lessons. Across all age groups, participants are presented with four core units: skills for learning (listening, focusing attention, self-talk, being assertive), empathy (identifying feelings, showing care and compassion, helping others), emotion management (managing anxiety, disappointment, and anger), and problem-solving (playing fairly, thinking of solutions, taking responsibility). Specific content is adjusted for age and level of cognitive ability of participants, with attention to what would be developmentally appropriate or salient at a given age. For example, in the emotion management unit, preschoolers discuss managing waiting, while Grade 5 students address avoiding making assumptions. Additional units addressing bullying prevention, substance abuse prevention, and goal setting are added to the program beginning in Grade 6.

There is support for the broad benefit of social competence interventions for typically developing youth, across age groups. In a meta-analysis of 213 studies examining social competence interventions for typically developing children completed between 1955 and 2007, Durlak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) found that participation in interventions led to moderate improvement in social and emotional skills ($d = 0.57$), as rated by participants themselves, their parents, or their teachers, as well as small improvements in self-esteem and self-efficacy ($d = 0.23$) and small improvements in level of positive social behaviors such as cooperation with peers ($d = 0.24$; Durlak et al., 2011). In addition, participants showed a small reduction in conduct problems ($d = 0.22$) and reduced emotional distress ($d = 0.24$; Durlak et al., 2011). Intervention participation was also predictive of small improvements in academic performance ($d = 0.27$; Durlak et al., 2011). More recent studies replicate these results. Training in social competence has led to more positive social interactions with peers, as rated by children and their teachers, as well as improvements in self-esteem, decreases in internalizing and externalizing problems, and, for younger intervention participants, increases in social initiations and cooperative play (Holsen et al., 2008; Kimber et al., 2008; Stanton-Chapman et al., 2014).

While research supports the benefit of social competence programs, effect sizes are small. While social skills are a focus across childhood and adolescence, and emotion understanding and regulation, as well as cognitive-perspective, taking appear to be more of a focus after age 10, there is little emphasis on neuropsychological cognitive processes. These processes are important to consider given their role in learning (Milligan et al., 2015). In particular, executive functions are still under development throughout the childhood and adolescent periods, and social competence groups that tailor content and delivery to the specific level of EF within a class may be more successful in enhancing social competence. It is also important to recognize that universal programs may be associated with smaller effect sizes because many of the students may already possess appropriate levels of competence, leaving little room for improvement on outcome measures. Regardless, it may be beneficial to explore if pre-intervention EF (e.g., working memory, impulse control, flexibility) moderates the impact of social competence programs. If differences do exist, future research that informs tailoring of social competence program curriculum to support the development of these executive functions or accommodate for weaknesses in executive functions may impact on social competence may improve the strength of the observed effect.

Social Competence Interventions for Neurodevelopmental Disorders

The most common neurodevelopmental disorders for which social competence interventions have been developed are autism spectrum disorder (ASD), ADHD and LDs. Review of this literature suggests that both content and program delivery attend more explicitly to behavioral, cognitive, and emotional factors associated with social competence, with the specific focus depending on the central deficits associated with each disorder. For example, social deficits are central to the diagnosis of ASD. Children with ASD have difficulties experiencing and displaying empathy and engaging in reciprocal social interactions (APA, 2013). Often, these difficulties lead to a lack of behaviors necessary to build and maintain social interactions, such as maintaining eye contact, displaying engaged or welcoming body language, responding to direct or indirect social advances, and engaging in cooperative play and activities. Additionally, children with ASD can display restrictive and repetitive behaviors and interests—for example, repetitive motor movements such as hand flapping or obsession with cars—and tend to be inflexible regarding changes to established routines (APA, 2013). Such behaviors or obsessive interests can be seen as confusing, frightening, or off-putting by peers (Swaim & Morgan, 2001). Further, comorbid social anxiety is highly prevalent, affecting up to 84% of children with ASD (White et al., 2009) and further impairing children from engaging in social situations.

Review of the social competence programs designed for ASD suggests that both the content and the method of delivery take into account behavioral, cognitive, and emotional processes involved in learning and performing socially competent behavior. One exemplar intervention is the *Social Competence Enhancement Program* (SCEP; Cotugno, 2009) for elementary school-aged children with ASD. This 30-week (1 h/week) program focuses on.

eye contact and gaze sharing with others (behavioral), social initiations and social responding (behavioral), joint attention with others (cognitive-attention), and flexibility and transitioning between thoughts and activities (cognitive-executive functioning). Anxiety and stress management strategies, such as visualization and breathing (emotion regulation), are also integrated. Similar to other social competence programs, program delivery capitalizes on multiple instruction methods, including didactic instruction, discussion, modeling, and peer-based practice. However, it is adapted to the neuropsychological processing profiles of children with ASD, with particular attention to challenges with the executive function of cognitive flexibility. For example, (1) all sessions follow a strictly consistent outline in order to accommodate need for predictable routines, (2) acknowledge and anticipate transitional difficulty when changing activity to the next; setting aside time between tasks and providing transitional support, and (3) predictability is increased by pre-teaching activities and breaking them down into simpler steps.

A similar program, *Social Competence Intervention* (SCI; Stichter et al., 2010), was developed for children and adolescents with ASD and includes three separate curricula specified for children (ages 6–10), adolescents (ages 11–14), and high school students (ages 14–18). All programs are 10 weeks (1 h/week) in length and school based. The adolescent curriculum focuses on recognizing facial expressions, communication skills such as eye contact and nonverbal cues, turn-taking in conversation, recognizing emotions in oneself and others, stress and anxiety management, and problem-solving. As in *SCEP*, *SCI* is adapted to suit the needs of ASD participants, using small group sizes (maximum six participants/ group) to avoid overstimulation and minimize social anxiety and adhering to a strictly structured lesson format that always begins with the practice of acknowledging, greeting, and making eye contact with all participants. A study of 27 *SCI* participants showed that participation was associated with improvements in parent-rated social skills and executive functioning, and improved performance on measures of facial expression recognition and ToM (Stichter et al., 2010).

ADHD is associated with a different profile of neuropsychological cognitive challenge. Children often have difficulty remaining focused on the task at hand or understanding and sticking with difficult tasks or problems (e.g., playing a complex game, engaging in school group projects), which often impairs cooperative work and play with peers (Wehmeier, Schacht, & Barkley, 2010). Due to distractibility and/or hyperactivity, children with ADHD often have difficulty waiting their turn in conversation or acknowledging a peer's thoughts and ideas, which can hinder conversations or budding friendships (Wehmeier et al., 2010). Finally, children with ADHD may be prone to outbursts of frustration (APA, 2013), which may alienate peers.

Similar to ASD, the social competence interventions for ADHD for children 6–12 tailor the content and the delivery of the program to the behavioral, cognitive, and emotional processes of social competence. For example, the *Therapeutic Summer Day Camp for Children with ADHD* (Hantson et al., 2012) is a 2-week social skills training program offered in the milieu of a summer day camp that aims to increase understanding and labeling feelings, emotional self-control, and positive approaches to deal with anger and frustration (e.g., response to teasing and avoidance of verbal and physical confrontations). Specific skills addressed include introducing oneself (behavioral), joining social situations (behavioral), anger management (emotional), and using self-control (emotional/cognitive-executive functioning). Program delivery is tailored to provide a mix of active and calm activities in order to keep children engaged and introduce and practice skills across domains. Concurrent parent training is provided to support generalization to home (e.g., effective praise and rewards, providing a structured day schedule, building a positive parent-child relationship). Participation in the program has been shown to be associated with parent-rated improvements in peer relations, as well as behavioral and emotional problems (Hantson et al., 2012).

Meta-analyses examining the impact of social competence interventions for neurodevelopmental disorders suggest that the strength of the observed effect is small ($d = 0.199$, small effect size, Quinn, Kavale, Mathur, Rutherford, & Forness, 1999; PND = 69%, low or questionable effectiveness, Bellini, Peters, Benner, & Hopf, 2007). Despite multiple researchers noting the need for intervention programs to specifically cater to the neuropsychological deficits of a disorder (Cragar & Horvath, 2003; Rao, Beidel, & Murray, 2008), this appears to be inconsistently put into practice. While certain interventions may address the global deficits of the population they seek to serve (e.g., eye contact in children with ASD), most interventions do not take into account the specific needs of the subgroup attending the intervention, and how this subgroup's abilities and deficits may vary slightly from the disorder as a whole (Cragar & Horvath, 2003; Rao et al., 2008). Researchers propose that by tailoring interventions more specifically to the participants attending them, interventions may have a greater positive impact (Attwood, 2000; Rao et al., 2008).

The Integra Social ACES (Awareness, Competence, Engagement, Skills) Program is one program that aims to advance social competence in children with LDs by tailoring programming to individual strengths and needs in cognitive, emotional and behavioral processes that support social competence. The program will be outlined here as a model for social competence programming that successfully integrates emotional, cognitive, and processing facets of social competence.

Integra Social ACES Program: A Social Competence Intervention for LD

While we often think of LDs in the context of academic achievement, challenges experienced by children and adolescents extend beyond the classroom, with approximately 75% of students with LDs having lower levels of social competence than typically developing children, as assessed by teachers, peers, and children themselves (Forness & Kavale, 1996). Further, approximately 50% of children with LDs are rejected, neglected, or victimized by peers (Baumeister, Storch, & Geffken, 2008; Mishna, 2003), and many have impoverished and unstable friendships (Wiener & Schneider, 2002; Wiener & Sunohara, 1998).

While there is considerable current debate how LDs should be defined, we will use the consensus definition of the LDAO (2001), which defines LDs as a disorder that (1) affects how individuals acquire, understand, retain, or organize information; (2) resulting in specific rather than global deficits in individuals with average to above average intelligence; and (3) result from impairments in one or more psychological processes related to learning (e.g., language processing, visual-spatial skills, processing speed, memory, and attention).

Overview of Program

The Integra Social ACES (Awareness, Competence, Engagement and Skills) Program is a strength-based, client-centered, and experiential program intended to provide children and youth with LDs with a positive social experience and increase their social competence. Unlike many manualized social skills treatment programs, the Integra Social ACES Program tailors the curriculum to the child's and group's treatment goals and takes an individualized approach in terms of flexibility of content, therapeutic stance, and group matching (Integra Program, 2016). A key component of the Integra Social ACES Program is the tailoring of group activities to accommodate group participants' neuropsychological processing deficits. This is accomplished through careful group matching and informed by a review of each participant's learning profile (based on a comprehensive psychoeducational assessment).

Group Matching

Through a multisource assessment informed by the child's psychological assessment report, clinical observations of the child in an assessment group, as well as clinician and parent report, a child's learning profile, self-regulation, and emotion regulation skills, in addition to their baseline level of social competence, are taken into account. Children are categorized into group profiles on the basis of clinician ratings of social competence and emotion regulation, further delineated by age and gender, to ensure that children with compatible goals are placed together and to provide a framework for tailoring group activities and lessons (see Table 1).

Children are then matched carefully according to their individual treatment goals with consideration of each child's self-regulation and emotion regulation abilities and how these abilities may positively or negatively affect the group process and opportunities for learning for the children in the group. For example, a child who needs to work on basic social competence, such as turn-taking, eye contact, and basic conversational skills, may be placed with other children with similar social competence treatment goals. The level of self-regulation may help to determine the pacing and nature of the group activities. For instance, children with low levels of regulation may need a faster pace of activities and less talking and processing of the activities in order to sustain their attention and focus. Groups vary in size from three to eight children or youth and are matched according to age, developmental stage, and gender.

Group Content

One of the key features of the Integra Social ACES Program is that there is less of an emphasis on teaching social skills in a didactic manner. Rather, the program content largely consists of games and activities (e.g., tabletop games, drama activities, teamwork-based activities) that provide naturalistic and engaging opportunities for participants to practice their skills. Children learn from each other and facilitated and directly coached by adult facilitators. This encourages children to approach social situations that they may normally avoid and to learn to manage the associated emotion. In addition, the games and activities allow for "in the moment" teaching opportunities, group discussion of the skills learned to "real-world" situations, and direct modeling and coaching by the group facilitators.

Table 1 Group matching by social competence and emotion regulation

		Social competence		
		Low	Medium	High
Regulation	Low	Low social competence/ low regulation	Medium social competence/low regulation	High social competence/ low regulation
	High	Low social competence/ high regulation	Medium social competence/high regulation	High social competence/ high regulation

Sample Group Session: Skills, Information Processing Deficits, and Accommodations

Given that each child brings to the group a unique set of social competence strengths and needs across behavioral, cognitive, and emotional areas, treatment goals differ by group, and no two groups are structured in the same exact manner. However, the groups follow a general structure with the common elements of a form of check-in and a time for "snack and chat" at the end of the group. The specific group activities that make up the content of the group are based on several factors including, but not limited to, individual participant treatment goals, group treatment goals, stage of treatment, and progression toward goals. Decisions regarding the specific content of each group session also account for the participants' specific information processing deficits. For example, all group sessions begin with an overview of the group agenda, as well as a visual schedule to accommodate participants with memory difficulties, such that they know the plan for the group and can refer back to the schedule to know what is coming next. Providing a visual schedule also helps to support group members who struggle with transitions as they know what to expect and what is expected of them.

Group Check-In

Most group sessions begin with an active check-in or a feelings check-in as a way to ground and reconnect the participants since their last group session together. An active check-in involves having the group participants demonstrate a particular movement with their bodies, while the other group members mirror the movement. This type of check-in works best for children with self-regulation difficulties who would benefit from having an opportunity to release excess energy from their bodies, allowing them to experience improved self-regulation during the rest of the group. An active check-in also encourages the group to tune in to the participant leading the movement, which involves visual tracking and shifting one's attention to the participant, important skills in social interactions. For children with slower processing speed, group leaders will ensure that each child has an opportunity to engage in the movement by adjusting the pace of the check-in. A feelings check-in often involves having the participants discuss their current feeling state and briefly explain their choice to the group. Feelings check-ins are often adapted by having a visual component that includes a card with a picture of an animal and an associated feeling label (e.g., a bear is associated with irritable). This accommodation supports participants who may learn and express themselves best with visual rather than verbal information. Feelings check-ins promote emotional awareness and conversation skills, including visual tracking, sharing about oneself, the opportunity for group participants to ask follow-up questions, and opportunities to demonstrate empathy. Throughout a verbally based check-in, group leaders will scaffold for group members how to show good listening skills and how to ask follow-up questions to demonstrate appropriate listening skills and may provide direct feedback regarding making eye contact for participants who struggle with eye contact, for example.

The following content activities are examples of activities that could be used to target skills such as taking turns, compromising, and cooperation.

Squiggle Game

The Squiggle Game involves having the group members draw a simple squiggle on a piece of paper and passing the paper to someone else. The next group member will turn the squiggle into a drawing, while the original participant who drew the squiggle has to watch their squiggle transform into something new. The children who are not involved in drawing are encouraged to ask questions and show an interest in the drawing. For the child who is drawing, visual-motor integration difficulties may make this activity particularly challenging. To accommodate for visual-motor integration difficulties, group leaders may provide suggestions for how to turn the squiggle into a drawing or may subtly provide a concrete example to assist the child in visualizing a potential drawing. For the group member who originally drew the squiggle, executive functioning difficulties may impact on their ability to regulate their reaction and shift their expectations. Group leaders may provide verbal feedback to the group member who is having a hard time seeing their squiggle turned into something unexpected by labeling their feelings and praising them for regulating their emotional response.

Change the Room

In this activity, one group member will leave the room, while the remaining group members change three things about the room. The group member who left the room has a few guesses to figure out what is different upon re-entering the room. This game fosters compromise, negotiation skills, and cooperation and involves visual attention to detail. A common accommodation for the participant who is guessing which changes have been made is that the rest of the group members will indicate "hot" or "cold" if they are getting closer to the vicinity of the change. This accommodation is only provided with the permission of the guessing participant. Group members are instructed to discuss each change with one another and to ensure that all group members contribute and approve each change, thereby promoting the skills of negotiation, cooperation, and compromise. Children with executive functioning difficulties may struggle with the emphasis on compromise involved in this activity as a result of their difficulty shifting. To accommodate for this executive functioning difficulty, group leaders will have introduced the skill of compromising prior to this activity and provided them with opportunities to practice this skill. Group leaders will provide immediate and direct feedback during the negotiation part of this activity to support children who have executive functioning difficulties.

Snack and Chat

Each group session ends with "snack and chat," a structured time during which the group members are supported to practice their conversational skills while having a snack. Specific skills targeted during the snack and chat include asking on-topic questions, sharing about oneself, making on-topic comments to build on the conversation, and complimenting. Depending on the level of social competence of the group members, more or less scaffolding is provided by the group leaders during snack and chat. For example, a group with overall low levels of social competence may require more explicit direction, modeling, and coaching to practice asking questions of one another to keep the conversation going. Over time, group participants build their skills in this area with the highest level of social competence being a conversation that begins and is maintained with minimal facilitation on the part of the group leaders. In addition to explicit instruction on how to maintain conversation, as well as opportunities to role play these skills and practice them in a naturalistic context, group leaders will accommodate for memory difficulties, slow processing speed, and executive function difficulties by moderating the pace of the conversation, providing scaffolding to group members, and adjusting their tailored feedback according to the group member's level of difficulty with the skill. See Table 2 for a summary of the skills targeted related to the activity, the information processing deficits that may interfere with the activity, and the accommodations that are often provided in the Social ACES Program.

Another key component of the Social ACES Program is its focus on self-regulation and emotion regulation, and how these affect the acquisition and development of social skills. Children with self-regulation difficulties may struggle with monitoring and controlling their energy level, maintaining focused attention during social interactions, or providing conversational space for others to participate, for example. A child's regulation may significantly impact their ability to actively participate in group process and may impact their social interactions. Due to difficulties with self-regulation, a child's ability to attend to and follow conversation may be affected. For children who have some social competence yet who struggle with self-regulation, their difficulties may impede performance of their social skills. Often, a focus of intervention for these children is on improved awareness of self and others, as well as monitoring their self-regulation.

Table 2 Sample activity and associated skills and neuropsychological cognitive processes and accommodations

Activity	Skills targeted	Neuropsychological cognitive processes involved	Accommodations
Feelings check-in	• Emotional awareness • Conversation skills	• Language processing • Visual-spatial processing • Processing speed	• Modeling from group leaders (sharing their internal feeling state as well as asking follow-up questions to engage others in conversation) • Visual images to represent and match feelings listed on cards • Allowing enough time for group members to respond (i.e., group leaders moderate pace of turn-taking)
Squiggle game	• Communication • Creativity • Expression through art • Adapting to change and compromising	• Language processing • Executive functioning (e.g., shifting) • Visual-motor integration skills	• Visual activity for children who may have difficulty with language-based activities • Scaffolding by group leaders to support group members to “let it go”/adapt to unexpected changes • Repetition of instructions related to activity provided to group members • Check-in with group members to ensure their understanding • Extra time (related to visual-motor integration difficulties)
Change the room	• Negotiation • Compromise • Cooperation	• Language processing • Processing speed • Executive functioning • Memory • Attention • ToM	• Scaffolding by group leader to support group members to ask each other questions and tune in to others • Ensuring that each group has a chance to contribute their ideas • Group leaders ensuring enough time for group member who is guessing the changes • Repetition of rules to reduce memory demands • Didactic lesson on what it means to compromise
Snack and chat	• Conversation skills, including asking on-topic questions • Sharing about oneself • Making on-topic comments to build on the conversation • Complimenting	• Language processing • Processing speed • Memory • Attention • Executive functioning skills	• Didactic lesson related to how to keep a conversation going • Role plays to allow group participants to practice the skills • Modeling from group leaders • Scaffolding (i.e., group leader asks, “does anyone have any questions about that?”)

Similarly, for children with higher levels of social competence and low levels of self-regulation, a focus of intervention is on improving their awareness of the impact of their actions on others and reducing silliness. To address difficulties with self-regulation, the Social ACES Program uses a tool called the silly-serious scale. The goal of introducing the silly-serious scale is such that group members will learn that different activities and situations require different levels of silliness or seriousness and develop the skills to self-monitor and adjust their behavioral output accordingly. In introducing the silly-serious scale, group leaders will elicit from the group participants what are acceptable energy levels for particular activities (e.g., watching television requires a relatively calm energy level, while playing outside at recess can involve more silliness and less regulation). Once this tool has been introduced in the context of a group, it is referred to throughout the group so that the group participants gradually build their awareness related to their energy level and its impact on others.

In addition to difficulties with behavioral self-regulation, children with LDs often have difficulty managing and regulating emotional reactivity due to their executive functioning deficits. Their difficulties with emotion regulation may impact them socially as they are more likely to struggle with managing their reactions to others and perspective-taking, for example. The Social ACES Program pays particular attention to children who demonstrate rigidity and low frustration tolerance as these characteristics can significantly impact on a child's ability to engage in and benefit from the intervention. For example, children who exhibit extreme rigidity regarding rules of a game or the concept of fairness will benefit most from opportunities to interact with peers who model flexibility and who will be tolerant of the group member's rigidity.

Evaluation research of the Integra Social ACES programs attests to its promise in enhancing the social skills of children with LDs and co-occurring mental health issues (Milligan et al., 2016). The program was associated with significant gains in initiation and engagement in positive social interactions, foundational skills that support improvement in social competence. Effect sizes ranged from $d = 0.40–0.59$, which reflects larger effects than seen in previous research (Quinn et al., 1999) and effects that approach or are medium in strength. Qualitative interviews with parents, children, and teachers suggested improvements in social self-concept, initiation, and emotion regulation. Tailoring treatment to the child's information processing and emotion regulation abilities, as well as "in the moment" feedback, was reported to support gains made and contributed to participants having a positive social experience.

Conclusion

This chapter highlights the complexity of social competence, both in terms of its development, as well as its enactment. We have provided a possible framework for understanding the interaction of behavioral, cognitive, and emotional factors in social competence. Review of the extant literature suggests that cognitive and emotional factors are not consistently attended to in the curriculum or delivery of social competence interventions and that differences in targeting these factors may depend, at least in part, on the age and clinical characteristics of the group the intervention is designed for. Effect sizes for social competence are small. It is possible that attending to behavioral, cognitive, and emotional factors in our interventions, with flexibility to individualize to participants in groups (as is done in the Integra Social ACES program), may enhance the effectiveness of our social competence interventions.

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Observational Methods

Susan M. Vener, Alison M. Wichnick-Gillis,
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We all engage in social interactions throughout the course of a day. Much of our verbal and nonverbal behavior is learned and results in either a welcome or unwelcome response during social exchanges. Whether we are at work or in the park with a friend, a person who is socially skillful is able to navigate through an interpersonal interaction and access pleasant consequences. A verbal initiation might result in a smile from a conversation recipient. A correct response to a question might result in social praise from a professor. Conversely, a young girl walking with her head down when entering a room might not be met with a social greeting. A young man with poor interviewing skills might not be offered a job.

Although there is no universally agreed upon set of responses that are used to define socially skillful behavior (Boisjoli & Matson, 2009), there are several important components of skillful behavior. For example, attention to basic elements of physical appearance, such as grooming, might facilitate social interaction. The ability to initiate and maintain informal conversations, to ask questions, to engage in eye contact during verbal exchange, to maintain appropriate affect and intonation, and to remain on topic are some of the crucial components of social behavior. Voice intensity, duration of verbal response, body language, and listening all impact social behavior.

Social skills deficits and excesses have been correlated with many difficulties later in life, including substance abuse (Green et al., 1999, as cited in Matson, 2009), depression (Sato, Ishikawa, Arai, & Sakano, 2005, as cited in Matson, 2009), aggression (Dodge et al., 2003), and delinquency in adulthood (Roff & Wirt, 1984, as cited in Matson, 2009). Social difficulties can also lead to peer rejection (Dodge et al., 2003), poor academic functioning (Elliott, Sheridan, & Gresham, 1989), and long-term deficits in social problem-solving skills (Yeates et al., 2007). As a result, it is important that disruption in social function be assessed and targeted for intervention.

Assessments measuring social behavior serve several important functions. They allow for a detailed description and identification of an individual's strengths and weaknesses. Identifying the specific responses, dimensions, and environmental conditions involved in the problem enables one to set a course for treatment. Assessments are also used to predict a later outcome, to determine the

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amount of intervention needed, and to classify or diagnose an individual. The latter enables the individual to access the needed intervention services, to access financial remuneration for the services rendered, and to receive information regarding progress given the particular intervention implemented (Merrell & Gimpel, 2014). In addition, they may also be used to better understand the relationship between two or more factors such as length of utterances during a social exchange and eye contact. If an assessment tool is used to evaluate progress given a particular intervention, the quality of the response is important. If the assessment is used to accurately diagnose a condition, classification becomes important (Cordier et al., 2015; Wade, 2004).

Assessments measuring social functioning in children are often questionnaires presented in paper-and-pencil format. Although they often rely on child self-report, some rely on peer, parent, and teacher reports. Self-reports alone have been found to result in low correlations with other assessments, can be affected by social pressure, and rely on a child's ability to comply with directions (Frankel & Feinberg, 2002, as cited in Crowe, Beauchamp, Catroppa, & Anderson, 2011). Crowe et al. (2011) stated that one-time parent reports rely on the parent's awareness and willingness to identity deficits in their child's social function in comparison to other children. A teacher report, in conjunction with a parent report, can provide essential information. Multiple informants can provide information regarding child performance in a variety of environments across peer groups (Merrell, 2001).

Another assessment tool is behavioral observation. Although observation allows for the direct and objective measurement of behavior, there can be concerns with the accuracy, reliability, and validity of the data collected.

The purpose of this chapter is to identify various assessment strategies that have been used to assess social behavior and to discuss their strengths and limitations. The strategies that will be discussed include direct behavioral observation and indirect assessments, such as interview methods, sociometric techniques, self-reports, and use of behavior rating scales.

Direct Observation of Behavior

Direct observation requires that an observer develop an operational definition of the targeted behavior, observe child behavior, and systematically record the behavior. An advantage of direct observation is that it allows an observer to obtain information about behavior as it occurs in an interactive environment (Whitcomb & Merrell, 2013). Information about the conditions in the environment that may evoke and maintain problem behavior enables the development of intervention plans. For example, loud noises in a lunchroom may result in social behavior that is different from social behavior that occurs in a quite kitchen. Interaction skills in the presence of a less preferred teacher may be quite different than those in the presence of a highly preferred adult. An assessment that examines behavior in the environment within which it occurs is referred to as an "ecological assessment" (Whitcomb & Merrell, 2013). Nevertheless, according to Cordier et al. (2015), there has been limited research on the influence of external factors on a person's social functioning.

Although direct observation relies on empirical data and minimizes the need for making qualitative inferences (Merrell & Gimpel, 2014), one must be alert to the accuracy, reliability, and validity of behavioral observation data obtained. The operational definition itself largely impacts the behavioral data collected. A broadly defined response might result in observational data that are quite different from a response that is narrowly defined. For example, engaging in eye contact during an interaction can be broadly defined as looking at the conversation recipient's face for a minimum of 2 s during the verbal exchange. A more narrowly defined response might include standing within 3 ft. of the conversation recipient, orienting one's head toward the conversation partner throughout the conversation, and looking at the recipient's face for a minimum of 2 s during the exchange. The more narrowly defined response would likely result in fewer occurrences of the target behavior.

One concern that does exist regarding direct observation is known as observer drift, the tendency for the observer to gradually drift from the originally agreed upon definition (Kazdin, 1981, as cited in Merrell & Gimpel, 2014). For example, a verbal initiation that would have previously been scored as inarticulate might later be scored as clearly articulated as the observer becomes more familiar with the child's speech pattern.

Another concern is known as observer reactivity and occurs when the child's behavior changes in the presence of the observer (Merrell & Gimpel, 2014). In 1982, Haynes and Horn (as cited in Mayer, Sulzer-Azaroff, & Wallace, 2012) identified a number of ways to minimize reactive effects, such as observing covertly (e.g., using a golf counter to tally behavior), minimizing the obtrusiveness of the observers and data collection stimuli, minimizing interactions between the observers and the subjects, and allowing children time to adapt to the presence of the observers before formal observations begin.

A different concern is that without knowing how other children might react in a similar social situation, it can be quite challenging to interpret the observational data collected. How many initiations should the child emit? What is the appropriate body language? To address this concern, it would be helpful to collect social comparison data and to compare the data collected with that of peers in the same environment (Merrell & Gimpel, 2014). Such data would enable inferences to be made about whether behavioral excesses or deficiencies are present. If deficiencies or excesses are identified, intervention can be planned.

Merrell (2001) added the following four concerns when conducting direct behavioral observations. First, he stated that direct behavioral observation requires extensive time and preparation. Second, behavior might not be adequately recorded. Inappropriate conclusions might be reached. Third, biased expectations might influence recording. And lastly, the number of observations needed to make useful conclusions needs to be considered. The reactivity of social behavior indicates a need for multiple observations to obtain meaningful information.

Subjective perception was raised as an issue by Dirks, Treat, and Weersing (2007). They raised some interesting concerns regarding observer perceptions of social behavior. Two different observers might disagree on the appropriateness of the same behavior. Different perceptions within the same social context can lead to different interventions.

Dirks et al. (2007) also stated that people are not equally socially skillful across situations. Children have demonstrated different levels of competencies in different situations. In a study by Dodge, Cole, and Brakke (1982) (as cited in Dirks et al., 2007), "popular" children were more likely to initiate interactions toward peers in the playground and less likely to initiate similar interactions in the classroom. The authors concluded that social skillfulness is not exclusively a property of the behavior or the person, but rather relies on interactions within the situation in which the person is behaving (Dirks et al., 2007).

Matson (2009) discussed the need to consider whether a disruption in social function is a result of skill deficits or situational variables. Are the needed social responses not in the child's repertoire? Or does the child have the needed skills, but does not display them in the social situation? If a child does not have the social skills needed to manage a social interaction, components of social behavior are taught. If a child has the needed social skills, but does not display them, then the course for treatment might be quite different. For example, for a child who has the skills to engage in conversation, yet is not displaying the skill while at the lunch table with peers, it might be appropriate to create a motivational system that will reinforce verbal exchanges.

Although difficult to interpret, direct observational data can provide useful information to determine social skills deficits or excesses. Behavior can be recorded in its natural environment (naturalistic observations) or in an environment designed to simulate the conditions in the natural environment (analogue observations). Similarly, behavior can be measured by the child himself or herself (self-monitoring) or by an observer.

Naturalistic Observation

Perhaps the most efficient way to assess social behavior is to do so in the environment within which it occurs. According to Jones, Reid, and Patterson in 1979 (as cited in Whitcomb & Merrell, 2013), naturalistic observation involves (a) observation and recording of the behavior in the natural environment at the time of occurrence, (b) trained observers, and (c) an operational definition of the targeted behavior. Observations in the student's classroom, cafeteria, or playground allow for ongoing opportunities for unobtrusive data collection within a peer group.

Analogue Observation

An analogue observation occurs in an environment that simulates the natural environment in which the behavior of concern is likely to occur (Hintze, Stoner, & Bull, 2000, as cited in Whitcomb & Merrell, 2013). For example, a child who displays difficulty engaging in conversation about a topic of interest to a sibling may be presented with multiple opportunities to engage in similar social exchanges in the classroom with a peer. In this instance, the analogue situation would be designed to evoke brief verbal exchanges similar to those that might occur at home.

Although quite useful in creating real-life situations that are controlled and can be carefully manipulated, analogue observations make the assumption that the behavior observed in the simulated environment will be similar to the behavior observed in a naturalistic situation. To increase the likelihood that behavioral changes acquired in the simulated environment will generalize to the naturalistic situation, Stokes and Baer (1977) suggest (a) introducing naturally maintaining contingencies into the contrived situation (e.g., accessing a smile during a social exchange), (b) training sufficient exemplars (e.g., engaging in conversations with multiple peers/instructors in an effort to increase conversation with mom during dinner), (c) training loosely (e.g., leaving free to vary the stimuli presented and the correct responses allowed), (d) using indiscriminable contingencies (e.g., using an intermittent schedule of reinforcement), and (e) programming common stimuli (e.g., arranging an analogue situation in a pizzeria with a classmate).

Role-Play

Role-play assessments occur when the observer is presented with a sample situation and is instructed to react as if it were actually occurring (Matson, 2009). Such assessments enable a child's decision-making and interpersonal communication skills to be evaluated. Behavior such as eye contact, facial expression, voice volume, and number of words spoken can be recorded (Matson & Ollendick, 1988, as cited in Matson, 2009).

Although used to assess social behavior, role-play assessments have been found to have relatively poor validity (Matson, Esveldt-Dawson, & Kazdin, 1983, as cited in Matson, 2009). Nevertheless, in a study conducted by Leaf et al. (2016), a multiple-baseline experimental design was used to assess the effects of role-play in addition to a discrimination program to teach three young children with autism to engage in social communication skills. The role-play task required the investigator to demonstrate the target behavior appropriately two times and inappropriately two times. The discrimination task required the child to verbally discriminate whether the demonstration was appropriate or inappropriate. As part of the intervention package, the child was then asked to role-play a similar scenario that was likely to occur in a naturalistic situation. The authors identified one component of social behavior that was in need of improvement for each participant. For example, for Sally, the target response was to "chat" with a friend while watching a short YouTube© video. The results of the study showed that role-play, in addition to the discrimination-training program, was effective in improving social communication skills across all three participants.

Self-Monitoring

Self-monitoring occurs when the child observes his or her own behavior and records the occurrence or nonoccurrence of the target social behavior. Due to the reactive effect of the procedure, self-monitoring itself has been found to produce change in behavior in the desired direction

(Cooper, Heron, & Heward, 2007). If the child perceives that a response is desirable or undesirable, that response will tend to increase or decrease accordingly (Kanfer, 1970; Kazdin, 1974). For example, classroom teachers used self-monitoring to increase their use of positive statements during a class lesson (Silvestri, 2004, as cited in Cooper et al., 2007). Similarly, in a study by Broden, Hall, and Mitts in 1971 (as cited in Cooper et al., 2007), a self-monitoring procedure was useful in reducing the number of times an eighth-grade student talked out in class. Although self-monitoring can result in favorable outcomes, reinforcement contingencies to maintain desired outcomes may be necessary. Nevertheless, the effects of self-monitoring may be temporary (Ballard & Glynn, 1975; Critchfield & Vargas, 1991).

In addition to the desirability of the social response, additional parameters that might also contribute to the reactive effects of self-monitoring include (a) the feedback a child receives from observing his or her own behavior (Kazdin, 1974); (b) the timing of self-recording, that is, whether recording occurs prior to, during, or following a target response (Bellack, Rozensky, & Schwartz, 1974; Cavior & Marabotto, 1976; Kanfer, 1970); (c) the obtrusiveness of the recording device (Kazdin, 1979; Kirby, Fowler, & Baer, 1991; Nelson, Lipinski, & Boykin, 1978); and (d) the performance standard to which an individual adheres. A child who self-monitors may show greater behavior change when working toward a specific level of performance rather than merely recording responses with no clear goal (Kazdin, 1974).

Self-monitoring has also been shown to be useful in that it enables an individual to record private events such as thoughts and physiological changes, in addition to overt behavior. The reactive effects of the self-monitoring strategy result in concerns for both the reliability and validity of the measures obtained. To address these problems, one can (a) provide training on how to collect data, (b) use formal observation data sheets, (c) simplify the self-monitoring procedures, (d) conduct frequent interobserver agreement checks, and (e) reinforce reliable and valid self-monitoring responses (Whitcomb & Merrell, 2013).

Functional Behavior Assessment

The information gathered through direct observation can be used to guide the development of an intervention plan for social behavior. There are times, however, when a plan may be unsuccessful in modifying behavior and, perhaps, the true functions of the behavior are not being addressed. In such cases, it might be beneficial to conduct a functional behavior assessment (FBA). An FBA is a direct observational method that helps to explain the function of behavior. This method provides information on the consequences of the behavior or what causes the behavior to endure over time (Mayer et al., 2012). By identifying the reinforcers for a given response, one can then develop a treatment plan that alters the contingencies and incorporates those reinforcers to decrease undesirable behavior and to increase desirable behavior (Cooper et al., 2007).

One of the initial stages of an FBA is the direct observation of the behavior. This is typically conducted in the natural setting in which the behavior occurs, such as in school or at home, but it can also be conducted in a contrived or analogue situation. During this initial observation, one may gather information on the frequency of the behavior, the setting in which the behavior occurs, the intensity of the behavior, antecedents and consequences of the behavior, and duration of the behavior. After this information has been collected, it can be used to help formulate a hypothesis about the function of the behavior. Subsequently, an intervention plan can be created that incorporates the presumed function of the behavior (Whitcomb & Merrell, 2013).

An FBA helps to determine the source of reinforcement maintaining behavior. The source of reinforcement may exist in several forms, under the main umbrellas of positive and negative reinforcement. One possible source of positive reinforcement includes social attention. Positive social attention may include certain facial expressions, head turning, reprimands, or attempts to soothe or distract. In a study by Christensen, Young, and Marchant (2004), a functional assessment revealed that social attention had maintained inappropriate social behavior (e.g., disrupting the class, seeking peer attention, off-task behavior) of two 8-year-old boys in an elementary school for typically developing students. The authors used this reinforcer to then increase the likelihood of appropriate classroom behavior, such as attending to the teacher, raising hands, and complying with directions.

Access to tangible stimuli is another form of positive reinforcement, whereby a given response leads to a child obtaining desired or preferred materials. In a study by Richman, Wacker, and Winborn (2001), a functional analysis of aggressive behavior in a young child revealed that the behavior was maintained by access to preferred toys. This information was then used to implement a treatment plan in which toys were provided contingently upon the child's use of an appropriate request for the toys.

Automatic reinforcement is another possible contingency maintaining behavior. Behavior maintained by automatic reinforcers does not rely upon other people, but instead produces its own reinforcement. This function of behavior is an assumption made when social reinforcers have been eliminated as the source of reinforcement (Cooper et al., 2007). Roscoe, Iwata, and Zhou (2013) conducted a functional assessment of hand mouthing in individuals with intellectual disabilities. The results of the analysis indicated that hand mouthing was maintained by automatic reinforcement. With these findings, the authors were able to introduce a treatment package that successfully decreased the likelihood of this response.

Behavior also may be maintained by negative reinforcement contingencies. One possible source of negative reinforcement is the escape or avoidance of undesirable or aversive situations. This may include escape from social interactions. Harper, Iwata, and Camp (2013) conducted functional assessments with four individuals with intellectual disabilities. The subjects were included for their aggressive behavior, which tended to occur during play and demand conditions. It was concluded that the function of the aggressive behavior was to escape the social demands. With this information, the authors were able to develop a treatment plan that incorporated this function to decrease the future likelihood of aggressive behavior and to increase the likelihood of appropriate social behavior (Harper et al., 2013).

The functional assessment of behavior is a powerful instrument that can greatly influence the formation of a treatment plan. Although each analysis is tailored according to the individual, their behavior, and the context in which the behavior occurs, Hanley, Iwata, and McCord (2003) have provided several general guidelines for conducting an assessment. Some of the guidelines include focusing on one or a few responses at a time, programming consequences for the target response, limiting the amount of session time to about 10 min, and incorporating the use of other sources of information when conducting the assessment, such as observations and interviews. It is also important to consider and to weigh out the benefits and potential risks or dangers of conducting a functional assessment.

Functional assessments are frequently used in hospitals and other settings in which the learner is not available for treatment on a daily basis for long periods of time. In a school setting, for example, it may be less important to spend a week or more to conduct a formal assessment of a learner's current reinforcer preferences and the current functions of behavior, when one can often provide training from day 1 to establish new preferences and functional relations within the same time frame. For example, often one can use pairing operations to teach preferences for more appropriate reinforcers within a week or 2.

Recording Procedures

Now that we have identified different ways to observe social behavior, we need to identify different ways to record the behavior observed. There are four types of recording procedures that will be discussed: frequency recording; time sampling, including whole-interval recording, partial-interval recording, and momentary time sampling; duration recording; and latency recording.

Frequency Recording

Frequency recording requires a tally of the number of times that a response occurs within a specified observation session (Gast & Ledford, 2014). Frequency recording is most efficient when assessing behavior that has a discrete beginning and ending. It is also important that the behavior lasts approximately the same amount of time each time it occurs (Merrell & Gimpel, 2014). Otherwise, the data collected might be misleading. For example, if an observer is measuring tantrum behavior and the behavior occurs three times on the first day and once the following day, the data might suggest a decrease in behavior. Nevertheless, the three occurrences on the first day might have been brief in duration, whereas the behavior on the second day might have lasted an hour. It is also important that the behavior does not occur too frequently such that it is difficult to identify the end of one occurrence and the beginning of the next (Cooper et al., 2007). Furthermore, the behavior must not occur so rapidly that the observer loses count (Mayer et al., 2012).

The challenge with frequency recording is that a tally of behavior does not provide any information about the temporal occurrences of the behavior (Gast & Ledford, 2014). Nevertheless, one might record the order in which the behavior occurs and indicate the events preceding (antecedents) and the events following (consequences) the recorded behavior.

Continuous observation and recording of the target behavior can provide important information about the child's social behavior in the environment within which it occurs. Continuous measurement involves a report of all instances of the target behavior during an observation session (Johnston & Pennypacker, 1993a, as cited in Cooper et al., 2007). For example, it can be possible to count the number of times a child initiates toward his peers during a 30-min recess, usually referred to as rate per minute. Nevertheless, it might not be practical to count the number of times that the child initiates toward his peers throughout the school day. Discontinuous measurement involves measurement in which some instances of the target response might not be observed and recorded (Cooper et al., 2007). For example, an observer can observe the occurrence or nonoccurrence of the target behavior during a 15-min time interval during recess, a 15-min interval during lunch, and a 15-min interval during homeroom.

Whole-Interval and Partial-Interval Recording

Some behavior tends not to be discrete, but rather continuous (e.g., eye contact, posture, voice volume, intonation) (Mayer et al., 2012). Identifying when a response ends and another begins might be quite challenging. In these instances, interval recording would be appropriate. Interval recording involves dividing the observation session into time intervals and recording the presence or absence of the target behavior within each interval (Cooper et al., 2007). Unlike frequency recording, with interval recording, there is an indication of when the behavior occurred. Whole-interval recording involves recording whether the behavior occurred throughout the entire interval (Gast & Ledford, 2014). Responses that are continuous and conducive to this measurement procedure might include walking in the park with a friend, playing with a peer, or sitting on a chair during a movie. Nonverbal measures that are also continuous, such as eye contact or posture, would be quite challenging to observe using a whole-interval recording system. These nonverbal measures would require continuous observation on the part of the observer throughout the interval. Similarly, low-frequency behavior such as arguing with a friend and tantrum behavior might require long observation sessions, such as an entire school day, in order to be observed. Continuous observation in these situations would not be practical.

Partial-interval recording involves the recording of behavior if it occurs at any time during the specified interval (Gast & Ledford, 2014). Data collection of non-discrete behavior that might be fleeting (e.g., smiling, laughing, cheering) and/or low-frequency behavior such as tantrum behavior would also be possible using a partial-interval recording system. An observer would score the behavior as having occurred, regardless of how long or how often it occurred within the interval. If the intervals are long enough, an observer can measure the presence of multiple responses.

Momentary Time Sampling

Momentary time sampling involves recording the presence or absence of the behavior at the end of the interval at a moment in time (Gast & Ledford, 2014). Unlike interval recording, momentary time sampling does not require continuous observation. Nonverbal components of social behavior such as engagement in an activity and posture could be measured in this manner. Nevertheless, it is important to note that because behavior is observed for only a moment in time, much behavior will be missed. As a result, it is not recommended that low-frequency, short duration behavior be recorded using this recording method (Saudargas & Zanolli, 1990, as cited in Cooper et al., 2007).

Duration

If one is interested in measuring the length of time that a behavior occurs from start to finish, duration is an appropriate dependent measure (Merrell & Gimpel, 2014). One might measure the duration of time that a child is riding a bicycle or walking on a treadmill in gym class.

Response Latency

Response latency refers to the time elapsed between the onset of a stimulus and the beginning of a subsequent response (Cooper et al., 2007). The amount of time it takes for the response to begin is critical in this observation (Merrell & Gimpel, 2014). For example, following the instruction to stand on line, the critical aspect is the amount of time it takes the child to engage in the behavior.

Indirect Assessments

There may be times when it is not possible to directly observe the behavior of the child of interest or when one may be interested in gathering information prior to direct observation. In these cases, an indirect assessment may be used. During an indirect assessment, one does not directly observe the behavior, but may collect information through interviews, sociometric measures, or self-report measures. These may be completed by parents, siblings, teachers, peers, or other people who are familiar with the child. Across these different assessments, information is provided on the environmental conditions surrounding the behavior, such as the antecedent events and the consequences of behavior. This information helps to provide more details on the child's behavior that may not be observable during a direct assessment. Indirect assessments are relatively easy to implement, are not risky or invasive in the child's environment, and may provide some valuable information. Nevertheless, in general, indirect assessments also have their disadvantages, including the subjectivity and unreliability of the content provided. For these reasons, direct measure is preferable in terms of assessing behavior, and indirect measures should be used only as an initial step in the process (Mayer et al., 2012).

Interviewing Techniques

Interviews are a form of assessment that can be conducted with the child of interest or with people familiar with the child. Interviews provide some initial information to help guide an assessment. In the absence of a structured interview that can be widely used to assess social behavior, one must rely upon a loosely structured format when conducting an interview (Whitcomb & Merrell, 2013).

When conducting interviews with children, there are several factors that could influence the quality and extent of information obtained. First, one must take the child's age into account. Typically, the younger a child is, the greater the likelihood that information reported may not be accurate or may be affected due to limited language and verbal skills (Whitcomb & Merrell, 2013).

In terms of social behavior, an interview is likely to include questions pertaining to *what* and *when* information in the child's environment, rather than questions of *why*. Questions of *why* encourage the interviewee to make inferences and may not be useful as reliable or valid information. An interview also may include a survey or questionnaire or may even ask the child to self-monitor their own behavior. Interviews help to identify the variables surrounding a given response and help to provide information on how to plan intervention (Cooper et al., 2007).

At times, it may not be possible to interview the child of interest, or one may want information from those familiar with the child to get a more detailed picture of the social behavior. In this case, one may choose to interview the child's parents, family members, or teachers. Those familiar with the child may be asked to describe the child's social skills and to provide specific information on the events surrounding certain behavior. Interviews with significant others not only help to provide information in terms of developing an intervention plan, but they also can help to determine the likelihood that these people may be willing to be a part of the intervention plan and help to change the child's social behavior. This support may be needed for the success of the child's behavior plan (Cooper et al., 2007).

Although interviews can provide some valuable information, it can be difficult to assess social skills through an interview because information gathered is subjective and may not be a valid report on the child's behavior.

Sociometric Techniques

Sociometric techniques are also used to assess social behavior. These techniques allow for information to be obtained from children within the social context. Peer participants, as opposed to an outside observer, are asked to observe and record behavior. Data are obtained on measures of "social status" within the group. Qualities such as popularity, peer rejection, peer acceptance, leadership ability, athletic ability, academic abilities, social awkwardness, and aggressiveness can be measured (Merrell & Gimpel, 2014).

The quality of social interactions, and the difficulties that children may have with peer relationships, may have a large impact on adjustment in later life. A child's ability to interact with peers enables that child to (a) build friendships and (b) develop social interaction skills that are useful in other situations (Whitcomb & Merrell, 2013).

This next section concerns the following sociometric procedures used to assess social behavior: (a) peer nomination procedures, (b) peer rating procedures, (c) sociometric ranking procedures, (d) picture sociometrics, (e) "guess who" procedures, (f) the class play, and (g) alternative sociometric procedures.

Peer Nomination

The peer nomination strategy was first introduced in 1934 by Moreno (as cited in Merrell & Gimpel, 2014). Group participants are instructed to nominate peers that can best fit specific positive and negative behavioral characteristics. For example, participants are asked to identify classmates that they would most like to play with, to eat lunch with, or to work with on a project. Participants might be instructed to either (a) write the names of classmates on blank lines for each item or (b) place an "x" under the names of the students who are to be nominated. When the assessment is completed, the number of times each name appears is counted. The overall results can be confidential, and the findings quite interesting. Children can be classified as frequently nominated, infrequently nominated, never nominated, or mutually nominated (e.g., child 1 selects child 2 and child 2 selects child 1). Similarly, preference regarding gender choices can be investigated, and "cliques" can be identified (e.g., children nominated each other within a group) (Merrell & Gimpel, 2014).

Peer Rating Procedures

The peer rating procedure requires that each member of a group assign a rating to every other member in the group. For example, when asked the question "Would you like to play with this child?," a rating from 1 to 5, 1 being the lowest and 5 being the highest, is assigned to each member. An average of all the ratings he or she receives is calculated to determine each child's score (Whitcomb & Merrell, 2013).

Sociometric Ranking Procedures

Although the objective of sociometrics is to obtain data from within the social group, the task of making social discriminations might be challenging for young children and children with varying degrees of social and intellectual impairment. As a result, variations in procedure might be needed. The sociometric ranking procedure provides information on a child's social status and peer relations using information provided by an adult outside of the social context. One way to obtain data on sociometric measures from an outside observer is to ask the teacher to rank each child in the classroom according to some criteria (e.g., a child's popularity in the class). A second way to obtain similar data is to identify a subgroup of children within a social context that fit a particular description (e.g., children that are "shy") and rank the children according to severity with the subgroup (Whitcomb & Merrell, 2013).

Picture Sociometrics

Picture sociometrics is similar to peer nomination with the exception that photographs are presented to the child. Each child is presented with photographs of each child within the class. Questions are asked, and the child is instructed to either point to or obtain a photograph. Questions such as "Who is your best friend?" and 'Who do you like to play with most?" are examples of questions that can be asked. This strategy has been found to be useful when obtaining information from young children who are not yet proficient readers. Following a series of questions, the number of times each name appears is counted and is tallied, and inferences regarding "social status" (e.g., social acceptance and social rejection) can be made (Whitcomb & Merrell, 2013).

The literature has suggested that this assessment technique has high interrater reliability, high short-term test-retest reliability, and adequate long-term test-retest reliability (Milich & Landau, 1984, as cited in Merrell & Gimpel, 2014). Milich and Landau (1984) have also found picture sociometric assessments to result in clear discriminations between groups of aggressive, aggressive-withdrawn, and "typical" boys (as cited in Merrell & Gimpel, 2014).

"Guess who" Measures

The "guess who" technique requires that the child respond to questions such as "Guess who fights with other children?" and "Guess who has so many friends?" When all questions have been asked, findings are often summarized by tallying counts from each question. This assessment strategy has been found to be easy to administrate and simple to score (Whitcomb & Merrell, 2013).

The Class Play

The class play technique involves having children pretend to direct an imaginary play and to assign their classmates to roles in the play. Roles are either intended to be positive (e.g., a child who plays in the park with a classmate) or negative (e.g., a child who reads a book during recess). For a given child, one score was achieved by dividing the number of negative roles by the total number of negative plus positive roles given to the child. High percentages are intended to be indicative of a high degree of peer rejection. Low percentages are intended to be indicative of a low degree of peer rejection (Merrell & Gimpel, 2014).

The class play procedure is viewed as positive for the following two reasons. First, children appear to enjoy assigning classmates to roles and participating in pretend play. And second, teachers appear to be more receptive to having children participate in this type of an assessment than some other types of sociometic procedures (Merrell & Gimpel, 2014).

Limitations of Sociometric Procedures

Whitcomb and Merrell (2013) encourage professionals using sociometric strategies to carefully attend to potential racial, ethnic, and/or gender bias that might exist. Similarities among peers greatly effect peer nominations and ratings. For example, girls are more likely to nominate girls, and boys are more likely to nominate boys. Singleton and Asher (1977) found that black children were more likely to select black children when identifying peers to play with, and white children were more likely to select white children. In 1989, Kistner and Gatlin (as cited in Whitcomb & Merrell, 2013) found that both black and white children were more likely to reject children of the opposite gender.

Similarly, although sociometric procedures leave children with specific labels (e.g., "a good leader," "often left out," "often struggles"), the specific dimensions of behavior that earned these labels are unclear. When creating an intervention strategy, it is uncertain what components of social behavior should be targeted.

In addition, some sociometric procedures involve asking children to nominate or rank peers based on negative criteria. As a result, parents, teachers, and/or the administration often hesitate using such assessment tools. It is a concern that negative nominations will further isolate children already demonstrating social challenge. According to Whitcomb and Merrell (2013), to date, no research has been found to validate these concerns. In a study by Hayvren and Hymel (1984), no observable negative effects were found. Twenty-seven preschool students were asked to nominate peers to positive and negative characteristics. For example, a positive nomination might occur when the child was asked to point to a picture of a peer with whom they like to play. A negative nomination might occur when a child was asked to point to a photograph of a peer with whom they would not like to play. Direct observations of peer interactions were conducted (a) 5 or 6 weeks before the assessment, (b) 5 or 6 weeks after the assessment was completed, and (c) during the 10 min immediately following the assessment. The results clearly showed that the sociometric procedures did not alter patterns of peer interaction. In addition, in the 10 min immediately following the assessment, no negative behavior was directed toward the children nominated as least preferred.

Similarly, in a study by Mayeux, Underwood, and Risser in 2007, 91 third-grade students participated in a sociometric assessment. The investigators interviewed the participants 15 weeks after the assessment and found that (a) the children did not report negative emotional reactions following the assessment, (b) the children did not feel that they were treated differently by their peers after the assessment, and (c) the children reported understanding their research rights. They understood their right to refuse to participate, to stop participating at any time, and that their responses would be confidential. In a similar study by Iverson and Iverson in 1996, 82 children participated in a sociometric assessment during the last week of school that required them to associate peers with positive and negative characteristics. After their summer break, participants were interviewed and asked to report on their experience with the assessment. The results indicated that the participants liked the assessment process. One-third of the participants stated that they did discuss the measures with their peers. No negative or harmful effects were reported.

To reduce the potential risk to children by negative nominations, it is suggested that researchers be sure to (a) explain confidentiality, (b) arrange for a structured activity to occur following the assessment in an effort to reduce the likelihood of discussion after the testing, and (c) conclude the testing with positive questions (Mayeux, Underwood, & Risser, 2007).

Another concern with sociometric assessments is that the assessment relies on the participation of the entire classroom student body. Important information might be missed if a few students do not participate. It is not uncommon for a parent to refuse student participation.

Behavior Rating Scales

Rating scales are a popular method of measuring behavior in the social sciences. Rating scales are available in many forms, wherein raters assign many responses a number on a scale (Johnston & Pennypacker, 2009). Within the realm of childhood social skills, rating scales typically consist of an itemized list of various responses being measured, representative of the overall behavior of interest. Scales are typically completed by people familiar with the child who can provide information on their social skills. This may include parents, caretakers, or teachers. Each item requires the rater to indicate the likelihood that a child engages in a given response. This is usually presented in a Likert-type fashion, where the scale can range from 0 (never happens) to 5 (always happens). Most rating scales are comprised of about 25–75 items and are an efficient means of assessing behavior, in that they generally only take about 10–30 min to complete. The ratings then may be compared to a normative sample of children of a similar age and gender. This comparison provides information on the extent to which the child's social skills are adaptive or maladaptive and may assist in the decisions for any needed treatment planning (Boisjoli & Matson, 2009).

Although there are many measures that can be used to assess social skills, this chapter includes only a brief review of several popular rating scales used to assess social behavior in children. This is by no means an exhaustive review of child social behavior scales. A more detailed description of behavior rating scales will be covered in a later chapter of this handbook.

Matson Evaluation of Social Skills with Youngsters (MESSY)

There are many rating scales that can be used to assess social skills in children. One measure is the Matson Evaluation of Social Skills with Youngsters (MESSY; Matson, 1989). The MESSY is a scale comprised of 64 Likert-type items that relates to the observable behavior of children. Each item is rated on a scale from 1 to 5, with 1 being "not at all" and 5 being "very much." This scale is available in two versions, one that can be completed by a teacher or adult who knows the child and the other that can be completed as a self-report by the child of interest. The MESSY provides information on inappropriate assertive or impulsive behavior, as well as appropriate social behavior. Items on the scale relate to behavior such as bullying, helping others, and engaging in conversation (Wilkins & Matson, 2007). The MESSY is an efficient tool that takes about only 10–25 min to complete. This scale can be very helpful in identifying social skills deficits in children and can provide useful information in the development of goals for individualized education plans (IEPs), treatment programs, and educational curricula (Boisjoli & Matson, 2009).

Social Skills Rating System (SSRS)

The Social Skills Rating System (SSRS; Gresham & Elliott, 1990) is another widely used rating scale that assesses social skills in children and is available in different versions for preschool, elementary, and secondary ages. The SSRS consists of three different forms that can be completed by parents, teachers, and the child being assessed (Boisjoli & Matson, 2009; Wilkins & Matson, 2007). Any of the three different versions of the SSRS can be completed within approximately 15–25 min. The number of items across the three different scales ranges from 34 to 57, and each item is presented in a 3-point Likert scale. For each item, the rater indicates how often the social behavior occurs (never, sometimes, often) and the importance of the social behavior in classroom success (not important, important, critical). The three main scales of the SSRS are social skills, problem behavior, and academic competence. Teachers can complete all three scales, parents can complete the social skills and problem behavior scales, and the child can complete only the social skills scale. The social skills scale assesses cooperation, assertion, responsibility, empathy, and self-control. The factors included in the problem behavior scale include externalizing, internalizing, and hyperactivity. The SSRS is considered one of the most inclusive social skills rating scales and is a strong tool for predicting important social outcomes (Wilkins & Matson, 2007).

Social Skills Improvement System (SSIS)

The Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) is an updated version of the SSRS. This measure assesses relationships that a child has with parents, teachers, and peers. Scales within this measure can be completed by parents and teachers and also include a self-report scale. The SSIS is available in versions for different age groups including preschool level (ages 3–5), elementary level (kindergarten to 6th grade), and secondary level (7th to 12th grade). Within the elementary level of the SSIS, 83 items are divided among three different scales, including social skills, problem behaviors, and academic competence. The social skills scale consists of 46 items that measure teacher and peer relations. The seven areas of focus within this scale include communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. Each item uses a 3-point rating scale where the likelihood of behavior is indicated with 0 as never occurring, 1 as sometimes, and 2 as very often. In addition, teachers can rate the extent to which the given behavior is important for success in the classroom by using the same 3-point scale. This component of the scale can then be used to guide plans for treatment programs (Whitcomb & Merrell, 2013).

Home and Community Social Behavior Scale (HCSBS)

The SSBS-2 is the partner measure to the Home and Community Social Behavior Scale (HCSBS; Merrell & Caldarella, 2002). The HCSBS is designed for the same age group and consists of the same number of items and scaling format as the SSBS-2. This measure also assesses social competence and antisocial behavior but is to be completed by parents and other home-based informants. The items on the measure are very similar to those presented in the SSBS-2 but are reworded to accommodate the home environment. The information provided between the SSBS-2 and the HCSBS comprises a broad scope of the child's social behavior across settings and can be useful in the processes of screening, classifying, and developing treatment programs (Whitcomb & Merrell, 2013).

Waksman Social Skills Rating Scale (WSSRS)

The Waksman Social Skills Rating Scale (WSSRS; Waksman, 1985) is another rating scale intended for children between kindergarten and 12th grades. The scale consists of 21 items presented on a 4-point Likert-type scale. The WSSRS contains a major scale that assesses social skills and two subscales that assess aggressive and passive behavior. The scale is intended to be completed by teachers of the child of interest. Nevertheless, the WSSRS only measures social skills deficits, and does not include prosocial behavior (Demaray et al., 1995).

Preschool and Kindergarten Behavior Scales (PKBS)

The Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994) is a multidimensional rating scale that consists of 76 items that measure social skills and problem behavior in children ages 3–6 years. Items on the measure are presented on a 4-point scale reflecting the frequency of occurrence (Boisjoli & Matson, 2009). The measure can be completed by adults who are familiar with the child, such as a parent, teacher, or daycare staff. The PKBS consists of two subscales: the social skills scale and the problem behavior scale. The social skills scale consists of 34 items and contains several subscales including social cooperation, social interaction, and social independence. The social cooperation scale is made up of 12 items that focus on cooperative and self-restraint behavior. The social interaction scale consists of 11 items that look at social initiation behavior. Lastly, the social independence scale also consists of 11 items but assesses behavior related to gaining independence with peers (Merrell, 1996).

Social Emotional Assets and Resilience Scales (SEARS)

The Social Emotional Assets and Resilience Scales (SEARS; Merrell, 2011) is a system composed of various scales that can be completed by parents (SEARS-P), teachers (SEARS-T), children (SEARS-C), and adolescents (SEARS-A). The focus of these measures is to describe the social and emotional strengths of children between the ages of 5 and 18 years, in a way that is socially valid. Each of the different measures has a 12-item form with ratings provided in a 4-point scale. Items on this form assess the child's strengths in relationships with peers, empathy, responsibility, and awareness of thoughts and behavior (Whitcomb & Merrell, 2013).

The SEARS-C and the SEARS-A are self-report measures that will be described later in this chapter. The SEARS-T consists of 41 items that assess factors such as responsibility, social competence, self-regulation, and empathy. Items that assess responsibility include "Is someone you can rely on" and "Makes good decisions." For social competence, items may include "Asks others for help when he/she needs it." Examples of self-regulation items include "Can identify errors in the way he/she thinks about things." Lastly, empathy contains items such as "Cares what happens to people." The SEARS-P is comprised of 39 items and is similar to the SEARS-T (Whitcomb & Merrell, 2013).

Walker-McConnell Scales of Social Competence and School Adjustment (SSCA)

The Walker-McConnell Scales of Social Competence and School Adjustment (SSCA; Walker & McConnell, 1995a, 1995b) is another measure that is completed by the child's teachers or other school-based personnel familiar with the child. The SSCA is provided in two different versions according to age group. The elementary version is used with children between kindergarten and sixth grade. This version consists of 43 items that assess adaptive social-behavioral competencies in a school setting. Items are rated on a 5-point scale where 1 represents "never occurs" and 5 represents "frequently occurs." This version of the SSCA is comprised of three subscales. The first subscale is the Teacher-Preferred Social Behavior scale and consists of 16 items that measure peer-related social behavior that teachers would deem valuable including empathy, sensitivity, self-restraint, and cooperative, mature relationships with peers. The second subscale is the Peer-Preferred Social Behavior scale and consists of 17 items that measure peer-related social behavior that would be valuable to other children. The third subscale is the School Adjustment Behavior scale and includes 10 items that assess behavior important in an academic setting such as following instructions, having good study habits, and working in a manner that is beneficial to classroom management (Whitcomb & Merrell, 2013).

The adolescent version is used for 7th through 12th grade and includes 43 items from the elementary version of the scale, plus 10 additional items. This version of the SSCA contains the same subscale structure as the elementary version as well as an empathy subscale that consists of six items (Whitcomb & Merrell, 2013).

Self-Report Assessments

Although most rating skills for social behavior are completed by parents, teachers, and other adults familiar with a child, there are some assessments that do include a self-report measure to be completed by the child of interest. Of the behavior rating scales reviewed earlier, only two include a self-report form: the SSIS and the SEARS.

As described earlier, the Social Skills Improvement System (SSIS) assesses relationships that a child has with parents, teachers, and peers. One component of this measure is a student self-report form that can be completed by the child or adolescent. One version is designed for children ages 8–12 years, who are in grades 3–6. The other version is for adolescents between the ages of 13 and 18 years, in grades 7–12. Either version contains a social skills scale and a problem behavior scale and 11 subscales that assess areas such as communication, cooperation, responsibility, self-control, and bullying. Items are presented on a 4-point scale, on which students indicate "how true" items are to him or her. The rankings include Not True, Little True, A Lot True, and Very True. In addition to this set of ratings, students can also indicate how important certain responses are in their relationships with other people. These ratings are presented on a scale from 0 to 2, where 0 indicates Not Important, 1 indicates Important, and 2 indicates Critical (Whitcomb & Merrell, 2013). The inclusion of this latter set of ratings provides information on what may be important to target for treatment with the student.

The Social Emotional Assets and Resilience Scales (SEARS) also includes a self-report measure to be completed by children (SEARS-C) between grades 3 and 6 and by adolescents (SEARS-A) between grades 7 and 12. As with the adult forms of this measure, the self-report forms focus on the ratings of social and emotional strengths as perceived by the child about their own behavior. The structure and scoring is very similar to the adult forms for the SEARS, assessing areas such as empathy, self-regulation, social competence, and responsibility (Whitcomb & Merrell, 2013).

In addition to the scales reviewed in this chapter are other self-report measures that assess child social behavior. The List of Social Situation Problems (LSSP) (Spence, 1980) assesses difficult social situations for children and aims to identify behavior that requires treatment. This measure consists of 60 social problem situations to which the child responds "yes" or "no" to whether or a not a situation is perceived as a problem. Another is the Children's Self-Report Social Skills Scale (CS^4) (Danielson & Phelps, 2003), which consists of 21 items presented on a 5-point scale. This measure assesses prosocial skills and poor social skills (Boisjoli & Matson, 2009).

Self-report measures can provide some useful information, but they should be interpreted with caution. When assessing a child who displays maladaptive social behavior, the child may not provide truly objective ratings or be able to accurately report about their own behavior. It may not be practical to use this form of assessment with children who are unable to identify the strengths and weaknesses of their social behavior, or with children who may present cognitive delays (Boisjoli & Matson, 2009). It is also possible that the child may report their own behavior more positively than would an outside observer (Whitcomb & Merrell, 2013). More research is needed in developing self-report measures for children's social behavior and, therefore, these measures should be used carefully.

Limitations of Rating Scales

Multiple methods of assessment are required to fully grasp the strengths and weaknesses of one's social skills repertoire. Although rating scales do provide useful information with regard to one's social behavior, there are several limitations in the use of behavior rating scales. One limitation is that rating scales provide information on one's current levels of behavior. The ratings provided at one moment in time may not reliably reflect the ongoing and dynamic nature of the behavior. Therefore, follow-up evaluations are strongly encouraged. Furthermore, ratings may vary according to the person completing the scale and, therefore, may not provide an accurate representation of the social behavior. Ratings also may not provide information on the causes of the behavior or the environmental conditions surrounding the behavior, such as antecedents or consequences (Demaray et al., 1995). Furthermore, agreement across raters may not be reliable given the fact that the items may cover a long period of time during which the behavior may occur and the subjectivity of the scale values (Johnston & Pennypacker, 2009). Finally, one must take caution with the biases that may arise in the use of scales. For example, a rater's opinion of the child may influence the ratings that they provide. Instead of providing objective ratings on the child's behavior, they may provide ratings based on their judgment of the subject as being a "good" or "bad" child. If the rating scale is a self-report measure, the objectivity in rating one's own behavior may be difficult. The subject may provide ratings believed to be desirable answers, or the subject may not be completely honest in the answers. Therefore, rating scales should not be used as the exclusive measure for assessing social skills but, instead, should be used in combination with other methods of assessment.

Conclusion

Social skills enable children to interact with conversation recipients within their environment. The assessment of social behavior, and the identification of specific skill deficits, allows for needs to be targeted for intervention.

This chapter identified the different assessment strategies that have been used to assess social behavior. Direct behavioral observation and indirect assessments such as interview methods, sociometric techniques, self-reports, and use of behavior rating scales were discussed. Because each strategy has its strengths and weaknesses, multiple methods of assessment can and should be used to assess social behavior.

Regardless of whether the child identifies his or her own deficits, a parent reports about his or her child's social challenges, or a peer rates a child's strengths and weaknesses in comparison to that of his classmates, the information is important. The way in which a child is perceived by others, and the way in which a child perceives him or herself, greatly impacts the quality of an interaction.

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Checklists and Scaling Methods

W. Jason Peters and Johnny L. Matson

Introduction

Social interactions are encountered by individuals numerous times throughout the day in various locations and settings such as at their place of employment, home, or school. Further, they involve the individual exhibiting social skills so as to achieve a successful interaction. According to Crowe, Beauchamp, Catroppa, and Anderson (2011), the development of fulfilling social relationships, which are important for both psychological and physical well-being, relies on the use of appropriate social skills. While adequate or poor social skills may be easily identifiable, defining what social skills are is difficult as a number of definitions for social skills exist throughout the literature on assessment and treatment (Merrell & Gimpel, 1998). According to Gresham and Elliott (1984), three main conceptual definitions, or models, of social skills exist including behavioral, peer acceptance, and social validity. According to the behavioral model, social skills are learned behaviors that encounter positive responses while helping to avoid negative responses which allow for the appropriate interaction with others. In the peer acceptance model, the individual who is accepted by their peers is said to be socially skilled. Lastly, the social validity model defines social skills as those skills which allow the individual to achieve socially important outcomes.

One important distinction regarding social skills is the difference between it and social competence. According to Gresham (1986), social skills and social competence are two different constructs where social skills refer to specific behaviors exhibited by the individual to perform adequately on a social task, while social competence refers to how well the individual has performed that task and is based upon the judgements of others (i.e., peers, parents, teachers, etc.). Said another way, social competence refers to behavior that is successful in initiating and maintaining social interactions, while social skills are the discrete behaviors involved in achieving social competence (Foster & Ritchey, 1979).

In the literature, the importance of assessing the social skills of children is well documented as impairments in social skills are associated with a number of undesirable outcomes. For example, according to Dodge et al. (2003), children with poor social skills were more likely to experience peer rejection as well as engage in increased amounts of antisocial behavior. Additionally, children with deficits in social skills are more likely to experience other difficulties such as substance abuse or depression (Greene et al., 1999; Sato, Ishikawa, Arai, & Sakano, 2005). Further, social skills impairments are among the defining

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characteristics for some neurodevelopmental disabilities including autism spectrum disorder (ASD; American Psychiatric Association, 2013) and are strongly associated with other forms of psychopathology including attention-deficit/hyperactivity disorder (ADHD; Storebø et al., 2011) and schizophrenia (Meyer & Kurtz, 2009). Therefore, due to the demonstrated association between impairments in social skills and undesirable outcomes, it is of the upmost importance that accurate assessment of those deficits takes place so as to facilitate appropriate interventions.

Social skills assessment and treatment have an extensive history dating back to one of the earliest known interventions involving assertiveness training for shy men (McFall & Marston, 1970). Due to the demonstrated success of this study and others like it in identifying targets and implementing effective intervention, the social skills of other groups, including children, were soon targeted for study. Some of these early studies on social skills assessment focused on individuals with more severe forms of psychopathology. Research on social skills assessment and treatment, therefore, became an area of clinical interest due to the relationship between undesirable outcomes and interpersonal difficulties (Matson & Ollendick, 1988). Various clinical populations have been subject to research on social skills assessment including individuals with ASD (Matson & Wilkins, 2007), intellectual disabilities (Kearney & Healy, 2011), ADHD (Storebø et al., 2011), schizophrenia (Meyer & Kurtz, 2009), anxiety (Crawford & Manassis, 2011), depression and bipolar disorder (Segrin, 2000), emotional disturbance (Milsom & Glanville, 2010), learning disabilities (Agaliotis & Kalyva, 2008), and typically developing children (Matson, Rotatori, & Helsel, 1983). One of the earliest approaches used by researchers to identify targets for intervention for these groups was role-play assessments. More recently, however, assessment methods such as informant-based rating scales and direct observation of behavior have been developed and used to evaluate social skills in children.

Assessment Methods

Rating Scales

Rating scales are a popular and widely used method for assessing social skills. Typically, rating scales are comprised of items representative of a particular construct. Ratings of items on rating scales assessing social skills are typically based on how often an individual engages in a particular behavior (e.g., 0 = “never”; 1 = “sometimes”; 2 = “often”; 3 = “always”). According to Matson and Wilkins (2009), rating scales consist of between 25 and 75 items, on average, and take about 10–30 min to administer. For most rating scales, normative data based on age and gender are used to evaluate an individual’s score. Specifically, social skills rating scales for children generally include parents or teachers (i.e., an individual who knows them well and can report on their social behaviors) as informants. Social skills rating scales generally assess both adaptive and maladaptive skills, and, by doing so, useful information for planning intervention can be provided.

One advantage in using rating scales is the ability to rate less frequent behaviors. Additionally, rating scales, due to their efficiency, can be ideally used in settings where time or resources may be limited. It is important to note, however, that the use of rating scales is subject to limitations. For example, information regarding an individual’s present level of behavior is measured by rating scales and may not accurately or reliably reflect the changing nature of behavior, suggesting the need for follow-up evaluations. Additionally, ratings may vary across informants which may provide an inaccurate representation of the individual’s social skills. Lastly, the use of rating scales may invite the influence of a rater’s biases or opinions regarding the individual being assessed and therefore providing overly subjective ratings. In sum, it is strongly encouraged that evaluators use rating scales in combination with other assessment methods when evaluating children’s social skills. What follows is a review for a number of different rating scales.

Matson Evaluation of Social Skills in Youngsters

The Matson Evaluation of Social Skills in Youngsters (MESSY; Matson, 1988) is an informant-based measure of observable behaviors representative of social skills in children between the ages of 4 and 18. There are two forms for the MESSY, self-report form and a parent/teacher report form. The self-report form of the MESSY is comprised of 62 items, and the parent/teacher report form of the MESSY consists of 64 items. Each item for both forms is rated on a 5-point Likert-type scale (i.e., ranging from 1 = "not at all" to 5 = "very much") based on how often the child engages in the behavior. The self-report version of the MESSY is comprised of five subscales (i.e., appropriate social skills, inappropriate assertiveness, impulsive, overconfident, and jealous), while the parent/teacher report version consists of only two subscales (i.e., assertiveness/impulsiveness and appropriate social skills; Matson et al., 1983).

Several studies have reported on the reliability and validity of the MESSY, indicating a high internal reliability and a moderate to high test-retest reliability, as well as high internal consistency reliabilities across different age groups (Matson et al., 1983, 2010). Further, the MESSY has been demonstrated for use among children with hearing and/or visual impairments as well as children with ASD (Matson, Heinze, Helsel, Kapperman, & Rotatori, 1986; Matson, Horovitz, Mahan, & Fodstad, 2013; Matson, Macklin, & Helsel, 1985). The MESSY has also been translated into several languages including Spanish (Méndez, Hidalgo, & Inglés, 2002), Chinese (Kee-Lee, 1997), Turkish (Bacanli & Erdogan, 2003), Dutch (Prins, 1997), Hindi (Sharma, Sigafoos, & Carroll, 2000), as well as several others with psychometric properties reported for several of them.

The MESSY recently underwent an update and is now the MESSY-II (Matson, 2010). Like the original MESSY, the MESSY-II is intended to measure both appropriate and inappropriate social behaviors in children. The MESSY-II consists of 64 items, divided into three subscales (i.e., hostile, adaptive/appropriate, and inappropriately assertive/overconfident). These subscales were determined based on an exploratory factor analysis (Matson, Neal, Worley, Kozlowski, & Fodstad, 2012). Additionally, each item is rated on the same 5-point Likert-type scale as is the original. One key difference between the two is that the MESSY-II shifted its norms down to include children between the ages of 2 and 16. Additionally, the MESSY-II currently does not have a self-report form due to difficulties populations frequently administered the MESSY may have with poor insight (e.g., ASD; Matson et al., 2012). Research regarding the psychometric properties of the MESSY-II has demonstrated good to excellent internal consistency, excellent split-half reliability, and moderate to high interrater reliability (Matson et al., 2010, 2013). Additional research has also demonstrated good to strong convergent and divergent validity for the MESSY-II with subscales of the Behavior Assessment System for Children, Second Edition (BASC-2; Matson et al., 2010; Reynolds & Kamphaus, 2004).

Social Skills Rating System

The Social Skills Rating System (SSRS; Gresham & Elliott, 1990) is a norm-referenced rating scale used to assess social skills, problem behavior, and academic competence in children ranging from preschool age to secondary school. There are three separate forms for the SSRS including parent, teacher, and student self-report. Additionally, each form of the SSRS is further subdivided into separate versions for different age groups (i.e., preschool, elementary, and secondary); however, there is no self-report version for the preschool age group. The SSRS-Parent (SSRS-P) and SSRS-Teacher (SSRS-T) forms are comprised of 49 items each, and the SSRS-Student form (SSRS-S) is comprised of 34 items. All items across the different forms of the SSRS are rated on a 3-point Likert-type scale based on the perceived frequency with which the individual being assessed engages in the behavior (i.e., 0 = "never"; 1 = "sometimes"; 2 = "very often").

Both the SSRS-P and SSRS-T contain two scales including a social skills scale and a problem behaviors scale with the SSRS-T containing a third academic competence scale. The SSRS-S contains only the social skills scale. The social skills scale is comprised of four factors including empathy, self-control, cooperation, and assertion. Factors on the problem behaviors scale include externalizing, internalizing, and hyperactivity.

Analyses regarding the psychometric properties have demonstrated adequate reliability and validity across all forms of the SSRS (Gresham & Elliott, 1990). Reliability estimates for the preschool version of the SSRS are good; however, researchers have failed to replicate the original social skills scale factor solution in a low-income sample of children (Fantuzzo, Manz, & McDermott, 1998). Research regarding the elementary versions of the SSRS has demonstrated moderate to high internal consistency, test-retest reliability, and interrater agreement, as well as good convergent and divergent validity (Diperna & Volpe, 2005; Gresham & Elliott, 1990). Similar to the MESSY, the SSRS has been translated into a number of different languages and studied across a number of different populations. The SSRS has been translated into Spanish (Jurado, Cumba-Avilés, Collazo, & Matos, 2006), Japanese (Van Horn & Tamase, 2001), Dutch (Van der Oord et al., 2005), Iranian (Shahim, 2004), and Farsi (Eslami, Mazaheri, Mostafavi, Abbasi, & Noroozi, 2014). Additionally, the SSRS has been researched and used among the following populations: ADHD (Van der Oord et al., 2005), spina bifida (Lemanek, Jones, & Lieberman, 2000), and neurofibrosis (Barton & North, 2004).

The Social Skills Improvement System – Rating Scales (SSIS-RS; Gresham & Elliott, 2008) is a re-normed and revised version of the SSRS. Like the SSRS, it assesses social skills, problem behaviors, and academic competence based on ratings from parents, teachers, and student self-report across age groups ranging from preschool (i.e., ages 3–5) to secondary (i.e., ages 13–18). The SSIS-RS contains the same scales (i.e., social skills, problem behaviors, and academic competence); however, each scale is comprised of a higher number of factors as compared to the SSRS. The social skills scale on the SSIS-RS consists of seven factors including cooperation, assertion, responsibility, self-control, communication, empathy, and engagement. The problem behaviors scale consists of five factors including externalizing, internalizing, bullying, hyperactivity/inattention, and autism spectrum. Each item on the SSIS-RS is rated on a 4-point Likert-type scale, ranging from 0 = "never" to 3 = "almost always." Additionally, ratings are based on the perceived frequency of the behavior being assessed. Research has demonstrated adequate evidence regarding reliability and validity for the SSIS-RS (Gresham, Elliott, Cook, Vance, & Kettler, 2010; Gresham, Elliott, & Kettler, 2010). Additionally, comparisons between the SSRS and SSIS-RS revealed strong relationships between the two, suggesting good convergent validity and comparability (Gresham, Elliott, Vance, & Cook, 2011).

School Social Behavior Scales

The School Social Behavior Scales (SSBS; Merrell, 1993) is a rating scale primarily used in school settings by teachers to assess the social behavior of children and adolescents. Recently, the SSBS underwent a revision and is now the SSBS, Second Edition (SSBS-2; Merrell, 2002b). The SSBS-2 consists of 64 items equally divided into two separate scales labeled Social Competence, which assesses positive behaviors, and Antisocial Behavior, which assesses common social-related problem behaviors. Similar to the original SSBS, the SSBS-2 is primarily used by teachers to assess social competence and antisocial behavior of children and adolescents between the ages of 5 and 18 in the school environment. Each item for the SSBS-2 is rated on a 5-point Likert-type scale (i.e., ranging from 1 = "never" to 5 = "frequently"), based on the frequency with which the individual being assessed engaged in the behavior over the last 3 months (Merrell, 2002b). Both peer- and teacher-related behaviors are reflected on the items of the SSBS-2. According to Merrell (2002b), both forms of social behaviors are important for achieving social success in a school environment.

Psychometric analyses for the full SSBS-2 as well as the Social Competence and Antisocial Behavior subscales have demonstrated adequate psychometric properties including adequate internal consistency, 1-week test-retest reliability ranging between 0.86 and 0.94, and interrater reliability ranging between 0.53 and 0.71 (Froeschle, Smith, & Ricard, 2007; Merrell, 2008; Raimundo et al., 2012). Additionally, previous research has demonstrated both good convergent and discriminant validity with other rating scales (Cummings, Kaminski, & Merrell, 2008). According to Raimundo et al. (2012), the SSBS-2 has been translated into several languages. However, there are only two references in the literature including a Turkish version of the full SSBS-2 (Yukay-Yuksel, 2009) and a Portuguese version for the Social Competence scale only (Raimundo et al., 2012). Both studies reported adequate psychometric properties for the translated versions of the SSBS-2. Lastly, the SSBS-2 has been used among a number of different populations including a Spanish community sample (Molinuevo, Bonillo, Pardo, Doval, & Torrubia, 2010), adolescent females in a school-based drug prevention program (Froeschle et al., 2007), and kindergarten children who were born both extremely preterm and extremely low birth weight (Scott et al., 2012).

Home and Community Social Behavior Scales

The Home and Community Social Behavior Scales (HCSBS; Merrell & Caldarella, 2002) is a rating scale designed to be used by parents to screen and assess social competencies and behavior problems of children aged 5–18 years. The HCSBS consists of 65 total items divided into two separate subscales measuring social competence and antisocial behavior. Each item is scored on a 5-point Likert-type scale (i.e., ranging from 1 = "never" to 5 = "frequently") based on the frequency a child engages in the behavior being assessed. Originally, the HCSBS was designed as a parent rating form of the teacher-based SSBS for cross-informant purposes (Merrell & Caldarella, 1999). The main difference between the HCSBS and the SBSS, aside from the informant, is that certain items on the HCSBS have been reworded to assess behaviors reflective of the home and community environments as opposed to the school.

Previous research on the HCSBS has demonstrated good psychometric properties. According to Lund and Merrell (2001), a national standardization for the HCSBS revealed that the overall scale has strong internal consistency and that the two subscales are strong measures of social competence and antisocial behavior. Additionally, the two subscales have strong internal consistency coefficients (i.e., above 0.9; Merrell & Caldarella, 1999). Regarding interrater and test-retest reliability, previous research indicates that the HCSBS is good to excellent (Merrell & Caldarella, 2002). Further, the HCSBS has been demonstrated to have good convergent and divergent validity with various scales from the SSRS, Child Behavior Checklist, Conners Parent Rating Scale – Revised-Short form, and the BASC (Merrell, Streeter, Boelter, Caldarella, & Gentry, 2001). Lastly, construct validity for the HCSBS has been demonstrated for several populations including children with ADHD, learning disabilities, and emotional-behavioral disorders (Lund & Merrell, 2001; Merrell & Boelter, 2001).

Preschool and Kindergarten Behavior Scales

The Preschool and Kindergarten Behavior Scales (PKBS; Merrell, 1994) is a rating scale designed to assess the social skills and problem behaviors of children aged 3–6 years with parents or teachers serving as the informant. The PKBS underwent a recent revision and is now the PKBS, Second Edition (PKBS-2; Merrell, 2002a). The PKBS-2 is comprised of 76 total items divided into two scales measuring social skills and problem behavior. Based on exploratory and confirmatory factor analyses, these two scales are further subdivided into three subscales within the social skills domain (i.e., social cooperation, social interaction, and social independence) and two subscales within the problem behavior domain (i.e., externalizing problems and internalizing problems). Each item is scored on a 4-point Likert-type scale (i.e., ranging from 0 = "never" to 3 = "often"), based on the frequency with which the child being assessed engages in the behavior.

Previous research on the PKBS-2 has demonstrated good psychometric properties. According to Merrell (2002a), the PKBS-2 demonstrates good internal reliability, ranging between 0.81 and 0.97, as well as good cross-informant agreement. Additionally, test-retest reliability at 3 weeks for the PKBS-2 ranged between 0.58 and 0.87. Convergent and divergent validity has also been demonstrated for the PKBS-2 through comparisons with other widely used rating scales such as the SSRS, the Achenbach Teacher Report Form, and the Adjustment Scales for Children and Adolescents (Canivez & Bordenkircher, 2002; Merrell, 2002a). Both editions of the PKBS have been translated into other languages including Spanish (Carney & Merrell, 2002), German (Al Awmleh & Woll, 2013), and Portuguese (Major & Seabra-Santos, 2014). The PKBS and PKBS-2 have also been validated for use among children with ADHD (Carney & Merrell, 2005) as well as ASD (Major, Seabra-Santos, & Albuquerque, 2017; Wang, Sandall, Davis, & Thomas, 2011). One of the strengths of the PKBS-2 is that it is one of only a few standardized rating scales designed specifically to assess the socio-emotional characteristics of young children that has sound psychometric properties and makes use of content created from developmentally specific constructs appropriate for an early childhood population (Carney & Merrell, 2002).

Peer Social Maturity Scale

The Peer Social Maturity Scale (PSMAT; Peterson, Slaughter, & Paynter, 2007) is a brief seven-item, teacher-based measure of children's performance in peer group interactions. Teachers are instructed to rate each child using a 7-point Likert-type scale based on the social competence and maturity level of the child relative to an average child of the same age (i.e., ranging from 1 = "very much less mature than the average child this age" to 7 = "very much more mature than the average child this age"). The PSMAT was designed to take advantage of teachers' experiences with students with differing levels of social competence. Further, items on the PSMAT are designed to assess skills such as group entry, peer leadership, and interactive social play. Research on the PSMAT indicates that it has excellent internal consistency, as well as good interrater and test-retest reliability (Fink, Rosnay, Peterson, & Slaughter, 2013). Additionally, according to Fink et al. (2013), the PSMAT demonstrated good convergent validity with the SSRS as well as peer ratings of likability. Overall, the PSMAT is a quick and easy to use measure for assessing the social competence of children with sound psychometric properties.

Social Competence Inventory

The Social Competence Inventory (SCI; Rydell, Hagekull, & Bohlin, 1997) is an informant-based questionnaire that is designed to assess social skills and behaviors related to prosocial orientation and social initiation. The SCI can be filled out by either parents or teachers and is comprised of 25 items, each rated on a 5-point Likert-type scale. According to Rydell et al. (1997), each item is rated based on how well the item applies to the child (i.e., ranging from 1 = "doesn't apply at all" to 5 = "applies very well to the child"). Based on factor analyses, the SCI is divided into two scales, the Prosocial Orientation scale and the Social Initiative scale, with 17 and 8 items comprising each scale, respectively. Research regarding the psychometric properties of the SCI indicates that it demonstrates excellent internal consistency and reliability (Rydell et al., 1997). Additionally, the SCI demonstrates good interrater reliability as well as convergent validity with observed peer behavior. Taken together, this suggests that the SCI is a reliable and valid measure of social skills and behavior in children.

Social-Emotional Assets and Resilience Scale

The Social-Emotional Assets and Resilience Scale (SEARS; Merrell, 2011) is an informant-based measure that assesses positive social-emotional competencies of children from kindergarten to 12th grade. The SEARS consists of four separate forms: the SEARS, parent form (SEARS-P); the SEARS, teacher form (SEARS-T); the SEARS, child form (SEARS-C); and the SEARS, adolescent form (SEARS-A). Both the SEARS-P and the SEARS-T are based on parent and teacher report, respectively, while the SEARS-C and SEARS-A are based on self-report for children from 3rd to 6th grade and 7th to 12th grade, respectively. Factor analyses were conducted on all forms of the SEARS, from which subscales were created, with the exception of the SEARS-C. The SEARS-P is comprised of 39 items, each rated on a 4-point Likert-type scale (i.e., ranging from 0 = "never" to 3 = "always"). Parent ratings are based on how true the item is for the child over the previous 6 months. The SEARS-P is divided into three subscales labeled Self-Regulation/Responsibility, Social Competence, and Empathy (Merrell, Felver-Gant, and Tom, 2011). The SEARS-T is comprised of 41 items, each rated in a similar fashion to the SEARS-P, with the only difference being that teachers are used as the informants. Subscales of the SEARS-T include Responsibility, Social Competence, Self-Regulation, and Empathy (Merrell, Cohn, & Tom, 2011). The SEARS-C and SEARS-A are both comprised of 35 items and are rated in a similar fashion to the other forms of the SEARS. Additionally, the SEARS-A is comprised of the same subscales as the SEARS-T (Cohn, Merrell, Felver-Grant, Tom, & Endrulat, 2009). Short forms of each version of the SEARS have also been developed (Nese et al., 2012).

Strong psychometric properties have been demonstrated for the SEARS. According to Merrell, Cohn, et al. (2011) and Merrell, Felver-Gant, and Tom (2011), the SEARS-P has a strong internal consistency of 0.96 in addition to strong interrater reliability between pairs of parents. Likewise, strong internal consistency (0.98) has also been found for the SEARS-T (Merrell, Cohn, et al., 2011). Convergent validity with other rating scales, such as the SSRS, as well as construct validity has also been established for the SEARS. Overall, the SEARS appears to be a good strength-based measure of child and adolescents' social behaviors.

Vineland Social-Emotional Early Childhood Scales

The Vineland Social-Emotional Early Childhood Scales (Vineland SEEC Scales; Sparrow, Balla, & Cicchetti, 1998) is a semi-structured interview used to assess children's social and emotional functioning from birth to age 5 years, 11 months. The interview is generally conducted by a professional with a background in child development with a parent or caregiver familiar with the child's behavior. The Vineland SEEC Scales consists of 122 total items derived from the Socialization Domain of the Vineland Adaptive Behavior Scales (Sparrow, Balla, Cicchetti, Harrison, & Doll, 1984) and is divided into three subscales: Interpersonal Relationships (44 items), Play and Leisure Time (44 items), and Coping Skills (34 items). Each item is scored based on a specific scoring criterion, with scores ranging from 0 to 2. A score of 0 indicates that the child "never" performs the behavior, a score of 1 indicates that they "sometimes or partially" perform the behavior, and a score of 2 indicates that the child "usually" performs the behavior. According to the test manual (Sparrow et al., 1998), the Vinland SEEC Scales demonstrate good psychometric properties such as good internal consistency and reliability, as well as good interrater and test-retest reliability. Additionally, adequate construct validity as well as moderate convergent validity with other developmental scales such as the Battelle Developmental Inventory was indicated. Overall, the Vineland SEEC scales appear to be a helpful measure of young children's social and emotional behaviors and can be used in clinical and educational settings for the screening and identification of potential developmental concerns or delays.

Direct Behavior Observation

In addition to rating scales, a popular alternative method for assessing social skills in children is through the use of direct behavior observation. According to Nock and Kurtz (2005), the direct observation of behavior can provide information, through the identification and evaluation of antecedents and consequences, regarding the cause or purpose of a given target behavior. Additionally, direct behavior observation can provide objective measurement in regard to the frequency, intensity, and duration of a number of behaviors as they occur in either a natural or contrived environment. One of the potential drawbacks of this approach is that only external, observable behaviors may be recorded, meaning that internal, mental states are unable to be evaluated in this manner. Additionally, many target behaviors may occur infrequently or only in particular environments or contexts and are therefore difficult to observe and evaluate (Bellack, 1979). As such, multiple observations of behavior may be required. Social skills involve a number of discrete verbal and nonverbal behaviors; however, they are complex and are subject to the influence of one's environment and social partner (Michelson, Sugai, Wood, & Kazdin, 1983). What follows is a brief review of social skills assessments which incorporate and take advantage of direct observation of behavior.

Evaluation of Social Interaction

The Evaluation of Social Interaction (ESI; Fisher & Griswold, 2010) is a criterion-referenced assessment designed to evaluate verbal and nonverbal behaviors that contribute to social interaction. The evaluator using the ESI rates 27 skills, all of which relate to social interaction in some manner such as producing a social interaction, initiating and ending a social interaction, maintaining the flow of an interaction, verbally or physically supporting the interaction, adapting to problems within a social interaction, or shaping the content of an interaction. Typically, the evaluator observes an individual as they engage in relevant activities with typical social partners in a natural environment. After the individual is observed engaging in two or more social interactions, the evaluator rates each skill on the ESI on a 4-point rating scale which indicates the individual's level of competence in that skill. The ratings of each skill are then weighted according to their relative difficulty.

Researchers have been able to demonstrate that the ESI has adequate psychometric properties. According to Simmons, Griswold, and Berg (2010), the ESI demonstrated good internal scale validity as well as person response validity, using Rasch analysis. Further, validity for 24 of the 27 skills was established. Sensitivity of the ESI among different populations has also been established. In an examination of the overall quality of social interaction among children with disabilities and those without, statistically significant differences in the quality of social interactions for the two groups were found (Griswold & Townsend, 2012). Similar results have been found when examining the quality of social interactions among adults with and without disabilities, where adults without disabilities demonstrate significantly higher performance (Simmons et al., 2010). One particular strength of the ESI is that it is conducted in the individual's natural context. This allows for the evaluator to better assess and understand the individual's social skills as well as the challenges experienced by the individual so as to better plan social skills interventions.

Interaction Rating Scale

The Interaction Rating Scale (IRS; Anme, 2009) is an assessment designed to measure the social competence of children as well as the child-rearing competence of a child's caregiver through observations of child-caregiver interactions over 5-min periods. This scale is appropriate to use for the assessment of interactions between children from infancy to age 8 years and their caregivers. The IRS is comprised of 81 total items, 70 of which are used to obtain a behavioral score with the remaining 11 used to obtain an impression score. The items of the IRS are grouped into ten different subscales. Of the 10 subscales, five focus on aspects of the child's social competence including empathy, responsiveness, autonomy, emotional regulation, and motor regulation. The remaining five subscales focus on the child-rearing skills of the caregiver including respect for empathy development, respect for responsiveness development, respect for autonomy development, respect for social-emotional development, and respect for cognitive development. Lastly, one item is used to provide a rating on the overall impression of synchronous relationships.

The behavior items of the IRS are scored based on the presence of a behavior (i.e., 0 = "no"; 1 = "yes"). An overall behavior score for each subscale is obtained by summing all of the behavior items of that subscale. The impression items of the IRS, of which there is one for each subscale and one for an overall impression, are rated on a 5-point scale (i.e., 1 = "not evident at all"; 2 = "not evident"; 3 = "neutral"; 4 = "evident"; and 5 = "evident at a high level"). The 70 items used to determine a behavioral score are divided into two separate components: 45 items are focused on a caregiver's behavior toward children and 25 items are focused on children's behavior toward a caregiver. The evaluator using the IRS completes the 70-item checklist and then provides impression scores for each of the ten subscales as well as an overall impression. Previous research has demonstrated good psychometric properties, with internal consistencies for each subscale ranging from 0.43 to 0.88, as measured by Cronbach's alpha, as well as an excellent total internal consistency of 0.91 (Anme et al., 2010). Additionally, the IRS has demonstrated good discriminant validity between children with pervasive developmental disorders, children with ADHD, and children who have experienced abuse or maltreatment as well as good convergent validity as evinced by high correlations with the Strength and Difficulties Questionnaire (SDQ; Goodman, 1997).

Two additional versions of the IRS have been developed and were designed to assess social competence outside of the interaction between a child and caregiver. The Interaction Rating Scale for Children (IRSC; Anme et al., 2012) was designed as a measure of social competence for children aged 3–18 years through observations of interactions between children. The IRSC is comprised of 43 items used to obtain a behavioral score for three separate subscales measuring self-control, assertion, and cooperation. Additionally, there are three impression items, one for each subscale. Items for the IRSC are scored in the same manner as they are scored for the IRS. According to Anme et al. (2012), the IRSC has an internal consistency of 0.87. The Interaction Rating Scale Advanced (IRSA; Anme et al., 2011) was designed as a measure of social competence for individuals over the age of 15 through observations. The IRSA is comprised of 92 items used to obtain a behavioral score for six subscales measuring assertiveness, responsiveness, self-control, sensitivity, regulation, and expressivity with six additional impression items, one for each subscale. Like the IRS and IRSC, behavior items are scored based on the presence of the behavior (i.e., 0 = "no"; 1 = "yes"), and impression items are scored based on a 5-point Likert-type scale. According to Anme et al. (2014), the IRSA has an internal consistency of 0.89. Overall, the IRS and its alternative forms allow for the evaluation of various features of interactions and social skill development across different age groups and different types of interactions (Anme et al., 2010).

Social Profile

The Social Profile (SP; Donohue, 2003) is an observational measure that evaluates levels of social participation in groups for individuals across childhood and adulthood. Two separate forms for the SP exist, a long and a short form, and both forms are intended to measure five overarching developmental level concepts of participation: parallel level, associative level, basic cooperative level, supportive cooperative level, and mature level. The long form of the SP is comprised of 262 items divided into seven subscales including communication, cooperation, roles, norms, behavior, activity, attraction, and power.

The SP short form is comprised of 40 items divided into three subscales including group membership, activity participation, and social interaction. According to Donohue (2005), the SP is primarily intended for use among occupational therapists for the purpose of enhancing the observation and measurement skills of those therapists in groups. Each item on the SP is scored on a Likert-type scale after descriptive, qualitative notes are taken during observation of the individuals being assessed in a group setting. Scores on the SP first provide averages across the different subscales, which then map onto the five developmental levels providing an indication of how many, or how few, levels of group participation the individual being assessed has achieved.

Previous research on the SP has indicated that it has moderate internal reliability as well as moderate to high interrater reliability for most of the five developmental levels, depending on the age group being assessed (Donohue, 2007). For example, according to Donohue (2005), moderate to high interrater reliability was found for the parallel and basic cooperative levels, but not the associative level, in a sample of preschool children. Because this is a young age group, it is unlikely that these individuals will achieve the higher, adult-like supportive cooperative and mature levels of group participation (Donohue, 2007). Additional research has indicated that the SP has good content and construct validity for both the long and short forms. Further, the SP has been used and validated among a number of different community populations across different age groups, as well as psychiatric inpatient populations (Donohue, 2007).

Conclusion

The appropriate use of social skills in day-to-day social interactions is important for the development of social relationships as well as psychological and physical well-being (Crowe et al., 2011). Additionally, social skills deficits are associated with a variety of negative outcomes (e.g., depression; Sato et al., 2005) highlighting the importance for conducting accurate assessments regarding social skills in order to appropriately target behaviors for intervention. Social skills assessment and treatment have a long history and have been extensively researched across a number of different populations. Currently, it appears that a majority of research in the assessment of social skills has focused on the development and validation of informant-based or self-report rating scales, measures involving the direct observation of behavior, or some combination thereof. Additionally, many of the assessment methods discussed focus on observable behavior across a variety of contexts. This chapter reviewed a number of different social skills assessments and presented evidence supporting their use in children and adolescents. Overall, the majority of social skills assessments reviewed here consisted of rating scales intended to measure both adaptive and maladaptive social skills or aspects of social competence with research indicating adequate to excellent psychometric properties.

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Behavior Analytic Methods

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Introduction

From a behavior analytic standpoint, socials skills are typically conceptualized as behaviors or series of complex behaviors that have an impact on the responses of others (McFall, 1982). The principles of operant conditioning thus apply to the development and generalization of social skills in children (Allen, Hart, Buell, Harris, & Wolf, 1964; Chandler, Lubeck, & Fowler, 1992; Odom & McConnell, 1992). These principles are not only used to explain the emergence and maintenance of social skills but also to treat difficulties in both children with and without disability. Young children learn social skills by contacting the social contingencies present in their environment. These social contingencies typically include three components: a discriminative stimulus, a response, and a social consequence (Cooper, Heron, & Heward, 2007).

The discriminative stimulus appears before the response (i.e., social behavior). The response is more likely to be followed by a reinforcing consequence in its presence than in its absence. In other words, the discriminative stimulus signals the availability of the reinforcer maintaining the social behavior. Assume that playing is a reinforcing activity for a child, Billy. When Billy asks his friend Tara to play with him, she only agrees when they are in the schoolyard; otherwise, she refuses to play with him. Thus, the schoolyard functions as a discriminative stimulus because the social behavior of asking to play is more likely to be followed by reinforcement (i.e., playing) within this specific context.

The second component of the contingency is the response, which is the social behavior emitted by the child. Social behaviors may take on many forms ranging from simple nonverbal interactions (e.g., eye contact, gesturing) to complex verbal exchanges (e.g., conversations on abstract topics). Although social behaviors can vary widely in form (sometimes referred to as topography), they share the commonality of resulting in some type of social consequence. More complex behaviors can be specifically conceptualized as behavior chains, which are series of responses. For example, the behavior of saying "hi" to a friend in the hallway may be further divided into smaller units: (a) stopping approximately 1.5 m in front of the friend, (b) looking at the friend, (c) saying "hi," and (d) waiting for a response. Within a behavior chain, the first response serves as the discriminative stimulus for the second response, the second response for the third response, and so on.

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The social consequence is the final component of the contingency, which is used to explain the development and maintenance of social skills. A social consequence is a stimulus event mediated by another person that is provided contingent on the occurrence of the social behavior. If the consequence increases responding, it is referred to as a reinforcer. Contrarily, consequences that decrease responding are referred to as punishers. For example, most mothers are more likely to talk to their babies in a soothing voice when they smile. If the infant smiles more often as a result, the mother's talking in a soothing voice would be considered as a social reinforcer for smiling. In contrast, if a mother scolds her young child when he screams and it results in a reduction of screaming, scolding would be considered as a social punisher. In both previous examples, the consequence involved the addition of stimulus (i.e., positive reinforcement and punishment). Social behavior may also result in the removal of a stimulus (i.e., negative reinforcement and punishment). If a child asks a friend to stop playing a game, the removal of the game may function as a reinforcer for the social behavior of asking to stop.

Traditionally, most learned behaviors are explained using this three-term contingency, but behavior analysts have been increasingly turning to a fourth term to supplement their analyses, the motivating operation (Laraway, Snycerski, Michael, & Poling, 2003; Michael, 1993). Motivating operations are stimulus events that alter both the value of a consequence and the frequency of the behavior associated with it. The abolishing operation reduces the value of a consequence, whereas the establishing operation increases its value. For example, engaging in the same activity (e.g., game) for extended periods of time may reduce its value as well as the behavior of engaging in the activity. In this case, the stimulus event (extended duration of engagement in the activity) functions as an abolishing operation. As an example of establishing operation, assume that two children are playing together. When a third child arrives, they ask her to play tag. Even though tag was available as a game beforehand, the presence of a third child increased the value of the game and the frequency of asking to play tag, functioning as an establishing operation for the behavior.

Within a behavior analytic conceptualization, the practitioner generally aims to manipulate these contingencies to teach children social skills. For example, a practitioner may add discriminative stimuli (e.g., prompts) to facilitate the correct execution of the behavior, use stimulus events functioning as establishing operations to increase the value of the reinforcer associated with the social behavior, or alter the consequences contingent on engagement in the behavior. Multiple interventions have been derived from the principles of applied behavior analysis to support the acquisition, generalization, and maintenance of social skills in children. The next section presents common behavioral assessments that may be warranted prior to the implementation of interventions for social skills. Then, we define and discuss methods that have been used to increase interactions and improve social skills in children.

Behavioral Assessment

Assessment is the first step conducted by the practitioner when aiming to improve social skills in children. Direct observation methods, checklists, and scales are all options available to practitioners who need to assess social skills (Gresham & Elliott, 1984; Matson & Wilkins, 2009). As these assessment methods have already been reviewed previously (see Chapters "Observational Methods" to "Behavior Analytic Methods"), providing a detailed description goes beyond the scope of the current chapter. That said, we will provide an overview of three behavioral assessments that are often central to the success of interventions based on behavior analytic principles: task analysis, preference assessment, and functional assessment. These three assessments may support practitioners in planning their interventions and optimizing treatment effects when teaching social skills.

Task Analysis

Prior to teaching complex skills, practitioners often conduct a task analysis, which involves the division of a behavior into smaller units (i.e., a behavior chain; Neidert, Dozier, Iwata, & Hafen, 2010). According to Cooper et al. (2007), there are three methods to construct a task analysis: observing skilled persons preforming the target task, consulting an expert of the target task in question, and performing the task yourself. By dividing complex behaviors into smaller units, it becomes easier to measure and to teach. Once every step of the chain is clearly defined, it is essential to assess the child's ability to perform each of the chain units. The practitioner can then develop a checklist that describes each unit that the child must perform. Two methods may be used to assess the units of the task analysis: single and multiple opportunities. The single opportunity assessment consists of assessing the task in the correct order. The assessment typically ends when the child fails one of the steps because the discriminative stimulus to produce the subsequent units of the chain is absent. During multiple opportunities assessment, the instructor assesses each unit of the chain, providing prompts if necessary so that the child has the opportunity to perform each step.

In an example of single opportunity assessment, Parker and Kamps (2011) conducted a task analysis in order to assess performance during social activities in two high functioning children with autism spectrum disorder (ASD). During baseline, the instructor simply asked the participants to complete the tasks without further prompting. Given that the tasks had to be completed in a certain order, the child did not have the opportunity to perform the subsequent tasks if the first one was not executed or was performed incorrectly. In contrast, Haring, Kennedy, Adams, and Pitts-Conway (1987) conducted a task analysis to assess community skills in young adult with ASD. During the initial assessment, the instructor presented relevant prompts so that the youth could emit a step even if the previous step had been failed. Although this study was conducted with young adults, the level of functioning of the participants was low (functioned at levels of 4 and 5 years old), suggesting that this method may also be relevant to young children.

Preference Assessment

Engagement in appropriate social behaviors typically generates reinforcing consequences through continuing interactions with others. For some children, social consequences may not be sufficient to lead to the acquisition of new social behaviors for two reasons. First, the execution of the behavior may not be correct or accurate during the learning process, which may fail to lead to the delivery of social reinforcement in the natural environment. Thus, the child may not contact the social contingency frequently enough to increase responding. Second, social consequences may not be a potent reinforcer for the child in question. In this case, an additional reinforcer should be paired with the social consequence in order to (a) condition the social responses of others as reinforcers and (b) strengthen the novel social behavior. Because most of the interventions for teaching social skills have a reinforcement component, assessing preferred stimuli is paramount.

Preference assessments are procedures designed to assist practitioners in identifying preferred stimuli for treatment (Graff & Karsten, 2012). The stimuli evaluated within preference assessments can take on many forms such as edibles (e.g., preferred food), leisure items (e.g., toys, games), sensory stimuli (e.g., music), or even other types of social stimuli (e.g., praise, tickles; Virués-Ortega et al., 2014). During treatment, the practitioner can either provide preferred stimuli directly as reinforcers or use them as backup reinforcers within a token economy (Doll, McLaughlin, & Barretto, 2013). One of the simplest methods and least time consuming procedure to assess preference is the use of surveys (Resetar & Noell, 2008; Rotatori, Fox, & Switzky, 1979). In this type of indirect assessment, a survey is administered to the child, a teacher, or parent to identify the preferred stimuli of the child. However, studies have indicated that this method does not necessarily identify the most potent reinforcers (Hagopian, Long, & Rush, 2004; Northup, George, Jones, Broussard, & Vollmer, 1996), which suggests that direct assessments methods should be used when possible.

During direct assessments of preference, the child has the opportunity to directly access the stimuli in the assessment, and the practitioner measures whether the child interacts with the stimulus or the duration of interaction. Depending on the functioning of the child and type of stimulus, interactions can include approaching, manipulating, consuming, picking up, or gazing at the item (Virués-Ortega et al., 2014). Typically, direct preference assessments involve between 5 and 15 stimuli, which will vary according to stimulus category and type of assessment, and begin by sampling so that the child has the opportunity to interact with the stimuli beforehand. The four most common procedures are the single-stimulus assessment, the paired-choice assessment, the multiple stimulus assessment, and the free-operant assessment (Graff & Karsten, 2012; Kang et al., 2013; Virués-Ortega et al., 2014).

During the single-stimulus assessment (Pace, Ivancic, Edwards, Iwata, & Page, 1985), the practitioner presents each stimulus one at a time for a brief period of time (e.g., 30 s) and records whether the child interacts with the stimulus or not. The procedure is generally repeated several times for each stimulus. The most preferred items are the ones selected the most often. Alternatively, the practitioner may measure the duration of interaction with the stimulus, which may be useful for assessing preference for activities; in this case, the item with which the child interacts for the longest duration is considered the most preferred (Hagopian, Rush, Lewin, & Long, 2001). The single-stimulus assessments have the advantage of being straightforward to implement and can be rapid to complete. The main disadvantage is that the procedures may produce multiple false positives and prevent rank ordering as some children may interact with all stimuli.

The paired-choice preference assessment involves presenting stimuli in pairs (Fisher et al., 1992). Each stimulus is presented with each other stimulus once, so that all stimuli are eventually paired together in a random order. During each presentation, the child is asked to choose between one of two stimuli and can interact with the one selected for a short period of time (e.g., 30 s). The practitioner records the item selected on each trial (if any), and the one selected the most frequently is the most preferred. The methodology has also been adapted to assess preference for music and video recordings (Chebli & Lanovaz, 2016; Horrocks & Higbee, 2008). The paired-choice method has the advantage of ranking the items in order of preference, but the procedures can be time consuming, especially as the number of items assessed increases.

The multiple stimulus assessments are similar to the paired-choice method, but all stimuli are presented simultaneously (DeLeon & Iwata, 1996). Two versions of the multiple stimulus assessment are available to practitioners. In the multiple stimulus with replacement method, the practitioner records the selection and replaces the selected item in the array following each choice. In the multiple stimulus without replacement method, the practitioner records the rank at which the item was selected and does not replace it in the array following its selection. The multiple stimulus without replacement is generally recommended first among all the methods because of its rapid administration and its ranking of items (Kang et al., 2013). Conditions in which other methods may be preferable include when (a) the child engages in problem behaviors contingent on the removal items, (b) assessing preference for activities, and (c) assessing preference in children with severe disabilities, which may limit the number of items that can be presented simultaneously.

A final alternative is the free-operant preference assessment, which consists of providing access to multiple stimuli simultaneously during a period of 5–15 min and recording the duration of interaction with each item (Roane, Vollmer, Ringdahl, & Marcus, 1998). This method has the benefit of having a predictable duration and may result in lower levels of problem behaviors as items are not removed (Verriden & Roscoe, 2016). It should be noted that the method may produce false negatives as some children may only interact with one item during the entire duration of the session, limiting its utility when multiple preferred stimuli must be identified and ranked.

In sum, practitioners should strongly consider conducting a preference assessment when planning to use reinforcers as part of their treatment. The multiple stimulus without replacement method has clear advantages, especially for children who do not have an intellectual disability and engage in few problem behaviors. That said, the other procedures may prove particularly useful when it is not possible or advisable to implement the multiple stimulus without replacement procedure.

Functional Assessment

As previously discussed in the introduction to this chapter, the behavior analytic conceptualization of social skills implies that these behaviors have social functions. That is, children engage in social skills to contact social contingencies in their environment. These functions can be numerous such as accessing a desired item mediated by another person, seeking attention, or terminating an activity with a partner. As such, conducting a functional assessment can be particularly useful when either identifying the contingencies maintaining an inappropriate social behavior or attempting to target a replacement behavior (Frea & Hughes, 1997; Maag, 2005). By identifying the specific function of the social behavior, the practitioner may more precisely select alternatives that will allow the child to contact similar social contingencies. Adopting a functional approach may thus improve the probability of success of the social skills intervention (Hurl, Wightman, Haynes, & Virues-Ortega, 2016; Matson, Bamburg, Cherry, & Paclawskyj, 1999). For details on conducting functional assessments, we refer the reader to the Chapter "Challenging Behavior", which provides a thorough review of the different methods.

Behavioral Treatment

Many treatments to improve social skills in children have been derived from applied behavior analysis. For clarity, we present each behavior analytic method individually in our review of treatments. However, nearly all treatments involve the implementation of multiple methods simultaneously in order to support the development and maintenance of new social skills; we thus encourage practitioners to combine these methods to meet their treatment objectives. We did not review self-management and behavioral skills training as part of the current chapter as they are thoroughly covered in subsequent sections of this book (see Chapters "Self-Regulation in Childhood: A Developmental Perspective" and "Social and Emotional Learning: Recent Research and Practical Strategies for Promoting Children's Social and Emotional Competence in Schools").

It should be noted that a lot of the research on behavior analytic interventions to improve social skills in children without developmental disability has been conducted more than 20 years ago. More recently, research has focused on social skills in children with ASD and other developmental disabilities. Our review of the interventions will provide an overview of both older and more recent research on the topic. Given that the principles of behavior apply to all (regardless of diagnosis), the results are most likely generalizable from one population to another.

Prompting

One of the most common components of behavioral interventions used to teach social skills to children is prompting. Prompting involves the addition or modification of a stimulus prior to the occurrence of the behavior that increases correct responding. In other words, the parent or instructor adds supplementary antecedent stimuli to help a child perform a skill (Odom & Strain, 1984; Spence, 2003). During social skills training, the use of prompting procedures aims to reduce errors while teaching new socially appropriate behaviors.

The two main types of prompts are stimulus prompts, which involve the addition or modification of a social cue, and response prompts, which operate directly on the behavior. Stimulus prompts are divided in two categories: extra-stimulus prompts and intra-stimulus prompts (Shreibman, 1975). When providing an extra-stimulus prompt, the parent or instructor adds a stimulus (prompt) to increase the child's correct responding. For example, Ivy, Lather, Hatton, and Wehby (2016) used automated tactile cues delivered by a vibrating pager to prompt children with visual impairments to engage in pro-social behavior during lunchtime (i.e., eating with mouth closed). The prompting procedure was effective at increasing the pro-social behavior in all three participants. In another example of extra-stimulus prompts, Harrell, Kamps, and Kravits (1997) taught three children with ASD strategies to maintain social interactions with others. To this end, one of the components of the intervention involved cue topic cards to prompt conversations during lunchtime.

When implementing an intra-stimulus prompt, the instructor enhances a component of the discriminative stimulus that helps the child respond correctly. In an example of intra-stimulus prompt, Taylor and Hoch (2008) taught a child to respond to pointing. As a prompt, the instructor exaggerated the pointing gesture and accompanying verbal command in order to increase the salience of the discriminative stimulus (i.e., the stimulus [pointing] was enhanced to facilitate responding). In a study of the perception of robots by children with ASD, Peca, Simut, Pintea, Costescu, and Vanderborght (2014) reported that children preferred robots with exaggerated facial features. Using this type of intra-stimulus prompt may facilitate the initial development of receptive nonverbal social skills as the child may be more readily able to identify emotions and nonverbal cues when the facial features are more salient.

Response prompts can also be further divided into three categories: verbal instructions, physical guidance, and modeling (Cooper et al., 2007). Verbal instructions are frequently used to teach new behaviors in training contexts; they can either be vocal or nonvocal instructions (e.g., written). Koegel, Koegel, Hurley, and Frea (1992) used verbal instructions to teach four boys with autism to self-manage their edible reinforcers after successfully responding to questions from others. In order to support the participants, the instructor provided verbal cues such as "What happens when you earn all of your points?" or "How many points did you earn?" Another example of verbal instructions is the use of social scripts, which involves written or audio recorded cues to teach social initiations and interactions (Brown, Krantz, McClannahan, & Poulson, 2008; Cowan & Allen, 2007). Social scripts have been shown effective in teaching children to increase social initiations, to interact with their peers, and to engage in conversations about various topics (Krantz & McClannahan, 1993, 1998; Sarokoff, Taylor, & Poulson, 2001). In most cases, scripts are gradually faded when the children show mastery of the socials skills so that the newly learned behaviors are emitted in the presence of natural stimuli.

Physical guidance refers to the instructor physically assisting the child with movements to improve the accuracy of the social behavior. O'Connell, Lieberman, and Petersen (2006) explain that when paired with verbal instructions and proper feedback (i.e., adapted to the level the child's receptive language), physical guidance is crucial for teaching children with visual impairments and developmental delays. Physical guidance is often used to teach motor skills, like playing games or physically requesting attention.

Modeling refers to providing a demonstration of the targeted social behavior prior to its performance by the child. To learn by modeling, children should be able to imitate immediately after the stimulus has been presented (within 3–5 s). During modeling, the child watches a model of the social behavior to be executed. This model can be presented in vivo or through video. Video modeling is usually implemented by presenting a video recorded sample of the specific social behavior to the child. Then, the child is asked to perform the sequence. In video modeling, models can either be adult models, peer models, self-models, point-of-view models, or mixed models (any combination of the previous models; McCoy & Hermansen, 2007). McCoy and Hermansen (2007) have indicated that adults as models have been effective in increasing play skills, perspective taking skills, and conversation skills for children with ASD. Peer modeling has also been effective in increasing and generalizing communication skills in social situations. As mentioned by Reichow and Volkmar (2010) in a review of social skills, more studies are needed to clarify what type of model may lead to better outcomes in teaching social skills.

Video self-modeling can either involve (a) videotaping children and editing out inappropriate behaviors to focus on the appropriate social behavior or (b) watching an unedited video so the children can self-critique their performance. Video self-modeling has demonstrated encouraging results in increasing socially relevant behaviors, but more studies are needed to further support its effectiveness (Hagiwara & Myles, 1999; McCoy & Hermansen, 2007). Point-of-view modeling involves showing video footage as if the child was engaged in the sequence. Relatively new, this approach has been effective in teaching play skills and other developmental skills to children with ASD and without developmental delay (Norman, Collins, & Schuster, 2001; Schipley-Benamou, Lutzker, & Taubman, 2002). Finally, mixed models have been used to teach conversational skills, social initiation skills, and play skills to children with variable results (Maione & Miranda, 2006; Sherer et al., 2001). When compared to in vivo modeling, video modeling seems to produce faster results and better generalization of social behaviors (Charlop-Christy, Le, & Freeman, 2000). It may also be less time consuming and more cost efficient (Graetz, Mastropieri, & Scruggs, 2006). Once videotaped, the sequence may be used numerous times by different instructors without being modified.

Fading

When using prompts, the purpose is to gradually fade them until the child is able to respond in their absence (Riley, 1995). Four different procedures can be used to transfer control of the response from the prompt to the natural social discriminative stimulus: most-to-least prompting, graduated guidance, least-to-most prompting, and time delay (Barton & Wolery, 2008). Most-to-least prompting is a strategy in which the instructor initially provides guidance using more intrusive prompts and then gradually replaces them with less intrusive ones until the child performs the skill in the absence of prompting. The amount of guidance is gradually reduced as the child begins to perform the social skill correctly with less instructor assistance. Often, most-to-least prompting begins with physical guidance, then moves to gestural prompts followed by verbal instruction, and ends with the natural social discriminative stimulus. Jones (2009) implemented most-to-least prompting in order to teach joint attention skills to two children with ASD. In this case, the instructor began with physical guidance, then replaced it by pointing, and finally introduced a 4-s time delay. Most-to-least prompting has also been shown effective in teaching play and communication skills to children with ASD and other developmental disabilities (Taylor & Hoch, 2008). Graduated guidance is a variation of most-to-least prompting, but in this case, the practitioner only uses physical prompts and gradually fades the different forms until the learner emits the behavior without additional prompts (Bryan & Gast, 2000; MacDuff, Krantz, & McClannahan, 1993).

When implementing least-to-most prompting, the parent or instructor waits for the child to perform the behavior before providing a prompt; the prompting hierarchy moves from least-to-most intrusive (Cihak, Fahrenkrog, Ayres, & Smith, 2010; Kroeger, Schultz, & Newsom, 2007; Murzynski & Bourret, 2007). A set amount of time is usually given to the learner to do so after the presentation of the social cue (e.g., 3 s). For example, an instructor may say, “hi” and wait 3 s for the child to respond. If the child does not respond correctly, the instructor may provide a subtle gesture as a prompt (e.g., waving) and wait again for a response. After an additional 3 s, the instructor may provide a more intrusive prompt such as a verbal cue or physical guidance to wave. Once the child performs the social behavior correctly, the instructor provides a reinforcer and continues teaching. Jolly, Center, Test, and Spooner (1993) used role-play to teach social skills to children with ASD and integrated a least-to-most prompting procedure to facilitate engagement in correct responding. In a recent example, Davis-Temple, Jung, and Sainato (2014) implemented a four-step least-to-most prompting hierarchy to teach three children with special needs to play social board games. The hierarchy involved an indirect verbal prompt, a direct verbal prompt, a gestural or model prompt, and a physical prompt. Both the previous studies are examples of how least-to-most prompting strategies may be implemented to support children in the development of their social skills.

Finally, time delay refers to the amount of time that the instructor provides between the presentation of the social request and the prompt (Yilmaz & Birkan, 2005). Instructors can implement the delay in a constant or progressive manner. For the constant time delay, the prompt is presented after a specific amount of time (e.g., 3 s). For the progressive time delay procedure, the instructor starts by presenting the prompt simultaneously with the social stimulus. The time delay is then systematically increased by 1 s at a time following the child's progression. Time delay procedures have been shown to be effective in teaching social and communication skills within children's natural environments (Liber, Frea, & Symon, 2008; Yilmaz & Birkan, 2005). For children with ASD or other disabilities, this contextual teaching may promote generalization of social skills across individuals and settings.

Stimulus fading and stimulus shaping are fading procedures that are implemented by modifying the discriminative stimulus presented to the child (Wolery & Gast, 1984). When implementing stimulus fading, the parent or instructor introduces a new stimulus with enhanced characteristics to increase the likelihood of an errorless response (e.g., Lancioni, 1983). Then, the altered characteristics (e.g., color, size, shape) are faded by the instructor. For stimulus shaping, relevant dimensions of a stimulus that already evokes the target behavior are gradually modified until the child responds correctly following the presentation of the natural social stimulus only. Krantz and McClannahan (1998) used a script fading procedure to teach three boys aged 4 and 5 with autism to interact with an adult by saying, "Look" and "Watch me." First, the instructor showed the children a card with the word scripted on it. Then, the instructor removed one third of the card at every step until no card was visible. The script fading procedure was effective in increasing child-adult social interactions for the three boys and its effects also generalized to a new adult. As discussed earlier, Taylor and Hoch (2008) used fading with intra-stimulus prompts to bring a social response under the control of naturally occurring social stimuli; that is, they reduced the salience of an adult's pointing when teaching children to respond to this social cue.

Chaining

Chaining involves teaching a complex behavior, which has been divided into many simpler ones within a chain of behaviors. Every behavior within the chain is reinforced and serves as a cue for the subsequent behavior of the sequence. In other words, the feedback provided from one behavior functions as the discriminative stimulus for the subsequent one. As for the first and the last unit of the chain, they serve only one function, either the discriminative stimulus or reinforcer. Chaining is a validated procedure to teach self-help, adaptive, community, and domestic skills to children (Rayner, 2011; Shrestha, Anderson, & Moore, 2012; Thomson, Walters, Martin, & Yu, 2011). Moreover, Odom, Collet-Klingenberg, Rogers, and Hatton (2010) performed a review of evidence-based intervention in children and youth with ASD and indicated that task analysis and chaining had accumulated enough empirical support to be considered as evidence-based practices in teaching communication, play, and social skills.

Before implementing chaining procedures, a task analysis must be developed and validated. Once the complex behavior is divided into a chain, the skills of the child are assessed and the instructor selects one of the four chaining methods: forward, total-task, backward, or backward with leap ahead (Cooper et al., 2007). Forward chaining consists of initially teaching the first behavior of the chain and then every subsequent unit in a sequential order. To clarify this principle, let's use the simple behavior of brushing teeth. The first step to be taught would be "open a tube of toothpaste." After the child has shown acquisition of the first step, the behavior "apply toothpaste on toothbrush" could be taught and so on, until every behavior of the chain was mastered. DeQuinzio, Townsend, and Poulson (2008) showed that forward chaining with contingent social interaction was effective at teaching a sharing response chain to four children with ASD. In another study, Libby, Weiss, Bancroft, and Ahearn (2008) compared two prompting techniques to teach play skills with forward chaining to five children with ASD and other disabilities. Their results indicated that forward chaining led to play skills acquisition, regardless of the prompting procedure.

Total-task chaining represents a variation of forward chaining in which the instructor teaches every unit of the chain at each training session until the child is able to accomplish the entire sequence. One example of an intervention that takes advantage of total-task chaining is video modeling. During video modeling, all the components of complex social behaviors are taught simultaneously within the recording, which is a form of total-task chaining (Kagohara et al., 2013; Tetreault & Lerman, 2010). Similarly, Arntzen, Halstadtrø, and Halstadtrø (2003) taught a child with developmental disability to play appropriately by teaching all steps that he performed incorrectly simultaneously. Specifically, the instructor provided prompts on steps performed incorrectly during a previous trial.

Backward chaining consists of teaching the last step of a chain and then introducing every unit of the chain in a reversed sequential order. Using our earlier example of brushing teeth, putting away the toothpaste and toothbrush could be the first behavior taught and after successfully meeting the mastery criterion for this step, rinsing the toothbrush (i.e., the second to last step) could be introduced, until the first unit of the chain was mastered. In backward chaining, the reinforcer is always provided at the end of the chain. Backward chaining with leap ahead is essentially the same process as backward chaining except that one would not teach every step of the chain because the child may have already mastered some units. Rather, the mastered steps can be probed while teaching the rest of the chain (Spooner, Spooner, & Ulicny, 1986). Backward chaining is part of the picture exchange communication system (PECS), a widely used program to teach social communication to children with developmental disabilities (Bondy & Frost, 1994). For example, Charlop-Christy, Carpenter, Le, LeBlanc, and Kellet (2002) taught children with ASD to initiate communication spontaneously using PECS. The initial step of the program, the exchange, is taught using backward chaining. The behavior of giving a picture to the instructor can be divided into three steps: (1) pick up the card, (2) move hand over the instructor's hand, and (3) let go of the card. The instructor physically prompts the two first steps, and then the child must release the card without prompting. When this behavior meets the mastery criterion, the instructor prompts only the first step; the child then has to perform the last two independently. Research on PECS suggests that backward chaining may be useful to teach basic social communication skills to children with developmental disabilities.

Shaping

Shaping is a procedure used to teach a behavior that is not yet in a person's behavioral repertoire and consists of reinforcing the nearest approximation of the target behavior (Cooper et al., 2007). The shaping procedure contains two components: differential reinforcement and successive approximations. The procedure involves the differential reinforcement of behaviors that share some characteristics with the target behavior while withholding reinforcement for other behaviors. In doing so, the occurrence of the desirable behavior is likely to increase. The first step of shaping consists of identifying a behavior already in the repertoire of the person that shares some characteristics with the target behavior (nearest approximation) and providing reinforcement contingent on its occurrence. When the occurrence of the initial approximation increases, the instructor modifies the criteria and reinforces a novel approximation closer to the final behavior. Successive approximations refer to this progressive change in reinforcement criteria. In shaping attending behavior, the instructor could provide reinforcement when the child is orienting her head towards the instructor. When the occurrence of this behavior increases, the instructor could then reinforce when the child makes direct eye contact and then when the child responds to the instructor's question.

As with other behavioral procedures, shaping is often integrated into comprehensive intervention programs (Lovaas, 2003; Rogers, 2000). Shaping may also represent a core intervention strategy within a program. Allen et al. (1964) showed that shaping was effective to teach social play to a preschool girl who had a low rate of social interactions. Another study demonstrated shaping as an effective technique for increasing peer-to-peer interactions for children who were socially withdrawn, but that modeling appeared to be more effective (O'Connor, 1972). In a more recent example, Hall, Maynes, and Reiss (2009) used shaping with overcorrection to improve eye contact in children with fragile X syndrome. The instructor only reinforced increasingly longer durations (i.e., approximations) of eye contact using percentile schedules. As such, shaping contributed to increasing the duration of eye contact, an essential nonverbal social behavior. One of the benefits of implementing shaping procedures is that it may reduce frustration by reinforcing already mastered behaviors (Lovaas, 2003). That said, using shaping to teach novel social behavior may be time consuming when compared to other strategies (e.g., prompting); it should mainly be used when it is not possible to prompt the behavior (e.g., vocal behavior, eye contact) or the person is unable to execute the correct behavior despite prompting.

Discrete Trial Training

Discrete trial training is a format used to teach a variety of skills to children such as communication, play, social, self-help, and academics (Hayward, Gale, & Eikeseth, 2009; Smith, 2001). Typically, discrete trial training includes five distinct parts: (1) a discriminative stimulus provided by the instructor, (2) a prompt to help the child emit the target behavior, (3) the child's response, (4) a consequence (reinforcing a correct response or implementing an error correction procedure in the case of an incorrect response), and (5) a brief pause before presenting the discriminative stimulus for the next trial. Discrete trial training is typically applied within one-to-one teaching sessions between an instructor and a child.

Downs, Downs, Johansen, and Fossum (2007) showed that discrete trial training brought positive change in social-emotional and adaptive behaviors in young children with developmental disabilities. In addition, Nuzzolo-Gomez, Leonard, Ortiz, Rivera, and Greer (2002) demonstrated that discrete trial training combined with reinforcement could increase engagement in appropriate functional play in preschoolers with ASD. In a review study, Odom et al. (2010) indicated that discrete trial training was considered evidence-based in teaching new behaviors and communication skills, but that it did not have sufficient support to be considered an evidence-based practice when teaching social skills to children with ASD.

Lovaas (2003) presented four reasons to use discrete trial training: (1) the nature of the teaching format helps the children access the discriminative stimulus, (2) it is easy to observe when a child responds correctly, (3) it allows the instructor to teach with consistency, and (4) it facilitates data collection to assess progress. The opportunity to implement this teaching format in a large range of contexts also represents an advantage (Downs et al., 2007). Although discrete trial training is an efficient teaching format, some limitations should be considered. Given the structured nature of this method, Smith (2001) indicated that children may fail to respond in the absence of a clear discriminative stimulus. To address this issue, practitioners should implement a more flexible instructional approach after the child has met the mastery criterion.

Reinforcement Schedules

As with any other type of behavior, reinforcement is generally an essential component of social skills training. With some children, the social reinforcement provided by the continued interaction with others may be insufficient to teach novel behaviors, which is why adding other types of reinforcers may be important (Reichow, Steiner, & Volkmar, 2013). Ratio-based schedules involve the delivery of a reinforcer after the child has emitted the behavior for a prespecified number of times (Catania, 2013). This delivery can occur after a fixed number of responses or a variable number of responses. When the reinforcer is provided every time the behavior occurs, the schedule is referred to as continuous reinforcement. For example, Russo and Koegel (1977) taught a young girl with ASD social skills in the classroom by providing tokens every time she emitted specific skills; she could accumulate tokens that she later exchanged for backup reinforcers (e.g., edible items). Intermittent ratio schedules, wherein the reinforcement is provided after a fixed or variable of response, are often used to promote maintenance of behavior over time (Beiers, Derby, & McLaughlin, 2016; Hopkins, 1968; Martins & Harris, 2006).

In contrast, interval-based schedules involve the delivery of a reinforcer contingent on engaging in a target behavior after a variable or fixed period of time (Catania, 2013). In a recent example, Vallinger-Brown and Rosales (2014) taught basic conversational skills (i.e., intraverbal responding) to children with attention deficit disorder. The instructor provided reinforcement for attending on a 30-s variable-interval schedule, and responses during posttest were also reinforced on a 1-min variable-interval schedule using tokens as reinforcers. As a variation of the variable-interval schedule, Matson, Fee, Coe, and Smith (1991) implemented a procedure whereby an instructor provided edible reinforcers to children with developmental delay if they had engaged in the behavior when a timer beeped on a variable 4-min schedule. This procedure increased social play for two of three participants. We recommend interval-based schedules when the target social behavior may have a variable duration (e.g., play, maintaining a conversation); using ratio-based schedules may result in briefer social responses as the child may attempt to maximize reinforcement (i.e., engage in shorter but more frequent bouts of the behavior to meet the reinforcement requirement more rapidly), which may be counterproductive.

Finally, lag schedules are often reported in studies of social skills, particularly in the acquisition of play. Lag schedules involve reinforcing the variability of a behavior (Page & Neuringer, 1985). For example, a lag 5 schedule involves the reinforcement of a response only if five consecutive responses differ from one another. Baruni, Rapp, Lipe, and Novotny (2014) taught children with intellectual disability to vary play behavior by implementing lag 1 and lag 2 schedules. Interestingly, the lag 2 schedule did not significantly increase variability when compared to the lag 1 schedule for two of three participants. Using a combination of lag and interval schedules, Lepper, Devine, and Petursdottir (2016) used lag 1 and 2 schedules to teach varying conversational topics in two children with ASD. Specifically, the conversational partner provided attention if the topic differed from the topics discussed in the previous one or two 10-s intervals.

Generalization Training

Generalization is the process whereby children display learned behavior within novel stimulus conditions or show novel responses under stimulus conditions in which a similar response was previously reinforced (Catania, 2013). For example, a child who learns to say “hi” to a relative and then applies the same behavior to an instructor (without prior reinforcement or prompting) is said to have shown stimulus generalization. Similarly, a child who learns to hold a conversation about cars and then applies this new skill to discussing planes is displaying response generalization. A child may show generalization to novel persons, settings, contexts, or responses. Long-term maintenance of skills is also a form of generalization but across time. Generalization is not necessarily a passive process and should thus be actively programmed when teaching social skills to children (Chandler et al., 1992).

In a seminal paper on generalization, Stokes and Baer (1977) described seven proactive strategies to promote generalization. Researchers have incorporated each of these strategies in prior studies examining the effects of social skills training in children (Chandler et al., 1992). The first strategy, introducing naturally maintaining contingencies, involves the use of contingencies that maintain themselves in the child's typical environment. Probably the best example of natural contingencies for social play is the use of peers during training because the consequences provided by these peers are the same as those that the child will contact when emitting the behavior in the natural environment. For example, Laushey and Heflin (2000) implemented a buddy system for two children with ASD. The teacher instructed peers to stay, play, and talk with both children. The contingencies in the training environment (i.e., receiving social reinforcement through continued interaction) were the same as the ones present in the natural environment (e.g., classroom, recess), which made it more likely that the children would show generalization.

A second strategy to promote generalization is to teach sufficient exemplars for the child to display the behavior to untaught exemplars. A practitioner may train the behavior with multiple persons, in many settings, or with different materials (e.g., toys) in order to increase the likelihood of the learned behavior being emitted in novel stimulus conditions. To promote generalization of helping behavior, Reeve, Reeve, Townsend, and Poulson (2007) taught multiple exemplars of helping by varying the teaching materials with four children with ASD. Their results indicated that teaching using multiple exemplars was effective in promoting multiple forms of generalization. In an interesting variation of the peer buddy system, Gunter, Fox, Brady, Shores, and Cavanaugh (1988) systematically introduced three different peers to teach social skills to two children with ASD. Both children increased appropriate responding to training peers, and one participant showed generalization to peers outside training. In addition to representing the use of naturally occurring contingencies (as discussed previously), this study also demonstrates the method of teaching sufficient exemplars by varying the peers used.

Third, practitioners may program for generalization by training loosely; that is, the instructor exerts less control over the stimulus conditions used during training. During this type of training, the child has the opportunity to contact the contingencies under various stimulus conditions, which encourages responding in the presence of novel stimuli. In other words, training loosely is similar to teaching sufficient exemplars, except that the instructor does not systematically control the introduction of exemplars. La Greca and Santogrossi (1980) developed groups to teach social skills to children without disability using modeling, coaching, and role-play. The results showed that the children receiving the intervention showed more social initiations in the classroom. The intervention can be conceptualized as an example of training loosely because the instructors exerted little control over the exemplars produced during role-play in the group context and over the questions that arose from the participants. In a more recent example, McMahon, Vismara, and Solomon (2013) incorporated unstructured play time within their social skills training program, which could promote generalization through the training loosely strategy.

To promote generalization over time, one of the most common strategies is the use of indiscriminable contingencies. These contingencies involve the delivery of intermittent reinforcement schedules, which have been repeatedly shown to be more resistant to extinction than continuous reinforcement (Lerman, Iwata, Shore, & Kahng, 1996; MacDonald, Ahearn, Parry-Cruwys, Bancroft, & Dube, 2013). To teach cooperative play to three children with intellectual disability, Lancioni (1982) showed that continuous edible reinforcement was initially necessary, but that gradually thinning the schedule to a variable ratio promoted the generalization of the skills. Likewise, Martins and Harris (2006) initially used continuous reinforcement schedules to teach joint attention initiations to three children with ASD. Once each child had mastered the skill, the researchers changed to variable-ratio schedules, which should promote both generalization and maintenance at follow-up.

A fifth strategy is to include stimuli common to both the training and natural environments. Programming common stimuli is a relatively simple strategy to promote generalization: The instructor only needs to make the training environment as similar as possible to the context in which the child is expected to display the social skill. One common strategy to program common stimuli is to include peers in the environment such as in peer-mediated treatments discussed earlier. In an interesting example, Beiers et al. (2016) taught a coach to prompt and reinforce appropriate social interactions during hockey practices. In this case, the prompting and reinforcement were delivered by the same person and in the presence of the same peers as in the natural environment. The intervention effectively increased social interactions of both participants. Moreover, the procedures also increased the likelihood that the new learned skills would continue when the procedures were faded. Another strategy is to conduct the training in the environment in which the skills will be used. To this end, multiple studies have shown that conducting training in schools may promote the generalization of learned social skills (Bellini, Peters, Benner, & Hopf, 2007).

Children can also be taught to mediate their own generalization to promote the use of social skills in novel contexts. Mediation takes on multiple forms in the research literature. Notably, Alber and Heward (2000) recommend teaching students to recruit attention in the form of praise when using social skills appropriately, which could promote generalization. In a variation, Hagopian, Kuhn, and Strother (2009) taught children to recruit attention to reduce inappropriate social behavior; the results showed that the intervention was effective, but the researchers did not measure generalization of the new skill. Another method of promoting generalization through mediation is to provide homework or handouts following social skills training sessions in order to prompt the child to practice the skill in other contexts (La Greca & Santogrossi, 1980; Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012; Ollendick & Hersen, 1979). Self-monitoring is an alternative form of mediation, which involves recording the frequency that the skill was used outside the training setting (Ivy et al., 2016; Morrison, Kamps, Garcia, & Parker, 2001; Warrenfeltz et al., 1981).

Finally, generalization can be conceptualized as an operant that can be reinforced as any other behavior. This strategy is typically referred to as "train to generalize" (Stokes & Baer, 1977). For example, Lang et al. (2014) taught children with ASD to play using lag schedules of reinforcement. The intervention involved the reinforcement of novel or different responses (i.e., response generalization) in order to increase variability in play and thus facilitate social integration. Another strategy can be to have parents deliver reinforcement in the natural environment. In a study incorporating this strategy, Pfiffner and McBurnett (1997) taught parents of children with attention deficit disorder to provide social and token reinforcement for displaying learned social skills at home. In both previous examples, generalization was reinforced as an operant, which should encourage responding under novel stimulus conditions or the production of novel responses.

As with other behavior analytic methods, these seven strategies are not mutually exclusive. As an illustration, the peer buddy system is often a combination of naturally occurring contingencies, programming common stimuli, and multiple exemplars. Similarly, lag schedules of reinforcement are examples of both the indiscriminable contingencies and the train to generalize strategies. Practitioners should also note that the research literature does not currently indicate whether one strategy is better than others. Therefore, we encourage practitioners to combine multiple strategies together.

Conclusions

In sum, several social skills training procedures have been derived from behavior analytic principles. Most of these strategies have not been tested individually but rather as part of broader intervention packages. Given that the principles of behavior analysis should apply to most behaviors regardless of their topography, the results of studies using these interventions provide sufficient support to be confident that they can also be effective alone or in combination with other interventions to improve social skills training. Social skills behavioral training generally involves prompts and reinforcement procedures and may also include other behavior analytic strategies (Spence, 2003). As general guidelines, we recommend that practitioners always conduct an assessment prior to the implementation of social skills intervention and collect data to monitor its effects. When designing treatments, practitioners should also consider combining multiple procedures within social skills programs as is often done in group training and peer-mediated interventions. Last, generalization should not be expected to occur on its own following training but should rather be actively programmed. Ultimately, researchers and practitioners alike should take advantage of behavior analytic methods and research when implementing social skills assessments and interventions with children.

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Social Learning Instructional Models

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Introduction

Developing and maintaining interpersonal relationships with peers is a hallmark of adaptive childhood development (Foster & Bussman, 2008). Children who fail to achieve this milestone are at risk of a variety of negative outcomes, including dropping out of school, juvenile delinquency and impaired mental health that may emerge or persist into adolescence and adulthood (Kupersmidt, Coie, & Dodge, 1990; Mikami & Hinshaw, 2006). Due to the negative long-term consequences of poor peer relationships in childhood, there has been a strong focus in the educational and psychological literature on methods to teach children who are rejected or ignored by their peers the skills they need to establish, develop and maintain satisfactory friendships.

Child social skills training (SST) programs first began to flourish in the 1970s and 1980s in schools and clinics. The programs that are available today are diverse in the social skills that they target, their instructional methods and program format (small group or whole class). Common skill targets include starting, continuing and ending conversations and play activities with others, social problem-solving and preventing and managing bullying and teasing. Some programs (e.g. PATHS, Kusche & Greenberg, 1994; Secret Agent Society Program, Beaumont, 2010; Superheroes Social Skills, Jenson et al., 2011) also teach foundational skills in emotion recognition and regulation prior to social interaction

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skills. These programs are founded on the premise that an impaired ability to recognise emotions in oneself and others and manage one's emotions effectively will impair a child's performance of social skills.

Children with a variety of mental health conditions are likely to display social impairments, although the factors underlying these may differ. Children with an autism spectrum disorder (ASD) are generally understood to have social skill deficits, whereas children with attention deficit hyperactivity disorder (ADHD) or other externalising disorders may have intact social skills but an impaired ability to demonstrate their social skills on a consistent basis due to challenges with sustaining their focus during social exchanges, impulsivity and hyperactivity (Mikami, Jia, & Noa, 2014). The difficulties underlying the impaired social interactions of children with social anxiety may relate more to their distorted perceptions of social situations and bias to threat cues (Cartwright-Hatton, Tschernitz, & Gomersall, 2005). Often children present with a combination of skills and performance deficits. A comprehensive assessment helps to determine the unique combination of social skill and performance deficits to be targeted for a given child and the optimal way to do this.

Most available SST programs involve a mix of teaching methods, including didactic instruction, modelling (including peer-, instructor-led or video-modelling of target skills), behavioural rehearsal and the provision of feedback. Strategies to motivate children to engage and participate in skills training lessons are of critical importance, particularly in a group context, where one child's disruptive behaviour can impair others' learning. One of the greatest challenges with SST is supporting children to generalise skills learned in training to daily life. Several strategies have been employed to address this in contemporary SST programs, including assigning between-session homework tasks, visual supports, upskilling peers to help children to put their social skills into action when needed and training parents and teachers to prompt, praise and reward children for using their social skills when needed. Tech-tools such as apps, computer games and virtual reality technology are also providing new and exciting ways of teaching and supporting children to apply social skills.

This chapter will provide an overview and critique of the above social skill teaching and application methods and the evidence supporting them, as applied to primary school-aged students. Examples of programs that employ these teaching methods will be presented. The chapter will conclude with recommendations for future research in the SST domain to further determine what social skills training methods are effective for children presenting with different mental health conditions and/or presenting problems.

Social Skills Instructional Methods

Didactic Instruction

Didactic instruction involves explicitly teaching a child the steps involved in a social skill. To boost a child's motivation to learn and apply a skill, a rationale for learning the skill and an explanation of how it can help the child are typically initially provided (Bourke & Van Hasselt, 2001). Didactic instruction is the predominate focus of traditional SST approaches and is typically used in conjunction with other teaching methods (particularly modelling and behavioural rehearsal). As such, the research literature sheds little light on the effectiveness of this technique as a stand-alone SST strategy. The specific social skills taught are tailored to the identified needs of a child. It may take a child several lessons/sessions to learn and competently demonstrate one skill before moving on to the next.

Didactic instruction typically involves task analysis and chaining. Task analysis breaks down a complex skill into its component steps. For example, the social skill of preventing and managing bullying and teasing can be broken down into specific steps that can be taught individually: (1) stay close to friends and away from others who tease, (2) maintain a calm face and body, (3) say something to stand up for yourself, (4) calmly walk away and (5) go to a safe place. Once the individual steps are identified, each component part can be taught and demonstrated individually before being chained together in a sequence. Once the child has mastered the component steps, he/she can integrate them to successfully execute a coordinated bully management plan.

Social Stories A creative example of a didactic instruction technique that has been predominantly used with students with ASD is Social Stories. Developed by Carol Gray, Social Stories typically involve an adult working with a child to write a story that explains why the child needs to perform a particular skill or behaviour in a certain context and the skill steps involved. Gray (2015) provides specific guidelines for how a social story is to be constructed to achieve optimal learning outcomes. The focus of the story is to be on describing a target situation and why a skill is to be used, rather than directing a child what to do. The story is tailored to the developmental level of the child and can feature illustrations or pictures. For example, a social story could be written about why it is important for a child to raise his/her hand before talking in class, with specific details included about the child and the specific class. Large-scale well-controlled evaluations of social stories are lacking. However, case studies suggest that Social Stories can help in reducing disruptive behaviours (Scattone, Wilczynski, Edwards, & Rabian, 2002) and improving conversational abilities (Sansosti & Powell-Smith, 2006) in children with ASD. They are also likely to have merit as a teaching technique for other children whose lack of understanding as to why they should perform a social skill in a given context (or refrain from performing an inappropriate behaviour) contribute to their social difficulties.

Comic Strip Conversations Comic strip conversations are a visual teaching tool (again developed by Carol Gray and drawn from the autism literature) to improve children's understanding of social situations. They involve a child ideally taking the lead in drawing stick figure pictures (like cartoon strips) showing who was involved in an event, what people said and did and what they were likely to be thinking and feeling, with the help of an adult (Gray, 1994). Feelings are typically illustrated with different colours. Well-controlled evaluations of the effectiveness of Comic Strip Conversations are lacking, although clinicians and teachers often describe them as a valuable teaching technique (especially for children who learn best visually). They can also help to reduce a child's level of anxiety or distress when discussing a social problem that has occurred or an upcoming social challenge, as the child's focus is on drawing the stick figures, rather than verbally describing what happened to them in a situation.

Modelling

Modelling involves a child observing the behaviour, attitudes and emotional responses of others. Observation and imitation are the core components of the learning process. Research suggests that this teaching technique is more effective if children are shown models who they perceive to have characteristics similar to themselves (e.g. age, gender, interests; Kamps et al., 2002). Children are also more likely to imitate the behaviours of others that they believe are admirable or powerful (Bandura, 1977; Kazdin, 2001). Models can be live or videotaped. Rather than being *told* the component steps of a skill (didactic instruction), the child is *shown* the skill steps in action by an instructor, peer, caregiver or via a video demonstration. This social skill instructional method has significant empirical support (Gresham, 1985), although it is rarely used as a stand-alone teaching tool in SST programs.

In Vivo Modelling In vivo modelling involves an instructor, peer or caregiver demonstrating a skill for a child in real time. One of the strengths of in vivo modelling is that it can be done in an actual problematic social situation for a child, with the modelled response tailored to the specific needs of the situation. For example, if a child becomes frustrated in session, the instructor can pause and demonstrate for the child how to use relaxation strategies such as taking slow breaths and thinking helpful thoughts (cognitive behavioural therapy techniques) to calm down.

The child can then be prompted to perform these skills themselves (behavioural rehearsal—see below).

Training peers as role models can be a particularly powerful teaching approach, as children may see them as being more similar to themselves than adult instructors. Kamps et al. (2002) showed that this approach was more effective at increasing the frequency of social initiations and the quality of social interactions and facilitated more skill generalisation with an ASD population than adult centred training. Peer-mediated interventions appear to be particularly powerful in boosting the popularity of socially neglected children (Collins, Gresham, & Dart, 2016).

Video Modelling Video modelling involves a child being shown a filmed demonstration of a skill. The film clip can be stopped and replayed at any time by the child, educator or instructor to allow for discussion and skill consolidation, deepening a child's learning. Advantages of video modelling over in vivo modelling include the ability to remove distractors or unnecessary details from the skill demonstration and the capacity for a child to review the skill demonstration multiple times. To optimise children's engagement and learning from filmed skill demonstrations, it is important to use motivating themes, everyday appropriate conversational language that is used by the child's peers and play objects or activities that interest the child. In recording video clips, it has been recommended that 75–80% of the clip duration involve footage of the target behaviour(s) and that the child watch the video at least two times before assessing for skill acquisition (Charlop-Christy, 2004).

Video self-modelling involves the child acting as the model in the video clip. The child either receives adult prompts to successfully demonstrate a behavioural sequence or video footage of the behavioural sequence is spliced from many imperfect demonstrations to create an ideal prototype clip. For children with ASD, a meta-analysis suggested that video modelling is effective for teaching social communication skills and functional skills. However, generalisation was limited because the skills were not targeted in naturalistic environments (Belllini & Akullian, 2007). Recent advances in technology have addressed this concern and have used more naturalistic video modelling procedures. For instance, Simpson, Langone, and Ayres (2004) conducted a study with four children where computer-based video modelling was done in a classroom setting, allowing for the video to be shown within the context of the actual problematic social situation. Results suggested that the technique shows promise, with students showing increases in their unprompted use of social skills in the classroom environment (Simpson et al., 2004). Clinical experience suggests that children most likely to respond to video self-modelling are those who enjoy being filmed and like watching themselves on film.

Video modelling and in vivo modelling have been shown to be equally efficacious for preschool children with ASD (Gena, Couloura, & Kymissis, 2005). However, video modelling appeared to result in faster acquisition of skills than did in vivo modelling (Charlop-Christy, Le, & Freeman, 2000).

Video modelling has also been utilised successfully in SST programs for children with ADHD, early-onset conduct problems and oppositional defiant disorder. For example, it is a primary technique used in Webster-Stratton's (2006) Incredible Years Programs. In the child program, video modelling is used in every session to promote discussion, problem solving and behavioural rehearsal of prosocial behaviour. The scenes selected represent home and school situations where teasing, lying, stealing, etc. occur. After watching them, children discuss feelings, generate ideas for effective responses and role-play solutions. Life-size puppets are also used by therapists to model appropriate behaviours and thinking processes for children (Webster-Stratton & Reid, 2016). Research has shown that the combination of group discussion, a trained therapist and videotape modelling produced more enduring treatment gains from the Incredible Years Program than treatment that involved only one training component (Webster-Stratton, Hollinsworth, & Kolpacoff, 1989).

Behavioural Rehearsal

It is vitally important for children to practice skills taught in session before trying them out in daily life. Research suggests that behavioural rehearsal facilitates encoding, memory and retrieval of skill steps (King & Kirschenbaum, 1992). Behavioural rehearsal is a structured teaching process that involves the instructor or other group members playing the role of characters in a specific scenario while the child pretends to be him/herself. For example, after discussing how to handle teasing and bullying, an educator or therapist may model the sequence of steps for a child using a scenario that is relevant to the child's daily life and then ask the child to demonstrate the steps. A behavioural sequence (e.g. saying 'Whatever…' to a bully with a calm face and body and walking away) can be repeatedly practiced by the child to improve his or her skill and confidence in performing it. The child can also take on different roles in the vignette to improve his or her perspective-taking skills. For example, by taking on the role of the 'bully', the child may realise that the reason the other child yelled 'Get out of my way, loser!' was because he or she walked in front of him in the middle of a handball game.

If a child is anxious about trying something new or performing in front of others, he or she may initially be reluctant to role-play a skill. In this instance, it can be helpful to introduce role-play through simple games like charades or a board game that involves role-play elements, such as the Socially Speaking Game (Schroeder, 2003). It may also be helpful to demonstrate the skill first, with the child taking on a nonspeaking role or a role that involves minimal dialogue that is scripted. Tokens or other concrete reinforcers can be offered to encourage participation and shape the child (Rose & Edleson, 1987).

Role-plays allow for 'in vivo' skill practice and provide a fun way for children to actively participate in SST. However, like all of the teaching techniques reviewed in this chapter, it is not recommended that this technique be used in isolation. Matson, Sevin, and Box (1995) found that role-plays alone are unlikely to lead to social skill generalisation for children with ASD. These children typically need additional guidance and support to apply social skills 'in the moment' when they need them (see the skill generalisation section below for further details).

Feedback and Self-Evaluation

Feedback involves adults or peers informing a child about how they performed a skill during a role-play or everyday situation. Positive feedback can be provided in the form of praise, approval or tangible rewards. Constructive feedback helps to shape behaviour and helps children to develop a greater self-awareness of their social skill strengths and areas of difficulty. The feedback process can be enhanced by filming a child's social skill demonstrations and then watching the footage with the child. The filmed skill demonstration can be stopped, played back and concretely analysed with the child or as a small group activity with peers.

Research has shown that the effectiveness of feedback can be increased when it is provided immediately after a skill has been performed, is specific and concrete, emphasises the positive and supplies constructive information to shape future skill performances (Kazdin, 2001). One of the risks of providing feedback to children is their perception of it as criticism. A way to avoid this is for educators, therapists and fellow group members to be trained in how to provide feedback constructively by starting with the positives, being specific and only providing one suggestion for improvement. Children should also be encouraged to self-evaluate their performance of social skills (in session and in daily life situations) to build their self-awareness of their behaviour and how it impacts on others.

Behaviour Management

Effective behaviour management strategies are critical, irrespective of whether an instructor is delivering individual or group SST. Children who have social skills deficits are more likely to have low frustration tolerance and emotion dysregulation. Effective strategies need to be used both preventatively and reactively to help children to engage and learn in session and to manage their emotions and behaviours. It is recommended that clear behavioural expectations are spelled out at the outset. These may take the form of a group rules chart, verbal or written contract or individualised skill target card for each child. Children can be reinforced for performing behavioural targets (e.g. using a friendly face, voice and words, trying their best, listening quietly to others' ideas) with praise and tokens or points that are exchanged for tangible rewards at the end of session.

It is important that social skills curricula include self-control skills (e.g. emotion regulation, problem solving) so that children can be prompted to use these when needed in session. Should a child become too behaviourally dysregulated in the heat of the moment, it may be necessary to take a time out from the session or to curtail the length of the session for that day. The break time should be used as a preventative self-control technique taught to children early in the program. Children can also be encouraged to ask for it when needed and rewarded for calming down and re-engaging in session activities.

Strategies to Promote Social Skill Generalisation

The lack of generalisation of skills to environments outside of the treatment setting is a common criticism of traditional SST approaches. Many old school SST programs focused mainly on in session instruction and used a 'train and hope strategy' when it came to skill generalisation (DuPaul & Eckert, 1994). Research indicates that skills learned in these outpatient clinic programs frequently did not generalise well to home, school or community settings (Crager & Horvath, 2003; Marriage, Gordon, & Brand, 1995; Storebo, Gluud, Winkel, & Simonsen, 2012). By contrast, several contemporary SST programs include a variety of specific techniques to promote social skills application and generalisation across settings. These include assigning homework activities, visual supports, caregiver and school staff involvement, delivery of programs within a school setting and peer buddy programs.

Homework Tasks

A cornerstone of several evidence-based cognitive behavioural SST interventions is homework tasks. Independent research trials of the Secret Agent Society social skills program described later in this chapter (e.g. Beaumont & Sofronoff, 2008; Einfeld et al., 2017) have consistently shown that the only consistent and reliable predictor of treatment outcome is the completion of between-session skills practice tasks ('missions'). For example, the 'relaxation gadgetry' mission in this program involves children using relaxation 'gadgets' or strategies that they learn in session to calm down when they detect low to medium levels of anxiety or anger in daily life and then answering questions about how helpful these strategies are in a secret agent journal. Every effort should be made to make homework tasks fun and engaging for children, to increase the chances that these tasks will be completed. For example, in the Secret Agent Society program (Beaumont, 2010), children can collect electronic 'evidence' (photos, film clips or voice memos) of their mission completion with a smart device with adult permission and create pictures using a scene generator device in the Secret Agent Society computer game to answer mission questions.

Visual Supports

Children vary in their learning style, with some struggling to process and learn information presented solely in verbal format. Visual supports can be particularly valuable for children who process information best visually. Photographs and visual behaviour support cards (portable or displayed in a prominent place) can help children remember and implement the constituent steps of complex social skills in the environments where they are needed. For example, in the Superheroes Social Skills program (Jenson et al., 2011) described later in this chapter, children are given a card listing three to five steps for each social skill taught in the program. Parents and school staff can prompt children to refer to pocket-sized social skill cards in private to remind themselves of the steps of a target skill (e.g. talking to others) immediately before they enter a situation where the skill is used (e.g. lunch break). The cards can also be used to help children review the skill steps they did well and any that they would improve on after a target skill has been demonstrated.

Caregiver Involvement

Parents and caregivers play a vital role in facilitating social skill application across settings. To promote the continued learning and generalisation of skills, parents and caregivers must be knowledgeable about specific skills and strategies. SST programs may offer explicit parent training/coaching to give parents information and feedback about how to support their children to practise skills learnt in session at home.

For example, in the Secret Agent Society program (Beaumont, 2010), a parent group runs concurrently with the child treatment to teach parents the specific skills that are being targeted in the child group. Parents review the skills and strategies that children learn each week and receive instruction about how to help their children complete the between-sessions skills practice tasks (missions). Parents are taught how to model and role-play target skills with their children at home, prompt their children to apply their social skills when needed in daily life and help their children to answer mission questions, offering praise and rewards for effort. A parent workbook is also included in the program materials to remind parents of the skills and strategies that they can use to promote their children's social skill generalisation.

School Involvement and Peer Buddy Programs

In an attempt to maximise the effectiveness of SST programs and optimise children's social skill application at school (where there are ample incidental opportunities for peer interaction), programs are increasingly being offered in the school environment. However, until recently, there has been limited empirical support for the effectiveness of this approach. For example, Bellini, Peters, Benner, and Hope (2007) conducted a meta-analysis of school-based SST interventions for children with ASD and found minimal treatment effects and generalisation across settings. By contrast, contemporary effectiveness trials examining interventions that more specifically program for skill generalisation suggest that SST conducted in schools holds promise as an effective intervention approach (e.g. Beaumont, Rotolone, & Sofronoff, 2015; Kasari et al., 2016; Kenworthy et al., 2014). Group SST interventions implemented in schools may also have a more powerful impact on children's friendships and social networks as child group members all experience the same class or school culture. The curriculum can be tailored to address unique class- and/or school-specific concerns (Kasari et al., 2016). Details of specific school-based SST programs are provided later in this chapter.

Teachers and school staff can also facilitate the application and generalisation of social skills for children with social-emotional challenges by incorporating appropriate peer models into SST groups. Specifically, peer-mediated interventions aim to engage typically developing peers as social models to improve social responses, initiations and interactions in children with social-emotional challenges. Outpatient psychiatric clinic SST groups rarely offer this opportunity, as it can be difficult to find and engage typically developing peers in SST programs (although target children's siblings can sometimes be recruited).

Peer-mediated programs provide an additional impetus for children to interact directly with their typically developing peers by assigning the peers to serve as 'peer buddies' in cooperative learning experiences (e.g. Garrison-Harrell, Kamps, & Kravits, 1997). Children with strong social communication skills are selected by teachers to specifically act as 'buddies' to children with social-emotional challenges in the classroom, playground and other social situations in the school setting. In this model, typically developing peers are educated about the students with whom they are paired (e.g. taught to engage in or support specific social interaction behaviours) and may also be reinforced by teachers for engaging in positive peer interactions with their buddies. In this context, children with social-emotional challenges have the opportunity to work regularly with peer buddies that have received direct instruction regarding ways to promote the development of their social communication skills.

While there is emerging evidence to support the efficacy of school-based interventions for improving social interactions in children with ASD (e.g. Watkins et al., 2015), few studies have documented the most effective methods to generalise skills to new situations over time and with child psychiatric populations beyond ASD. Those studies that have been conducted typically utilise a single-subject design, with the notable exception of Kasari, Rotheram-Fuller, Locke, and Gulsrud's (2012) randomised controlled trial that compared the effectiveness of different SST techniques for children with ASD. This trial compared peer training, direct child instruction, and a combined approach to a no treatment control group of 60 children with ASD in regular education settings. Target child instruction or peer instruction interventions were implemented for 6 weeks (20 min sessions occurring twice weekly). The primary social outcomes included social network salience and peer engagement during playground observations. Overall, the peer-mediated approach resulted in better social outcomes than direct child instruction for both outcomes, and gains were maintained at 12-week follow-up. Children in the combined intervention condition demonstrated the greatest improvements in social network salience, suggesting that the most powerful SST method was teaching skills to both target children and peer buddies.

Outpatient SST programs can upskill school staff as co-intervention agents. In this way, adults can support children in applying their social-emotional skills at school. Information for school staff is provided on weekly social skill targets and effective school-based methods for promoting skill usage (e.g. prompting, monitoring, praising and offering rewards). For example, the Secret Agent Society program (Beaumont, 2010) includes weekly teacher tip sheets and a home-school diary that are forwarded to school staff by parents.

Innovative Technologies to Enhance Social Skill Learning and Application

Recent technological advances have helped to optimise children's engagement in social skill instruction and assist with skill generalisation. Apps like i-Modeling—Skills for autism spectrum disorder (Autism SA, 2016) and Social Detective (Social Skill Builder Inc., 2016) provide children with easy access to video modelling examples of prosocial behaviours at the swipe of a finger. The i-Modeling app (Autism SA, 2016) involves an adult working with a child to create self-instructional video demonstrations of target pro-social skills. Children select a reward image that is shown when they watch the self-instructional video. The Social Detective app (Social Skill Builder Inc., 2016) uses video clips to teach children how to understand others' behaviours and thoughts and to use their eyes, ears and brains to make smart guesses about how other people may be feeling and what they may be thinking. The app tracks gameplay data that can be shared by parents and educators.

While there has been a recent explosion of social skills training apps and gaming-based approaches to social skills instruction (particularly for children with ASD), there is a lack of empirical research to indicate whether tech-enhanced SST methods are superior to traditional teaching techniques in terms of optimising children's learning and application of social skills in daily life. Intuitively, gaming-based approaches appear to have several advantages over face-to-face instructional methods, including potentially being more engaging and interactive, allowing for self-paced learning in a consistent, distraction-free environment, easy repetition of skills and concepts taught and the provision of immediate individualised feedback to children in an environment free from social demands (Moore, McGrath, & Thorpe, 2000; Murray, 1997).

However, without the opportunity for social skill practice in real life and the provision of feedback from a peer or adult, one might question the generalisation of social skills and knowledge learnt from these tech-therapy tools. Beaumont et al. (2015) showed that improvements in the social-emotional functioning of children with ASD at home and at school appeared to be greater when a SST computer game intervention (the Secret Agent Society Computer Game Pack) was supplemented with a small group skill application curriculum, involving behavioural rehearsal and feedback from a school guidance counsellor and peers. However, surprisingly, significant improvements in children's social-emotional skills were still achieved at home and at school for the computer game pack only condition, where no behavioural rehearsal or feedback was involved. A possible reason for this is that real-life skills practice tasks and visual supports (skill code cards) were integrated into the computer game pack intervention, helping to support skill generalisation.

Virtual reality technology also holds great promise as a social skill teaching and skill practice tool. Virtual environments offer safe, three-dimensional vignettes that can be built to depict everyday social scenarios that children might struggle with (e.g. playing cooperatively with others, group work, lunch conversations at school, etc.). Parsons, Leonard, and Mitchell (2006) used a qualitative case-study approach with two teenagers with ASD to explore their capacity to understand, use and interpret the technology appropriately. The teens appeared to understand the scenes (canteen and bus), discussing appropriate social responses for each with a facilitator. The teens endorsed the experience of the virtual environments as enjoyable and were able to explain how the technology could help to improve their ability to navigate social interactions in daily life. A follow-up study with six teenagers with ASD indicated that experiencing these virtual reality environments improved teens' judgements and explanations of where to sit in videos of real café and bus scenarios, suggesting some knowledge generalisation (Mitchell, Parsons, & Leonard, 2007). However, it would appear that at the present time, virtual environments are a potential supplement to, rather than a replacement for, real world SST, providing the client with a quiet, safe and nonthreatening environment to explore social situations and responses. The capacity of children who are younger than adolescents to interpret, navigate and learn social skills in virtual environments also remains largely unexplored in the research literature.

Integrating Social Skill Teaching and Skill Generalisation Techniques: Multicomponent SST Programs

Research supports the efficacy of a variety of SST programs that integrate many of the teaching and skill generalisation approaches described above, from single-case multiple baseline study designs to large-scale randomised controlled trials with longitudinal follow-up. Programs are delivered in a variety of formats (e.g. small group and whole class) in school and clinic contexts. A description of some of these programs is provided below, including the skill teaching and generalisation enhancement techniques that each uses.

School-Based Programs

Stop and Think Social Skills Program The stop and think social skills program (Knoff, 2001) is for children in preschool through 8th grade, with content presented in four levels to match the developmental and academic needs of participants (preschool and 1st grade, 2nd and 3rd grade, 4th and 5th grade, 6th through 8th grade). Social skills are taught in general education classrooms with opportunities for small group instruction for those children with more academic or social challenges. In each level, children are introduced to ten core skills and ten advanced skills that will improve their social functioning while also enhancing self-management and academic engagement in the classroom through the reinforcement of daily routines.

Targeted skills are introduced in each level, with opportunity to practise a learned skill in the classroom setting throughout the year using five universal steps. In each level, the skills are adapted to reflect changes in developmental and academic expectations. The first step, 'stop and think!', prompts children to approach situations calmly and in control. They are then encouraged to consider the consequences should they make a 'good choice or a bad choice' in a given situation. Teachers are encouraged to guide children towards all possible good choices by focusing on positive outcomes, while the children, themselves, are encouraged to consider the negative consequences of all potential bad choices. In the third step, 'what are your choices or steps', children are introduced to 'skill scripts', including choice skills and step skills scripts. In choice skills scripts, children learn to evaluate different situations to determine which choice is most appropriate. In step skills scripts, the prosocial choice is broken into sequential steps (task analysis) to ensure that the implementation of the choice is successful. In the fourth step, children implement the prosocial skills that they have chosen using the sequential steps outlined in the step skills script (chaining). If they are unsuccessful, children are encouraged to return to step 3 and either practice the steps in the step skills script or identify another prosocial skill to try from their choice skills script. Finally, children learn to reward themselves for choosing the best prosocial skill and implementing it correctly. The program relies on teaching, modelling, role-playing, performance feedback and the application of skills to everyday situations to teach and reinforce core and advanced social skills.

The stop and think program was designated as an evidence-based and national model prevention program by the US Department of Health and Human Services' Substance Abuse and Mental Health Services (SAMHSA) in 2000, a 'promising program' by the US Department of Justice's Office of Juvenile Justice and Delinquency Prevention (OJJDP) in 2003, and a 'select' program by the Collaborative for Academic, Social, and Emotional Learning (CSEL) in 2002 (Knoff, 2005).

PATHS—Promoting Alternative Thinking Strategies (PATHS) The PATHS curriculum is a program that promotes the social and emotional development of elementary-aged children from kindergarten through 6th grade (Kusche & Greenberg, 1994). This program also addresses aggression and other problematic behaviours in the classroom. The PATHS curriculum was designed for implementation in a classroom setting throughout the school year by teachers and school counsellors. Developmentally appropriate lesson plans are introduced in 20–30 min segments approximately two to three times per week over the course of the entire school year. The curriculum supports children in the development of skills to increase emotional awareness and regulation, to maintain self-control, to improve social competence, to develop positive peer relationships and to use problem-solving skills.

The PATHS curriculum is organised by grade and includes an instructor's manual, a curriculum manual, storybooks, puppets, a feelings chart, cards depicting different emotions, posters, stickers and resources for parents. Younger children are introduced to 'Twiggle' a turtle who teaches children how to manage feelings of anger, frustration and disappointment.

The PATHS program has been evaluated in large-scale randomised controlled trials. Twenty head start classrooms totalling 246 pre-school students were randomised to either implement the PATHS program or serve as a control classroom (ten classrooms in each condition). The study found that children exposed to the PATHS program demonstrated higher emotion knowledge skills, were less socially withdrawn at the end of the school year and were rated by parents and teachers as more socially competent compared to the students in the control classrooms (Domitrovich, Cortes, & Greenberg, 2007). A longitudinal study of 18 special education classrooms randomised to either the PATHS curriculum or the control condition demonstrated that the PATHS program was associated with a reduction in the rate of growth of teacher-reported internalising and externalising behaviours from the students 2 years after the intervention. A reduction in student-reported depression symptoms was also maintained 2 years' post study treatment (Chi-Ming, Greenberg, & Kusche, 2004).

Superheroes Social Skills The superheroes social skills program (Jenson et al., 2011) is a manualised social skills program for elementary-aged children with an ASD. The program was developed for the Utah State Office of Education and is distributed free for Utah educators. The program utilises video vignettes and social narratives to introduce each of the targeted social skills and then engages the group members in role-playing exercises and games to reinforce those skills. Finally, group members are encouraged to practice each targeted skill between sessions and to self-evaluate their experiences. The social skills that are targeted in this program include getting ready, following directions, reducing anxiety, participating, generalised imitation of others, body basics, expressing wants and needs and joint attention.

Each session is structured similarly with nine main components. The sessions begin with a check-in during which group members are welcomed, group rules are reviewed and the agenda for that session is discussed. Any homework assignments from the previous session are reviewed to reinforce previously taught skills. Group members watch a video of animated superheroes demonstrating three to five steps of a social skill and then receive a self-monitoring card that lists those steps. Group members then watch three videos of children successfully following the steps for that targeted social skill. After watching the videos, the group members first watch the facilitators demonstrate the targeted skill and provide feedback before demonstrating the skill themselves in a role-playing exercise. Finally, the skill is reinforced by viewing a social narrative in a comic book, playing a game involving the targeted skill and/or completing homework in which group members practice the skill in a natural setting. To aid in homework completion, parents are provided with a letter that explains the targeted skill and are encouraged to support their children in using that skill in interactions with family and friends. In the session, group members are provided with positive reinforcement for attending to and participating in the sessions.

Two single-case research design studies have demonstrated improved social skills at the individual level using the Superheroes Social Skills program. Two pre-school age children with autism participated in the Superheroes program and showed improvements in skill accuracy and social functioning following the program when compared to baseline functioning (Radley, Hanglein, & Arak, 2016). Four adolescents with intellectual disabilities participated in the program 2 days a week for 3 weeks specifically targeting expressing wants and needs, conversations and turn taking. All four participants demonstrated improvements in skill accuracy in both the program and classroom setting based on clinician and teacher report (O'Handly, Ford, Radley, Helbig, & Wimberly, 2016).

Superflex Social Skills Program The Superflex teaching curriculum (Winner, Crooke, & Knopp, 2008) has been incorporated into social skills groups, classrooms and entire schools to teach children to be better social detectives, thinkers and problem solvers. The program is paired with a series of comic books that introduce the Team of Unthinkables. The team is a group of characters who represent ways in which the brain can be inflexible when approaching social problems. The program was designed for children from kindergarten through 5th grade, though younger children have been found to have more difficulty with self-regulation skills. The social thinking curriculum was evaluated using a multiple baseline design with six children with ASD. The evaluation noted positive changes in verbal and non-verbal social behaviours from pretreatment to post-treatment (Crooke, Hendrix, & Rachman, 2016).

Children are first introduced to several core concepts of social learning in the comic book—You are a Social Detective. Once children become familiar with these skills, they begin to learn self-regulation skills while becoming more aware of expectations in their social environment. This is accomplished through a series of comic books with Superflex, the social thinking superhero, who teaches children strategies to defeat the

Unthinkables by having more flexible thinking in different social situations. As the program has evolved, Superflex, the social thinking superhero, has enlisted five new friends to help him defeat the Unthinkables. These new superheroes each have their own power to support children in developing more flexible thinking in different social situations.

Clinic-Based Programs

Children's Friendship Program The Children's Friendship Program is a 12-week program that supports elementary school children (2nd through 5th grade) in enhancing their peer relationships (Frankel & Myatt, 2003). The program is delivered in a clinical setting with trained mental health clinicians, paraprofessionals and behavioural coaches. Both children and parents participate in concurrent group sessions that emphasise conversational skills, identifying common interests, joining in when other children are playing, taking turns, being a good sport, managing rejection and teasing and being respectful of adults. Children are expected to practice the skills between sessions during scheduled play dates with parents acting as coaches to support the generalisation of skills. Controlled studies suggest that the Children's Friendship Program improves the peer relationships and social behaviours of children with autism (Frankel & Whitham, 2011), ADHD and those without any formal psychiatric diagnosis (Frankel, Myatt, Cantwell, & Feinberg, 1997). Long-term follow-up data was collected on close to 50% of participants in the Children's Friendship Program. After an average of 35 months post involvement in the program, parents reported that participants were invited on more play dates, showed less conflict with peers on play dates, showed improvements in social skills and problem behaviours and reported less loneliness compared to pretreatment (Mandelberg, Frankel, Cunningham, Gorospe, & Laugeson, 2014).

Secret Agent Society Program The Secret Agent Social Skills program is a 10-week social skills program for children between the ages of 8 and 12 with social and emotional difficulties, including children with high-functioning ASD (Beaumont, 2010). The social skills that are targeted by this program include the ability to recognise emotions in oneself and others; to express feelings in appropriate ways; to cope with feelings of anger and anxiety; to communicate and play with others; to cope with mistakes, transitions, and challenges; to build and maintain friendships; to solve social problems; and to prevent and manage bullying and teasing.

The program consists of small group child 'club meetings', concurrent parent sessions, home practice missions, weekly teacher tip sheets, a multi-level computer game and a system to monitor and reward skill generalisation at home and at school. In each session, the group rules and agenda items are discussed, and home missions are reviewed with rewards distributed for the completion of assignments. A targeted skill is subsequently introduced through didactics and colour illustrations in children's cadet handbooks, spy-themed games and code cards, and role-playing activities are used to consolidate the skill.

A randomised-controlled trial of 49 youth with ASD assigned to either the Secret Agent Society (SAS) program, or wait-list control demonstrated that children in the SAS program had greater improvements in social skills and social functioning, as rated by parents and teachers, than those in the control group, with improvements maintained at 5 months follow-up (Beaumont & Sofronoff, 2008). Findings were similarly promising in a parent delivery format with therapist assistance via Skype for 41 children with high-functioning ASD. Families who completed the program reported improvements in child social skills, parent self-efficacy, child behaviour and child anxiety (Sofronoff, Silva, & Beaumont, 2015). Versions of SAS offered in school settings to 69 students (ages 7–12) with ASD also demonstrated improvements in social skills, emotion regulation and behavioural control at home and at school (Beaumont et al., 2015). Individual delivery variants of the program have also shown promise in improving children's emotion regulation and social interaction skills (Tan, Mazzucchelli, & Beaumont, 2015; Thomson, Riosa, & Weiss, 2015).

Conclusion

Research suggests that contemporary SST approaches that employ a hybrid of tried and tested social skill instructional techniques (e.g. didactic instruction, modelling, behavioural rehearsal, feedback and reinforcement) and skill generalisation strategies (e.g. assigning homework tasks, caregiver support, school involvement and peer buddy programs) appear to be effective at improving children's social-emotional functioning at home and at school. However, research identifying the core or essential ingredients in these programs is lacking, and there is a lack of research evaluating whether improvements in social-emotional functioning translate to improved friendships and peer acceptance.

Most of the evidence-based SST programs that are currently available adopt a cognitive behavioural therapy framework and are delivered in a group context and have been predominantly evaluated with children who have ASD. Therefore, future studies are needed to evaluate if and how social skills training can be effectively delivered in individual therapy, using different theoretical approaches (e.g. acceptance and commitment therapy, interpersonal psychotherapy) and to children with a range of psychiatric conditions, including those who are socially shy or awkward but do not have clinical levels of psychopathology. The capacity of latest technological innovations (e.g. apps, computer games, virtual reality technology) to enhance social skills teaching and application processes also requires further empirical investigation. This is a field ripe for future research to determine whether the time and money invested in the development of these tools pay dividends in terms of improved SST accessibility, cost-effectiveness and outcomes for children and families.

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Self-Regulation in Childhood: A Developmental Perspective

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Introduction

The National Research Council and the Institute of Medicine of the National Academies released an important report in the year 2000 called *From Neurons to Neighborhoods* (Shonkoff & Phillips, 2000). The report, which, to this date, serves as a main guideline to early childhood researchers and practitioners, had emphasized ten core concepts which are crucial to our understanding of the process of human development. One of these concepts is *self-regulation*—which stands at the center of the current chapter. In explaining why they see self-regulation as a factor standing at the core of human development, Shonkoff and Philips stated that: "The growth of self-regulation is a cornerstone of early childhood development that cuts across all domains of behavior. Regulation is a fundamental property of all living organisms. It includes physiological and behavioral regulations that sustain life… Regulatory processes modulate a wide variety of functions to keep them within adaptive ranges. The simultaneous operation of these multiple systems at different levels of organization is an essential feature of human development" (Shonkoff & Phillips, 2000, p. 26).

Notwithstanding the significance of Shonkoff and Philips's conclusion, it is important to note that the definitions of what is considered as self-regulatory capacities are not as clear as may be expected from such a core concept. Moreover, these definitions are likely to change across childhood as a function of age and development. Consequently, it is an important aim of this chapter to review the concept of self-regulation from a developmental perspective in order to further our understanding of the similarities and differences between self-regulatory capacities as a function of age and developmental milestones. The chapter is divided into four main sections. In the first section, we look at the different definitions of self-regulation as they appear in the literature and suggest an informative definition of that construct. The second discusses the development of self-regulation from infancy to middle childhood. The third section presents different methods of assessing self-regulation (again, as a function of age and development), and the fourth discusses the links between self-regulation and psychopathology and their implications to field practitioners, focusing mainly on clinical and educational implications. We summarize the chapter with a set of conclusions and recommendations for future research in the field.

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Defining "Self-Regulation"

In a highly cited article, Kopp (1982) defines self-regulation as "the ability to comply with a request, to initiate and cease activities according to situational demands, to modulate the intensity, frequency, and duration of verbal and motor acts in social and educational settings, to postpone acting upon a desired object or goal, and to generate socially approved behavior in the absence of external monitors" (Kopp, 1982, pp. 199–200). Similarly to Shonkoff and Phillips (2000), Kopp emphasizes the simultaneous operation of various regulatory capacities and, as such, while recognizing the multiplicity and complexity of self-regulation, seems to discuss it essentially as one entity. More recently, however, researchers and theoreticians have argued that discussing self-regulation as one core concept could be misleading and thus it is more useful to make more specific and clear distinctions between separate regulatory capacities that may be related but are still distinct (Eisenberg, Hofer, Sulik, & Spinrad, 2014; Ursache, Blair, & Raver, 2012). For example, Eisenberg and colleagues suggest that it is useful to differentiate between internally motivated and externally enforced regulation processes and between more or less volitional regulatory processes (Eisenberg, Duckworth, et al., 2014; Eisenberg, Hofer, et al., 2014), whereas Ursache and colleagues highlight the distinction between emotion-related self-regulation and cognitive-related self-regulation capacities (Ursache et al., 2012). For these researchers, discussing different regulatory capacities, such as the maintenance of body temperature, the expression of feelings, and the capacity to pay attention, from the perspective of one core concept, necessarily assumes a connecting link that does not always exist.

On the other hand, it was also convincingly claimed that too many distinctions between different regulatory capabilities could be confusing, as different research traditions may refer to what seems to be identical (or, at least, very similar) processes in different names (Bridgett, Oddi, Laake, Murdock, & Bachmann, 2013; Liew, 2012; Zhou, Chen, & Main, 2012). For example, there is an unclear distinction in the literature between *effortful control* and *inhibitory control*. The former is mainly used in the context of research traditions focusing on temperament and, as such, is defined as the regulatory component of temperament (Rothbart & Bates, 2006). The latter, on the other hand, is typically used by researchers focusing on cognitive development and is referred to as one of the central executive functions controlled by the prefrontal cortex (Liew, 2012; Zhou et al., 2012). However, although these two constructs are mostly discussed as independent constructs (but, in some cases, inhibitory control is discussed as part of effortful control), their description seems to be very similar and focuses on the ability to use a less desired but more appropriate response over a more desired but less appropriate response (Bridgett et al., 2013).

Thus, it is important to suggest a clear definition of self-regulation that can help in what was recently described as a lack of clarity of this construct and its subcomponents (McClelland & Cameron, 2012). In the current chapter, we borrow from different prominent theoreticians and researchers (e.g., Bandura, 1991; Block & Block, 1979; Bridgett, Burt, Edwards, & Deater-Deckard, 2015; Eisenberg, Duckworth, et al., 2014; Eisenberg, Hofer, et al., 2014; Kopp, 1982; Ursache et al., 2012) and suggest the following definition: self-regulation includes a broad set of *self-initiated* behaviors that aim to regulate and modulate emotional, cognitive, and behavioral arousal through *conscious*, *deliberate*, *flexible*, and *effortful* inhibitory actions. There are a number of important features to this definition. First, it refers to self-regulation as a *set* of distinct behaviors rather than one core construct. Second, it highlights the cognizant aspect of regulation (i.e., that the person must be aware of what she is doing). Third, it emphasizes that self-regulation necessarily includes an important ability of restricting and limiting actions taken by the individual. Based on this definition, we look next at the developmental milestones related to these capacities.

Self-Regulation in Childhood: Main Developmental Milestones

When can we expect to see the first signs of deliberate and effortful inhibitory actions and how do these abilities develop across childhood? In this section we try to answer these questions starting with infancy, continuing in early childhood, and concluding in middle childhood.

Self-Regulation in Infancy and Toddlerhood (Ages 0–3)

While there are signs of self-regulation activities even before birth (Florez, 2011), most developmental theories concur that voluntary control over behavior only appears in the latter part of the first year of life and, even by then, it is mostly expressed in the form of the infant's compliance to the caregiver's requests (e.g., Rothbart, Sheese, Rueda, & Posner, 2011; Ruff & Rothbart, 1996). Thus, in the early years, self-regulation is regarded many times as "guided self-regulation" or "mutual regulation" because of the general conception that infants and toddlers can only regulate themselves through the guidance and specific instructions of their caregivers (Sroufe, 1995) or through co-constructions of these capacities (Beebe & Lachmann, 1998). As such, our definition of self-regulation as a set of conscious, deliberate, flexible, and effortful self-initiated behaviors does not adequately represent children regulatory capacities in the first 3 years of life.

Still, infants as young as 2 months old (and, as mentioned, even before birth) regularly engage in some form of self-regulatory activities. Their abilities are usually manifested in the form of neurophysiological modulation which, as mentioned, is highly unlikely to involve conscious intention or awareness to the meaning of a given situation. But even without the conscious aspect, these more primitive behaviors (which are usually reflex movements organized in patterns of functional behavior) aim to achieve the goal of regulating and controlling arousal states (Gartstein, Bridgett, Young, Panksepp, & Power, 2013). In these first months, the caregiver's ability to help the infant regulate her emotions and arousal state is crucial for her development. The caregiver will typically assist the infant through interaction and routine, and the infant will use her limited capabilities to adjust to the caregiver's directions. At around 3–4 months of age, infants gain more sensorimotor modulation and can activate a motor act and change the act if needed. During this period, infants add to their previous passive repertoire of self-soothing behaviors more active behaviors such as direct approach to caregivers and attainment of more control of their visuospatial orientation (Rothbart, Ziaie, & O'boyle, 1992). At 6 months, they start redirecting their visual attention more toward inanimate aspects in the environment than toward their mothers (Rothbart et al., 1992). Then, toward the end of the first year of life, infants show even more increase in inhibitory capacities, self-soothing, and social communications, which signifies an important developmental period of self-regulation (Rothbart et al., 1992). During that period, infants not only show an ability to respond to the caregiver's control effort but also develop an ability to plan an act toward a desired regulatory goal (e.g., crawling to the other side of the room to pick up the pacifier and put it in their mouth). Notably, that already in the first year of life, there are pronounced gender differences in self-regulation capabilities, with girls generally showing higher capabilities of self-control and lower levels of anger and frustration than boys (Kochanska, Coy, & Murray, 2001; Weinberg, Tronick, Cohn, & Olson, 1999). These differences continue to be evident throughout childhood (Raffaelli, Crockett, & Shen, 2005).

During the second year of life, infants start to show more direct signs of voluntary control and an ability to monitor their behavior in some ways. During this phase, children are aware of social and task demands of the caregiver and can react accordingly by "initiate, maintain, modulate or cease physical acts, communication and emotional signals" (Kopp, 1982, p. 204). Finally, the shift to internal monitoring, which more adequately fits our initial definition of self-regulation, starts to be manifested more clearly during the third year of life, when young toddlers begin to acquire the ability to postpone an act if requested and to behave according to external standards without external monitoring (Kochanska, Murray, & Harlan, 2000; Posner & Rothbart, 1998). This phase depends on the emergence of representational thinking and evocative memory which allow the child to understand social standards and to link her behavior to her caregivers' expectations regarding acceptable and nonacceptable behaviors. Importantly, throughout these first years of life, children do far better in "don't" situations (i.e., when they are instructed by an adult not to engage in a pleasant task) than in "do" situations (i.e., when they are instructed by an adult to engage in an unpleasant task) (Kochanska et al., 2001). From a developmental perspective, this difference between "do" and "don't" situations suggests that the ability to suppress a response develops earlier than the ability to execute an undesired activity. It is plausible that this developmental difference occurs because of social demands (i.e., that parents start asking children to suppress a response before they ask them to initiate an undesired activity) or because the latter requires more complicated coordination between various behavioral elements than the former (Kochanska et al., 2001).

It is evident from the above review that voluntary self-regulation is an extremely hard task for children in the first 3 years of life. On the other hand, we also know that voluntary self-regulation capabilities are instrumental for children's learning and development (Ursache et al., 2012). Taken these two facts together, what does it say about children's ability to learn and develop during these early years? Does it mean that because they cannot regulate efficiently, they are also not efficient learners? An interesting and provocative perspective that may shed a somewhat different light on children's limited self-regulatory capacities in the first 3 years of life is suggested by Thompson-Schill, Ramscar, and Chrysikou (2009) in an article titled "Cognition without control." These authors claim that during the first 3 years of life, children exhibit what could be described as severely impaired behavioral and cognitive control which is remarkably similar to patients with neurological prefrontal cortex (PFC) damage. They argue that this erratic behavior occurs because the PFC, which is the part of the brain that is in charge of our ability to regulate our thoughts and behaviors, is the last part in the human brain to achieve synaptic maturation. In contrast to other mammals, this process reaches its pick only around the end of the fourth year of life (Huttenlocher & Dabholkar, 1997). Thompson-Schill and colleagues suggest that these early years differ significantly from later years in being a developmental period in which self-regulation may not be as important to learning as it is in later periods.

Their suggestion is fueled by the fact that during these years children gain multitude of life skills and world knowledge that are essential for their development even though they cannot control and regulate their thoughts and behaviors as efficiently as in later years. Moreover, they suggest that the absence of sufficient regulatory capacities during the early years not only does not interfere with learning but also serves as an advantage for specific developmental tasks such as language development and probability matching. Thompson-Schill and colleagues summarize by saying that, based on the Darwinian principle of "trade-offs", the advantages of PFC immaturity during the first 3 years of life outstrip the disadvantages (Thompson-Schill et al., 2009).

From our perspective, their take on cognitive development in the first 3 years of life is important for the acknowledgment that self-regulation, while extremely important for the acquisition of adequate social, emotional, and cognitive skills, has also some costs and can put significant limitations on our learning. Importantly, it also puts in different light Shonkoff and Philips's determination that regulatory processes modulate a wide variety of functions to *keep them within adaptive ranges* (Shonkoff & Phillips, 2000) as in infancy and toddlerhood, it seems that adaptability is more related to the absence of self-regulatory capabilities than to its existence.

Self-Regulation in Early Childhood (Ages 3–7)

The early childhood years (from preschool to the first years of elementary school) mark an important developmental period in which children make large and significant gains in their abilities to self-regulate (Bronson, 2000). What was previously highlighted by "cognition without control" is changing into more controlled behaviors and thought processes that could change based on the specific context (i.e., are flexible), that are more conscious and deliberate, and that are more multidimensional (Bronson, 2000; Whitebread & Basilio, 2012) than in the first 3 years of life. In the next few pages, we focus on the development of self-regulation during the early childhood years from two perspectives: the cognitive perspective and the socioemotional perspective.

Self-Regulation in Early Childhood: The Cognitive Perspective

Cognitively, children after the age of 3 can engage in a much wider range of cognitive tasks than before. Their perspectives on events and objects in the world are getting to be more multidimensional, they are more able to control their attention and resist distractions in their environment, they are getting to be more advanced and complex problem solvers, and they start to see the world from a more "objective" perspective. Because of these more advanced abilities, they begin to be more selective and choose tasks while taking into account their own level of skills (Whitebread & Basilio, 2012). This means that they are showing the first signs of what is referred to in later developmental period as metacognitive thinking (Flavell, 1979).

The main construct discussed by scientists researching self-regulatory capacities in early childhood from a cognitive perspective is "executive functions" (EF). The term "executive functions" is an umbrella term describing the ability to monitor and regulate different types of cognition and behavior to achieve specific internal goals (Xu et al., 2013). It usually includes three main brain functions that are strongly related yet considered to be independent: *working memory*, which refers to our ability to recall and operate distinct pieces of information over a very short period of time; *cognitive flexibility*, which describes our ability to shift attention between competing tasks in the most efficient way; and *inhibitory control*, which, within a specific context, enables us to select a less desired but more appropriate response over a more desired but less appropriate response (Diamond, Barnett, Thomas, & Munro, 2007; Miyake et al., 2000). Researchers discuss executive functions in relation to self-regulation because the main role of these executive skills is to monitor and control behavior in a flexible and adaptive manner, especially in novel situations (Bryce, Szűcs, Soltész, & Whitebread, 2011).

During the fourth year of life, we see a significant developmental leap in children's efficient use of their working memory, in their ability to shift between tasks (cognitive flexibility), and in their ability to inhibit desired responses in accordance to environmental demands. From around age 4 onward, there is a linear increase in working memory capacity that continues throughout childhood (Gathercole, Brown, & Pickering, 2003). During the early parts of this stage (ages 3–5), children use simple tactics for remembering but do not use mental strategies and do not typically show a clear ability to differentiate between what is considered as memory and what is considered as comprehension. Thus, in order to remember objects and events, they tend to verbally name or visually inspect items and use memory strategies intermittently or inconsistently even if they are aware of how they can improve recall (Henry & Norman, 1996). However, when they enter elementary school (ages 6–7), they begin to understand the advantages of memorizing and start to use more advanced techniques such as constant rehearsal and the use of categorization (Justice, 1985). These increased capacities allow them to more fully understand social rules and apply breaks or let go, as needed and commended by their environment.

Also at around age 4, there is an increase in children's ability to use rules more flexibly and to change and shift between rules based on their understanding of environmental demands.

Zelazo (2006) has shown a rapid change in children's cognitive flexibility from age 3 to age 5. Using the dimensional change card sort (DCCS)—a card sorting task in which children are asked to switch their card sorting strategy (first by one dimension, e.g., color, than by another, e.g., shape, and, finally, either by color or by shape, depending on whether the card has a drawn border or not)—Zelazo has found that whereas 3-year-olds could not even make the initial switch (i.e., from color to shape), 4-year-olds had no problem doing it, but found it difficult to make a conditioned decision (i.e., to decide whether to sort by color or shape based on the existence of a border), whereas, by age 5, most children were also able to perform the conditioned switch with relative ease (Zelazo, 2006). Zelazo's important findings converge with Deák's (2003) conclusion that the most rapid change in children's ability to think more flexibly and switch between tasks based on environmental demands occurs between the ages of 3 and 6 years. Similar findings to Zelazo's, albeit with different measures, were found in a number of more recent studies (e.g., Deák & Narasimham, 2014; Deák & Wiseheart, 2015).

Finally, and strongly related to the other two executive functions discussed above, children from age 3 onward also show dramatic development in their inhibitory control (IC). As mentioned, inhibitory control refers to the ability to suppress or promote responses based on their appropriateness to the environment (Bryce et al., 2011) and, more specifically, to stop an ongoing thought or behavior in a sudden and complete manner (Williams, Ponesse, Schachar, Logan, & Tannock, 1999). Until the preschool years, this type of restrictive behavior is virtually impossible for toddlers. Only at around age 3, children begin to use restrictive judgments in selecting responses, with this ability rapidly developing until the early school years (Gagne & Hill Goldsmith, 2011; Liu, Zhu, Ziegler, & Shi, 2015). In a comprehensive study assessing various EFs of children, Carlson (2005) has shown a linear increase in children's IC from age 3 to 6 using both "cold" (i.e., the more traditional measures of PFC functions, e.g., a "Simon says" game or a "Stroop test") and "hot" (i.e., flexible control of appetitive reward systems which is more similar to the definition of effortful control, e.g., snack or gift delay) measures. For example, whereas only half of the young 3-year-olds passed the "cold" "bear/dragon" test (Reed, Pien, & Rothbart, 1984), all of the 5-year-olds passed this test successfully. Similarly with the "hot" measures, whereas 42% of the young 3-year-olds passed the "gift delay" test (Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996), three quarters of the 5-year-olds were able to pass this task successfully (Carlson, 2005).

This last point brings us to the fine line between the cognitive and emotional aspects of self-regulation. As Carlson and others have shown, there are clear associations between the emotional and cognitive aspects of regulation; however, there seem to be more variance in emotionally-related self-regulation abilities, compared to the more "pure" (or "cold") cognitive regulation abilities. In the next section, we therefore review these emotional aspects of self-regulation, as exhibited in early childhood.

Self-Regulation in Early Childhood: The Socioemotional Perspective

The two constructs most frequently used by researchers focusing on the socioemotional aspects of self-regulation are emotional self-regulation (or just, emotion regulation) and effortful control. From a socioemotional perspective, children entering their fourth year can more easily control their emotions, are more capable to use language to regulate their behavior, are more able to adjust their behavior based on their perceptions of others' behavior and state of mind, and, in general, seem to behave in ways that are based on an effort to adjust and adapt to the social demands of their environment (Bronson, 2000).

In the literature, emotional self-regulation typically refers to one's ability to respond to environmental demands with a range of emotions (both positive and negative) in a controlled manner (Panfile & Laible, 2012). Whereas emotional self-regulation continues to develop throughout the life-span, the period between ages 3 and 6 seems to be especially important for the development of children's understanding of their own and others' emotional responses and self-control (Cole, Dennis, Smith-Simon, & Cohen, 2009). For example, it has been suggested that lip compression represents a conscious effort to suppress high levels of (negative or positive) emotional arousal (Bridges & Grolnick, 1995). Whereas lip compression and other self-soothing strategies are visible already in infancy, there is a dramatic increase in children's ability to control their emotions and understand the emotions of others after age 3.

Like in the other self-regulation capabilities discussed thus far, the fourth year of life seems to bring about an especially important developmental change in effortful control. As mentioned earlier, there are major similarities in the definition of inhibitory control and effortful control. Like IC, EC is defined as the ability to suppress a dominant response to perform a subdominant response (Rothbart & Rueda, 2005). Perhaps the best way to discriminate between the two is the way mentioned earlier of differences between "cold" (i.e., cognitive, PFC related) and "hot" (i.e., emotional, temperamentally related) inhibitory actions (Carlson, 2005). Kochanska and her colleagues were instrumental in defining the specific effortful control skills as well as designing appropriate measures to assess those (as will be discussed in Chapter "Challenging Behavior"; e.g., Kochanska et al., 1996, 2000). The five main effortful control skills identified by Kochanska and colleagues were *delay of gratification* (measured with tasks showing a candy or a gift for which the child has to wait for before receiving it), *slowing motor activity* (measured with tasks such as drawing a line very slowly), *suppressing or initiating a response based on changing signals* (measured by "go/no-go games"), *effortful attention* (measured via shape recognition tasks), and *lowering the voice* (measured by tasks of changing the level of voice pitch, i.e., asking the child to whisper). We will return to these constructs in Chapter "Challenging Behavior" when discussing the tasks designed to measure them and will see that some of these tasks may actually measure "cold" rather than "hot" traits, but, for the sake of this section, what is important to note is that in all of these tasks, 3–6-year-old children show linear and constant development, suggesting that there is an underline construct connecting all of them.

Self-Regulation in Early Childhood: A Summary

The literature clearly shows that the early childhood years are a defining period for the development of self-regulation capabilities. From age 3 to the early elementary years, children progress in what seems to be a constant and linear line in their working memory capacities, cognitive flexibility, inhibitory control, emotional self-regulation, and effortful control. Still, even though children's development during these years is impressive, they are far from being skillful in exhibiting self-control and regulation. These capacities continue to develop through the middle childhood years, a period discussed in our next section.

Self-Regulation in Middle Childhood (Ages 7–12)

Although self-regulation develops most rapidly at younger ages (Carlson & Moses, 2001), it continues to develop throughout the life-span (Best & Miller, 2010; Cicchetti & Tucker, 1994; Raffaelli et al., 2005). From both a cognitive and a socio-emotional perspective, middle childhood is a particularly demanding period of development, in which children are requested to manage multiple tasks at their homes, schools, and social lives. Moreover, many times they receive conflicting messages from parents, teachers, and peers, which add another layer of complexity to their ability to coordinate and facilitate their mental processes and behaviors. Thus, the task to self-regulate becomes more complicated and demands more advanced cognitive and emotional capabilities during this stage. Therefore, self-regulatory capacities at the middle childhood ages improve both qualitatively, in terms of the type of capabilities being mastered, and quantitatively, in terms of the degree to which self-regulatory capabilities are being mastered. Similarly to the previous section discussing self-regulation in early childhood, we turn to discuss the development of self-regulation in middle childhood separately from a cognitive and socioemotional perspectives.

Self-Regulation in Middle Childhood: The Cognitive Perspective

Self-regulation capabilities during the middle childhood years are dependent upon the development of advanced cognitive strategies that help children better control their arousal level (Heckhausen & Dweck, 1998; Zimmerman, 2000). Importantly, children at these ages face much more challenging environmental demands than in the early childhood years, both academically and interpersonally. Therefore, their capacities to self-regulate their behaviors and cognitions are a hallmark of adaptive adjustment. Advancements in cognitive processing capabilities that are typically discussed in the literature in relation to self-regulation in middle childhood are the more efficient use of memory and better inhibitory control abilities.

In terms of children's use of memory, research shows a generally linear increase in children's working memory capacity and efficient use from the preschool age to early adolescence (Conklin, Luciana, Hooper, & Yarger, 2007; Gathercole, Pickering, Ambridge, & Wearing, 2004; Luciana, Conklin, Hooper, & Yarger, 2005; Xu, Farver, & Zhang, 2009). However, it was suggested that the developmental course of working memory depends on the complexity of the task, namely, its executive demands. Indeed, several studies showed that less demanding tasks are being fully mastered earlier in the preschool age and more complicated tasks continue to mature until early adolescence (Conklin et al., 2007; Luciana et al., 2005). These findings suggest that middle childhood is a stage characterized with the refinement of working memory capacities. The more nuanced capabilities developed during this phase allow children to not only store more information in their memory but also to be much better than in the early childhood years in retrieving this information in the right context. During these years, they become more proficient in using advanced memory strategies like relying on heuristics (like an educated guess or a rule of thumb), shortcuts, and grouping. These advanced capabilities replace the former methods of mostly memorizing and thus afford higher capacities and more efficient retrieving, thus assisting in goal-directed behaviors.

Inhibitory control is also an important facet of self-regulation that continues to develop through middle childhood (Romine & Reynolds, 2005) and particularly for tasks that combine inhibition and working memory (Carlson, 2005; Gerstadt, Hong, & Diamond, 1994). However, unlike the improvements evident in preschool children, improvements in inhibitory control during the middle school years are unlikely to be fundamental qualitative changes in cognition but instead seem to involve quantitative improvements in accuracy, perhaps due to an increasing efficiency to override proponent responses. Accordingly, Best and Miller (2010) suggested that inhibition tasks have varying sensitivities, with some being sensitive to the conceptual gains in early childhood and others being sensitive to the refinements in strength of the relevant cognitive skills or the generality of application in later childhood.

These advanced cognitive capabilities lay the infrastructure for the child's functioning in several contexts. Specifically, they are essential to school functioning, which imposes growing demands on children in the middle childhood years compared to the early childhood years. Self-regulation in academic settings has been defined as the "active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment" (Pintrich, 2000, p. 453). Models of self-regulation conceptualize the self-regulating student as a motivated proactive agent and depict the self-regulatory process as progressing along phases that include assessment of task conditions and relevant personal resources, goal setting and selection of strategies to pursue these goals, application of the strategies and metacognitive monitoring of this application, and evaluation of the products and metacognitive control of the continued use of these strategies (i.e., whether to maintain the strategies or change them). These phases are thought to operate cyclically, with the evaluation phase leading back to the planning phase of goal setting and selection of strategies and so on (Winne & Hadwin, 1998; Zimmerman, 2000).

Thus, self-regulation in middle childhood goes beyond holding data in short-term memory and inhibiting unwanted responses. It is an active process that allows children at that stage to plan goal-directed actions, reconceptualize the situation, redefine their goals, or change their strategy in order to achieve that goal.

Self-Regulation in Middle Childhood: The Socioemotional Perspective

Although the capacity for effortful control develops most rapidly in early childhood (Posner & Rothbart, 2000), there are some evidence showing that children further develop their regulatory skills in middle childhood (Eisenberg & Morris, 2002). In addition, as children grow up, they develop much more sophisticated ways to self-regulate their emotional experiences. Thus, while younger children rely mostly on attentional resources and self-soothing to self-regulate, school-aged children can rely on diverse internal mental and cognitive mechanisms to regulate their emotional experiences (Eisenberg, Duckworth et al., 2014; Eisenberg, Hofer, et al., 2014). In other words, in addition to the quantitative improvement of their inhibitory control capacities, children improve the quality of dealing with emotional experiences.

An example to a more sophisticated strategy of emotion regulation, which was explored extensively in adult population, is reappraisal. Reappraisal is considered an adaptive form of emotion regulation, which involves the capacity to cognitively reappraise events by interpreting them in ways that change the emotional responses to them (Gross & Thompson, 2007). So far, only a few studies have explored the use of reappraisal in middle childhood. For instance, McRae et al. (2012) have demonstrated that 10–13-year-old children use reappraisal to effectively deal with unpleasant emotions. However, much more research is needed in order to understand the developmental pathways that enable both younger and same age children to use more or less adaptive forms of emotion regulation and the normative development of the capacities for such forms of emotion regulation.

The Assessment of Self-Regulation in Childhood

In the childhood years, self-regulatory capabilities are usually measured through direct assessments and/or behavioral ratings completed by adults (typically parents and teachers). Within this methodological framework, the following selective review highlights some frequently used measures in that field. We start by reviewing measures of executive functions and follow by reviewing measures of emotional self-regulation and effortful control.

Measures of Executive Functions in Childhood

As shown by Carlson's comprehensive review (Carlson, 2005), there are numerous measures of executive functions in childhood. These measures focus mainly on the three main executive functions described earlier, working memory, cognitive flexibility, and inhibitory control. These measures are discussed next.

Working Memory

Most measures of working memory are characterized by having both a processing and a storage component (Waters & Caplan, 2003). Performance on these measures is usually expressed as a continuous score of memory span. Depending on their developmental stage, children are asked to recall sequences of objects/numbers/letters (Gathercole et al., 2004). An excellent example of the ways by which working memory is measured in children is the comprehensive *Working Memory Test Battery for Children* (WMTB-C; Pickering & Gathercole, 2001). This measure is designed for children and young adults (ages 4–22) and includes nine subtests: four tests examining verbal storage (digit recall, word list recall, non-word list recall, and

Word List Matching task), two tests focusing on visual recall (blocks recall and mazes memory), and three tests examining more complex recall patterns (backward digit recall, listening recall, and counting recall). All of these tests can be used with children from age 6, and five of these tests (digit recall, backward digit recall, word list recall, nonword list recall, and block recall) can be used with children as young as 4 (Gathercole et al., 2004).

A related yet methodologically different example of direct assessment measure of working memory in children is the *Automated Working Memory Assessment* (AWMA; Alloway, Gathercole, & Pickering, 2006)—a computer-based measure of working memory for children age 4 and up. Like the WMTB-C, it is responsive to the definition of working memory as a system comprising multiple components whose coordinated activity provides the capacity for the temporary storage and manipulation of information in a variety of domains (Baddeley, 2000). As such, it includes tests corresponding to each of these domains: word recall, listening recall, dot matrix, and a measure of visuospatial working memory called Mister X. Other examples of working memory assessments in childhood include the *backward digit span* (Davis & Pratt, 1996), which serves as the basis to some of the measures mentioned above, and *count and label* (Gordon & Olson, 1998) in which children are asked to both count and label correctly a set of objects.

Although parent and teacher ratings that directly tap working memory are not common, one way to assess working memory through such ratings is by asking about behavior problems that were previously found to be strongly related to working memory deficiencies. For example, the Working Memory Rating Scale (WMRS; Alloway & Gathercole, 2008) is a 20-item, four-point rating scale (from 0, not typical, to 3, very typical) of problem behaviors that are known to differentiate children based on their working memory abilities. The authors of this measure report that it is particularly valuable for teachers who do not wish to use more formal assessments of working memory, but do want to provide a more systematic evaluation of the potential working memory problems than can be provided by information observation alone (Alloway & Gathercole, 2008).

Cognitive Flexibility

Measures of cognitive flexibility typically assess children's ability to flexibly switch between competing tasks. Among these measures, the dimensional change card sort (DCCS; Zelazo, 2006) mentioned above is likely the most well known and widely used. The DCCS is an easily administered measure in which children are required to sort a series of bivalent test cards, first according to one dimension (e.g., color) and then according to another (e.g., shape). The child is then asked to sort the cards either by color or shape, depending on whether or not the card has a border. In recent years, more complex versions of this measure such as the Three Dimension-Changes Card Sorting Photoshop-modified (Deák & Wiseheart, 2015) were introduced. These new measures include more colors and shapes and thus can produce higher distinguishing capabilities.

Other cognitive flexibility measures from the same group of researchers (Deák, 2000; Deák & Narasimham, 2014; Deák & Wiseheart, 2015) include the Flexible Induction of Meaning-Objects (FIM-Ob) and the Flexible Induction of Meaning-Animates (FIM-An). These measures use novel objects (FIM-Ob) or novel animated creatures (FIM-An) as stimuli. In each of these measures, the child has to sort these novel objects/creatures a number of times based on different criteria. It is considered to be a strong measure of flexibility because on the later trials, the child must ignore matches that are perceived similarly, and, moreover, must ignore responses that were previously primed (Deák, 2000).

Inhibitory Control

There are numerous measures that are used to assess inhibitory control in children from the preschool years. The common thread among these measures is their attempt to measure the child's ability to postpone a preferred response in favor of an undesired response. Carlson (2005) provides a comprehensive list of these measures and here we review only a selection. Another important point to be made: we discussed earlier the unclear distinction between inhibitory control and effortful control. This vagueness is also vividly apparent when reviewing measures of inhibitory and effortful control. In order to somewhat clear this vagueness, we use in this chapter the distinction used by Carlson (2005) and others between "cool" and "hot" regulation that we believe could be very useful also when trying to distinguish IC and EC measures. Using this perspective, we treat measures of "cool" regulation skills (i.e., measures that seem to include less affective components) as inhibitory control measures, whereas we present measures of "hot" regulation skills (i.e., measures that clearly include affective components) as measures of effortful control.

The following is a selective review of IC measures that are frequently used with children age 4 and older. Some of these measures are Stroop-like assessments of children's ability to follow a direction that asks them to inhibit an automatic (i.e., dominant) response to a stimulus and to use an opposite (i.e., subdominant) response instead. For example, in the day/night assessment (Gerstadt et al., 1994), children are asked to say "night," when they see a card with a sun drawn on it, and to say "day," when they see a card with a moon. Similarly, in the grass/snow assessment (Carlson & Moses, 2001), children are asked to point to a white card when the experimenter says "grass" and to point to a green card when the experimenter says "snow." In other examples of such tests, children are asked to make a fist when the experimenter points her finger and to point their finger when the experimenter makes a fist (Hughes, 1998) or to tap once when the experimenter tap twice and vice versa (Blair, 2003).

Other inhibitory control measures assess children's ability to follow inhibiting directions for a long time and to keep turns. For example, in the whisper task (Kochanska et al., 1996), the experimenter asks the child to name different cartoon characters but to always do it in a very quiet voice. In the tower game (Kochanska et al., 1996), children are asked to build a tower with an experimenter but only do it on their turn. During this task, children are never reminded on the turn-taking rule and are scored for their ability to maintain the rule for the duration of the game. Similarly, in the pinball task (Reed et al., 1984), children are asked to wait for the experimenter's direction each time it is their turn to play the game. Other tasks imitate the well-known children game "Simon says" (Bear-Dragon; Reed et al., 1984; Simon Says, Strommen, 1973) in which the child is supposed to follow the direction of the experimenter, but only under certain conditions (e.g., when the experimenter says that Simon said to do it) but not under other conditions (e.g., when the experimenter tells the child to do the task without saying "Simon said to").

Finally, Rothbart and her colleagues have created a series of parent and teacher reports of children's temperament which include a significant number of items tapping inhibitory control. Whereas some of these items may tap effortful control (based on our distinction between measures of "cold" and "hot" regulation), we briefly present these questionnaires in this section. This set of questionnaires covers almost every period of development (infancy to adulthood). The questionnaires relevant to the current chapter are the Infant Behavior Questionnaire (IBQ; Rothbart, 1981; for infants ages 3–12 months); the Early Childhood Behavior Questionnaire (ECBQ; Putnam, Gartstein, & Rothbart, 2006; for toddlers ages 18–36 months); the Children's Behavior Questionnaire (CBQ: Rothbart, Ahadi, Hershey, & Fisher, 2001; for children ages 3–7 years); the Temperament in Middle Childhood Questionnaire (TMCQ; Simonds & Rothbart, 2004; for children 7–10 years old); and the Early Adolescent Temperament Questionnaire (EATQ-R; Capaldi & Rothbart, 1992; Ellis & Rothbart, 2001; for children ages 9–15 years). All of these questionnaires include items that ask parents or teachers to rate children's capacity to plan ahead, as well as their ability to suppress inappropriate response.

Measures of Emotional Self-Regulation and Effortful Control in Childhood

The most well-known battery of effortful control measures is likely the one proposed by Kochanska and her colleagues (e.g., Kochanska et al., 1996, 2001). As mentioned earlier, Kochanska's measures focus on five components of EC: (a) delaying (e.g., waiting with an instruction not to do anything for a pleasant event (receiving a candy or a gift) that will only occur if waiting), (b) slowing down gross and fine motor activity, (c) suppressing/initiating activity to a signal (e.g., games in which the child produces a response to one signal and inhibits it to another), (d) effortful attention (Stroop-like assessments, which requires ignoring a dominant perceptual feature of a stimulus in favor of a subdominant feature), and (e) lowering voice (whispering). As can be seen, based on our "hot" and "cold" definitions above, not all of these tests qualify as "real" EC measures, and some seem to tap the cognitive rather than the affective part of control. Thus, in the following short description of EC measures, we focus only on those that seem to trigger the arousal levels of specific affective systems.

Most of these measures seem to be related to the first of Kochanska's definition of EC, delaying, in which children are asked to delay their response to an attractive stimulus in order to receive a better reward later. For example, in the delay of gratification task (Mischel, Shoda, & Rodriguez, 1989), after children select their favorite treat out of two options, two bowls with their favorite treat are placed in front of them, one with a large number of treats and the other with a small number of treats. After making sure that the children prefer the bowl with the larger amount of treats, the children are then told that the experimenter needs to leave the room for a while but if they wait until she returns, they will receive the bowl with the large number of treats. Children are also given the option to call the experimenter back to the room but are being told that if they do that, they will receive the bowl with the smaller amount of treats. Mischel and his colleagues designed a number of delay of gratification tasks, perhaps the most well known is the Stanford Marshmallow test (Mischel, Ebbesen, & Raskoff Zeiss, 1972), which is an earlier and simpler version of the delay of gratification measure described above.

Other researchers designed innovative measures that add complexity to Mischel's delay of gratification tasks. For example, in the less is more task (Carlson, Davis, & Leach, 2005), Carlson and her colleagues added a layer of reverse reward contingency to the task. In this procedure, children are also asked to select between a larger and smaller selection of candies (put on trays) but, in addition, are told that the tray they will select will go to a naughty puppet, whereas they will receive the other tray. Carlson (2005) also combined the Saarni's disappointing gift task (Saarni, 1984) with Kochanska's gift delay task (Kochanska et al., 1996) to create an even more elaborated version of the delay of gratification task. In this combined version, children are asked to wait until an experimenter wraps a gift that she "forgot" to wrap before. This is done behind their back. Then, when they open the gift, it turns out to be a disappointing gift, and their affective responses are being measured.

Self-Regulation and Psychopathology: Implications to Field Practitioners

Failures of self-regulation contribute to children's maladjustment and are manifested in various forms of children's psychopathology. Particularly, children's difficulties at self-regulation are evident in a wide range of maladjusted patterns of behaviors, including both externalizing and internalizing spectrums (Neuhaus & Beauchaine, 2013; Nigg, 2000). On the other hand, research has clearly demonstrated that optimal self-regulatory capacities contribute to children's adaptive social and academic adjustment (Eisenberg, Duckworth et al., 2014; Eisenberg, Hofer, et al., 2014; Liew, 2012). Therefore, informing practitioners and socialization agents how to foster optimal self-regulatory capacities should be a primary goal of self-regulation research. The present section will first discuss how self-regulatory capacities are involved in children's maladjustment and then discuss implications for practitioners.

Self-Regulation and Externalizing Problems

Lower levels of self-regulation capabilities have been consistently linked to higher levels of externalizing problems, manifested in aggression, impulsivity, and inattention. This association is evident in the toddler and preschool years as well as in later childhood and adolescence (for a review, see Eisenberg, Spinrad, & Eggum, 2010). However, closer inspection at different externalizing symptoms and different self-regulatory capacities reveals a more complicated picture.

Notably, failures of self-regulation are evident in attention deficit hyperactivity disorder (ADHD). ADHD has long been associated with impaired abilities for response suppression, manifested in ADHD children's difficulties at executing goal-directed behaviors (Nigg, 2000). Thus, large body of evidence has demonstrated that children who exhibit ADHD symptoms perform worse than controls on tasks measuring response suppression such as the stop-signal task (Logan, 1994) and the go/no-go task (Miller, Schäffer, & Hackley, 1991). Willcutt, Doyle, Nigg, Faraone, and Pennington (2005) reviewed studies and noted a composite effect size for ADHD versus control of $d = 0.61$ (a medium effect size). Similarly, Schoemaker, Mulder, Deković, and Matthys (2013) reviewed 18 studies that explored the relations between executive functions and ADHD symptoms among preschoolers and found a medium correlation effect size (ESzr = 0.21) for overall executive functions, as measured by teachers' and parents' questionnaires. More specifically, small effect sizes were found for working memory (ESzr = 0.17) and for cognitive flexibility (ESzr = 0.14), and medium effect size was found for inhibitory control (ESzr = 0.24). Therefore, these studies suggest that although children who exhibit ADHD symptoms manifest impaired cognitive self-regulation abilities, this link may be less robust than what was commonly argued.

Beyond cognitive control mechanisms, deficiencies in emotional self-regulation have also been associated with ADHD (Barkley, 1997; Nigg & Casey, 2005; Wender, 1995). Accordingly, researchers (e.g., Martel, 2009; Nigg, Goldsmith, & Sachek, 2004) have suggested that deficiencies in effortful control may account for the inattentive symptoms of ADHD. Following these claims, a growing body of research has explored the links between effortful control and ADHD symptoms. Although preliminary, this research has consistently demonstrated that children with ADHD score lower than controls on measures of effortful control (De Pauw & Mervielde, 2010; Foley, McClowry, & Castellanos, 2008; Martel, Gremillion, & Roberts, 2012; Martel & Nigg, 2006). Similarly, studies that explored individual differences in effortful control and ADHD symptoms found negative relations between the constructs, both among preschool children (Papageorgiou et al., 2014) and among college students (Graziano et al., 2015).

Another line of research has followed Shiner and Caspi's (2003) suggestion that temperament and personality traits can and should be integrated in children due to similarities between the two domains. Specifically, these researchers claimed that there is a certain degree of overlap between effortful control and the trait "conscientiousness," defined as "the propensity to follow socially prescribed norms for impulse control, to be goal directed, to plan, and to be able to delay gratification and to follow norms and rules" (Roberts, Jackson, Fayard, Edmonds, & Meints, 2009, p. 369; see also Eisenberg, Duckworth, Spinrad, & Valiente, 2014). Accordingly, several studies have demonstrated that children who exhibit ADHD symptoms score lower than controls on measures tapping conscientiousness (Martel, 2016; Martel, Nigg, & von Eye, 2009; Ullsperger, Nigg, & Nikolas, 2016).

Taken together, these results suggest that emotional self-regulatory capacities play a role in ADHD symptomatology. However, more research is needed to establish this assumption. Specifically, longitudinal studies are required to examine developmental trajectories and causal pathways. In addition, more direct scrutiny should explore the differentiation between measures supposedly tapping the same constructs (i.e., effortful control, inhibitory control, and conscientiousness) and their relation to ADHD.

Deficiencies in self-regulatory capacities are also evident in disruptive behavior disorders (DBD), such as oppositional defiant disorder and conduct disorder. In the past two decades, a growing body of research has explored the relations between effortful control and externalizing problems and DBD (for a full review, see Eisenberg, Spinrad, & Eggum, 2010; Eisenberg, Spinrad, Eggum, Silva, et al., 2010). This research demonstrated that effortful control assessed at toddlerhood and early childhood negatively predicted externalizing symptoms both at preschool (Eisenberg et al., 2005; Murray & Kochanska, 2002; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005; Valiente et al., 2013) and middle childhood (Choe, Olson, & Sameroff, 2014; Eisenberg et al., 2004). Also, Woltering, Lishak, Hodgson, Granic, and Zelazo (2016) found that 7–12-year-old children diagnosed with DBD scored lower than controls on measures of effortful control.

However, both Spinrad et al. (2007) and Eisenberg, Taylor, Widaman, and Spinrad (2015) found that effortful control did not negatively predict toddlers' externalizing problems over time when controlling for earlier levels of externalizing problems. Therefore, it is suggested that effortful control is linked to maladjustment only after it is fairly sophisticated and mature. Eisenberg et al. (2015) also found that high levels of children's externalizing problems at both 30 and 42 months negatively predicted effortful control a year later. Thus, it is likely that, at these ages, high levels of externalizing problems impair the development of effortful control by affecting children's social environment, including aspects of parenting.

While the research exploring the relations between effortful control and DBD has been intensively explored over the years, the relations between executive functions, and specifically inhibitory control, and DBD have only lately gained researchers' attention. This late inspection might have been the result of the historical view that ascribed the impairments in executive functions, often found in children with DBD, to comorbid ADHD in these children (Pennington & Ozonoff, 1996). However, in recent years, a growing body of research has addressed this lacuna and showed links between executive functions and DBD, above and beyond the presence of comorbid ADHD. Indeed, Schoemaker et al.' (2013) meta-analysis mentioned above reviewed nine studies that explored the relations between DBD and executive functions and found similar effect sizes as in studies that explored ADHD and executive functions (ESzr = 0.19, 0.15, 0.22, and 0.13 for overall executive functions, working memory, inhibitory control, and flexibility, respectively).

In recent years, researchers have further established this link between executive functions and different types of aggressive behavior (Buss, Kiel, Morales, & Robinson, 2014; Choe, Shaw, Brennan, Dishion, & Wilson, 2014; Euler, Sterzer, & Stadler, 2014; Granvald & Marciszko, 2016; Monette, Bigras, & Guay, 2015; Sulik, Blair, Mills-Koonce, Berry, & Greenberg, 2015; Suurland et al., 2016; Verlinden et al., 2014; Woltering et al., 2016). Overall, findings from these studies support the assumption that a strong link exits between executive functions and different types of aggression, both in children diagnosed with DBD (e.g., Euler et al., 2014), and in non-referred populations (e.g., Sulik et al., 2015).

Self-Regulation and Internalizing Problems

In internalizing problems, deviant emotion-driven behaviors are targeted inward toward the individual (Colman, Wadsworth, Croudace, & Jones, 2007). This category encompasses a wide range of problems, such as anxiety, depression, withdrawal, and somatic complaints. At a first glance, the relations between self-regulation and internalizing problems may seem less clear and straightforward, as these have often been mentioned as problems characterized by overcontrol. However, Eisenberg and her colleagues have suggested that this overcontrol is reactive and therefore could be counteracted by effortful control (Eisenberg, Spinrad, & Morris, 2002).

Indeed, several internalizing problems are manifested by dysregulated emotion expression and experience (e.g., rumination; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), as well as heightened emotional reactivity and impulsivity (Carver, Johnson, & Joormann, 2008; Yap, Allen, & Sheeber, 2007). However, the relations of self-regulatory capacities with internalizing problems have been less systematically explored than their relations with externalizing problems. In addition, most studies that examined this link focused on the concept of effortful control, and less on inhibitory control.

Studies that explored the relations between effortful control and internalizing symptoms exhibited mixed findings that tend to vary with age. Specifically, whereas several studies conducted in the toddlerhood and preschool years found negative relations between effortful control and internalizing symptoms (Carrasco, Holgado-Tello, Delgado, & González-Peña, 2016; Hopkins, Lavigne, Gouze, LeBailly, & Bryant, 2013; Lemery, Essex, & Smider, 2002), others found positive relationships (Murray & Kochanska, 2002) or mild/null relationships (Dennis, Brotman, Huang, & Gouley, 2007; Eisenberg, Spinrad, Eggum, Silva, et al., 2010; Ghassabian et al., 2014; Moran, Lengua, & Zalewski, 2013). In addition, in all cases where internalizing and externalizing symptoms were simultaneously measured, the internalizing symptoms' relationships with effortful control were weaker than they were with externalizing symptoms (e.g., Carrasco et al., 2016; Eisenberg, Spinrad, & Eggum, 2010; Eisenberg, Spinrad, Eggum, Silva, et al., 2010; Moran et al., 2013).

Interestingly, there was a stark division between the measurements used to assess effortful control in the studies that found negative relationships between effortful control and internalizing symptoms and those that did not. Thus, while the former relied solely on the CBQ (Putnam & Rothbart, 2006; Rothbart et al., 2001) to measure effortful control, the latter used the battery developed by Kochanska (1996, 2001) or similar observational methods. This distinction casts doubt on the assumption that early childhood internalizing problems are related to deficiencies in effortful control at these ages. Thus, the negative links found in the early years might as well be the result of a self-report bias or of construct validity bias, wherein items from both the CBQ and the measurements of internalizing symptoms tap similar constructs (Lemery et al., 2002; Lengua, West, & Sandler, 1998).

A different pattern of results emerged in middle childhood and adolescence, where fairly consistent negative relationships between effortful control and internalizing symptoms emerge (Hilt, Armstrong, & Essex, 2012; Hofer, Eisenberg, & Reiser, 2010; Muris, 2006; Muris, Meesters, & Blijlevens, 2007; Oldehinkel, Hartman, Ferdinand, Verhulst, & Ormel, 2007; Sportel, Nauta, de Hullu, & de Jong, 2013; Sportel, Nauta, de Hullu, de Jong, & Hartman, 2011). These negative relationships were found both in relation to depression (Sportel et al., 2013), to anxiety (Muris, 2006; Oldehinkel et al., 2007; Sportel et al., 2011; Vervoort et al., 2011), and to mixed measures of internalizing symptoms, which include withdrawal, anxiety/depression, and somatic symptoms (Dyson, Robertson, & Wong, 2015; Hofer et al., 2010; Muhtadie, Zhou, Eisenberg, & Wang, 2013). In addition, recently several studies have indicated that effortful control capacities served as a moderator between several risk factors and later internalization problems (e.g., Gulley, Hankin, & Young, 2016; Hilt et al., 2012; Muhtadie et al., 2013).

Thus, these results suggest that effortful control capacities developed early in life might protect children against internalizing symptoms in adolescence. However, as the research is still preliminary, more data is needed to determine the developmental trajectories that follow from early effortful control capacities to internalizing symptoms in adolescence. In addition, much less research has explored the relations between inhibitory control and internalizing symptoms, and recent evidence suggests that such an exploration is warranted. For instance, Ghassabian et al. (2014) relied on self-report measures of inhibitory control and showed positive relations between parents' reports of inhibitory control at age 4 and internalizing symptoms at age 6. As mentioned, more research is needed in order to establish these findings, and specifically, behavioral measures of inhibitory control are needed.

Self-Regulation and Adaptive Adjustment

Beyond their role in the development and prevention of psychopathology, self-regulatory capacities contribute to children's adaptive adjustment (for a review, see Liew, 2012). Research has consistently demonstrated that children with good self-regulatory capacities do better than other children both socially and academically. For instance, several studies found positive relationships between effortful control and adaptive indicators of social adjustment among children, such as empathy (e.g., Eisenberg, Wentzel, & Harris, 1998; Panfile & Laible, 2012; Rothbart, Ahadi, & Hershey, 1994) and prosocial behavior (e.g., Diener & Kim, 2004; Eisenberg et al., 1997; Luengo Kanacri, Pastorelli, Eisenberg, Zuffianò, & Caprara, 2013).

In addition, researchers have demonstrated positive relationships between self-regularity capacities and academic skills and achievements both in the preschool years (e.g., Blair & Razza, 2007; McClelland et al., 2007) and in grade school (e.g., Liew, McTigue, Barrois, & Hughes, 2008; Valiente, Lemery-Chalfant, Swanson, & Reiser, 2008; Valiente et al., 2013).

Promoting Self-Regulatory Capacities

The evidence overviewed in the previous sections emphasized the importance of self-regulatory capacities to children's psychosocial and academic adjustment. In addition, a large body of evidence indicates that beyond heredity, socializers' practices affect the development of self-regulatory capacities (Eisenberg, Cumberland, & Spinrad, 1998). Together, this body of evidence underscores the importance of developing effective interventions to foster self-regulation. However, the research supporting the effectiveness of such attempts is still limited. Thus, whereas several attempts were focused on the improvement of children's executive functions, including inhibitory control (for a review, see Diamond & Lee, 2011), only a few have targeted effortful control.

Diamond (2012) described three types of interventions aimed at improving children's executive functions, namely, computerized training, school curricula, and physical exercise (including martial arts and meditation training). Computerized training tasks were originally designed to improve the working memory aspect of executive functions (for a review, see Shipstead, Redick, & Engle, 2012). The most researched approach for improving children's working memory is Cogmed computerized training. This training was found to be successful in several studies (e.g., Holmes, Gathercole, & Dunning, 2009; Holmes et al., 2010; Klingberg et al., 2005; Thorell, Lindqvist, Bergman Nutley, Bohlin, & Klingberg, 2009). However, other authors advised more caution in the interpretation of results (Shipstead, Hicks, & Engle, 2012). Specifically, these authors claimed that Cogmed improves performance on tasks that resemble Cogmed training, but probably does not transfer to untrained tasks. Several studies have also tried to implement Cogmed to also improve recipients' inhibitory control abilities, with partial success. Specifically, whereas gains in inhibitory control following Cogmed practice were observed in middle childhood (Karbach & Kray, 2009), none were observed in preschool children (Rueda, Rothbart, McCandliss, Saccomanno, & Posner, 2005; Thorell et al., 2009).

School curricula were designed to more specifically address children's self-regulatory capacities of inhibitory control. For example, the Promoting Alternative Thinking Strategies (PATHS; Greenberg, Kusche, Cook, & Quamma, 1995) curriculum involves classroom lessons and students' practice of inhibitory control and emotion identification, on children's self-regulation. Riggs, Greenberg, Kusché, and Pentz (2006) found that students (second and third graders at pretest) participating in PATHS performed better than control children on measures of executive function (inhibitory control) and verbal fluency. However, these results were not replicated in other intervention studies that used the PATHS (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Domitrovich, Cortes, & Greenberg, 2007).

The *Tools of the Mind* (Tools; Bodrova & Leong, 2007) is an intervention program that focuses specifically on promoting young children's (aged 3–6) executive functions, including self-regulatory capacities. This program was inspired be Vygotsky (1978), who emphasized the importance of social pretend play for early development of executive functions. During pretend play, children must inhibit acting out of character, remember their own and others' roles, and flexibly adjust as their friends improvise. Such play exercises all three core EFs and is central to Tools. Diamond et al. (2007) demonstrated the effectiveness of the Tools curriculum to children's three aspects of executive function among young children. However, more research is needed to establish the effectiveness of Tools and similar programs in improving children's executive functions. These efforts should extend beyond specific populations and age levels and explore the mechanisms through which these programs exert their changes.

There are also several studies that explored the effectiveness of both habitual (also referred to in the literature as "chronic") and singular (also referred to in the literature as "acute") physical activity on children's executive functions (for a review, see Best, 2010). It was suggested that this effect was typical to forms of exercise that are cognitively engaging and that this cognitive engagement inherent in exercise may help explain how exercise impacts cognition (Sibley & Etnier, 2003; Tomporowski, Davis, Miller, & Naglieri, 2008).

Along the same lines, Diamond (2012) suggested that exercise alone may be less effective in improving children's executive functions than activities that involve both exercise and character development (e.g., traditional martial arts) or activities that involve both exercise and mindfulness (e.g., yoga). For example, Razza, Bergen-Cico, and Raymond (2015) showed that preschoolers (3- to 5-year-olds), who went through a daily mindful yoga practice for a year, performed better than control children on several indices of self-regulation (including effortful control). Similarly, Lakes and Hoyt (2004) randomly assigned children in kindergarten through fifth grade (5- to 11-year-olds) by homeroom class to take part in either traditional taekwondo or standard physical education. Students in the taekwondo group improved more than students in the standard physical education group in working memory and on several dimensions of inhibitory control.

Nevertheless, the claim that martial arts may promote children's executive functions was criticized by other authors (Mercer, 2011; Strayhorn & Strayhorn, 2011), doubting the scientific status of the evidence showing such links. Furthermore, beyond criticizing the quality of research, Strayhorn and Strayhorn (2011) espoused an educational and ethical stance and claimed that "in a world beset by violence, there is irony and pathos in hoping that our children will be improved by teaching punching, kicking, and tripping" (p. 310).

Conclusions and Future Research Directions

There are a number of important conclusions that could be drawn from the current review:

There is a lack of clarity in the definition of self-regulation and its subcomponents. Like many others before us (e.g., Liew, 2012; McClelland & Cameron, 2012; Zhou et al., 2012), we identified some inconsistencies and overlaps in the various definitions of self-regulation and its subcomponents. This may be the result of self-regulation being the focus of two distinct research traditions, one that views self-regulation from a cognitive perspective and another focusing on the affective aspects of self-regulation. These two research traditions have identified constructs and developed measures independently, and this resulted in major overlaps. Perhaps one solution to this state of affairs is to reconstruct measures within each research tradition that are conscious of the definitions and measures created within the other tradition. For example, conceptualize effortful control measures as those tapping "hot" self-regulation and inhibitory control measures as those tapping "cold" self-regulation, as we tried to demonstrate in the current chapter (see "Inhibitory Control" and "Measures of Emotional Self-Regulation and Effortful Control in Childhood" sections).

Moreover, we suggest that current definitions of self-regulation do not do full justice to the complex set of behaviors and mental representations that children may be using to gain control over their own and others' behaviors. Most definitions (as is the one we suggested at the beginning of this chapter) focus on self-soothing and attention control, yet children as young as 2 can use a chain of behaviors in response to actions and events in their environment that require regulating their arousal levels. For example, they may fail to self-regulate based on traditional definitions when they do not receive the toy they wanted (i.e., respond with a temper tantrum) but later may show prosocial behavior that hints on a connection they make to the previous act (e.g., give the toy they received after the tantrum to their sister to play with). We suggest that researchers should reconsider current definitions of self-regulation to include also the chain of reactions that may occur after the initial trigger.

A promising line of research that could provide insight into such complexities is the study of different emotion regulatory strategies (Gross, 1998), which has been mostly applied to adults' population. As several studies have demonstrated that children use emotion regulatory strategies such as reappraisal (e.g., McRae et al., 2012), we advise a more thorough scrutiny of the different tactics both young and older children use to regulate their emotions.

Whereas the ability to self-regulate has clear developmental advantages, its limitations should also be considered. Related to the last point we just made, the restrictive definitions of self-regulation may prevent us from focusing not only on the potential problems that are associated with dysregulation but also on the possible advantages that may exist in some unregulated behaviors.

We have discussed earlier that there are clear developmental benefits to the seeming inability to efficiently and independently regulate during the first 3 years of life. The knowledge that we pose today on the development of the PFC and the likely evolutionary trade-off occurring during these early years (i.e., cognition without control: young children cannot efficiently regulate but still learn multiple skills in the most efficient way; see "Self-Regulation in Infancy and Toddlerhood (Ages 0–3" section) should inform practitioners developing intervention programs for infants and toddlers perhaps not to put too much emphasis on teaching and enhancing regulation abilities during these years.

Moreover, this knowledge should also inform our thinking and research on self-regulation in later years. As mentioned earlier, traditional thinking on self-regulation is pretty much one directional in nature, i.e., self-regulation is almost always considered as advantageous for the development of children, whereas dysregulation is always considered a disadvantage. This line of thinking has led to the fact that there are no studies focusing on the possible advantages of dysregulation. For example, is it possible that children showing difficulties to self-regulate think more innovatively? Perhaps because they rarely fit the box, they are forced to think "outside the box"? We believe that future research should explore these possibilities by, for example, (a) designing studies focusing on measuring outcomes that are different from the usual school readiness and adjustment constructs that are typically measured in relation to self-regulation and (b) studying in depth children with self-regulation problems who are still successful in school and in other aspects of their lives. This type of research could certainly inform the practices of educators and clinicians committed to improve the developmental outcomes of children with self-regulation difficulties.

The associations between self-regulation and psychopathology should be more specifically explored. We have reviewed above the abundance of literature on the links between self-regulation and psychopathology with a majority of studies showing links between self-regulation failures and various adjustment problems. However, in order to advance the field, the developmental pathways by which early self-regulation problems affect later externalizing and internalizing problems should be further explored. In addition, existing research on these links did not control sufficiently for the possible overlap between different developmental problems, for example, differentiating externalizing problems that are or are not the result of ADHD or differentiating anxiety and depression when examining the links between self-regulation and internalizing problems.

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Social and Emotional Learning: Recent Research and Practical Strategies for Promoting Children's Social and Emotional Competence in Schools

Eva Oberle and Kimberly A. Schonert-Reichl

Parents, educators, and society at large have long agreed that, by the time young people graduate from high school, they should be independent, socially skilled, and well-rounded citizens who are ready to responsibly navigate their personal and professional pathways into adulthood (Greenberg et al., 2003). There has been wide agreement that schools play a central role in fostering these skills, in addition to their mandate for teaching academic competencies (Zins & Elias, 2006). However, until the turn of the century, instruction in social-emotional skills was generally missing in kindergarten to 12th grade educational curricula, and schools were not required to address children's social-emotional development explicitly and systematically. Indeed, social and emotional learning (SEL) has long been considered the "missing piece" in education (Elias, 1997; Schonert-Reichel & Hymel, 2007). SEL encompasses processes through which individuals acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage their own emotions, establish and achieve positive goals, develop and maintain positive relationships with peers and adults, and make responsible and healthy decisions (CASEL, 2013; Greenberg et al., 2003; Weissberg, Payton, O'Brien, & Munro, 2007).

Much progress has been made in the past two decades. A steady growth of research has been conducted, examining central questions such as "Are social and emotional competencies malleable and can they be taught by regular teachers in typical classrooms?," "Does teaching social and emotional competencies influence student development in other domains, such as their academic achievement?," and "How can instruction in social-emotional competence be incorporated into the classroom effectively, consistently, and sustainably?" The research conducted in the past two decades has resulted in compelling and consistent empirical evidence showing that, indeed, social-emotional competencies can be taught and that teaching those competencies leads to positive and significant improvements for other important outcomes, including student behavior, health and well-being, and academic achievement (e.g., Domitrovich, Cortes, & Greenberg, 2007; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011; Payton et al., 2008; Sklad, Diekstra, Ritter, Ben, & Gravesteijn, 2012; Weare & Nind, 2011; Zins, Bloodworth, Weissberg, & Walberg, 2004a, 2004b).

Despite these advances and the widespread recognition that SEL is a key contributor to positive child and adolescent development, many educators

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are still experiencing barriers for incorporating SEL into schools and classrooms (Oberle, Domitrovich, Meyers, & Weissberg, 2016). Barriers include lack of resources (e.g., financial budget, time), little administrative support, and lack of training and guidance in implementing SEL systematically. Because SEL is considered to be the foundation of students' well-being and success in school and life, researchers, educators, and policy makers need to collectively advance the agenda of bringing SEL to all children by incorporating it consistently and effectively into school curricula (Jones & Bouffard, 2012; Osher, Sprague, Weissberg, Keenan, & Zins, 2008).

The goal of this chapter is to present the current state of theory, research, and practices of SEL instruction in schools. The chapter has three main parts. *First*, we define SEL and introduce core social-emotional competencies, provide an overview of the history of SEL in schools, and review research evidence of the impact of SEL on developmental outcomes in children. *Second*, we discuss ways in which SEL can be taught successfully in schools. We describe best practices that have been established through research, present established criteria of high-quality SEL programs, and discuss different strategies of incorporating SEL into the curriculum. Further, we provide explicit examples for evidence-based SEL programs at different grade levels (i.e., preschool through high school). *Third*, we discuss the importance of establishing sustainable SEL in schools. We point out the need for a systemic approach for SEL implementation and for taking into account teachers' social and emotional competence and incorporating SEL instruction into both in-service and preservice teacher education. We conclude with future directions in the field of SEL in schools and highlight important next steps that need to be taken on a practical and a research level.

Two Decades of SEL in Schools: What Is It and Why Is It Important?

SEL is the process of providing all children and adolescents with the opportunities to learn, acquire, and practice the knowledge, attitudes, and skills necessary for identifying and achieving positive goals, identifying, understanding, and regulating emotions, showing empathy for others, initiating and maintaining positive relationships, and making responsible decisions (Greenberg et al., 2003; Osher et al., 2008; Payton et al., 2000; Zins et al., 2004a, 2004b). SEL can be implemented within the family, school, and community context. For the purpose of this chapter, we discuss SEL in schools.

The term SEL was first coined in 1994, when the Collaborative for Academic, Social, and Emotional Learning (CASEL; www.casel.org) was founded as an international organization with the mission to establish evidence-based SEL as an essential part of preschool through high school education. In 1995, Daniel Goleman first described the crucial role of emotions in determining crucial educational and life outcomes in his best-selling book *Emotional Intelligence* (Goleman, 1995). The book was responsible for popularizing the topic of emotions and its contributions to thoughts, behaviors, and success in life. In 1997, to catalyze the field of SEL, a group of scholars at CASEL published a book *Promoting Social and Emotional Learning: Guidelines for Educators* and delineated a list of 37 guidelines to inform educational practices to support educators in implementing SEL in their classrooms (Elias et al., 1997). The guidelines for educators were a groundbreaking contribution that influenced SEL research and practice for years to come. Up to this point, the influential role of children's and adolescents' feelings and understanding, thereof, emotional experiences and regulation, and well-being in relation to academic learning had remained widely unrecognized (Zins et al., 1998). Considering these events in combination, the field of school-based SEL was born.

What are the social-emotional competencies that comprise SEL? In defining the outcomes that school-based SEL aims to achieve, CASEL has identified five core intra- and interpersonal and cognitive competencies that are interrelated and reflect the cognitive, affective, and behavioral dimensions of SEL (CASEL, 2013; Elias et al., 1997; Payton et al., 2000):

1. *Self-awareness* involves the ability to identify and recognize one's own emotions, thoughts, and their influences on behavior. It includes recognizing one's own strength and challenges and being aware of one's own goals and values. High levels of self-awareness require recognizing how thoughts, feelings, and actions are interconnected.
2. *Self-management* entails the ability to regulate one's emotions, thoughts, and behaviors effectively, including stress management, impulse control, motivating oneself, and working toward achieving personal and academic goals. It also contains self-management in social interactions.
3. *Social awareness* is the ability to take the perspectives of others—including those who come from a different background and culture—to empathize with others, to understand social and ethical norms, and to recognize resources and supports in family, school, and community.
4. *Relationship skills* provide children with the tools to form and maintain positive and healthy relationships, communicate clearly, listen actively, cooperate, negotiate constructively during conflict, solve problems with others effectively, and offer and seek help when needed.
5. *Responsible decision-making* skills equip children with the ability to make constructive and respectful choices about their own behavior and social interactions, taking into account safety concerns, ethical standards, social and behavioral norms, consequences, and the well-being of self and others.

Children and adolescents who are proficient in those core SEL competencies are able to integrate feeling, thinking, and behaving to master important tasks in school and life (Zins et al., 2004a, 2004b). Those children are competent in recognizing and managing their emotions, forming healthy relationships with peers and adults, setting realistic and positive goals, meeting personal and social needs, and making responsible and ethical decisions (Elias et al., 1997). Proficiency in core SEL skills is critical for positive outcomes in the school context in particular. SEL competencies facilitate effective communication with peers and teachers, help setting and achieving academic goals, increase motivation to learn, and increase commitment to school, all of what are important aspects of thriving and success in the school context.

A brief history of SEL in schools. After growing curiosity in SEL in the 1990s, interest in school-based SEL practices exploded in the beginning of the twenty-first century (Humphrey, 2013). To date, a multitude of programs and strategies designed to teach and foster SEL—classroom-based, school-wide, and through school-community partnerships—have been developed, implemented, and reviewed (Weissberg, Durlak, Domitrovich, & Gullotta, 2015). Further, many SEL interventions have been comprehensively examined and analyzed in several reviews and meta-analytic studies, resulting in strong and stable evidence that well-implemented, high-quality SEL programs lead to immediate and long-term positive social, emotional, behavioral, and academic outcomes in children (Durlak et al., 2011; Sklad et al., 2012; Taylor, Oberle, Durlak, & Weissberg, 2017; Weare & Nind, 2011).

The overwhelming empirical support for SEL programs has had a catalyzing effect on the implementation of such programs. The science of school-based SEL has been further advanced, programs have been optimized (e.g., implementation practices, program characteristics, intervention support), and educational guidelines and policies that mandate, support, and prioritize SEL in schools have emerged (Mart, Weissberg, & Kendziora, 2015; Oberle et al., 2016; Wright, Lamont, Wandersman, Osher, & Gordon, 2015).

Schools are particularly important contexts for the promotion of SEL. American children spend an average of 900–1000 h in school every year, depending on their grade level (Hull & Newport, 2011). Canadian figures mirror these numbers (OECD, 2012). This estimate does not include free time spent in school, such as lunch break, recess, and time in after-school programs. The school is undoubtedly a primary ecological context for children and adolescents to learn, grow, and develop (Bronfenbrenner & Morris, 2006), and schools are faced with numerous opportunities as well as the responsibility to help children and adolescents to grow socially, emotionally, and academically.

In addition to advances in SEL research, essential steps have been taken to ensure that SEL reaches the individuals and contexts for which it was developed: students, teachers, classrooms, and schools. CASEL has published two guides that list and review (1) SEL programs for preschools and elementary schools (CASEL, 2013) and (2) SEL programs for middle schools and high schools (CASEL, 2015b). Each guide summarizes characteristics of each program (e.g., age group for which the program was developed, duration, SEL skills targeted) and reviews empirical evidence supporting program effectiveness. Educators, researchers, and other interested individuals can access the CASEL guides freely through CASEL's website (www.casel.org). The guides have proven to be a critical and widely used practical resource for the field. The guides assist educators in selecting evidence-based SEL programs that align with their own and students' needs and interests.

Despite the growing interest in SEL, its strong empirical support, and the availability of evidence-based programs, SEL still lags behind in its importance relative to instruction in reading, writing, and numeracy in today's schools (Weissberg & Cascarino, 2013). In times of mandated high-stakes academic testing and academic achievement pressure on students, teachers, and schools, SEL often does not receive the necessary amount of time it requires to be firmly integrated into day-to-day education. Instead of a systematic approach to SEL programming that ensures consistent and continuous implementation, SEL is often incorporated via a piecemeal approach in which individual programs are chosen and implemented sporadically in selected classrooms (Jones & Bouffard, 2012). Even though many teachers are eager to incorporate SEL in their educational practice, tight budgets and the lack of an overarching supportive system that facilitates teaching SEL competencies often present a barrier difficult to cross (Bridgeland, Bruce, & Hariharan, 2013).

Yet, it is important to acknowledge the success that scholars and advocates for the school-based promotion of SEL have obtained over the past several years. The shift from a complete absence of formal SEL instruction in schools to an impressive accumulation of evidence, resources (e.g., programs, guidelines), and emerging policies that mandate SEL programs and practices in schools has grown considerably within less than two decades (Weissberg, Durlak, Domitrovich, & Gullotta, 2015). Even though the goal of making SEL in schools a national priority for all students has yet to be reached, the successes accomplished to date are important milestone of which scholars, educators, policy makers, families, and students must be cognizant because they provide a stepping stone for further advances in school-based SEL.

SEL and positive student outcomes. Several reviews have documented the effectiveness of SEL programs. Durlak et al. (2011) have completed the to-date largest meta-analytic review of 213 school-based universal SEL programs involving 270,034 students in kindergarten through high school, published from 1970 to 2007. The authors found that, compared to students who did not receive an SEL program, students who participated in SEL programs demonstrated significantly improved social-emotional skills and attitudes, increased prosocial and decreased in antisocial behaviors, and an 11-percentile-point gain in scores on standardized academic achievement tests. Two moderating variables that predicted the positive change in student outcomes were the degree to which the SEL program was implemented with fidelity and the quality of the SEL program (Durlak & DuPre, 2008).

Sklad et al. (2012), in another meta-analysis, reviewed 75 universal school-based SEL programs that were evaluated through experimental or quasi-experimental research and published in the literature between 1995 and 2008. The authors found that participation in an SEL program predicted significant improvements in students' social-emotional skills, prosocial behaviors, and academic achievement, and significant reductions in antisocial behaviors, mental health problems, and mental disorders. Effects were strongest in the short term (i.e., up to 6 months after program completion), and effect sizes were substantially weaker at follow-up (i.e., 6 months and longer since program completion), but they remained positive.

A review of previously conducted meta-analytic and narrative reviews on SEL programming was conducted by Weare and Nind (2011). The authors included 46 reviews in their study, involving hundreds of individual program evaluations and more than half a million students. Based on their findings, the authors concluded that school-based universal promotion programs produced positive impacts on mental health promotion, social-emotional skills, and academic achievement immediately following interventions. The need for the study of long-term effects of such interventions was raised as an important next step by the authors.

The latest systematic review was conducted to specifically fill the research gap of missing evidence on the long-term effectiveness of SEL programming in enhancing positive student outcomes (Taylor et al., 2017). Investigating the degree to which positive program effects are sustained over time is a critical question for cost-benefit analysis of SEL programs and can be a decisive piece of information when advocating for resources to be allocated for SEL in school budgets. Taylor and colleagues reviewed a total of 82 school-based, universal SEL programs involving 97,406 kindergartens to high school students that had been published by 2014. The students involved in the studies comprised an ethnically and sociodemographically diverse sample in urban and rural settings. Of the 82 studies, 38 were conducted in countries outside of the United States. Results showed that, compared to controls, students who had received an SEL intervention continued to show increases in social-emotional skills, positive behaviors, and academic achievement and decreases in conduct problems, emotional distress, and drug use up to almost 4 years after program completion. Effect sizes were moderate; the strongest effects were found for academic achievement.

Taylor et al. (2017) also reported positive effects of SEL programs on additional important developmental outcomes collected up to 18 years post-intervention, which were reported in a small subsample of studies and therefore could not be examined via a meta-analysis. Most notably, those students who had been exposed to an SEL program, compared to those who had not, were more likely to graduate from high school and obtain a college degree (e.g., Hawkins, Kosterman, Catalano, Hill, & Abbott, 2008), have improved sexual health (e.g., Hill et al., 2014), were less likely to have been arrested or have encounters with the justice system (Cook & Hirschfield, 2008), and be diagnosed with a clinical disorder (Riggs & Pentz, 2009) in adulthood. These findings are impressive, and they provide evidence that participating students and society at large can both profit from the effects achieved by SEL programs. They point at the significant economic benefits in society that can be achieved through school-based SEL programs (e.g., through reduced criminal justice expenses and better employment and income for individuals with high school and college degrees).

Financial benefits of SEL programs are particularly important to consider. Many policy makers and administrators shy away from implementing SEL programs because of the initial costs that emerge. However, a recent study that has examined the economic value of six widely used and evidence-based SEL interventions has determined that, for every dollar invested, there was a return of 11 dollars (Belfield et al., 2015). Thus the benefits of SEL far exceed the costs, providing further support that school-based SEL programming is well worth the time and the investment for individuals and for society.

SEL in times of heightened risk. Social-emotional development is considered a foundation of positive development, health, and success for all children. Hence, many SEL programs are universal and are designed to benefit all children. For young people at risk, SEL can become a particularly important resource and a protective factor that can also promote resilience and prevent negative developmental outcomes (Elias & Haynes, 2008; Greenberg et al., 2003; Payton et al., 2000). More than ever, today's students are faced with severe challenges that call for approaches to address their social-emotional well-being and competence in schools (Centers for Disease Control and Prevention, 2013). For example, the latest *Youth Risk Behavior Survey* (Kann et al., 2014) that surveyed 10- to 17-year-old youth in the United States reported that up to 30% of young people are experiencing serious social-emotional and mental health problems. Specifically, in 2013, 30% of students reported feeling sad and hopeless every day during the 30 days before the survey; 17% had seriously considered attempting suicide 12 months before the survey; 20% had been bullied on school property; 25% had been involved in at least one physical fight; and 21% reported having consumed at least five alcoholic drinks in a row on at least 1 day during the 30 days before the survey. Canadian statistics on child and youth well-being are similarly concerning. One out of five children in Canada are facing social-emotional, mental, and behavioral health problems, which jeopardize their positive development and success in schools, and rates are predicted to increase to 30% by the year 2020 (Canadian Pediatric Society, 2009). Such alarmingly high numbers of problematic and risky behaviors and mental health concerns pose a significant risk for young people and emphasize the importance of SEL as an approach that promotes both well-being and success in school.

Taken together, children and youth in our society today are faced with considerable challenges that can jeopardize their chances for success and positive development in the future. SEL is a foundation for positive development because it is an effective strategy to counteract those challenges, and it equips children with the tools and assets needed to make good, healthy, and responsible decisions that navigate them toward successful outcomes in life. In short, SEL is significant for life success and can be considered a crucial asset in the life of children who are experiencing behavioral and mental health problems (Dryfoos, 2010).

Linking SEL to Academic Achievement in School

As school districts are increasingly held accountable for students' academic achievement, many educators are concerned that allocating time toward SEL would be at the sacrifice of teaching core academic skills. Whereas academic and social-emotional skills have traditionally been considered separate and distinct domains in development, research conducted over the past decade has shown that, in fact, social-emotional skills are interrelated with academic skills and, moreover, explicitly foster academic learning and success (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Durlak et al., 2011; Hawkins et al., 2008; Izard et al., 2001; Oberle, Schonert-Reichl, Hertzman, & Zumbo, 2014).

The link between social-emotional and academic skills becomes evident considering that any learning in the school context is inherently a social process (Vadeboncoeur & Collie, 2013; Zins et al., 2004a, 2004b). Learning occurs in interactions with peers, teachers, and staff members and involves collaboration, negotiation, and cooperation across a wide spectrum of social situations. Students who are "fluent" in social and emotional competence tend to understand their own and others' emotions, manage their emotions successfully even when facing stress, make responsible decisions, and negotiate challenging situations effectively (Elias & Haynes, 2008; Payton et al., 2000; Zins & Elias, 2006). Hence, socially and emotionally competent children tend to be at ease in the school and classroom context and can focus better on the academic tasks provided to them compared to children who struggle socially and emotionally (Welsh, Parke, Widaman, & Neil, 2001).

Recent empirical evidence demonstrates that children's social and emotional skills forecast adult success. For example, a groundbreaking study showed that children's prosocial skills as rated by classroom teachers in kindergarten were positively related to high school and college graduation and stable and full-time employment and negatively related to the number of years that special education services were received and the number of years that children repeated in school (Jones, Greenberg, & Crowley, 2015). In addition to these important long-term academic outcomes, the authors found that early prosocial skills were linked to fewer mental health problems, less substance use, and less involvement with the criminal justice system in early adulthood.

Overall, implementing high-quality SEL in the classroom aids educators in establishing a positive classroom environment and provides students with core social-emotional skills that facilitate and drive their academic learning. Evidence-based SEL programming leads to a safe, well-managed, and caring learning environment with opportunities for rewards and positive behaviors. When becoming competent in core SEL skills, students can manage their emotions and relationships more effectively and exhibit fewer negative and more positive behaviors. Students also grow more attached to school, and engagement and commitment to school increases. Together, these factors have a positive influence on academic learning and increase students' academic success (Zins et al., 2004a, 2004b).

Putting SEL into Action in Schools

When financial and structural support is in place for school-based SEL, educators and administrators are eventually faced with the decision as to which SEL program to implement in their school. Thorough background research is required before choosing a program. Effective SEL programs are those that have been evaluated rigorously and findings support the program as evidence-based. A wide range of evidence-based SEL programs has been identified over the past two decades (CASEL, 2013, 2015b). Programs vary in which themes are addressed (e.g., bullying, substance use, mindfulness), which of the five core social-emotional competencies are targeted, for which age groups the program was designed, and program duration. Programs that have been found to be successful, however, also share key characteristics.

Characteristics of successful programs. In their meta-analytic review, Durlak et al. (2011) found that most effective studies were characterized with the acronym SAFE: (1) Does the program contain *sequenced* activities that teach the targeted social-emotional skills in coordinated and connected ways? An indicator for a sequenced program is—among others—the presence of a program guide, which outlines activities that build on each other. (2) Does the program include *active* forms of learning? Active forms of learning involve participatory elements such as role-plays or active discussions engaging students in active learning of SEL competencies. (3) Is the program's main *focus* developing one or more social-emotional skills? A main focus on social-emotional skills can often be identified through specific program elements that are dedicated to general social-emotional competence development and time dedicated to learning specific social-emotional skills. (4) Is the program *explicit* about targeting social-emotional skills? SEL is addressed explicitly when the program states which of the specific social-emotional competencies are addressed through the intervention. In the field of SEL implementation research, SAFE has become an established acronym for high-quality intervention programs.

The importance of program characteristics has also been discussed in the general field of primary prevention science. Researchers have argued that successful prevention and promotion programs are based on sound scientific theory and that their content, structure, and implementation are research-based (Bond & Hauf, 2004). Bond and Hauf in fact argue that programs can fail if they lack connection to a theoretical and research base. Basing content of prevention and promotion efforts on research requires a careful examination of empirical evidence available on the specific intervention topic. In addition, theoretically sound pedagogical practices have to guide the activities and ultimately the structure of prevention and promotion programs. Successful programs also have to have a clear and attainable goal that has been agreed upon broadly by the program's stakeholders (Bond & Hauf, 2004; Haney & Durlak, 1998).

Successful primary prevention and promotion programs have to be incorporated in the ecological levels in which children develop. Human development occurs in multiple contexts (e.g., school, classroom, community, family) and those settings reciprocally influence each other (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 2006). Hence, intervention programs should adopt a multisystem and multilevel perspective that attends to the influences and developmental pathways in different contexts (Bond & Hauf, 2004). This aspect of successful programs is discussed in further detail in the end of this chapter, when arguing for systemic approaches to achieve consistent, coherent, and sustainable SEL in schools. Multilevel and multisystem implementation is arguably the most challenging part of SEL in schools because it involves participation and collaboration of stakeholders in various societal settings. However, if successful, multisystem and multilevel programming can also yield most benefits because it is facilitated sustainably by an established infrastructure for programming.

Choosing an SEL program that fulfills the characteristics of high-quality programming and that has been supported by research is a critical first step in successful school-based SEL. A further essential step is understanding how the program is put into action in the classroom, ranging from teachers' preparedness, buy-in, and motivation to the degree to which implementation is carried out accurately and with fidelity (Devaney, O'Brien, Resnick, Keister, & Weissberg, 2006).

Implementation quality. Implementation refers to the ways a program is put into practice. It draws a picture of how program delivery ought to be and is an essential component of intervention effectiveness (Durlak, 2016). High-quality implementation of evidence-based SEL programming in schools is essential to achieve the specific outcomes targeted through the SEL program. To achieve high-quality implementation, program delivery needs to be facilitated through established and theory-driven guidelines (i.e., a program curriculum). Implementation also needs to be monitored throughout and support needs to be provided if necessary.

Although the importance of implementation fidelity is widely accepted (i.e., implementing the program and its individual components fully and as descried and intended in the curriculum), adaptations of program implementation are fairly common in educational settings (Domitrovich & Greenberg, 2000). For example, teachers may choose to adapt implementation in accordance with personal beliefs and attitudes, to match their teaching style or to address specific student interests and needs in their classroom. Some teachers also shorten implementation due to time constraints, competing projects, or financial restrictions. However altering implementation does not necessarily improve program outcomes and it can compromise the intended program effectiveness.

Eight major components have been discussed in establishing implementation quality (Devaney et al., 2006; Durlak, 2016; Durlak & DuPre, 2008; Elias, Zins, Graczyk, & Weissberg, 2003). *Fidelity* refers to the degree to which the major program components are delivered as intended. *Dosage* indicates how much of the program is delivered (e.g., how many of the sessions outlined in the curriculum were held during an intervention, and how many of the activities were completed during each session?). The *quality* of program delivery describes how competently a program implementation is conducted. Training in delivering the program is key for high implementation quality. *Adaptation* addresses the question whether the program was altered or adapted in any ways. *Participant engagement* indicates to what degree attendees (i.e., students) engaged in the program and its activities. Program *differentiation* takes into account the uniqueness of the intervention compared to other programs. *Monitoring of the control condition* considers the activities that took place in the control group while the experimental group received the intervention. This can reveal potential activities that were carried out with the control group that overlap or mirror intervention components. Last, program *reach* indicates what portion of the eligible population actually participated in the intervention.

The eight components of implementation can both overlap and interact with each other (Durlak

& DuPre, 2008). For example, if the control group activities are not monitored, potential unintended overlap in activities with the intervention cannot be identified and positive intervention effects might remain undetected. In addition, if dosage is low, overall implementation fidelity is affected and the intended program outcomes might not be achieved. The importance of implementation has been supported empirically. In their meta-analysis, Durlak et al. (2011) found that the positive effects of SEL interventions on academic gains, reductions in depression and anxiety, and reductions in conduct problems were approximately twice as large when no problems with implementation were reported compared to when the authors indicated implementation problems. Similarly, in a randomized controlled trial (RCT) study evaluating the responsive classroom intervention (Rimm-Kaufman et al., 2014), the authors initially found no significant difference in student outcomes between the control group and those who had received the intervention. However, when taking into account the level of intervention implementation, students in the experimental group showed significant increases in academic achievement in both math and reading if implementation was high. If no implementation data had been available, the researchers would have erroneously concluded that the program did not lead to the hypothesized result of increasing academic achievement in the classroom.

These findings underscore the importance of monitoring implementation in research evaluation studies and encourage schools to support high-quality implementation of SEL programs. Ignoring implementation can come at a high cost of failing to achieve the desired outcomes and falsely concluding that a program is ineffective when in fact effectiveness was jeopardized by poor-quality implementation (Durlak, 2016). As a consequence, a school's or a teacher's interest and perceived value in a program may drop, and the program might not be adopted for future implementation. Thus, current and future students who can benefit from SEL programs might not receive them.

Integrated versus add-on approaches to SEL in schools. SEL can be directly taught through implementing evidence-based SEL programs that extend the regular classroom curriculum and indirectly through effective adult modeling and infusing SEL into the existing curriculum (Durlak et al., 2011; Jones & Bouffard, 2012; Oberle et al., 2016). All three approaches have strengths and they can also be used jointly to complement each other. The advantage of implementing an evidence-based SEL program is that teachers obtain training for program implementation and are provided with a curriculum that guides them through intervention activities in a structured way. For many teachers, setting aside the time outlined in the SEL curriculum and carrying out the individual activities guided by the SEL syllabus facilitate their planning in teaching.

Teaching SEL through embodiment of social-emotional competencies in classroom interaction with students, colleagues, and parents encourages teachers to act as role models and to demonstrate to children how social-emotional competencies can be incorporated in social interactions effectively and consistently. This SEL approach does not follow a specific classroom curriculum. Even though some teachers are competent in modeling and using social-emotional skills naturally, most teachers benefit from explicit training that allows them to embody social-emotional skills in their classroom interactions and teaching style consistently and with awareness. Ideally, such training is provided to educators in university teacher training programs or through professional development opportunities (Schonert-Reichl, Hanson-Peterson, & Hymel, 2015).

Many scholars have argued for infusing SEL into the existing curriculum to enhance its sustainability and break the perceived barrier that there is a lack of time for SEL due to the pressures of the regular classroom curriculum. Integrating SEL into the existing curriculum can be achieved in multiple ways, for example, by drawing from literature in social studies and English language studies that offers natural opportunities for discussing emotions, behaviors, and relationships (Brown, Jones, LaRusso, & Aber, 2010; Jones, Brown, & Lawrence Aber, 2011; Yoder, 2013). To date, many integrated practices that are implemented outside of the existence of a program or curriculum tend to be ad hoc, lacking a research base, and are even carried out largely subconsciously by teachers (Jones & Bouffard, 2012). Therefore, commending a shift from programs to strategies, Jones and Bouffard call for integrative strategies that are designed, implemented, tested, and refined in order to gain empirically supported strategies that educators can integrate into their daily practices and improve the efficiency and continuity of SEL instruction.

Evidence-Based SEL Programs for Pre-, Elementary, and High School: Examples

Most SEL programs are universal (i.e., designed for all children in the classroom or school) rather than targeted to children with specific characteristics (e.g., children at risk for mental health problems). The goal of universal programs is to reach the entire student body rather than addressing indicated subpopulations. The universal characteristic of SEL programs reflects the empirically supported assumption that school-based efforts to promote SEL effectively enhance all children's success in school and life (Elias et al., 1997; Zins & Elias, 2006). The goal of universal SEL programming functions as a coordinated approach to prevention of risk and promotion of positive development in all children (Payton et al., 2000). Rather than addressing individual problems through multiple fragmented programs (e.g., substance use, risky behaviors, violence), universal SEL addresses the complex demands of growth and development by offering a general prevention and promotion approach through school-based programming. The targeted goals of universal SEL are enhancing positive social behaviors and academic success and reducing problem behaviors and emotional distress in students (CASEL, 2013).

A burgeoning number of universal SEL programs have been developed, implemented, and tested over the past two decades. The majority of programs are designed for implementation in elementary school. This might be due to the typical structure according to which elementary schooling is organized. Students spend almost all of their school hours with their classroom teacher and in their classroom setting. Hence, classroom teachers have some flexibility in organizing and planning their teaching schedule to add and integrate SEL program elements where possible. In high school, the traditional classroom setting is replaced by a system in which different courses are constituted of different groups of students taught by different teachers. Academic pressure also tends to increase in high school, and teachers tend to experience larger barriers to implementing SEL in addition to their regular curriculum. CASEL's guides for effective SEL in preschool and elementary school (CASEL, 2013) and middle school and high school (CASEL, 2015b) list programs that have been considered well designed, are accompanied by high-quality training and other implementation supports, and show research evidence for effectiveness. In the following sections, we briefly introduce selected programs from each guide, exemplifying SEL programs available for children in preschool through to high school.

Preschool and elementary school programs. The *4Rs Program* (reading, writing, and resolution; http://www.morningsidecenter.org/4rs-program) was designed for use in preschool through 8th grade. It includes "read-alouds," book conversations, and interactive skills lessons designed to foster children's understanding and managing of their emotions, developing empathy and perspective taking, being assertive, resolving conflicts nonviolently, honoring diversity, and standing up to bullying. The program consists of 35 sessions. It can be implemented classroom-wide and school-wide. Activities that connect the family to the program are also available. The units and activities are grade specific. Children engage actively in the program. A number of extension activities are available in addition to the core program. Training for 4Rs is required and typically lasts 25–30 h. Implementation support is available. The program's effectiveness has been evaluated in randomized controlled trials with 3rd and 4th grade students in inner-city schools. Among other outcomes, significant program effects have been found for improved academic performance, positive social behavior, reduced conduct problems, and reduced emotional distress (Brown et al., 2010; Jones, Brown, Hoglund, & Aber, 2010; Jones et al., 2011).

The *Caring School Community* (CSC) program was developed by researchers at the Center for the Collaborative Classroom (https://www.collaborativeclassroom.org/ formally called the Developmental Studies Center), a nonprofit organization with a focus on developing and disseminating programs that promote children's social, emotional, and academic development. The program targets children in kindergarten to 6th grade and teaches teachers to employ participatory instructional practices such as cooperative learning groups, mastery teaching, and experiential activities that promote relevant, interactive classroom learning. The program consists of four program elements: (a) class meeting lessons to promote dialogue among students, (b) a cross-age "buddies" program that pairs students across grades to build relationships and trust, (c) "home-side" activities that promote family involvement and inform parents of school activities while providing them with opportunities to participate, and (d) school-wide community building activities that involve school, home, and community. The CSC is unique in that it involves both extensive classroom-wide and school-wide efforts to create a sense of common purpose and commitment to prosocial norms and values such as caring, justice, responsibility, and learning.

Research conducted over the past two decades evaluating the effectiveness of CSC has shown that students who have participated in the program demonstrate more prosocial and less aggressive behaviors and a range of positive school and motivation outcomes (e.g., mutual trust in and respect for teachers and overall increases in prosocial behavior and social skills) compared to children who have not received it (Battistich, Schaps, & Wilson, 2004; Battistich, Solomon, Watson, & Schaps, 1997). These positive effects remained stable in high-poverty schools, suggesting the effectiveness of this program for high-risk settings (Battistich et al., 1997).

The *Promoting Alternative Thinking Strategies (PATHS)* program (http://www.pathstraining.com/main/curriculum/) teaches children to use peaceful conflict resolution strategies, emotional regulation, and responsible decision-making. The program was designed for children from preschool through 6th grade. It consists of a total of 40–52 lessons per grade. A combined set of lessons is available for preschool and kindergarten and 5th and 6th grade. Separate lessons have been designed for 1st through 4th grade. Detailed implementation support is provided to teachers through scripted lessons. The program offers opportunities for supplementary activities in addition to the core PATHS curriculum and for connecting family members to the program. Each lesson includes suggestions for generalizing the learned skills beyond the PATHS curriculum in the day-to-day school context. Program training lasts 2 days and is not mandatory. Empirical evidence for the program's effectiveness has been established widely in multiple randomized controlled trials with ethnically diverse groups of children in preschool through 5th grade (e.g., Domitrovich et al., 2007; Greca, 2000). Intervention outcomes include improved academic achievement, positive social behavior, reduced behavioral problems, and reduced emotional distress.

The *MindUp*™ program (http://thehawnfoundation.org/mindup/) is a classroom-wide program designed with the goal to enhance self-awareness, self-regulation, and focused attention and to reduce stress in children. Three separate sets of lessons are available for preschool through 2nd grade, 3rd to 5th grade, and 6th through 8th grade. A core practice of the MindUp™ program is the practice of deep breathing and attentive listening, exercised several times each day. Further practices include a wide range of mindfulness exercises and activities to create a positive and optimistic classroom environment. Supporting findings from brain research is described for each activity in the program manual. The program consists of 15 lessons grouped into 4 units: (I) Let's Get Focused! (1.

Learning How Our Brains Work; 2. Understanding Mindful Attention; 3. Focusing Our Awareness: The Core Practices), (II) Paying Attention to Our Senses (4. Mindful Listening; 5. Mindful Seeing; 6. Mindful Smelling; 7. Mindful Tasting; 8. Mindful Moving I; 9. Mindful Moving II), (III) It's All About Attitude (10. Perspective Taking; 11. Choosing Optimism; 12. Savoring Happy Experiences), and IV) Taking Action Mindfully (13. Acting with Gratitude; 14. Performing Acts of Kindness; 15. Taking Mindful Action in Our Community). A 1-day training workshop is available but not mandatory for implementing MindUp™ in the classroom. Quasi-experimental and experimental research with 4th to 7th grade student has supported the effectiveness of MindUP™ in enhancing academic achievement, positive social behaviors, well-being, and peer relationships and decreasing problem behaviors (Schonert-Reichl & Lawlor, 2010; Schonert-Reichl et al., 2015).

The RULER Feeling Words Curriculum is a multi-year, structured curriculum designed for elementary and middle school children to promote social, emotional, and academic learning with units and lessons centered on feeling words and related concepts (Brackett et al., 2009; Maurer & Brackett, 2004). The primary aims of RULER are to enhance the social and emotional skills of children and adolescents while creating an optimal learning environment that promotes academic, social, and personal effectiveness. Similar to other programs designed to promote SEL and prosocial skills, the RULER program uses a systemic approach to education—one in which the learner, the learning process, and the learning environment are all incorporated (McCombs, 2004).

The "feeling word" units are available for kindergarten through 8th grade and include developmentally appropriate lessons that are calibrated for each grade level. The curriculum is designed to help students obtain a thorough and deep understanding of the feeling words—words that characterize a range of human emotions such as excitement, shame, alienation, and commitment. Each of the RULER units focuses on one feeling word and includes a number of lessons or steps that are integrated into the regular classroom curriculum and instruction. Taking into consideration the demands on teachers' instructional time, the RULER units are most applicable to subject areas in English language arts (ELA) and history because of their focus on literature, writing, and understanding the experiences of humans. For example, through the ELA curriculum, characters in literature (from children's picture books to chapter books and novels) provide a rich opportunity for students to become cognizant of a range of rich human emotional experiences that need to be recognized, understood, labeled, expressed, and regulated.

Research evaluating the effectiveness of RULER has provided support for its effectiveness (e.g., Brackett, Rivers, Reyes, & Salovey, 2010). Using a rigorous empirical design, Rivers, Brackett, Reyes, Elbertson, and Salovey, (2013) examined 62 schools that either integrated RULER into 5th and 6th grade ELA classrooms or served as comparison school in which only the standard ELA curriculum was implemented. They found that in schools that received the intervention, there was a higher degree of warmth and connectedness between teachers and students, more autonomy and leadership among students, and teachers focused more on students' interests and motivations. These findings suggest that RULER enhances classrooms in ways that can promote students' SEL and well-being.

Middle school and high school programs. The *Facing History and Ourselves* program (https://www.facinghistory.org) integrates the study of history, literature, and human behavior with ethical decision-making and aims to promote students' historical understanding, critical thinking, and social-emotional development. Students in the program engage in reflecting on history, make connections to current events, and discuss the choices they confront and how they can make a difference in the world. The program is available for grades 6–12 and can be embedded within the social studies, humanities, and language arts curriculum. The program can be implemented classroom- or school-wide and includes activities to involve the family and community in activities (e.g., community members come into the classroom to share their experiences). There is no set number of lessons outlined in the program. The recommended amount of training for the program is 2–5 days. Implementation support is available for teachers. In a large randomized controlled trial, Facing History and Ourselves has been found effective in enhancing students' social-emotional skills and attitudes and in enhancing teachers' teaching practices (Barr et al., 2015).

The *Second Step: Student Success Through Prevention at Middle School* (http://www.cfchildren.org/second-step) aims to prepare students to navigate adolescence with effective communication, coping, and decision-making skills that have them make good choices and avoid peer pressure, substance use, and bullying. The program was designed for students in grades 6–8. Preschool and elementary school versions of the program that adapt the program focus and activities to students' developmental period are available. Second Step consists of 48 lessons that involve active participating in program activities and exercises. Training for Second Step implementation consists of four virtual modules that each last 30–60 min. Findings from a large-scale randomized controlled trial indicated that the program was effective in reducing violence, aggression, and sexual violence among socioeconomically disadvantaged students in 6th grade (Espelage, Low, Polanin, & Brown, 2013).

The aim of the *Student Success Skills* program for middle and high school (http://studentsuccessskills.com/programs) is to help children develop cognitive and self-management skills that improve student performance. The program is implemented by the school counselor through classroom lessons. Additional group counseling support is provided to children who need further support. The program consists of eight SEL-specific lessons. Student Success Skills has school-wide components and involves activities that connect the family to program activities. Training in program implementation takes one full day and some implementation support is available (e.g., program coaches). Experimental research with 7th grade students has found the program to be effective in enhancing executive functions, academic achievement, connectedness, and social-emotional skills (Lemberger, Selig, Bowers, & Rogers, 2015).

The advantages of evidence-based SEL programs are vast. Detailed program curricula and specific trainings and implementation support guide educators step by step through the implementation process, and many programs provide additional resources such as implementation coaches, booster sessions, and extension activities. Yet, many scholars have argued that in order to sustain SEL over time, schools need to shift away from individual programs and toward broader and continuous strategies through which SEL seeps into all teaching moments and interactions rather than occurring in isolation during program implementation (Jones & Bouffard, 2012; Meyers et al., 2015 ; Oberle et al., 2016). A broader and more strategic approach to SEL in schools encourages both implementation of evidence-based SEL programs and consistent utilization of SEL strategies for a full infusion of SEL into school practices.

Toward a Systemic Approach of SEL Implementation in Schools

Recent developments in school-based SEL have included a strategic move away from isolated implementation of individual programs towards a system of ongoing SEL that is fully integrated at all levels. A school-wide SEL approach defines the entire school community as the unit of change and aims to integrate SEL into daily interactions and practices at multiple setting levels in the school using collaborative efforts that include all staff, teachers, and children (Jones & Bouffard, 2012; Meyers et al., 2015). School-wide SEL involves effective classroom-level SEL, such as teaching and modeling social-emotional competence, fostering social skills in interactions among students, teachers, and staff, and providing regular opportunities to build, advance, and practice social-emotional skills (Bierman & Motamedi, 2015; Rimm-Kaufman & Hulleman, 2015; Williamson, Modecki, & Guerra, 2015).

At the school level, SEL strategies typically take the form of policies, practices, or structures that are in place to promote a positive school climate and a culture that enhances development across academic, personal, and social domains (Cohen, 2006; Jones & Bouffard, 2012; Meyers et al., 2015). Such practices and policies can include formulating a code of conduct that specifies social, emotional, and behavioral norms, values, and expectations for students and staff at school; fair discipline policies; anti-bullying prevention guidelines; and professional learning opportunities in the domain of SEL. Educators and staff school-wide need to be prepared and trained to implement SEL strategies in- and outside of the classroom. This can be realized through high-quality professional development programs that reach current teachers and by preparing prospective teachers during their in-service teacher training (Schonert-Reichl, Hanson-Peterson, et al., 2015; Schonert-Reichl, Oberle, et al., 2015). To achieve consistency and establish a multi-tier system of support for SEL, all staff (i.e., teachers, counselors, librarians, administrators, and other school members) need to be included in the efforts to establish school-wide practices of SEL (Weissberg et al., 2015).

In addition to classroom- and school-based approaches, family and community programming can extend SEL into the home and neighborhood context—the two developmental contexts in which children spend most of their time when out of school (Albright & Weissberg, 2010; Catalano, Berglund, Ryan, & Lonczak, 2010; Gullotta, 2015). School-family partnerships can be particularly important when promoting SEL in younger children whose primary focus is still the family when defining their own values, social goals, and acceptable behaviors and practices. Community partners can extend school-based SEL by providing students with additional opportunities to apply learned SEL skills in various practical situations (e.g., during after-school programs and other community programs) (Fagan, Hawkins, & Shapiro, 2015).

For school-wide SEL to be successful and sustainable, systemic support is also needed at higher governing levels (Jones & Bouffard, 2012; Meyers et al., 2015; Weissberg et al., 2015). At the highest level, support can be provided through national policies that allocate funding and specify guidelines for SEL in schools. In alignment with national policies, state (or provincial) policies can establish learning standards for SEL and provide a framework for what students should know and be able to do. At the level of school districts, administrative leaders have the capacity to build the foundation of a well-established and well-implemented system of SEL in schools through budget decisions and allocation of resources required to develop and implement continuous and consistent SEL programming. Leading district administrators also have the power to generate structural and policy changes that warrant the sustainability of SEL programming (Mart et al., 2015; Weissberg et al., 2015). In sum, systemic support at the highest levels enables administrators at the building level to provide the supports that are needed for the implementation and sustainability of effective SEL practices (CASEL, 2015a; Meyers et al., 2015). This systemic approach helps create a supportive context for introducing and maintaining effective SEL programming for all students (Greenberg et al., 2003).

One concern of non-systematic program implementation is that populations of students who could benefit from SEL programming do not receive it because an adequate infrastructure that reaches all students is missing (Spoth et al., 2013). To aid districts and schools in ensuring that SEL reaches all students, CASEL has developed a theory of action (ToA) that serves as a practical blueprint for setting up and sustaining school-wide SEL (Meyers et al., 2015; Oberle et al., 2016). The ToA can be considered an intervention in itself, guiding policy makers, administrators, and educators in building capacity for SEL and putting SEL into action school-wide—consistently and continuously. The ToA includes guidelines and activities staff can engage in at the school level to build a system for high-quality SEL in their building. It also identifies where schools require support and resources from the organizing school district. School administrators and educators can download the ToA for school-wide SEL from CASEL's website and use it as a practical step-by-step resource to achieve systemic SEL in their school.

Undeniably, teachers play a critical role in the successful integration of SEL into classrooms and schools. Nonetheless, until recently, the role of teachers in the implementation of SEL programs and practices into schools has been given scant attention. To what degree do teachers agree that SEL should be a part of education? How do teachers' attitudes and beliefs influence the successful implementation of SEL programs? In what ways do teachers' own social and emotional competencies and well-being influence SEL implementation? What knowledge and skills about SEL do teachers receive in their teacher preparation programs? Answers to these questions are addressed in the following section that highlights the important role of teachers in SEL implementation and the promotion of students' social and emotional competencies.

Integrating SEL into Schools: The Role of Teachers

Teacher support for incorporating SEL into schools. Teachers are strong advocates for the promotion of the social and emotional competencies of students. A report of a nationally representative survey including more than 600 teachers (Bridgeland et al., 2013) showed that most preschool to high school teachers believe that social and emotional skills are teachable (95%), that promoting SEL will benefit students from both rich and poor backgrounds (97%), and that SEL has positive effects on school attendance and graduation (80%), standardized test scores and overall academic performance (77%), college preparation (78%), workforce readiness (87%), and citizenship (87%). Additionally, these same teachers reported that in order to effectively implement and promote social and emotional skills in classrooms and schools, they need strong support from district and school leaders. These findings are important because they demonstrate that there is a readiness among teachers to promote social and emotional competencies and that teachers also need support in putting SEL into practice.

The influence of teachers' beliefs on implementation of SEL programs. Recent evidence suggests that teacher-related factors impact variations in the implementation of SEL programs that may influence the quality of the program and its success (Durlak & DuPre, 2008; Larsen and Samdal, 2012; Wanless & Domitrovich, 2015). For instance, teachers are more successful in implementing SEL programs when they have a positive attitude toward the program, are motivated to deliver the program with fidelity, and are confident that they possess the skills and knowledge to implement the program well (Durlak & DuPre, 2008). Teachers' implementation fidelity of SEL programs has been associated with a number of teacher beliefs: beliefs about whether the SEL program activities are aligned with their teaching approach (Domitrovich et al., 2015); self-efficacy beliefs about teaching (Ransford, Greenberg, Domitrovich, Small, & Jacobson, 2009); level of comfort with delivering a SEL curriculum (Brackett, Reyes, Rivers, Elbertson, & Salovey, 2012); beliefs about behavior management practices (Rimm-Kaufman & Sawyer, 2004); dedication to developing their students' SEL skills (Brackett et al., 2012); perceptions of whether the school leader supports an SEL program (Brown et al., 2010); and perceptions of whether the school culture supports SEL instruction (Brackett et al., 2012).

A study by Reyes, Brackett, Rivers, Elbertson, and Salovey (2012) further illustrates the critical role of the teacher in determining an SEL program's effectiveness. They examined whether the amount of training teachers received, the quality of delivery of the SEL program, and the amount of lessons students received (dosage) were associated with student outcomes of social and emotional competence during the initial implementation phase of the RULER program. Participants included 812 6th grade students and their teachers from 28 elementary schools in a large urban school district in the northeastern United States that were part of a large randomized controlled trial (RCT). Statistical analysis clustered teachers into one of three groups: *low-*

quality implementers (i.e., teachers initially very resistant to the program and delivered it poorly but became open to the program by the end of the school year), *moderate-quality implementers* (i.e., teachers who were moderate in their attitudes toward the program and in their delivery of the program from beginning to end), and *high-quality implementers* (i.e., teachers who were consistently open to and delivered the program very well from beginning to end). Analyses revealed no overall main effects for training, implementation quality, or dosage. There were, however, more positive outcomes for students when their teachers attended more trainings and implemented more lessons and were classified as either moderate or high implementers. Further analyses revealed that teachers categorized as "low implementers" were lower in their sense of teaching efficacy (i.e., beliefs about their capabilities to modify their teaching practices to influence students' engagement and learning even among difficult and unmotivated students) than teachers categorized as "high implementers." These findings underline the importance of not only considering training and program fidelity when examining effective SEL program implementation, it is also critical to take into account teachers' beliefs and attitudes about an SEL program and their teaching efficacy when assessing the influence of implementation on students' SEL outcomes.

The role of teachers' own social and emotional competence and well-being. Efforts to improve teachers' knowledge about SEL alone are not sufficient for successful SEL implementation. Indeed, teachers' own SEL competence and well-being appear to play a crucial role in influencing the infusion of SEL into classrooms and schools (Jones, Bouffard, & Weissbourd, 2013). Specifically, Jennings and Greenberg (2009) argued that teachers' social-emotional competence and well-being contributes to the classroom management strategies they use, the relationships they form with students, student and classroom management all mediate classroom, as well as student outcomes. The authors recommend that SEL intervention programs address teachers' SEL competence and the improvement of teacher well-being, in order to enhance teachers "fitness" in implementing SEL effectively.

Although limited, the past few years have seen the emergence of interventions specifically targeted at improving teachers' SEL and stress management in school. This is an important area of research given the indisputable link between teachers' and students' well-being and success in school (Hastings & Bham, 2003; Jennings & Greenberg, 2009; Oberle & Schonert-Reichl, 2016). For example, two programs designed to promote teachers' SEL competence by incorporating mindfulness-based approaches are *CARE* (Cultivating Awareness and Resilience in Education) and *SMART-in-Education* (Stress Management and Resiliency Training). Mindfulness is typically described as an attentive, nonjudgmental, and receptive awareness of present moment experiences in terms of feelings, images, thoughts, and sensations/perceptions (e.g., Kabat-Zinn, 1990). Both programs aim to increase teachers' mindfulness, job satisfaction, compassion and empathy for students, and efficacy for regulating emotions and decrease stress and burnout. Initial research to date has supported the effectiveness of both CARE (Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013; Jennings, Snowberg, Coccia, & Greenberg, 2011) and SMART in Education (e.g., Benn, Akiva, Arel, & Roeser, 2012; Roeser et al., 2013) in promoting teacher SEL competence and well-being. Nonetheless, further research is needed to examine whether such positive changes in teacher well-being spill over into the classroom and lead to improvements in students' SEL competence.

SEL and teacher preparation. Many educators have not been adequately prepared to apply and understand the effective implementation of SEL programs and practices. Given recent breakthroughs in the science of SEL, it is critical now more than ever that teacher preparation programs include both the science and practice of SEL into coursework and preservice field experiences in schools. To date, we have limited knowledge of the degree to which this is occurring.

Research on teacher attrition provides some interesting insights into understanding why it is essential to incorporate knowledge and skills about SEL into teacher preservice education, including a focus on promoting teachers' own social and emotional competencies and well-being. Clearly, teacher burnout and attrition is a major problem that poses a threat to efforts to improve teacher quality. According to a report from the National Commission on Teaching and America's Future (2007), teacher turnover costs the United States up to $7 billion a year, with the negative impact of teacher turnover being greatest at low-performing, high-poverty, high-minority schools. Stress and poor emotion management rank as the primary reasons why teachers become dissatisfied with the profession and leave their positions (Darling-Hammond, 2001). Another contributing factor is student behavior (Ferguson, Frost, & Hall, 2012). One study, for instance, indicated that of the 50% of teachers who leave the field permanently, almost 35% report reasons related to problems with student discipline (Ingersoll & Smith, 2003). Problems with student discipline, classroom management, and student mental health emerge at the beginning of teachers' careers, as first-year teachers tend to feel unprepared to manage their classroom effectively and are unable to recognize common mental health problems such as anxiety (Koller & Bertel, 2006; Siebert, 2005). On a more positive note, data also suggest that when teachers receive training in the behavioral and emotional factors that impact teaching and learning in the classroom, they feel better equipped to propose and implement positive, active classroom management strategies that deter students' aggressive behaviors and promote a positive classroom learning climate (Alvarez, 2007).

What is the extent to which teachers receive any knowledge or skills about SEL in their preservice teacher training? To address this question, Schonert-Reichl, Kitil, and Hanson-Peterson (2016) conducted the first ever scan aimed at determining the extent to which US colleges of education include any course content on SEL in teacher preparation programs. After conducting a detailed content analysis of 3916 required courses in teacher preparation program in 304 colleges of education in the United States (representing 30% of all colleges in the United States), Schonert-Reichl et al. found that few teacher education programs included any content on the five SEL competencies outlined by CASEL. Specifically, 13% had at least one course that included information on relationship skills, 7% for responsible decision-making, 6% for self-management, 2% for social awareness, and approximately 1% for self-awareness.

One strength of the scan conducted by Schonert-Reichl et al. (2016) is that a wide corpus of data were obtained—data representing each of the US states and the district of Columbia—allowing for informed decision-making for advancing the science and practice of SEL in preservice teacher education. Nonetheless, one limitation of the scan is that while the methods employed were high in breadth, there was a relative absence of depth of information obtained with regard to the actual ways in which SEL content is incorporated. For example, although the scan revealed the presence of SEL content in the descriptions of courses on the websites of colleges of education, there is no way of actually knowing the *specific content* covered in the courses reviewed or the *quality* of that content. Hence, future research efforts should seek to design studies utilizing mixed methodologies that include both quantitative and qualitative data in order to obtain a more complete picture of the precise nature of SEL efforts in teacher preparation.

Summary, Conclusions, and Future Directions

In this chapter, we offered a historical overview and the status quo on SEL instruction in elementary through to high schools, reviewed the state of research on the effectiveness of SEL instruction in enhancing positive developmental outcomes in children and youth, and outlined critical areas of future development for going to scale with SEL.

We outlined the substantial shift from a complete absence of formal SEL in schools in the end of the twentieth century to an explosion of interest in SEL, development of a multitude of school-based SEL programs, increased SEL implementation in schools, and recent frameworks that guide schools and districts in systemic SEL. We defined SEL within the CASEL framework that outlines five core social-emotional competencies that promote well-being and success in- and outside of school (Payton et al., 2000) and discussed several practical resources CASEL has developed to facilitate program selection and more recently to guide administrators and district leaders in establishing a sustainable SEL school-wide (CASEL, 2013, 2015b; Meyers et al., 2015; Oberle et al., 2016). The robust link between social-emotional competence enhancement and outcomes in the domains of academic success, health, and well-being was reviewed through presenting a wide range of program evaluations and meta-analytic research conducted within the past decade (e.g., Durlak et al., 2011). The importance of implementation quality and teachers' buy-in, motivation, and preparedness to teach high-quality SEL was emphasized.

Undoubtedly, the past two decades have witnessed tremendous advances in the research and practice of enhancing children's social-emotional skills through strategic programming in school. Several important milestones were reached: for example, coherent and consistent empirical research has shown that SEL can be taught in schools and that successful high-quality SEL instruction drives children's present and future success and well-being; educational policies have emerged that mandate schools to address students' SEL; practical resources and guidelines for implementing SEL successfully have been developed—at the level of the classroom, school, and district. Yet, the goal of making SEL—alongside academic learning—a national priority still has to be reached.

An agenda for the future of SEL is essential. Weissberg and colleagues (Weissberg et al., 2015) list a number of recommended next steps that need to be addressed to ensure a sustainable future of high-quality SEL. First, it is fundamental to identify core components and active ingredients that drive the success of evidence-based SEL programs. Identifying those components contributes to the design of further effective interventions and identifies core features (e.g., school climate, classroom context) and specific competencies (i.e., either of the five SEL competencies) that drive the success of SEL. Second, the cultural sensitivity of SEL programs needs to be investigated. Although SEL is a universal approach, it is possible that the success of individual programs can be enhanced if programs are modified according to the situational context or the ethnic and cultural background of students. Further, the axiom about measurement "what is assessed gets addressed" also applies to SEL. A wide range of measures has been used to assess social-emotional competence in students. Developing a coherent, psychometrically sound measure of SEL that measures core SEL competencies is critical. Depending on age, SEL can be assessed formatively or via self-, teacher-, peer-, or parent report. Ideally, a multiple measures approach is used to achieve a holistic picture of students' social-emotional competencies.

Important groundwork has been laid to move toward systemic SEL implementation in schools. Yet, going to scale with SEL requires active collaboration with federal, state, and local policy makers, stakeholders, and funders. Cost-benefit analyses—such as the investigation completed by Belfield et al. (2015)—are critical to provide transparency on the balance of costs invested into SEL programming and the economic returns offered for individuals and for society.

Finally, spreading SEL entails the preparedness of educators. As illustrated above, a small minority of preservice teachers currently receive sufficient training for fostering their students' social-emotional competencies, and very few are provided with opportunities for developing their own social-emotional skills. Importantly, SEL can only be successful if teachers possess the capability, motivation, and resources to put it into action.

If addressed adequately, these and other future developments can significantly contribute to establishing high-quality SEL and promoting its further growth and spread across schools and communities. Members of the society—including families, parents, teachers, administrators, and society leaders—have long recognized that

SEL skills are fundamental skills in life (Greenberg et al., 2003); it is our joint responsibility to provide children with the opportunities to develop core SEL skills that contribute to their health, well-being, and success in life.

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Using Parent Training Programmes to Teach Social Skills

John Sharry and Caoimhe Doyle

Do Parents Influence Children's Acquisition of Social Skills?

Across nations and cultures, families, and parents in particular, bear the primary responsibility for ensuring that children's physical and emotional needs are met and, importantly, for socialising them (Kostelnik, Whiren, Soderman, Rupiper, & Gregory, 2008). Socialisation is the process whereby a child acquires the skills, behaviours, values and emotional understanding needed to function competently within the society they are growing up in (Maccoby, 2007). A child's social competence therefore refers to his or her ability to establish and maintain positive relationships with others (Haven, Manangan, Sparrow, & Wilson, 2014). According to Newman and Newman (2012), early family experiences, including the nature of family conversations, how discipline is addressed and the quality of attachment with caregivers, have a significant impact on the development of children's social competence. Moreover, parents and primary caregivers provide children with their earliest social relationships, as well as being their first models for social roles and behaviour (Kostelnik et al., 2008). Current debate in the field of child development supports the ideas that development results from the interaction between genetic and environmental factors and that children actively contribute to their own development (Meece & Daniels, 2008; Siegler, DeLoache, & Eisenberg, 2011). However, many of the major theories of development, albeit to different extents, recognise and acknowledge the influence parents and primary caregivers have on children's and adolescent's learning and acquisition of social skills.

The Psychoanalytic Perspective

While biological maturation is central to two of the most influential theories of social development, namely, Freud's theory of psychosexual development and Erikson's theory of psychosocial development, both recognise the impact of children's early experiences within the family on their subsequent relationships (Siegler et al., 2011). Freud's theory asserts that there are three components to personality (i.e. the id, the ego and the superego) which emerge and integrate gradually as the individual passes through a

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series of five developmental psychosexual stages during childhood and adolescence. Freud maintained that during each of these five stages, the child is tasked with resolving specific conflicts related to different erogenous zones, in which their relationships with their mother and father are implicated. Furthermore, Freud believed that children's relative success or failure in resolving these conflicts has consequences for their social and emotional relationships throughout life (Shaffer & Kipp, 2010). For example, in Freud's first stage of psychosexual development, the 'oral stage', which begins at birth and lasts for approximately 1 year, the child's sex instinct centres on the mouth, with pleasure being derived primarily from oral activities such as sucking and eating. Considering this, the child's relationships with its primary caregivers who feed and nourish him/her are highly significant during this stage, and any impediments either to the caregiver-child bond or the child's weaning, for example, may have negative implications for their later emotional relationships (Shaffer & Kipp, 2010).

Though Erikson's theory places much less emphasis on sexual determinants of social development than that of Freud and much more on social and cultural factors, it also considers parents to be key social agents in the formative years of childhood (Shaffer & Kipp, 2010). Like Freud's theory, Erikson's model is a sequential stage theory which posits that each stage of life is characterised by a specific set of developmental tasks and personal dilemmas which the individual must resolve. Erikson's theory proposes that during each of eight distinct age-related stages, which span from infancy to elderhood, the developing individual is tasked with reorganising their self-concept based on new cognitive capacities, relationship skills and learning, in order to integrate their personal needs with social and cultural demands (Newman & Newman, 2012).

In contrast to Freud, Erikson believed that children are active contributors to their own development and not merely passive reactors dominated by sexual instincts and shaped solely by their parents (Shaffer & Kipp, 2010). Nonetheless, Erikson recognised the influence of parents and primary caregivers on children's development, particularly during the first five life stages specified in his model, namely, infancy, toddlerhood, early school age, middle childhood and adolescence. During these stages the psychosocial model proposes that children either develop basic trust or mistrust of caregivers in respect to their care (from birth to 1 year), autonomy or shame (from 1 to 3 years) with regard to doing things on their own (e.g. feeding, dressing, toileting, etc.), initiative or guilt (from 3 to 6 years) in relation to having responsibilities, industry or inferiority (from 6 to 11 years) in relation to mastery of social and academic skills and a sense of identity or identity confusion (from 12 to 20 years). While Erikson's model emphasises the agency of children and adolescents in shaping their own development, it acknowledges that the quality of relationships and support of parents or primary caregivers throughout these life stages influence the resolution of developmental tasks significantly (Shaffer & Kipp, 2010).

Despite having received criticism for the ambiguity and dubiousness of certain theoretical assertions which limit the extent to which their models can be tested, both Freud and Erikson have contributed significantly to our understanding of children's social development (Shaffer & Kipp, 2010). Moreover, Freud's and Erikson's theories have broadened our appreciation of the lasting effects of early experiences in the context of the family on the individual's interpersonal relationships throughout life (Siegler et al., 2011). This concept is the foundation of modern-day attachment research within the ethological school, which has determined that the quality of an infant's early relationship with their primary caregivers (i.e. whether there is a secure or insecure attachment) tends to remain stable over time and has an enduring effect on later social ties and development.

The Ethological Perspective

The principal tenet of attachment theory (Bowlby, 1969, 1973, 1980) is that for positive social development to occur, the infant needs to develop a strong emotional and physical attachment with at least one primary caregiver (most often their mother or father). Bowlby (1982; as cited in Ainsworth, 1989) proposed that throughout the first year, the infant gradually develops an 'internal working model' or cognitive representation of regularities in their physical environment, attachment figures and self, which has a lasting influence on his/her interpretation and formation of expectations about social interactions and relationships. Later, attachment theory was expanded and empirical support for Bowlby's assertions obtained by Ainsworth, Blehar, Waters, and Wall (1978) and Main and Solomon (1986) with their identification of distinct attachment patterns through observation of infants' responses to the behaviours of their mother and a stranger in a 'strange situation'—a laboratory-based procedure for assessing attachment (Bretherton, 1992). The attachment styles identified were secure (child is visibly upset when the caregiver leaves but happy to see them return), insecure-avoidant (child avoids or ignores the caregiver and shows little emotion both when the caregiver departs and returns), insecure-ambivalent (child is highly distressed when the caregiver leaves and is ambivalent on their return) and insecure-disorganised (child is distressed when their caregiver departs but due to fear of the caregiver does not feel reassured on their return).

Extensive longitudinal research has demonstrated that in comparison to insecurely attached age-mates, infants who develop a secure attachment with their primary caregivers attain more favourable developmental outcomes, display better social skills, enjoy better peer relations and are more likely to have close friends later in childhood and in adolescence (Shaffer & Kipp, 2010). However, it is important to note that attachment patterns in infancy and early childhood do not guarantee either positive or negative adjustment in later life; in fact a child's cognitive representation of themselves, their caregivers and their close emotional relationships can change over time. Nonetheless, a large body of evidence from attachment research strongly suggests that early parenting and parent-child attachment patterns have implications for later social development and functioning (Jaffari-Bimmel, Juffer, van IJzendoorn, Bakermans-Kranenburg, & Mooijaart, 2006).

The Sociocultural and Social Learning Perspectives

Although Vygotsky's sociocultural theory (1962; 1978) is concerned with the cognitive rather than the social domain of development (i.e. that which involves information processing, language learning and perception), it too maintains that children acquire social and cultural values, beliefs and problem-solving skills through interaction with more competent others such as parents and caregivers (Murphy, Scantlebury, & Milne, 2015). While Vygotsky stressed active rather than passive learning, he posited that children are products of their sociocultural context and that their cognitive development occurs when their parents and caregivers provide guided participation, joint attention and social scaffolding (Siegler et al., 2011). Guided participation refers to the process whereby a more knowledgeable other formulates activities and tasks so that a novice can engage in them and thus learn; joint attention is the mutual and intentional focus of social partners on the same external object which enhances children's ability to learn from others; and social scaffolding refers to the expert's provision of a temporary framework to advance children's thinking (Siegler et al., 2011). This idea that cognitive development is largely attributable to social interaction and experience also underpins Bandura's social learning theory of social development (Bandura, 1977, 1986). Bandura (1977, 1986) asserted that by observing and imitating the social behaviour of others in their environment and subsequently interpreting others' reactions to their own behaviour, children develop social understanding and skills.

The Bioecological Perspective

One of the most encompassing theories of the general context of development across the lifespan is Urie Bronfenbrenner's bioecological model (Bronfenbrenner, 1979; Bronfenbrenner

& Morris, 1998). The bioecological model considers human development to be an evolving function of the interaction between a person and their sociocultural environment. That is, both the individual and the environment influence one another bidirectionally (Bronfenbrenner, 2000). The bioecological model emphasises the interrelatedness and contextual variation of different structures and processes that impact on human development, while also highlighting the influence of the individual's biopsychological characteristics on their environment (Darling, 2007). Furthermore, Bronfenbrenner's model conceptualises the environment as a number of successively nested, interdependent and dynamic systems, namely, the micro-, meso-, exo- macro- and chronosystems (Bronfenbrenner, 1986).

For a young child, the microsystem comprises the environments, activities and relationships he or she directly participates in, such as his or her family, pre-school or neighbourhood play area; the mesosystem refers to the interconnections among each of the child's different microsystems (e.g. the relationship between their family and pre-school); the exosystem comprises the environmental settings not directly experienced by the individual but which affect them nonetheless (e.g. the child's parent's workplace); the macrosystem is the wider social and cultural context in which the other systems are embedded; and the chronosystem refers to the historical context or changes that influence the person over time (Newman & Newman, 2012). While the bioecological model asserts that an individual's development is influenced by several social and cultural systems and that concurrently these systems are influenced by the individual, the family component of the microsystem is recognised as the principal context in which development takes place during childhood (Bronfenbrenner, 1986). The complexity of the child's microsystem increases as he or she grows older and has more frequent interaction with individuals outside their immediate family, for example, school friends, teachers and sports coaches. However, the child's family is a crucial component of the microsystem, and during infancy, childhood and adolescence, its influence predominates (Siegler et al., 2011).

While the various theories of child development differ in terms of the extent to which they consider innate biological processes and environmental conditions to influence learning and sociocultural adaptation, most acknowledge that parents and primary caregivers have an important role in advancing children's social skills. In different ways psychoanalytic, ethological, sociocultural, social learning and bioecological perspectives on development examine and emphasise the significance of early experiences and emotional relationships within the family context to children's later social functioning and development (Feldman, Bamberger, & Kanat-Maymon, 2013). Furthermore, there is a growing body of evidence to suggest that positive parent-child interactions are the basis of healthy development across the lifespan (Sanders, Kirby, Tellegen, & Day, 2014).

Parent Training: Emergence, Rationale and Applications

Prior to the late 1960s, emotional and behavioural problems occurring in childhood and adolescence were predominantly addressed using child therapy, adolescent institutionalisation or juvenile adjudication, all of which targeted the child's behaviour exclusively (Kaminski, Valle, Filene, & Boyle, 2008). However, the realisation that parents influence and contribute to their children's social, emotional and behavioural tendencies and can therefore effect change of the same saw the emergence of parent training interventions seeking to empower parents to address children's behavioural problems. Over time, parent training evolved to incorporate content to help parents to maximise their children's cognitive development, physical health and social skills, in addition to enhancing their own self-efficacy with regard to parenting (Kaminski et al., 2008; NCCMH, 2009).

With roots in behavioural learning theory and play therapy, the rationale for parent training was the belief that disruptive behaviours occurring across childhood are mediated and maintained by the practices of their main socialisers and caregivers—parents (Lundahl, Risser, & Lovejoy, 2006). Parent training is therefore concerned with teaching parents the principles of child behaviour management and facilitating their development of skills and techniques for increasing the frequency of their children's prosocial behaviour (e.g. reinforcement) and reducing the frequency of their antisocial behaviour through ignoring, for example (NCCMH, 2009; Forgatch & Paterson, 2010; as cited in Carr, 2014). Furthermore, parent training aims to strengthen parent-child relationships by imparting strategies for good communication and attending positively to children (Barlow, Smailagic, Huband, Roloff, & Bennett, 2012).

Traditionally, parent training interventions have been delivered to families on a one-to-one basis, but a group-based format is increasingly being used (Furlong et al., 2013; Hand, Ni Raghallaigh, Cuppage, Coyle, & Sharry, 2012). While one-to-one parent training has greater flexibility for tailoring content and pace, group-based parent training is more cost-effective in terms of reaching a greater number of families, and it facilitates greater opportunity for social support (Chronis, Chacko, Fabiano, Wymbs, & Pelham, 2004). Typically group-based parent training programmes are interactive and collaborative with modelling, observation, behaviour rehearsal, role play and group discussion being used by the most effective models to facilitate participants' learning (Furlong et al., 2013). Furthermore, a standard curriculum incorporating video vignette content for modelling purposes is a common feature of many widely used parent training models, and this maintains consistency in programme dissemination across delivery settings and providers (Barlow et al., 2012).

A video-assisted manualised and group-based format is utilised by a number of long-running and internationally used parent training models such as the Incredible Years (Webster-Stratton, 1998) and Triple P (Sanders, 2012) programmes. Combining basic cognitive and behavioural strategies, these programmes help parents recognise and modify patterns of thought which may influence their behaviour and, in turn, that of their children (Barlow et al., 2012). Furthermore, participants are encouraged to parent positively, which essentially involves attending to and rewarding good behaviour while largely ignoring misbehaviour. According to Sanders et al. (2014), programmes underpinned by social learning principles and which adopt this positive parenting approach have been identified as the gold standard in addressing children's emotional and behavioural problems and promoting positive child adjustment. Numerous evaluation studies have produced evidence indicating the effectiveness of both the Incredible Years and Triple P programmes in terms of reducing children's emotional and behavioural problems, decreasing parents' anxiety, depression and stress and improving overall family adjustment (Barlow et al., 2012; Furlong et al., 2013; Menting, Orobio, & Matthys, 2013; Sanders et al., 2014).

Another lesser-known but empirically supported suite of practical manualised group-based parent training interventions is offered by Parents Plus. The Parents Plus Programmes aim to support families to communicate effectively, to build positive relationships and to address and overcome their children's emotional and behavioural difficulties. Like Incredible Years and Triple P, the Parents Plus Programmes draw largely from a social learning model of how social behaviours are learnt and changed. In addition, the Parents Plus model incorporates a solution-focused framework, whereby collaborating with parents and working on their individual goals is central to the delivery of the programme. Rather than correcting misbehaviour, parents attending the Parents Plus Programmes are encouraged to be goal focused and to encourage the development of positive social behaviours in their children.

Parents Plus

First launched in 1998, the original Parents Plus Programme (Sharry & Fitzpatrick, 1997) was a broad-based parent training intervention aimed at reducing children's emotional and behavioural problems and promoting learning and attachment in children aged 4–11 years. This programme has since been replaced with three age-specific programmes: the Parents Plus Early Years Programme (Sharry, Hampson, & Fanning, 2013) for parents of children aged 1–6 years, the Parents

Plus Children's Programme (Sharry & Fitzpatrick, 2007) for parents of children aged 6–11 years and the Parents Plus Adolescents Programme (Sharry & Fitzpatrick, 2012) for parents of children aged 11–16 years. Two further Parents Plus Programmes have also been developed—Parenting When Separated (Sharry, Keating, & Murphy, 2012) and Working Things Out (Brosnan, Sharry, Beattie, & Fitzpatrick, 2011). The former is a group-based parent training course for parents who are preparing for, who are going through or who have gone through a separation or divorce, and the latter was designed for use with small groups of adolescents to promote positive youth mental health through the development of communication, conflict resolution and coping skills. The Parents Plus Programmes follow international best practice guidelines instituted by the National Institute for Health and Care Excellence in the United Kingdom and are cited by the UK Department of Education as empirically supported parent training programmes.

Goals of the Parents Plus Programmes

The overarching objective of the three age-specific Parents Plus Programmes, which are the focus of this chapter, is to help parents foster positive relationships with their children by advancing their skills for promoting prosocial behaviour and taking a non-coercive approach to discipline. Specifically, the Parents Plus Early Years Programme aims to help parents maximise their children's learning, language and social development, to reduce behaviour problems and also to ensure that their children grow up happy and emotionally secure. The Parents Plus Children's Programme also aims to help parents curtail children's emotional and behaviour problems through positive communication and discipline and to develop more satisfying parent-child relationships. Similarly, the aims of the Parents Plus Adolescents Programme are to help parents foster good relationships with their teenage children while also engaging effective communication and discipline strategies to positively influence their children's social, emotional and behavioural development. The programmes are designed to be delivered over 8–12 weeks, with weekly sessions lasting between 2.5 and 3 hours.

Theoretical Foundations of Parents Plus Programmes

The structure and content of the Parents Plus Programmes share a number of similarities with other prominent group-based parent training interventions such as the Incredible Years and Triple P programmes. Firstly, like both the Incredible Years and Triple P suites, the theoretical basis of the Parents Plus Programmes is in social learning theory. Social learning theory posits that learning is a cognitive process which occurs through observation or direct instruction in a social context (Bandura, 1971). Secondly, a standardised video-assisted curriculum is employed ensuring consistency in programme dissemination across facilitators and delivery settings (Weisz, 2004). Also in common with Incredible Years and Triple P, cognitive-behavioural principles and concepts are incorporated and utilised in the Parents Plus Programmes (Sanders et al., 2014). Furthermore, the practices of promoting peer support within the training group and balancing discipline management with positive parent-child relationship building are shared by these three distinct intervention models (Carr, Hartnett, Brosnan, & Sharry, 2016).

One of the unique aspects of the Parents Plus Programmes which distinguishes them from other empirically supported and widely used parent training models is that they were developed in partnership with parents, children and young people. Much of the DVD teaching footage that is central to the programme delivery contains clips of real parenting scenes from families who attended child and family services and who volunteered to share this information for the benefit of others. The corresponding DVD for each Parents Plus Programme features comments from parents, children and young people as to how the ideas work in their contexts. Furthermore, the

Parents Plus Programmes are culturally sensitive to the Irish context.

Also unique to the Parents Plus Programmes is their systemic solution-focused basis (Carr et al., 2016). Derived from the systemic family therapy tradition, solution-focused brief therapy emerged in the 1980s (see deShazer et al., 1986) and presented an alternative to the pathology-centred problem-focused approaches which prevailed in psychotherapy (Sharry, 2007). A principal assumption of solution-focused therapy is that clients possess most of the strength and resources necessary to resolve their own problems (George, Iveson & Ratner, 1990; as cited in Sharry, 2007). Within this approach, the client is encouraged to identify, focus and draw on 'what's right and what's working' (i.e. the strengths, skills and resources existing within them as individuals, their families and communities), thereby enabling self-healing and generating a sense of empowerment (Sharry, 2007 pp. 8). In the context of group therapy, the solution-focused approach espouses group support (achieved through affinity with and acceptance of others), group learning (through interpersonal communication and collaboration), group optimism (by instilling hope that change is possible), group empowerment (finding strength through shared experiences) and facilitating the opportunity to help others (by making meaningful contributions and being valued in return). Taking a strength-based approach to working with parents is a key element of the Parents Plus Programmes. Facilitators are encouraged to focus actively on participants' strengths during sessions, with a view to building their self-esteem, so that the group process models the positive solution-focused attitude parents are encouraged to adopt with their children.

In line with the principles of solution-focused therapy, the Parents Plus model proposes that parents themselves are the initiators of positive change within their own families, and a cooperative and assertive parenting style is promoted. Likewise, the intervention process for each programme begins with facilitators and participants collaboratively identifying client-centred goals (Carr et al., 2016). Furthermore, participant involvement is a key feature at all stages of the programme delivery, and an interactive and collaborative format is adopted throughout. During each group session, one positive parenting topic (e.g. using encouragement and praise) and one positive discipline topic (e.g. using consequences) are explored with group discussion, role play, observation and behavioural rehearsal being used to facilitate learning. Participant feedback on session content, group dynamics and self-perceived progress is also formally collected following each session which facilitators are encouraged to review and adapt session content accordingly. Course outlines for the three age-specific Parents Plus Programmes are provided in Table 1 below.

Research Base for the Parents Plus Programmes

Several evaluation studies attest to the effectiveness of the Parents Plus Programmes in a variety of clinical, disability and community settings (Coughlin, Sharry, Fitzpatrick, Guerin, & Drumm, 2009; Fitzpatrick, Beattie, O'Donohoe, & Guerin, 2007; Gerber, Sharry, Streek, & Mc Kenna, 2015; Griffin, Guerin, Sharry, & Drumm, 2010; Hand, McDonnell, Honari, & Sharry, 2013; Hand et al., 2012; Hayes, Siraj-Blatchford, Keegan, & Goulding, 2013; Keating, Sharry, Murphy, Rooney, & Carr, 2016; Kilroy, Sharry, Flood, & Guerin, 2011; Lonergan, Gerber, Streek, & Sharry, 2015; Nitsch, Hannon, Rickard, Houghton, & Sharry, 2015; Rickard et al., 2015; Sharry, Guerin, Griffin, & Drumm, 2005; Wynne, Doyle, Kenny, Brosnan, & Sharry, 2016). A 2016 meta-analysis (Carr et al., 2016) of 17 evaluation studies on all five Parents Plus Programmes involving over 1000 families demonstrated that the Parents Plus Programmes can reduce parental stress, increase parental satisfaction and improve clinical and subclinical emotional and behavioural problems in children and adolescents both with and without developmental difficulties. The Programmes were also found to have a significant impact on participants' therapeutic goal

Table 1 Course outlines and session content for the three age-specific Parents Plus Programmes

Session	Parents Plus Early Years Programme	Parents Plus Children's Programme	Parents Plus Adolescents Programme
1	• Tuning in to your child • Pressing the pause button (in response to misbehaviour)	• Providing positive attention • Pressing the pause button when responding to misbehaviour	• Parenting teenagers • Positive communication
2	• Child-centred play and communication • Taking the lead with children	• Setting aside play and special time • Using do's rather than don'ts	• Getting to know your teenager • Establishing rules
3	• Child-centred play and communication • Establishing routines using rewards and picture charts	• Child-centred play • Establishing routines	• Connecting with your teenager • Communicating rules positively
4	• Encouraging and supporting your child • The 'praise-ignore' principle	• Encouragement and praise • Using consequences	• Encouraging your teenager • Communicating rules positively
5	• Ensuring encouragement gets through • Dealing with misbehaviour using consequences	• Encouraging homework and learning • Using sanction systems	• Listening to your teenager • Having a discipline plan
6	• Helping children learn through play and reading books • Step-by-step discipline	• Prevention plans • Assertive parenting and dealing with disrespect	• Empowering teenagers • Dealing with conflict and aggression
7	• Teaching children new tasks • Teaching children the skills to behave well	• Problem-solving with children • Step-by-step discipline	• Problem-solving • Dealing with specific issues
8	• Creative play activities • Solutions to specific problems and issues	• Active listening and problem-solving • Dealing with special needs	• Dealing with specific issues • Parent self-care
9	• Teaching new skills using books • Parent self-care	• Family listening and problem-solving • Parent self-care	
Additional sessions	In clinical settings parents receive up to five additional individual sessions to coach them in skills covered in group sessions and focus on attaining their specific goals. Parent-child interactions are also video recorded and reviewed collaboratively with parents who are given strength-focused feedback	In clinical settings parents may receive two additional individual sessions (which may take a conjoint family format) to coach them in skills covered in group sessions and focus on attaining specific goals. Vulnerable parents may be offered telephone support	In clinical settings two conjoint family sessions may be held after sessions 3 and 6 to address specific parent-adolescent issues and goals. Ideally the working things out programme is run in parallel with the parents plus adolescents Programme

Source: Parts of this table were adapted from Carr et al. (2016)

attainment. However, better child- and parent-level outcomes were achieved in smaller randomised trials involving families whose children were younger and had less severe problems, who attended more sessions and who had less concurrent child intervention.

While the evidence base for the Parents Plus Programmes is not without limitations, for example, few of the evaluation studies were randomised controlled trials or conducted intention-to-treat analyses, there is substantial evidence to suggest that the programmes are effective for families with children of all ages and for separated families (Carr et al., 2016). Furthermore, the effect size of 0.57 from Carr et al.'s (2016) meta-analysis of ten controlled Parents Plus evaluation studies compared favourably to those of meta-analyses of the Incredible

Years (Menting et al., 2013) and Triple P (Sanders et al., 2014) programmes which were 0.3 and 0.47, respectively.

Parents Plus and Teaching Social Skills

A central principle of the Parents Plus approach to overcoming emotional and behavioural problems in children and teenagers is to focus on teaching social skills. Within the programmes, parents are invited to view their children's misbehaviour as examples of 'missing' social skills. In order words, children misbehave because they have not yet fully learnt the skill of behaving well. For example:

- A child who is hitting out in frustration is doing this because he has not yet learnt the social skill of expressing his feelings rather than taking them out on other people.
- A child, who has a meltdown due to anxiety, has not yet learnt the social skills needed to resolve the situation that caused the anxiety in the first place.
- A child who gets into trouble in the classroom for wandering out of his seat has simply not yet learnt the skill of concentrating for extended periods at a table.
- A child who gets into fights with friends has not yet learnt the social skills of sharing or resolving conflict amicably.

The focus of the Parents Plus Programmes is to support parents in teaching their children these missing social skills, rather than simply correcting misbehaviour. Parents and caregivers attending Parents Plus courses are encouraged to:

1. Pause and closely observe their children.
2. 'Tune in' to their child and identify what they need to learn.
3. Think of a plan of action as to how they can support their children to learn, making sure to build on what they know already.

There are a number of advantages to having this positive social skills focus throughout Parents Plus courses. Firstly, such a focus removes the need to identify either the child or the parent as being to blame for the problems experienced, and it can also increase the parent's empathy for the child. Secondly, having a focus on encouraging newly identified skills empowers parents to take constructive action with regard to teaching their children. Thirdly, as they make progress, both the parent and child feel successful; this not only boosts their self-esteem and confidence but also helps to improve their relationship with one another.

To illustrate this process in action, there are case examples which are used to teach different 'social skills' strategies in the Parents Plus Programmes detailed below.

Parents Plus Early Years Programme: Picture Schedules

Within the Parents Plus Early Years Programme, parents are given input on a variety of strategies to help their children learn new social skills and to behave well. These include praising children's engagement in the desired behaviour when it is seen, modelling positive behaviours to the children, guiding children step by step as they engage in the positive behaviours themselves and reading story books together that emphasise the desired skills (e.g. such as a story about a little bear who learns to be gentle with his baby brother, etc.).

One of the challenges when teaching young children is the fact that their language skills may be underdeveloped, meaning that they find it more difficult to understand their parents' and caregivers' verbal instructions and guidance. This is especially the case for children with special needs, and indeed many of the behaviour problems that these children display are related to their lack of language (in comparison to their peers). A very helpful strategy, which does not rely on verbal language alone, involves teaching children using picture schedules (see Fig. 1 below for examples). In the Parents Plus Early Years Programme parents are shown several video examples of parents using picture schedules with their children, and they are also given detailed hand-outs on the principles of using picture

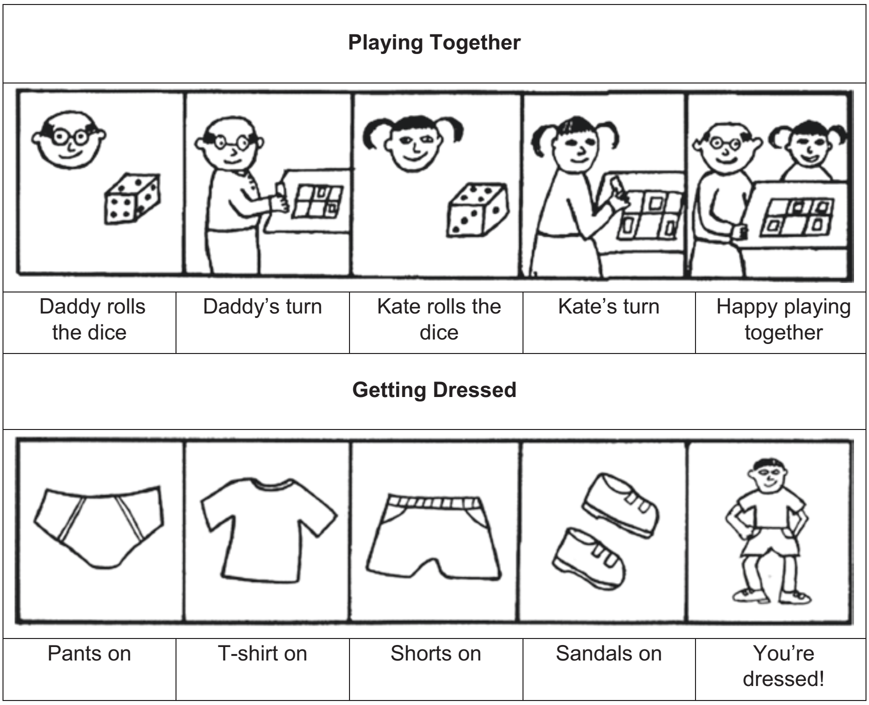


Fig. 1 Examples of picture schedules for young children

schedules. Within the group sessions, the parents are provided with the materials to make a picture schedule, and during individual family sessions with their children, they are coached in how to explain the picture schedules to their children and put them into practice in the home.

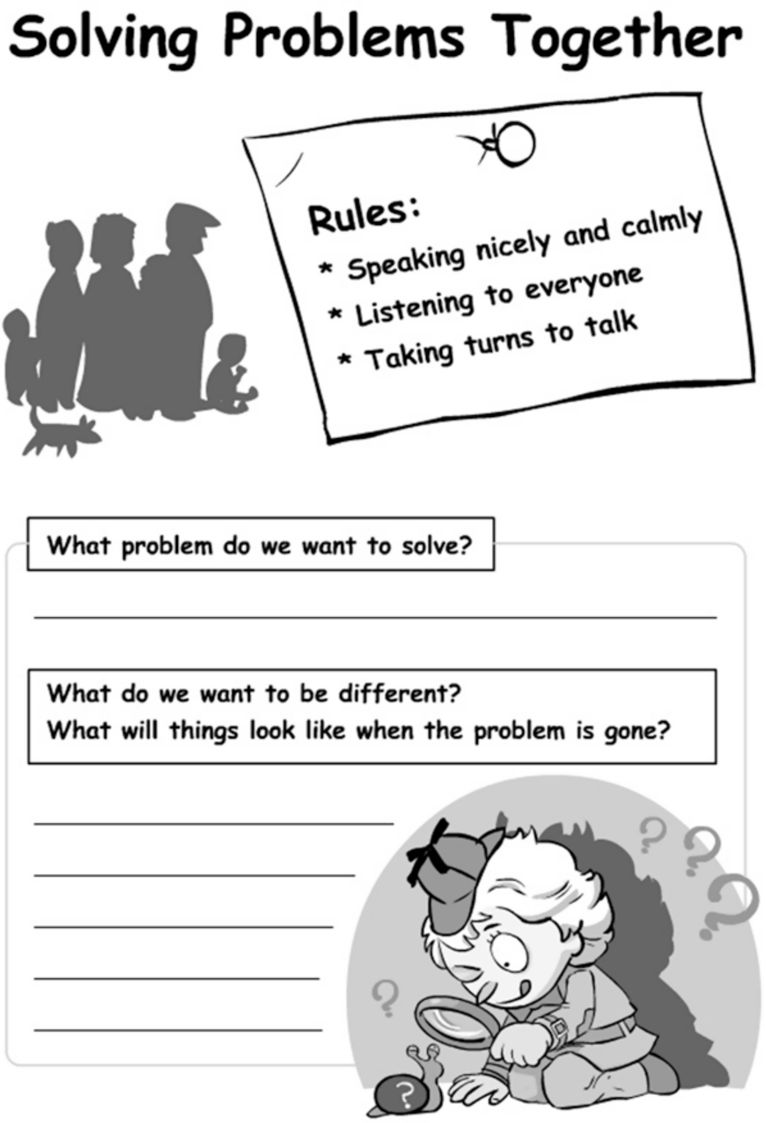
Parents Plus Children's Programme: Problem-Solving

As the Parents Plus Children's Programme targets older children in middle childhood (from 6 to 11 years), there is more scope for using verbal methods to teach them desired social skills. In Parents Plus Children's Programme courses, parents are invited to utilise a simple four-step problem-solving model with their children which involves:

1. Picking a good time and place to talk
2. Listening to everyone's point of view
3. Thinking up solutions
4. Agreeing on a plan

Parents are provided with a series of pictorial worksheets which they can complete along with their children, hence giving their children the opportunity to participate in the problem-solving process and to think about the best way to resolve problems through the use of good social skills. See an example of one of the worksheets in Fig. 2 below.

Within the Parents Plus model, parents are supported both in the context of the group and individually in family sessions with their children to put the Parents Plus problem-solving model into action. The dialogue given below is a real example of a parent who used the problem-solving model to help his son learn how to manage conflict with other children without hitting. This conversation between father and son was video recorded in the family's home, and with



Solving Problems Together

Rules:
* Speaking nicely and calmly
* Listening to everyone
* Taking turns to talk

What problem do we want to solve?

What do we want to be different?
What will things look like when the problem is gone?

Fig. 2 Parents Plus Children's Programme problem-solving worksheet

their permission the footage collected was used as part of the teaching DVD for the Parents Plus Children's Programme so that other parents can observe the procedure and learn the skills involved.

Father: *Right, we're here to talk about your problem about hitting...*
Son: *Yeah... (looks down)*
Father: *OK? We have to sort something out. So, we need to find other ways of sorting problems out without hitting... how do you feel when it happens?*
Son: *Annoyed.*
Father: *Do you feel very annoyed?*
Son: *Yeah.*
Father: *And then what happens?*
Son: *I just hit them.*
Father: *And how do you think that makes them feel?*
Son: *Sore.*
Father: *So, what do you think we can do about it?*

Son: *I don't know.*

Father: *We'll have to think of a few ideas... can you think of any? Well, what do you think you should do when people are annoying you?*

Son: *Tell them to stop and then go and tell you or Mam.*

Father: *You could tell them to stop and if they don't stop then you could call me or Mammy, and we'll tell them to stop. Is there anything else you can do?*

Son: *No.*

Father: *Did you ever think of counting?*

Son: *No.*

Father: *You could count to ten so you didn't get very angry. Would you like to try something like that?*

Son: *No.*

Father: *Why not?*

Son: *Cause it wouldn't work.*

Father: *Why do you think it won't work?*

Son: *I don't know.*

Father: *OK, any other ideas?*

Son: *No.*

Father: *So, you ask them to stop... or you…?*

Son: *Tell you or Mammy.*

Father: *OK. Are you going to try that?*

Son: *Yeah.*

Father: *Is it going to be hard?*

Son: *Yeah.*

Father: *Why do you think it'll be hard?*

Son: *I don't know.*

Father: *Well, you don't do it all the time, you can be very good, and you can play with your brothers and sisters, can't you?*

Son: *Yeah.*

Father: *And you can have fun together.*

Son: *Yeah.*

Father: *So when you start getting annoyed, you're going to try to tell Mam and Dad, or ask them to stop, aren't you?*

Son: *Yeah.*

Father: *Good lad.*

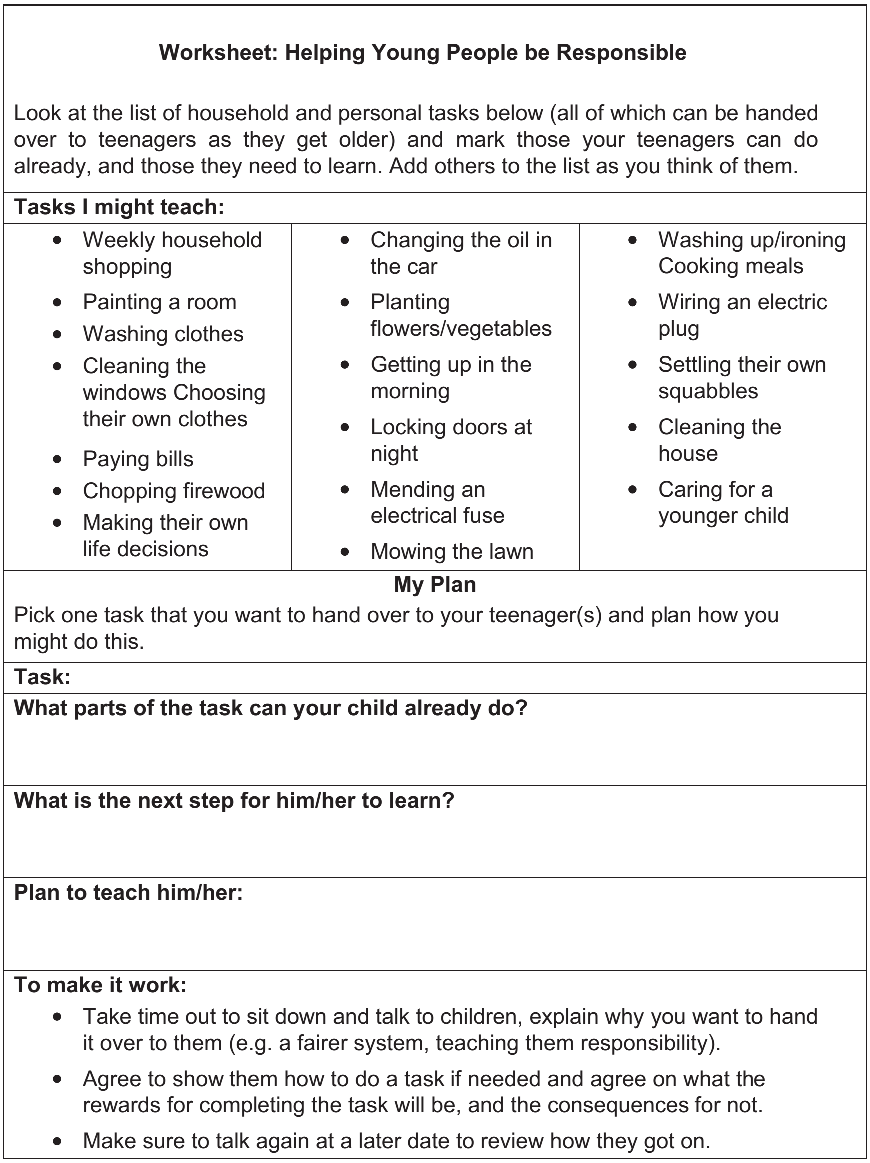
Within the Parents Plus Children's Programme, the scene detailed above serves as a good teaching example of parent and child problem-solving together. The key skills involved for parents are listening carefully, asking the child to come up with solutions themselves and being really encouraging. When shown to parents during the Children's Programme course, parents are asked to identify the skills the father is using throughout his interaction with his son and to think about how they could implement a similar problem-solving model with their own children.

Parents Plus Adolescents Programme: Teaching Responsibility

A central objective of the Parents Plus Adolescents Programme is to promote and develop effective communication skills such as listening, speaking up assertively, negotiating and collaborative problem-solving among young people aged 11–16 years. In a similar manner to the Parents Plus Children's Programme, parents participating in the Adolescents Programme are provided with a step-by-step problem-solving model for resolving conflict with their adolescents and for agreeing on new desired ways of behaving. In addition, there is a focus on encouraging independence and giving adolescents responsibility in order to help them learn social skills for life. To demonstrate and convey these ideas, parents are invited to firstly view video footage of parents teaching their children household tasks such as laundry and ironing. Following this, group discussion is used to consolidate learning, and parents are then asked to complete planning worksheets such as the one in Fig. 3. By completing the worksheet within the groups, parents are given time and space to develop a plan as to how they will teach their teenagers identified social skills in the home. In subsequent group sessions, the parents are invited to report on how their teens responded and the progress that they made. Further group support is provided as needed.

Teaching Parents Skills

The teaching skills focus at the heart of the Parents Plus Programmes is not just for the children, but it is also for the parents. Just as the children are being taught social skills, the parents are also being taught parenting skills for communicating effectively with their children. A 'skills



Worksheet: Helping Young People be Responsible

Look at the list of household and personal tasks below (all of which can be handed over to teenagers as they get older) and mark those your teenagers can do already, and those they need to learn. Add others to the list as you think of them.

Tasks I might teach:

- Weekly household shopping
- Painting a room
- Washing clothes
- Cleaning the windows Choosing their own clothes
- Paying bills
- Chopping firewood
- Making their own life decisions
- Changing the oil in the car
- Planting flowers/vegetables
- Getting up in the morning
- Locking doors at night
- Mending an electrical fuse
- Mowing the lawn
- Washing up/ironing Cooking meals
- Wiring an electric plug
- Settling their own squabbles
- Cleaning the house
- Caring for a younger child

My Plan

Pick one task that you want to hand over to your teenager(s) and plan how you might do this.

Task:

What parts of the task can your child already do?

What is the next step for him/her to learn?

Plan to teach him/her:

To make it work:

- Take time out to sit down and talk to children, explain why you want to hand it over to them (e.g. a fairer system, teaching them responsibility).
- Agree to show them how to do a task if needed and agree on what the rewards for completing the task will be, and the consequences for not.
- Make sure to talk again at a later date to review how they got on.

Fig. 3 Parents Plus Adolescents Programme worksheet on helping young people be responsible

focus' is a very helpful way to address emotional and behavioural problems in children and adolescents as it avoids blame being placed on either the parent or child, and it focuses both parents and children on concrete progress that they can make. In addition, within a strength-based approach to parent training, the goal is to build on the parents' strengths and on what are already doing right. The goal is to highlight that they already have many of the skills they need to solve the problems they face. See an example of this process below.

Example: Coaching a Parent to Resolve a Sibling Conflict

A mother attended the Parents Plus Early Years Programme with her 4-year-old son Jamie in order to address his tantrums and difficult behaviour, particularly during fights with his younger sister Katie. The facilitator helped the mother identify a clear prosocial goal for her children, namely, to help Jamie get along better with Katie. As part of the intervention, the Parents Plus facilitator conducted a family session during which a video recording of the mother playing with her two children was made, while she was being coached for managing a potential conflict between the children. Most of the work focused on providing feedback to the mother on how she was already providing positive attention to both children and helping them play in parallel.

During a second family session, a second video recording was taken while this particular mother and her two children played alongside one another, and a minor tantrum occurred. Jamie began to grab a toy from his sister without asking for it. The mother said *'Don't grab'* and gave the toy back to the sister. Jamie protested angrily and the mother argued with him in a loud voice. Jamie became angrier and raised his hand in a threatening way. The facilitator at this point intervened (while filming) and suggested to the mother that she pull away from Jamie and turn her attention to Katie instead. Jamie continued to protest somewhat and the facilitator encouraged the mother to remain relaxed and to play with Katie. He suggested that the mother simply say *'Jamie is angry right now. When he calms down he can come back in and play'*. A minute later, Jamie slowly moved back towards his mother. The facilitator said *'I think Jamie is ready to come back now. Maybe show him what he can play with'*. The mother then turned to Jamie and asked *'Come on and play with the Lego?'*. Jamie sat close to his mother as she helped him get started.

During a review of the video, the mother was fascinated to learn that pausing and pulling back for a moment could work in terms of preventing Jamie's tantrum and difficult behaviour. She described how she would normally argue or shout at her son in these situations and acknowledged that taking that approach would often make things worse. The facilitator highlighted the skills involved in her success, namely, remaining calm, turning away completely for a moment and crucially returning positive attention once he started to behave well. These skills were all illustrated in the video snippet. Rather than being 'taught', the mother could see herself on tape (with a little bit of coaching) carrying out these skills. This made the learning process very empowering for her.

Summary and Conclusion

With the widespread recognition of the influence of parents and primary caregivers on children's social development, parent training emerged as a treatment for emotional and behavioural problems occurring in childhood and adolescence, as well as a preventative intervention. By equipping parents with the necessary skills, parent training seeks to reduce children's emotional and behavioural problems and to promote positive child adjustment. Extensive research has demonstrated that behavioural and cognitive-behavioural group-based parent training interventions such as Incredible Years and Triple P are effective in terms of reducing child-focused problems and improving parental mental health (Furlong et al., 2013). Another such model is offered by Parents Plus; however, its programmes are distinguished from other evidence-based parent training interventions by their systemic and solution-focused theoretical basis (Carr et al., 2016). Within the Parents Plus model, parents are invited to view children's emotional and behavioural problems as the absence of a particular social skill (i.e. a 'missing' skill). That is, children's misbehaviour is attributed to the fact that they have not yet fully learnt the skill of behaving well or in a prosocial way. Using different developmentally appropriate strategies and techniques such as picture schedules and step-by-step problem-solving, the Parents Plus Early Years, Children's and Adolescents Programmes help parents help their children learn new social skills and ultimately how to behave well.

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Social Skills in Autism Spectrum Disorders

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Autism Spectrum Disorders

Autism spectrum disorders (ASD) are characterized by markedly abnormal or impaired development in social communication, a restricted and stereotyped repertoire of activities and interests, and atypical response to sensory stimuli. Based on the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR; American Psychiatric Association, 2000), which is a previous version of DSM-5, autism was categorized as the three subtypes of autistic disorders, Asperger's disorder, and pervasive developmental disorder not otherwise specified (PDD-NOS) (APA, 2000). The *Diagnostic and Statistical Manual of Mental Health Disorders Fifth Edition 1* (DSM-5) was published in May 2013, and the three subtypes of autistic disorders, Asperger's disorder, and PDDNOS were unified as one diagnostic category of ASD (APA, 2013). The integration of the three diagnostic subtypes would support a concept of continuous behavior and several corresponding factors in ASD (McPartland & Law, 2016).

ASD were once thought to be extremely rare, affecting two to four persons in a population of 10,000 (Pickles et al., 1995), but they have recently attracted great attention. According to the Autism and Developmental Disabilities Monitoring Network, as sponsored by the Centers for Disease Control and Prevention, the population prevalence of ASD is estimated at 1 in 68 children in the United States (Centers for Disease Control (CDC), 2014). ASD occur in males five times more than in females. The reasons for increasing the number of diagnoses might correlate with a change of diagnostic criteria and

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increase of information from the media. On the other hand, the number of diagnoses might practically increase in ASD because of environmental influences such as neurotoxic chemicals that affect the brain and behavior development of ASD (Schwatzer, Koening, & Berman, 2013).

In this chapter, we discuss the clinical characteristics, assessment, treatment, and brain function of social skills in children with ASD.

Early Clinical Diagnosis of ASD

Clinical diagnosis of ASD is usually demonstrated in children between 18 and 36 months (Mandell, Novak, & Zubritsky, 2005; Zachor & Curatolo, 2014). Early signs of ASD are poor eye contact, lack of interest in other children, social smiling, name response, stranger anxiety, pointing to interesting things, showing interesting things to caregivers, poor ability to understand language and gestures, failure in imitation, and differences in feeding behavior. Although both identification and diagnosis are usually made after the age of 3 years (Bolton, Golding, Emond, & Steer, 2012; Howlin & Asgharian, 1999), early identification of ASD could often occur before the age of 3 years (see Table 1).

Table 1 Early signs of ASD suspect

Social development by the first year of life
• Avoid or poor eye contact • Lack of interest in other children (except siblings) • Absence of social smile • Lack of response to name (lack of social responsiveness) • Lack of separation and stranger anxiety
Social development by 1½ year-old
• Lack of showing or pointing out objects of interest to others • Lack of looking at things, following pointing • Lack of looking at things, following gaze • Lack or failure to share enjoyment, excitement, or achievements with others • Negative affect • Reduced ability to understand language (whether a child understands instructions without gesture) • Lack of gesture for movement or language (whether a child can pretend close people) • Quality of play (a child can play with toys functionally, instead of dedicating sensory play such as dropping, getting his/her mouth around) • Absence of interest for other children • Lack or low level of empathy and emotional reactivity to others • Limited range of facial expression
Social development no matter what is the developmental level and age of a child
• Poor asking to be carried (holding him/her) by the caregiver • Concerns about sleep problems (circadian rhythm issues)

Bolton et al. (2012) indicated that differences in social skills and fine motor were evident from as early as 6 months of age and were accompanied by differences in communication skills and concerns over vision. Caregivers continued to be concerned about vision, and, by 15 months of age, this was accompanied by concerns about hearing, vocabulary, understanding of words, and problems feeding. Further characteristics of ASD were apparent by 18 months of age, with caregivers being concerned about hearing and marked differences in social and motor skills, listening/response to sounds, communication, and play behavior. By 15–24 months of age, repetitive and unusual behaviors and differences in temperament were apparent.

In contrast, clarifying the difference between ASD and typically developing (TD) children in earlier development stages is difficult, because the emergence of signs of ASD during the first 3 years of age has only partially been detected (Bolton et al., 2012; Howlin et al., 1999). The early screening and clinical assessments for ASD will be helpful for detecting early signs, and Zachor et al. (2014) have shown practical recommendations for ASD screening and clinical assessments. ASD diagnosis requires three levels of screening procedure, namely, Level 1, screening tools for ASD, which could be used by general pediatricians; Level 2, assessment of Level 1 abnormalities at specialized developmental clinics such as child and adolescent psychiatric clinics; and Level 3, tests used in ASD special clinics. ASD screening and clinical assessments comprise CHAT (Checklist for Autism in Toddlers), M-CHAT (Modified Checklist for Autism in Toddlers), CSBS DP (Communication and Symbolic Behavior Scales Developmental Profile) Infant-Toddler Checklist, and PDDSY-II

(Pervasive Developmental Disorders Screening Test-II) in Level 1, SCQ (Social Communication Questionnaire) and SRS (Social Responsiveness Scale) in Level 2, and ADI-R (Autism Diagnostic Interview-Revised) and ADOS (Autism Diagnostic Observation Schedule) in Level 3 (ASD screening and clinical assessments are described in detail in the chapter “Assessment”). To detect early signs of ASD, pediatricians should be trained to use screening tools. Pediatricians should also recognize somatic complaints including sleep and feeding problems, restlessness or apathy, and general dysregulation symptoms that might be related to early symptoms of ASD (Zachor et al., 2014). Not only specialists in child and adolescent psychiatric clinics but also general pediatricians need to use the screening and clinical assessments that could help detect early signs of ASD.

Early Biomarkers of ASD

Biomarkers of ASD in infants and toddlers have yet to be discovered because symptom onset is different with each toddler; however, early biomarkers are useful to detect early signs of ASD (Pierce et al., 2016). Eye tracking is attractive as a simple method in the early stages of ASD identification because patterns of eye gazing are objective behaviors based on neural systems known to be abnormal in ASD, such as the visual attention system (Belmonte & Yurgelun-Todd, 2003; Pierce et al., 2016; Shi, Wang, Peng, Wee, & Shen, 2013; Townsend, Courchesne, & Egaas, 1996). Recently, eye-tracking studies for ASD children have highlighted many social visual attention deficits (Jones, Carr, & Klin, 2008; Jones & Klin, 2013; Klin, Lin, Gorrindo, Ramsay, & Jones, 2009; Pierce et al., 2016). ASD children showed a deficit in social orienting and decreased attention to social contents such as faces and social scenes (Chawarska, Macari, & Shic, 2012; Falck-Ytter, Rehnberg, & Bölte, 2013; Hosozawa, Tanaka, Shimizu, Nakano, & Kitazawa, 2012; Klin et al., 2009; Nakano et al., 2010; Pierce, Conant, Hazin, Stoner, & Desmond, 2011). Nakano et al. (2010) demonstrated the gaze patterns of infants with ASD using video clips of social interaction and multidimensional scaling, which showed that each subject with similar gaze patterns would cluster together in a two-dimensional plane. The infants of the control groups clustered in the center, which indicates standard gaze behavior; conversely, the infants with ASD were distributed around the periphery. The infants with ASD looked less at faces in comparison with the control groups and preferred letters in the caption, which is associated with larger brain event-related potentials to objects in ASD compared to TD infants (Nakano et al., 2010; Webb, Dawson, Bernier, & Panagiotides, 2006). Pierce et al. (2011) demonstrated visual attention preferences of infants with ASD and TD infants toward social images and geometric images, also showing that children with ASD preferred to look at geometric images rather than social images. In addition, children with ASD do not look preferentially toward social stimuli compared to control groups (Campbell, Shic, Macari, & Chawarska, 2014; Chawarska et al., 2012). Chawarska et al. (2012) showed no difference between infants with ASD and TD infants in terms of developmental delays, but only when they looked at two specific types of social content. (In the sandwich condition, the actress looked down at the table and made a sandwich. There was no child-directed eye contact and speech. In the moving toys condition, after the actress looked up at the camera, a toy began to move and make noises.) The discrepancy between results might depend on differences in data analyses and experiment designs (Fischer, Koldewyn, Jiang, & Kanwisher, 2013; Guillona, Hadjikhani, Baduela, & Rogéa, 2014).

The studies for children later diagnosed with ASD are inconsistent. Chawarska, Macari, and Shic (2013) reported decreased looking time in response to the social scene and face of a woman at 6 months in children with ASD. In contrast, following the original findings, Pierce et al. (2016) also studied visual attention preferences of infants consisting of diagnostic subgroups and found that unaffected siblings of ASD groups did not show preferences for geometric images. The researchers reported that abnormalities in visual attention and preference were among the earliest emerging signs of ASD with more severe types of autism symptoms. Another study examining social attention with no sound showed that both high-risk siblings of ASD and TD infant groups preferred more dynamic social images such as people and faces to nonsocial contents such as figures (Kanai et al., 2013). Elsabbagh et al. (2013), studying orienting response to face, showed no difference between infants with high-risk ASD diagnosis and TD infants. This discrepancy could result from difference in social stimuli (dynamic or static). In Kanai's study, the high-risk siblings of ASD groups might increase looking time at a face because many children may love dynamic moving images such as people dancing and singing. On the other hand, in Elsabbagh's study, the TD infants' decreased looking time at the static social scene showed few communication styles, resulting in no difference between the two groups.

More studies are needed to investigate social interaction in relation to gaze behavior in children with ASD. Such studies will be meaningful for assessing children with ASD so as to provide precise and early diagnosis, leading to appropriate treatments and support such as curative education and educational support. In addition, the eye-tracking research in this field could reveal the nature of difficulties of social communication in children with ASD (Guillona et al., 2014).

ASD Family

Despite high levels of language skills, individuals who experience ASD with no intellectual deficit continue to encounter problems in nonverbal communication and understanding of others' minds on a lifelong basis (Senju, Southgate, White, & Frith, 2009). Previous studies showed that only 10.8% of individuals with ASD were married, which indicated the difficulty of a long-term couple relationship (Yukawa et al., 2013). In particular, partners of those with ASD reported that their own mental health had deteriorated due to the relationship and that they were feeling exhausted and neglected (Attwood, 2007). There is a high risk of divorce in parents of children with ASD (Freedman, Kalb, Zablotsky, & Stuart, 2012; Ramisch, 2012), and between 2.9% and 6.7%, more marriages end in divorce for parents of children with disabilities than parents of children with no disabilities (Risdal & Singer, 2004). In other words, when individuals with ASD marry and rear children, the married couples might experience problems within the marital and/or parent and child relationship. Therefore, some medical supports are needed for ASD families.

Our previous pilot study explored the influence of group therapy on ASD families in married adults, observing 12 ASD individuals (mean age 41.9 (8.8); 9 male, 3 female), 12 partners (mean age 43.6 (7.8); 3 male, 9 female), and 6 ASD children (mean age 5.8 (2.3); 3 male, 3 female) through administration of the Lazarus-type Stress Coping Inventory (SCI), Quality Marriage Index (QMI), and Dysfunctional Attitude Scale (DAS). The group therapy for ASD families was held once a month for 10 months at the university hospital. The group was divided into two subgroups of parents (both the ASD group and the partner group) and children. In the group therapy for parents, the program consists of ten sessions in which participants discuss various topics in each session. In the group therapy for children, participants play with other children and specialists such as a nurse and children's nurse in a free space.

One question posed in the sessions was "What is a hard time in your life based on family?" Some ASD individuals responded that they rightly decry someone's view and lack of flexibility in all areas, adding that they cannot control their feelings. Some partners, meanwhile, said that they (i.e., those with ASD) have no sense of time, exhibit a roller coaster ride of emotions, and become out of control over something unexpected. When asked, "What does your partner mean to you?" one ASD individual replied, "My partner looks like my lovely dog." Another person said, "My partner looks like my mother, who does practical things around the house." In terms of partner responses, some women said that they are not cognizant of the topic in its entirety. One woman said that she feels alone mentally and has no one to depend on in her life. When asked, "Tell me how things can work out well in your married life," one ASD person said, "I make an effort to listen to her conversation." Some partners said that they maintain a proper distance, though one woman said, "I hug him to switch his negative feeling." The next question was "How do you feel about your relationship with your children?" One ASD man thought that his children must be more lost without their mother than they are without him. Another person said that the sun shines out of their child's eyes. Regarding the partners' responses, some women said that they do not know that their partners have selfless love for their children. One woman said that her partner plays with their child when he is not enthusiastic over something else. On the whole, as each group increases the number of sessions, something is shown to have changed in the minds of its members. Some ASD individuals are able to learn how to communicate with their wives. For example, one morning, a husband with ASD became irritable over something. Although he never said sorry until now, he sent an email stating "I am so sorry for a little while ago" to his wife at lunchtime. He thus learned that apologizing and/or saying thank you were important for communicating with his wife in the group sessions. Meanwhile, the partners became better able to respond to the husbands with ASD well in advance. Some women felt that they found this persistence enjoyable and kept a proper distance from the husbands with ASD. The group sessions therefore provided the partners with some mental space within their relationships.

In questionnaire research, the scores of ability of coping with a restricted and stereotyped repertoire of activities, stable marriage, and flexibility were significantly higher in the last session than in the first session in the ASD group, and the score of self-blame was significantly lower in the last session than in the first session in the partner group. In the group therapy for children, both children and parents have a good opportunity to communicate with other people such as specialists, other parents, and children. The ASD children can potentially learn how to play with other children and finally communicate with both the specialists and other children. The findings demonstrated that group therapy for ASD families could constitute a comfortable setting (Kanai, Yokoi, Matsushita, Saito, & Kato, 2013); however, further study is necessary due to the small sample size and lack of a control group. Our study is therefore needed in order to clarify how group therapy can be useful for an ASD family.

Comprehensive Assessment of ASD

As previously mentioned, comprehensive assessments are necessary for supporting children with ASD. These assessments must include not only the ASD assessment but also assessment for other developmental disorders such as intellectual disorder (ID), attention deficit hyperactivity disorder (ADHD), and developmental coordination disorder (DCD). Moreover, evaluation of intellectual level and developmental level, including cognitive function, as well as assessment of communication skills, comorbid psychiatric symptoms, adaptive behavior, and psychosocial and environmental assessment (family, school, workplace, community etc.), are needed. In the section below, I will detail adaptive behavior assessment, because it has become standard practice to include assessments of adaptive functioning as part of a diagnostic evaluation for ASD.

Adaptive behavior is best defined as "the performance of daily activities required for personal and social sufficiency" (Sparrow, Balla, & Cicchetti, 2005). These are skills that children should be employing independently on a daily basis according to their age and intellectual ability level. Intellectual function and adaptive behavior are mentioned as correlated in the general population. However, for many individuals with ASD, adaptive behavior is often achieved at a much lower level than what is expected from the intellectual level. In particular, there is a large discrepancy between the level of adaptive behavior and IQ in high functioning individuals with ASD (Kanne et al., 2011; Klin et al., 2007; Perry, Flanagan, Dunngeier, & Freeman, 2009).

Among the adaptive behavior measures, the Vineland Adaptive Behavior Scales-Second

Edition (Vineland-II; Sparrow et al., 2005) is used widely in clinical and research situations. The Vineland-II is a valid and reliable measurement for individuals' adaptive level of functioning. It includes four forms: survey interview, parent/caregiver rating forms, expanded interview form, and teacher rating form. The Vineland-II can be used for individuals from birth to 90 years old, except the teacher rating form which is for ages 3:0–21:11.

The survey interview form is most appropriate for children. It is administered in a semi-structured interview with parents or caregivers. It takes 25–60 min to complete the interview. The content and scales of the Vineland-II were organized within a four-domain structure: communication, daily living skills, socialization, and motor skills. There are sub-domains of receptive, expressive, and written in communication; personal, domestic, and community in daily living skills; interpersonal relationships, play and leisure time, and coping skills in socialization; and gross and fine in motor skills. In addition, the Vineland-II offers an optional Maladaptive Behavior Index to provide more in-depth information on behaviors that interfere with adaptive development.

Regarding the evaluation method, the items included in each sub-domain are rated as 0 (usually), 1 (sometimes or partially), and 2 (never). The Vineland-II provides standard scores for each domain and an Adaptive Behavior Composite, both calculated with $M = 100$, SD = 15, and *v*-scale scores for each subdomain calculated with $M = 15$, SD = 3. The standard scores on the Vineland are similar to those on most intelligence tests insofar as the mean and standard deviation. For this reason, the results of intelligence tests like the Wechsler scales can be compared to Vineland domain standard scores as well as the Adaptive Behavior Composite. Also, the profile of scores from the Vineland-II is useful to diagnose and classify ID and developmental disorders such as ASD, ADHD, and LD. Given that approximately 40% of individuals with ASD also have ID and they tend to exhibit adaptive deficits above and beyond their cognitive delays and given that for even high functioning individuals with ASD, adaptive behavior is achieved at a much lower level than what is expected from their cognitive function; we must consider the evaluation of both ASD symptoms and adaptive behavior level in order to support children with ASD.

The Relationship Between Motor Function and Social Skill Development in Children with Autism Spectrum Disorders

Essential Questions and Research Directions

Early childhood is the period from prenatal development to 8 years of age. It is a crucial phase of growth and development, because experiences during early childhood can influence outcomes across the entire course of an individual's life (WHO, 2007). Usually, parents or pediatricians recognize developmental delays of children under the age of 3 years. During the last 20 years, screening tools and more reliable evaluation instruments have been developed, and professionals have become increasingly proficient in recognizing and diagnosing ASD. With recent heightened public awareness, parents are more likely to raise concerns related to developmental issues, specifically about ASD.

The importance of early identification and intervention highlights the need for research specifically applying the DSM-5 criteria to young children (Christiansz, Gray, Taffe, & Tonge, 2016).

Retrospective reports on what did and did not occur in early development are commonly used in diagnostic measures such as the Autism Diagnostic Interview-Revised (ADI-R) and the Childhood Autism Rating Scale (CARS) (Saemundsen, Magnusson, Smari, & Sigurdardottir, 2003). Thus, retrospective studies involving parental recollections provide several valuable insights into the early development of children with ASD (Goldberg, Thorsen, Osann, & Spence, 2008; Ozonoff et al., 2011; Werner, Dawson, Osterling, & Dinno, 2000). Parents of children later diagnosed with ASD recall developmental differences in the first few months of life, although a larger proportion became concerned during the second year of life (Young, Brewer, & Pattison, 2003). In 20–50% of children with ASD, parents retrospectively describe a pattern of regression in speech or social-emotional connectedness during the second year of life (Baranek, 1999; Werner & Dawson, 2005). Moreover, there are many indications that delays in movement development and speech usually prompt parents to raise concerns when visiting pediatricians. Most parents become worried when an infant is between 15 and 18 months of age, but, in many cases, they may delay asking for advice from their pediatrician for several months. The most common developmental concerns raised by parents to their family pediatrician are delayed movement developmental milestones, extremes in behavioral reactivity, disruption in social-communicative behavior (e.g., lack of responsiveness, impaired imitation), and concerns related to play development (Mostofsky et al., 2006; Turner, Stone, Pozdol, & Coonrod, 2006; Young et al., 2003). Table 1 shows a list of the most common motor-related problems and symptoms that indicate developmental delays or deviations in children from 3 months to 6 years old (Table 2).

Recently, Bhat, Landa, and Galloway (2011) found that early motor developmental delays within the first 2 years of life (the sensorimotor stage of cognitive development) play an essential role in social and cognitive development; thus, these delays could cause social impairments and cognitive deficiencies in children with ASD. Bhat et al. (2011) focused on five major issues in their study:

- Types of motor impairment
- A comparison between motor impairments in ASD and other pediatric conditions and diagnoses
- A theoretical viewpoint on how motor impairments might contribute to the social and communication impairments of ASD
- Research and clinical implications of presently available evidence
- Limitations of currently existing evidence on movement issues, motor findings, clinically available assessments, therapeutic approaches, and interventions for ASD

This study concludes that it is important to address fundamental motor and sensorimotor developmental issues and impairments through well-established assessments and effective early intervention programs (Bhat et al., 2011).

Table 2 A general list of symptoms related to *motor functions* indicating developmental delays (Lakatos & Toth, 2014)

Between 3 months and 3 years old	Between the ages of 3 and 6 years old
– Poor or absent suck reflex, not swallowing food properly, lack of eating – Appearance of defective postures, reflexes, co-movements that stay on (e.g., ATNR) – Hyperreflexia, hyporeflexia, areflexia – Newborn baby reflexes that will stay on too long – Appearance of atypical muscle tone: Spasticity, hypotonic, infantile cerebral palsy – Delay or complete lack of movement imitation – Appearance of bizarre, stereotypical movements – Deviant/delayed/accelerated movement development, hyperactivity – Complete lack or an excessive amount of a sense of danger – Lack of games involving movement (motor) – Appearance of stereotypical game forms – Tossing around toys and objects aimlessly, etc.	– Movement coordination weaknesses (inaccurate, too rigid movements with too much tension) – Weakness of the ability to learn new movements – Dyspraxia (or developmental coordination disorder), apraxia – Graphomotor dysmaturity, high risk of dysgraphia – Delayed language, hindered speech development or motor speech delays – Hyperactivity – Too few movement activities – Disorders of body scheme, spatial orientation and laterality – At-risk of learning difficulties – Quality of activities (slow, inefficient, or badly organized), etc.

Moreover, the next study undertaken by Bhat, Galloway, and Landa (2012) showed that children with early motor delays (overall gross motor delays) at 3 and 6 months continued to exhibit a risk of communication delay at the 18-month follow-up visit. The study states that early motor delays could be viewed as indicators of early disruptions related to higher risk for ASD; likewise, there is empirical support for the presence of motor delays in infants who later develop ASD, as well as later-born siblings of children with ASD. However, the sibling data used in this study showed that only a subset of infant siblings of children with ASD showed early motor delays and communication delays in the future. Therefore, motor delays may be a feature of ASD from early on and may present in infants who have a greater genetic risk of ASD (Bhat et al., 2012).

Frequently reported motor findings show impaired basic motor control (motor skill deficits) in children with ASD (Ghaziuddin & Butler, 1998; Jansiewicz et al., 2006; Noterdaeme, Mildenberger, Minow, & Amorosa, 2002; Rinehart et al., 2006). Difficulties with basic motor control include gait, posture, balance, speed, and coordination issues (see Fig. 1).

Comprehensive early sensory perceptions with gross motor activities and related social communication and language characteristics should be assessed and evaluated for infants at risk of ASD and children with ASD. These early sensorimotor and interconnected neurodevelopmental issues should be considered important clinical issues in further research (Landa & Garrett-Mayer, 2006). These developmental motor deficiencies are present from a very young age and are likely to affect social-communicative and language development negatively in children with developmental disabilities, especially ASD (McCleery, Elliott, Sampanis, & Stefanidou, 2013).

In the study of Bhat et al. (2011), the authors conclude that their results provide evidence that motor behavior is both quantitatively and qualitatively different in children with ASD (infants, toddlers, and school-aged) compared to children with TD. The study showed significant impairments in posture control, motor coordination, praxis, and imitation. Furthermore, the study provides direct empirical evidence for a link between motor and social impairments in children with ASD. Thus, targeted early therapeutic approaches (physical, occupational, and speech therapy) are needed in the future in order to improve motor functioning in children with ASD.

The study of McCleery et al. (2013) also describes research needs and future directions for the development of early intervention programs aimed at addressing the speech-language and social communication development difficulties in ASD from a motor-related perspective. Therefore, from the clinical and educational viewpoint,

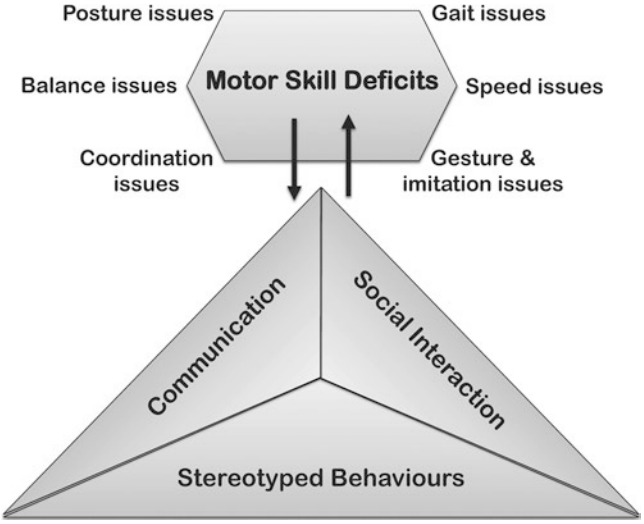

Fig. 1 Core deficits in ASD; *modified from* Stewart H. Mostofsky (2013)

there is an unquestionable need to develop and provide well-established early intervention programs and developmental theory-based therapeutic approaches that utilize sensory perceptions, motor activities, and motor learning principles for children with ASD.

Interrelation Between Sensory, Motor, and Executive Functioning in Children with ASD

Early detection of autism is critical for early intervention, which has a positive effect on the outcome of a child with developmental delays. There is a growing interest in using specified assessment of motor development for early detection of developmental delays in infants (from birth to 1 year of age) and toddlers (from 1 to 2 years of age) who are might be at risk of developing ASD (Landa & Garrett-Mayer, 2006; Ozonoff et al., 2008; Zwaigenbaum et al., 2007).

During the first 2 years of life, there is a strong connection between the development of the central nervous system and sensorimotor development. The sensory system includes seven primary senses: *touch* (somatosensory or kinesthetic), *vestibular* (balance, gravity, acceleration, head and body position, etc.), *proprioception* (bodily sense of body parts such as limbs, muscles, tendons, joints, etc.), *hearing* (audition, sound vibration, environmental pressure change, etc.), *sight* (vision: to focus on and identify images, visible light and colors, hues and brightness, etc.), *smell* (olfaction: to detect scent), and taste (gustation: to detect taste of substances and flavor character, etc.). Sensory integration is an essential neurological process that organizes sensation from the environment and one's body (see Fig. 2).

During sensory processing, the brain receives many kinds of specific sensory information (stimuli). Following receipt of a stimulus, the brain must process the information, which includes selecting (registration), discriminating (orientation), interpreting, and organizing the different impulses from the inner and outer environment. This process is called sensory processing or integration (Schoen, Miller, Brett-Green, & Nielsen, 2009) (see Fig. 3).

The effective registration and accurate interpretation of a sensory stimulus (sensory input) cause a person to react (motor output) and behave in a meaningful and consistent way (adequate behavior). There are three types of dysfunction or atypical responses that can occur during the sensory integration process (Miller, Anzalone, Lane, Cermak, & Osten, 2007). The first is called *sensory modulation disorder*, where the problem lies with the adequate controlled behavioral answer to sensory input and where the motor output

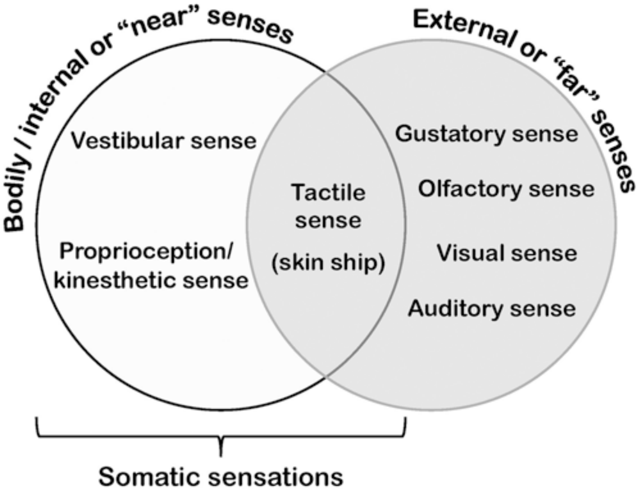

Fig. 2 Primary senses that contribute to the sensory system

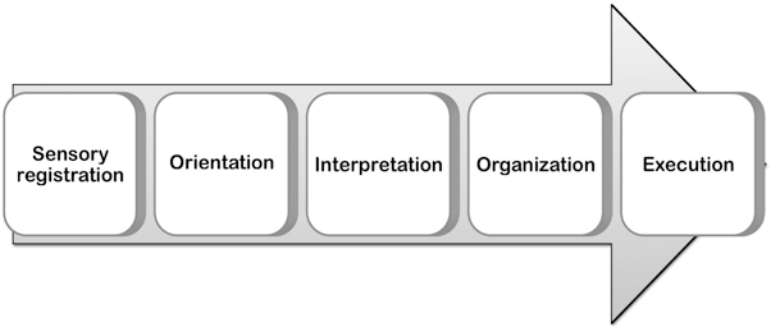
Sensory registration
Orientation
Interpretation
Organization
Execution

Fig. 3 The general process of sensory integration

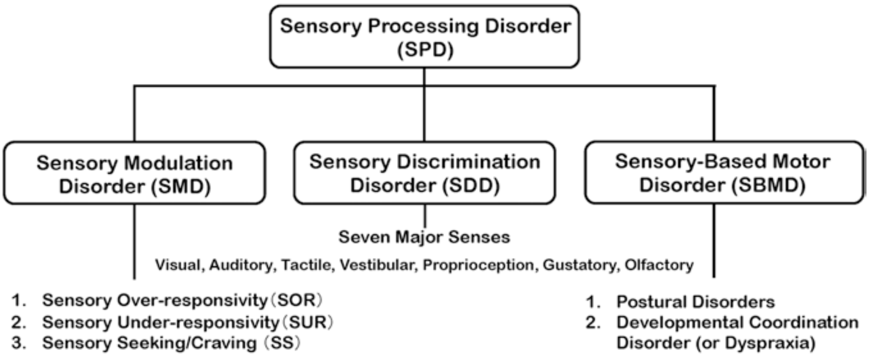
Sensory Processing Disorder (SPD)
Sensory Modulation Disorder (SMD)
Sensory Discrimination Disorder (SDD)
Sensory-Based Motor Disorder (SBMD)
Seven Major Senses
Visual, Auditory, Tactile, Vestibular, Proprioception, Gustatory, Olfactory
1. Sensory Over-responsivity (SOR)
2. Sensory Under-responsivity (SUR)
3. Sensory Seeking/Craving (SS)
1. Postural Disorders
2. Developmental Coordination Disorder (or Dyspraxia)

Fig. 4 Categories and subtypes of sensory processing disorder; *based on* Kranowitz (2006)

matches the nature and intensity of the sensory information (e.g., sensory sensitivity such as over-responsivity, under-responsivity, or sensory seeking). The second is called *sensory discrimination disorder* and occurs when the sensory input is poorly detected and the child cannot sense the differences or similarities of sensory stimuli. (Every type of sense—visual discrimination, tactile discrimination, etc.—has its discriminatory problems.) The third dysfunction is called *sensory-based motor disorder* and includes postural disorders and dyspraxia or developmental coordination disorder. In the case of sensory-based motor disorders, the problem lies in the stabilization of one's body (posture), motor planning, motor answer, and an adaptive/responsive movement series to sensory stimuli (Fig. 4).

Sensory-based motor disorders (postural stability and motor coordination skills) are commonly reported for children with ASD. Postural stability develops from a very early age and refers to the ability to maintain one's center of gravity within a given base of support (e.g., balance); indeed, it is a fundamental motor skill that helps a person to maintain an upright stance (Horak, Shumway-Cook, Crowe, & Black, 1988). Recently, Mache and Todd (2016) reported on the relationship between motor coordination skill, postural stability, restricted and repetitive patterns of behavior, diagnosis, age, and sex in children with ASD. The results show that children with ASD who participated in the study have deficits in postural stability compared to children without ASD (Mache & Todd, 2016). Thus, postural stability appears to be an influential factor in the development and performance level of gross motor skills.

Problems at the level of sensory integration arise when a child with ASD attempts to integrate too many sensory inputs at the same time. The difficulty with the sensory integration process could be the cause of anxiety or panic that results in rigidity or depression. If a child can control most sensory inputs from the environment (both from the outer environment and his/her inner environment), he or she will be able to coordinate these sensory experiences. Coordinating sensory inputs allows the child to manage one or two sensory inputs at a time. Controlled and processed sensory experiences are a gateway to executive functioning.

In summary, indicators of sensory processing dysfunction might include inappropriate or problematic motor, behavioral, attentional, and adaptive responses anticipating or following sensory stimulation (Lane, Young, Baker, & Angley, 2010). However, sensory difficulties should be considered a *sensory processing disorder* only when they cause significant issues in daily life and interrupt tasks and routines to the extent that the child cannot compensate or cope with those problems (e.g., when they result in psychological distress, anxiety, panic attacks, maladaptive behavior, self-injurious behavior, etc.).

Children with developmental disabilities, and ASD in particular, are more frequently observed to experience notable difficulties in sensory processing and motor skills development (Baranek, 1999; Baranek, David, Poe, Stone, & Watson, 2006). The pyramid of learning (see Fig. 5) shows the connection between the sensory system, sensory motor development, perceptual motor development, and cognitive development.

In many cases, inadequate motor performance at the early preschool age is one of the first clear signs of a comorbid developmental disorder with more prominent behavioral features, such as ASD or ADHD (Esposito, Venuti, Maestro, & Muratori, 2009; Van Waelvelde, Oostra, Dewitte, Van Den Broeck, & Jongmans, 2010). Thus, specified assessments should include the evaluation of all age-appropriate functions within the three “major areas” of developmental difficulties:

1. Motor area (e.g., gross, fine motor milestones, sensory and motor speech skills, etc.)
2. Psycho-cognitive area
3. Social behavior and communication area

Although motor disorders can occur in isolation, many studies have described frequent co-occurrence with ASD and ADHD (Fournier, Hass, Naik, Lodha, & Cauraugh, 2010; Grzadzinski, Dick, Lord, & Bishop, 2016). In general, small children need to react to any stimuli they encounter in a manner that is specific, precipitate, and present-oriented

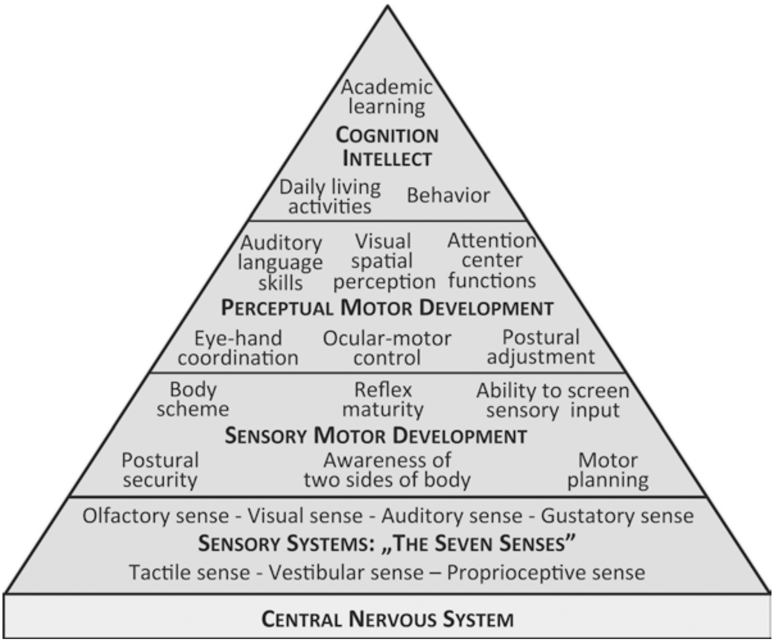
Academic learning
COGNITION
INTELLECT
Daily living activities
Behavior
Auditory language skills
Visual spatial perception
Attention center functions
PERCEPTUAL MOTOR DEVELOPMENT
Eye-hand coordination
Ocular-motor control
Postural adjustment
Body scheme
Reflex maturity
Ability to screen sensory input
SENSORY MOTOR DEVELOPMENT
Postural security
Awareness of two sides of body
Motor planning
Olfactory sense - Visual sense - Auditory sense - Gustatory sense
SENSORY SYSTEMS: „THE SEVEN SENSES"
Tactile sense - Vestibular sense – Proprioceptive sense
CENTRAL NERVOUS SYSTEM

Fig. 5 The pyramid of learning; *modified from* Williams and Shellenberger (1996)

("here and now") to be able to adapt to changes in their closed environment. Many studies have shown that improving executive function, motor coordination, motor learning, and planning is essential in children with ASD (Baranek, 1999; Travers, Kana, Klinger, Klein, & Klinger, 2014). The psychological hypothesis of executive dysfunction plays a significant role in explaining the behavioral phenotype of persons with ASD, along with other hypotheses such as deficits in theory of mind (Frith, 1993) or the weak central coherence hypothesis (Shah & Frith, 1993). Nevertheless, none of these predictions is sufficient to rule out the others, and behaviors that have their origins in one of these three hypotheses are also determined by many developmental processes and other factors (Martos-Perez & Paula-Perez, 2011).

Executive function is needed to express how someone feels, thinks, and acts within the surrounding environment. An executive function can be defined as a primary type of self-regulation that involves the ability to engage in goal-directed activity with necessary mental processes mainly regulated by frontal lobes (Panerai, Tasca, Ferri, Genitori D'Arrigo, & Elia, 2014). The necessary mental processes in executive functioning are attention, organization, time management, memory, flexibility, inhibition (interrupting one's actions and monitoring the dominant response), personal goals, and control of emotion and behavior. Young children with ASD—who have not yet developed organized and conscious play activity—engage with their environment with sensory-based impulsivity (e.g., over-sensory, under-sensory, or seeking reactions; see Fig. 4), moving from one stimulus to another (Freeman, Gulsrud, & Kasari, 2015). These sensory difficulties might cause repetitious and disorganized motor and play activities.

Toddlers and young children at risk or with ASD need to plan a course of action to be able to engage in a "goal-directed" way. Problems with executive function are neurological in nature and arise from a disruption or delay in neurological development (Hill, 2004). The prefrontal cortex is considered to be primarily responsible for executive functional skills, but many parts of the central nervous system have to "network" for successful executive functioning to take place (Dowell, Mahone, & Mostofsky, 2009; Landrigan, Lambertini, & Birnbaum, 2012; Panerai et al., 2014). The more practical the executive functions, the more social skills become functional, and the neurological network makes stronger and newer connections. Children with ASD need a more reliable and more stable executive function structure. Furthermore, children with ASD require a more precise executive function structure than children with TD.

In her study, Hill (2004) summarized research data and related scientific evidence on executive functioning and ASD. She concluded that, although many children with ASD do have difficulties with executive function, this should not be considered a defining feature of ASD, because there are also children on the autism spectrum who do not have problems with executive function. On the other hand, therapy approaches that focus mainly on social and communication difficulties might not have the best possible effect on the development of a child who has autistic problems combined with executive function issues (Hill & Bird, 2006; Robinson, Goddard, Dritschel, Wisley, & Howlin, 2009).

The Specificity of DCD or Dyspraxia and Imitation Task Performance Issues in Children with ASD

Problems with motor functions are more readily observable and quantifiable than complex social interaction or communication. Difficulties with motor coordination and control can be observed as early as infancy (Landa & Garrett-Mayer, 2006; MacNeil & Mostofsky, 2012) and usually include motor sequencing difficulties in creeping, crawling, and (later on) walking. Motor coordination ability includes muscle tone control, postural control, axial and limb coordination, gait movement, and the speed of adequate responses to stimuli from the environment.

Muscle tone is the appropriate degree of muscle tension or resistance within individual muscles and muscle groups at rest. The state of muscle tone affects postural control and stability, which develops in the neck muscles, the shoulder girdle muscles, and the core muscles of the trunk. The muscles of children with high tone are tight and tense even when not engaged in anything. High muscle tone causes the limbs to be tightly contorted, thus making any movement burdensome and convulsive (spasmodic). Children with low tone are not able to sit upright and may also lack endurance for gross and fine motor activities; additionally, they may have difficulties with game activities that require controlled and coordinated movements (Mandich, Polatajko, Macnab, & Miller, 2001).

Children with ASD show some degree of difficulty with gross and fine movements, skilled motor gestures, imitation, and tool use. Problems in basic motor skill development are connected to impairments in imitation skill (motor type), pantomime, and tool use in praxis testing situations. Studies refer to impaired skilled motor performance as "developmental dyspraxia" (Dowell et al., 2009; Dziuk et al., 2007; MacNeil & Mostofsky, 2012; S. H. Mostofsky et al., 2006). In recent decades, developmental coordination disorder (DCD) has been described as developmental dyspraxia, clumsy child syndrome, and sensory integrative dysfunction (Mostofsky et al., 2006; Toussaint-Thorin et al., 2013).

Many studies have shown impaired performance in imitation tasks in children with ASD. Imitation is important because it can form the developmental basis of social cognition, as in the theory of mind (von dem Hagen, Stoyanova, Rowe, Baron-Cohen, & Calder, 2014) and empathy. Being able to imitate another person involves explicit body awareness and the cognition of self and others, as well as perceptual processing, controlled attention, executive functions, motor planning, and comprehension of social cues and language (Mostofsky et al., 2006). Enhancing body awareness has thus been described as an essential element or mechanism of action for therapeutic approaches often categorized as mind-body approaches (Mehling et al., 2011). Therefore, signs of developmental motor difficulties together with impaired performance of skilled gestures and difficulty recognizing the gestures of others could serve as biomarkers for the early diagnosis and therapeutic approach for ASD (Dziuk et al., 2007).

Praxis is the ability of the brain to conceive, organize, and carry out a sequence of unfamiliar actions (Ayres, 1973). Praxis is not one action but a functional behavior made up of three primary processes. The first is called ideation, which refers to generating an idea (creative process) about how one might interact with the environment. The second is organizing a program of action processes, which is termed motor planning, while the third is the actual performance of a motor act, or execution (see Fig. 3). *Dyspraxia* means that, even though there is adequate motor capacity, the person has a reduced ability to carry out non-learned motor activities (Dejean, 2008). The specificity of inadequate motor performance, imitation performance issues, and dyspraxia or DCD in children considered at risk of developing ASD or with a diagnosis of ASD has been shown in many studies during the last 10 years. The difficulty with imitative behavior could be a key indicator of dyspraxia. Motor developmental problems (gross motor development, fine motor control, visual motor control, spatial awareness, etc.) and problems with motor imitation are more observable at an early age and are more easily comparable and measurable than communication and social interaction issues (May-Benson & Koomar, 2010). These developmental issues can serve as "biomarkers" (MacNeil & Mostofsky, 2012) in early diagnosis and early intervention approaches.

The impairment of ideomotor praxis is called ideomotor apraxia or dyspraxia (depending on the severity of symptoms). It is characterized by the inability to imitate hand gestures correctly (e.g., waving "bye-bye") and voluntarily mime tool use and skilled gestures (e.g., pretending to use a hammer or a scissor, to brush one's hair, etc.). Meaningful gestures produced in the presence of an object are called transitive actions (e.g., voluntary tool use). Situated representations of gestures that are created in the absence of an object are called intransitive actions (e.g., communicative hand gestures).

Findings reveal that the assessment results related to impairments in motor functions, lower performances in tool use, and difficulties with imitation tasks (postural, gestural, verbal, etc.) are correlated with measures of the core features of ASD (communication and social impairment) (Dowell et al., 2009). Therefore, these difficulties and disabilities might have a common underlying mechanism that contributes to the issues in the motor, sensorimotor, and social communication skill development of children with ASD (Dziuk et al., 2007; Srinivasan et al., 2015; Van Waelvelde et al., 2010).

Traditional assessments of praxis employ a combination of sensory integration and praxis tests. These include tests of imitation of postures and gestures, ideational praxis, oral praxis, sequencing praxis, bilateral motor coordination, constructional praxis, design copying, and praxis to verbal command (May-Benson & Cermak, 2007). Additional assessments can also be used, one of which is the Miller Assessment for Preschoolers (Parush, Winokur, Goldstand, & Miller, 2002). Others are formal clinical observations during the neurodevelopmental assessment (prone extension/supine flexion, diadochokinesis, finger identification, sequential thumb-finger touching, tactile discrimination, oculomotor control, graphesthesia, etc.) and informal clinical observations in different environments and social situations.

A general praxis assessment has the following components:

- Sensory processing and sensory discrimination ability assessments
- Ideational praxis assessment (through perception and action on object affordances)
- Gestural assessment (through use of imitation of postures, gestures, and following verbal commands)
- Motor organization (motor planning, bilateral coordination, projected action sequences)
- Feedback and ability to make adaptive responses to environmental demands

It is important to assess gesture praxis and imitation performances of children in different aspects (Lane, Ivey, & May-Benson, 2014). The following elements should be incorporated into the assessment of gestures in children:

- Imitations related to body parts and the whole body aspect
- Moving and not moving actions
- Asymmetrical and bilateral imitations
- Representational versus nonrepresentational, etc. (Lane et al., 2014)

On the other hand, gesture types vary by age. For example, at age 2, children should be able to point to body parts (self and others), while, at age 4, they should use their body parts as objects. Later on, at around 7–8 years old, children should be able to represent an object with no space, while, at age 12, they should develop a mature response and be able to represent an object with space (Lane et al., 2014).

Mostofsky et al. (2006) found that children with high-functioning autism had significant impairments in command gestures, imitation gestures, and gestures with overall tool use performance compared to the control group. The study of Dowell et al. (2009) showed an impaired postural knowledge and performance level in children with ASD compared to the control group of children with TD. MacNeil et al. (2012) found significantly worse performance in postural knowledge among children with ASD compared to an ADHD and a TD group. Their results showed that postural knowledge impairment is specific to ASD.

Dyspraxia in autism appears to be associated with the impaired formation of spatial representations, as well as transcoding and execution (Dowell et al., 2009), during the motor organization process. Methods for altering patterns of skill learning in children with ASD should begin at an early age. Therapeutic intervention at a young age might not only lead to improved social interaction with a more facile execution of communicative gestures and other social skills; it may also help the advanced development of children's ability to understand the actions of others, with resulting improvements in social cognition (MacNeil & Mostofsky, 2012).

Haswell, Izawa, Dowell, Mostofsky, and Shadmehr (2009) revealed that children with ASD showed a distinctive pattern of motor learning in their study. This study found a bias toward reliance on proprioceptive feedback from the internal body space, with greater dependence on cortical regions where movements are represented in intrinsic coordinates of motion (somatosensory cortex). On the other hand, the study suggests less dependence on regions (premotor, posterior parietal) where movements are represented in extrinsic coordinates in children with ASD, with relative ignorance of visual feedback from the external world (Haswell et al., 2009). Furthermore, MacNeil and Mostofsky (2012) found evidence that impairments in the recognition and performance of skilled correct gestures are specific to children with ASD. Their results also showed that impairments in primary motor control are a generalized finding in children with ASD, as they were observed in children with ADHD as well. The authors conclude that, next to the difficulties in the performance of skilled gestures, children with ASD also have specific problems with the ability to recognize skilled gestures in others.

Postural knowledge and control, primary motor skill performance (gross motor and fine motor), balance, and vestibular dysfunctions are commonly observed and well-documented difficulties in children with ASD. Researchers have published many studies on whether vestibular dysfunction (over−/under-sensitivity or sensory seeking; see also Fig. 4), problems in postural control, balance, and primary motor skill development are connected to the overall dyspraxia diagnosis and, later on, psycho-intellectual and social developmental issues in children with ASD (Baranek et al., 2006; Bhat et al., 2011; Esposito et al., 2009; Mache & Todd, 2016; Minshew, Sung, Jones, & Furman, 2004). Therefore, postural knowledge relates strongly to basic motor skill development (praxis), while the developmental issues in social awareness strongly relate to social skill development in children with ASD.

Social Behavior and Skills in Children with ASD

Treatment of Social Skills

Recent tendencies of treatment regarding social skills, the effects of treatment in the inclusive classroom, the collaboration between university and the community, video modeling instruction, emotion regulation, the relation with co-occurring problems of emotional control, Social Stories™, and the use of Social Stories™ in pre-school age children are reviewed and discussed in the following sections.

Recent Tendencies

The most important topic in terms of recent tendencies in social behavior and skills intervention research is the change of methodology to establish a rigorous line of research. On this note, several important reviews concerning a clear methodological line have been published.

Initially, Rao and colleagues examined social skills training (SST) programs for youths with ASD, with an emphasis on critically evaluating efficacy and highlighting areas of future research (Rao, Beidel, & Murray, 2008). The review highlights the disparity between SST programs described in the extant literature, including the lack of a universal definition of social skills, various levels of intensity and duration of treatment, divergent theoretical backgrounds, and variety in services provided in clinical or classroom settings. Based on this critical review, a “roadmap” for future research, consistent with recommendations put forth by a leading group of autism researchers, is identified.

Reichow and Volkmar (2010) reviewed the literature examining SST programs for youths with ASD and placed emphasis on critically evaluating efficacy and highlighting areas of future research. Sixty-six studies published in peer-reviewed journals between 2001 and July 2008 and featuring 513 participants were included.

The authors classified the research as age-specific findings into interventions for preschool children, school-aged children, and adolescents and adults, as well as specific findings. They also classified research into applied behavior analysis, naturalistic, parent training, peer training, and social skills groups. After they had classified these criteria, they provided recommendations for practice and areas of future research.

By contrast, Cappadocia and Weiss (2011) reviewed research comparing three types of social skills training group studies: traditional, cognitive behavioral, and parent-inclusive studies. They provided preliminary evidence for the efficacy of group-based social skills interventions; moreover, they stated that few studies used comparison group or randomized control trial designs. They went on to propose some future directions.

Using a randomized controlled trial (RCT) design, Gantman and colleagues tested the effectiveness of an evidence-based, caregiver-assisted social skills intervention known as PEERS for young adults with high-functioning ASD (ages 18–23) using self- and caregiver-report measures (Gantman, Kapp, Orenski, & Laugeson, 2012). They used descriptive measures (Autism Spectrum Quotient, AQ; Kaufman Brief Intelligence Test: Second Edition, KBIT-2; Vineland Adaptive Behavior Scales: Second Edition, Survey Form, Vineland-II) and primary outcome measures (Social Responsiveness Scale, SRS; Social Skills Rating System, SSRS; Social and Emotional Loneliness Scale for Adults, SELSA). As secondary outcome measures, they used Empathy Quotient, EQ; Quality of Socialization Questionnaire, QSQ; Social Skills Inventory, SSI; and Test of Young Adult Social Skills Knowledge, TYASSK. Results support the effectiveness of using this caregiver-assisted, manualized intervention for young adults with ASD.

Hotton and Coles (2016) aimed to critically evaluate studies published in the past 20 years that had used group-based social skills training to improve the social skills of adults and/or adolescents with ASD. Thirteen studies were identified, and group-based social skills training was found to be generally effective at improving social skills, with some studies observing transfer effects to improvements in wider psychological wellbeing.

Finally, White and colleagues summarized the state of research in group-based social skills training programs for school-age children and adolescents with ASD (White, Keonig, & Scahill, 2007). In this review, the authors identified 14 studies published from 1985 to 2006 using a template developed by a NIMH work group. They also mentioned that empirically supported treatment (EST) must be identified as having a rigorous line of research. Rigorous lines of research of EST are usually (1) in the form of randomized clinical trials (RCTs) and (2) a means of supporting EST's utility as a treatment for a particular disorder (Task Force on Promotion Dissemination of Psychological Procedures, 1995). Empirical support for efficacy can be established through (3) well-designed group experiments or several (>9) single case experiments, (4) treatment manuals, and (5) clearly defined patient samples. The role of (6) systematic reviews is to evaluate the state of the field and identify progress and gaps. Establishing psychosocial intervention as an EST therefore clearly requires much more than preliminary evidence.

As White and colleagues mentioned, several rigorous lines of research, randomized clinical trials (RCTs), definition of a particular disorder, patient samples, treatment manuals, and systematic reviews must be necessary in future treatment trials (White et al., 2007).

Effect of Treatment in the Inclusive Classroom

Another important topic is whether the student with ASD benefits from exposure to and interactions with typical peers. Laushey and Heflin (2000) offered one answer to the argument for the use of inclusive programs. They collected data on students with autism, with this data indicating that the peer buddy approach significantly increased students' appropriate social interactions.

The effects of peer role are important but complicated. Kasari and colleagues examined self, peer, and teacher reports on social relationships for 60 high-functioning children with ASD (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011), finding that 20% of children with ASD experienced reciprocated friendships and high social network status. Thus, while the majority of high-functioning children with ASD struggle with peer relationships in general education classrooms, a small percentage appear to achieve social success. How to evaluate the results of this research is very difficult, however. The percentage of students who achieved social success in this study is not so high, so the preliminary target is to clarify how to decrease the difficulty of the 80% of children with ASD and, at the same time, to ascertain why the other 20% of children increased the success of their social relationships and networks.

Kasari and colleagues also studied two interventions for improving the social skills of high-functioning children with ASD in general education classrooms (Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012). One intervention involved a peer-mediated approach (PEER) and the other involved a child-assisted approach (CHILD). Findings indicated that there can be significant improvements in peer social connections for children with ASD in general education classrooms with a brief intervention and that these gains persist over time.

Even though the effect of treatment in the inclusive classroom may vary among research studies, basic evidence about the importance of this treatment will increase in future research.

The Collaboration Between University and the Community

Another important task is to study intervention among children with ASD in inclusive settings, with collaboration between universities and community mental health centers.

Camargo and colleagues answered the requirements for the use of research on interventions in schools based on the increasing number of children with ASD being educated in inclusive settings (Camargo et al., 2014). Characteristics and components of the interventions are summarized, and their implications for practice and future research are discussed.

The goal of the collaboration between a university and two community mental health (CMH) centers was to increase the capacity among staff serving children with ASD in the usual care social skills groups (Bryson & Ostmeyer, 2014). Foundational education in behavior management may benefit successful implementation of ASD-specific evidence-based practices in community settings.

From these studies, the authors proposed various types of coordination between universities and inclusive school settings. Their implications for practice and future research are discussed.

Video Modeling Instruction

One effective method of social intervention, video modeling instruction, is empirically evaluated. Plavnick and colleagues adapted an efficacious protocol for adolescents with ASD, namely, video-based group instruction (VGI). According to the intervention outcomes, long-term maintenance and generalization outcomes for the participants were mixed (Plavnick, Kaid, & MacFarland, 2015). Even so, the use of these new methods in intervention promises an important future.

Emotion Regulation

To increase the social behaviors of children with ASD, emotion regulation is essential. There are several issues that need to be addressed in order to clarify the tendency of emotion regulation research, one of which is to study the relationship character of the difficulties encountered by such children.

Konstantareas and Stewart (2006) examined affect regulation (AR) and temperament in children with ASD. To determine AR, children were exposed to a mildly frustrating situation. Those with ASD exhibited lower control in attention focusing, inhibitory control, and soothability. The results showed that fewer symptoms of ASD and older chronological age predicted higher effortful control.

Ashburner and colleagues compared teachers' perceptions of students with ASD to their perceptions of students with TD regard to the capacity to perform academically and regulate emotions and behavior in mainstream classrooms, taking into account behavioral and emotional difficulties (including attention difficulties, anxiety, depression, and oppositional and aggressive behaviors) and offering alternative models of supporting these students in mainstream classrooms (Ashburner, Ziviani, & Rodger, 2010).

Students with ASD seem to be underperforming relative to their levels of ability and are struggling to maintain their attention and regulate their emotions and behaviors in mainstream classrooms. Consideration thus needs to be given to investigating alternative models of supporting these students in mainstream classrooms. In addition, Samson and colleagues examined the relationship between emotion dysregulation and the core features of ASD and found the strongest association to be with repetitive behaviors (Samson et al., 2014).

Among the younger children, Garon and colleagues investigated early temperamental profiles and their associations with autistic symptoms in high-risk infants ($N = 138$) with an older sibling with ASD and low-risk infants ($N = 73$) with no family history of ASD (Garon, Bryson, Zwaigenbaum, Smith, Brian, Roberts, & Szatmari, 2009). These findings suggest that temperament may be a useful framework for understanding the emergence of ASD early in life.

Gulsrud and colleagues studied 34 toddlers with autism, and the mothers participated in an early intervention targeting joint engagement (Gulsrud, Jahromi, & Kasari, 2010). An effect of intervention was found such that children decreased their expression of negativity across the intervention, while mothers increased their emotional and motivational scaffolding. Joint engagement in early days therefore has a role to play in emotion regulation.

Even in studies concerning adults, to assess emotional functioning in ASD and TD people is suggestive. Samson and colleagues studied 27 ASD adults (16 women) and 27 age-, gender-, and education-matched TD participants, all of whom completed a battery of measures of emotion experience, labeling, and regulation (Samson, Huber, & Gross, 2012). With respect to emotion regulation, individuals with ASD used reappraisal less frequently than TD individuals and reported lower levels of reappraisal self-efficacy.

It is important to note that these results in emotion regulation became more specific; hence, we must be cautious in evaluating the evidence of the result.

The Relation with Co-occurring Problems of Emotional Control

Swain and colleagues studied a mechanistic model in which anxiety culminates via emotion dysregulation and social motivation (Swain, Scarpa, White, & Laugeson, 2015). However, social motivation did not appear to play a moderating role in the relationship between emotion regulation and anxiety, even when controlling for social awareness.

Regarding emotion regulation and depression, Rieffe and colleagues examined the unique contribution of two aspects of emotion regulation: awareness and coping (Rieffe et al., 2011). Depression was unrelated to positive mental coping strategies, and the conviction that the emotion experience helps in dealing with the problem, suggesting that a positive approach to the problem and its subsequent emotion experience are less effective in the high-functioning ASD group.

Mazefsky (2015) studied mechanistic and applied papers on emotion regulation (ER) and emotional experiences in ASD. Important concepts for future research are discussed, including how to conceptualize emotion dysregulation in ASD, the importance of capturing variability in emotion dysregulation in ASD studies, and the promise of intervention approaches that target ER impairments.

Samson and colleagues studied maladaptive behavior, which is common in ASD (Samson, Hardan, Lee, Phillips, & Gross, 2015). However, the factors that give rise to maladaptive behavior in this context are not well understood. The present study examined the role of emotion experience and emotion regulation in maladaptive behavior in individuals with ASD and those with TD. It found that, by decreasing negative emotions, treatments targeting adaptive emotion regulation may reduce maladaptive behaviors in individuals with ASD.

As indicated by these studies, the relationship between co-occurring problems of ASD and emotional control may vary, meaning that evidence-based research is necessary.

Social Stories™

Social Stories™ offer one effective method of increasing social behavior and decreasing disruptive behavior. In terms of recent research on Social Stories™, quite a few reviews have been published.

Sansosti and colleagues pointed to Social Stories™ as one method that is increasingly suggested for teaching social skills to children with ASD (Sansosti, Powell-Smith, & Kincaid, 2004). This article consequently offers a synthesis of the available research regarding Social Stories™ and their effectiveness in education.

Karkhaneh and colleagues conducted a systematic review of the literature using pre-defined, rigorous methods (Karkhaneh et al., 2010). Studies were considered eligible if they were controlled trials evaluating Social Stories™ among persons with ASD. This review underscores the need for further rigorous research and highlights some outstanding questions regarding maintenance and generalization of the benefits of Social Stories™.

Test and colleagues' comprehensive review of Social Story™ literature included (a) a descriptive review, (b) analysis of research quality, and (c) meta-analysis using a percentage of nonoverlapping data (Test, Richter, Knight, & Spooner, 2011). Analysis of research quality yielded strengths in participant description and selection of socially important dependent variables, whereas weaknesses were identified in data collection related to procedural reliability and social validity of procedures.

Kokina and Kaczmarek (2014) summarized and discussed the results of some meta-analyses of Social Stories™, with particular focus on the outcomes of the intervention, the methodological quality of intervention research, and the role of the possible moderators of their effectiveness (e.g., participant and intervention characteristics).

Reynhout and Carter (2006) put together a review of the empirical research literature on Social Stories™, including a descriptive review and single-subject meta-analysis of appropriate studies. Examination of data suggests that the effects of Social Stories™ are highly variable. Data on maintenance and generalization are also limited. Social Stories™ stand as a promising intervention, being relatively straightforward and efficient to apply to a wide range of behaviors. However, further research is needed to determine the exact nature of their contribution and the components critical to their efficacy.

A meta-analysis of single-subject research was conducted, examining the use of Social Stories™ and the role of a comprehensive set of moderator variables (intervention and participant characteristics) on intervention outcomes (Kokina & Kern, 2010). While Social Stories™ had low to questionable overall effectiveness, they were more effective when addressing inappropriate behaviors than when teaching social skills. Social Stories™ also seemed to be associated with improved outcomes when used in general education settings and with target children as their own intervention agents.

Bozkurt and Vuran (2014) analyzed studies in which Social Stories™ were used for teaching social skills to individuals with ASD. The present study includes a descriptive review and meta-analysis of single-subject studies that met the criteria. Although most studies showed that Social Stories™ were effective in teaching social skills to children with ASD in the descriptive study, in the meta-analytic study, the mean of Percentage of Non-overlapping Data (PND) scores for all studies was 63.43%, with a range of 0–100%. These results suggest that Social Stories™ should not yet be considered as evidence-based practice for teaching social skills to individuals with ASD. Nevertheless, they seem to constitute a promising practice that warrants future research.

From these research studies, Social Stories™ appear effective in increasing social skills, decreasing inappropriate behaviors, or widening the exhibited range of behaviors. Further research is needed to determine the exact nature of their contribution and the components critical to their efficacy.

Use of Social Stories™ in Preschool-Aged Children

Thompson and Johnston (2013) used a multiple baseline across participants design to evaluate the effects of Social Stories™ so as to help preschool-aged children with the characteristics of ASD increase their engagement in functional behaviors and use sensory integrative-based strategies to promote self-regulation. The intervention package included reading individualized Social Stories™ that discussed desired behaviors, while self-regulation strategies increased the frequency of desired behaviors for all participants. The use of self-regulation strategies varied across participants. These findings suggest that the intervention was successful in increasing the desired behaviors.

An adapted alternating treatments design was used to compare mother-developed and delivered Social Stories™ and video modeling in teaching social skills to children with ASD (Acar, Tekin-Iftar, & Yikmis, 2016). Three other-child dyads participated in the study. Results showed that mothers could develop Social Stories™ and video images with 100% accuracy and implement them with high treatment integrity.

These studies showed various new directions for using Social Stories™, especially with young children and within the mother-infant relationship, and proposed new intervention methods such as video monitoring.

Brain Functions and Social Skills

Social skills encompass a wide group of abilities that facilitate interactions and communications with others. From infancy to childhood, humans acquire several social skills, such as the detection of biological motion, sensitivity to eye-like stimulus, joint attention, and social perspective taking, to solve social situations by predicting and understanding others' intentions, emotions, and behaviors. Brain regions that are involved in social cognition are collectively referred to as the social brain (Blakemore, 2008), and several brain regions in the social brain undergo structural and functional changes during development. However, the linkages between social skills and neural mechanisms and their implications for social deficits in ASD are still elusive. Here, we will first review the linkages between social skills and neural mechanisms in neurotypical children. Then, we will describe how abnormalities in the social brain network affect social deficits in children with ASD.

Neural Correlates of the Social Skills in Neurotypical Children

There are several techniques to assess functions in the human brain. Electroencephalography (EEG) is a noninvasive technique that records electrical brain activity from scalp electrodes (DeBoer, Scott, & Nelson, 2007). EEG may be suitable for measuring brain activity in infants and children, because, for other techniques such as magnetoencephalography (MEG), magnetic resonance imaging (MRI), and functional MRI (fMRI), children must fix their head during recordings.

The analyses of EEG signals indicate two types of neural activity. One is the response evoked by stimuli or events. Such response is called event-related potential (ERP). ERPs are calculated from the average of several trials with the purpose of eliminating noises related to the stimulus of interest. Thus, this method provides information regarding brain waves that are phase-locked to the stimulus presentation (i.e., event). Another method is the analysis of oscillatory brain activity. In this case, brain activity is not necessarily phase-locked to the event. This method therefore allows us to investigate spontaneous brain activity, i.e., brain activity not related to a specific task. Here, we will first review the evidence from EEG (i.e., ERP and oscillatory brain activity) and then review evidence from neuroimaging (i.e., MRI and fMRI).

EEG Evidence of Social Skills

Several ERP components are implicated in social cognitive skills. For example, the P1, which is also known as P100, is a positive-going deflection component that arises between 90 and 150 ms after visual stimulus onset (Luyster, Powell, Tager-Flusberg, & Nelson, 2014). Since P1 is evoked by visual stimulus, this component is observed in the occipital visual cortex. In infants and young children, the amplitude of the P1 component increases between 6 and 36 months of age (Luyster et al., 2014). In contrast, the amplitude of P1 decreases as age increases from 2 to 4 years (Itier & Taylor, 2004; Kuefner, de Heering, Jacques, Palmero-Soler, & Rossion, 2010), likely reflecting synaptic pruning. In line with this notion, Hileman, Henderson, Mundy, Newell, and Jaime (2011) revealed that the P1 component elicited by human faces exhibited a decrease in its amplitude and latency between 9 and 17 years of age. Furthermore, they observed that neurotypical children and young adolescents exhibited larger P1 amplitudes for inverted faces when compared to upright faces, suggesting that a decrease of P1 amplitude along with increasing age might be associated with improvement of social cognitive skills such as facial recognition.

Another important ERP component is N170. This component is a negative-going deflection that occurs approximately 170 ms after visual stimulus presentation (Eimer, 2000; Hileman et al., 2011) and is observed over posterior temporal sites. This component exhibits a shorter latency and larger amplitude for faces compared to other stimuli (de Haan, Pascalis, & Johnson, 2002; Hileman et al., 2011), indicating that the N170 might be associated with face-specific processing. While both the P1 and N170 components seem to be indicative of early face processing, it has been hypothesized that the P1 component reflects holistic face processing, while the N170 component reflects early structural encoding of a face (Cassia, Kuefner, Westerlund, & Nelson, 2006).

The P1 and N170 components are categorized as early ERP components that usually occur during the first 200 ms after the stimulus presentation. The Nc component is a late ERP component that occurs 200 ms after the stimulus presentation, and it exhibits a peak latency decreasing from 800 ms in 1 month old (Karrer & Monti, 1995) to 400–600 ms in 1–3 year olds (Goldman, Shapiro, & Nelson, 2004; Parker & Nelson, 2005). The peak amplitude of this component increases with age over the first year of life and then decreases again in the third year of life (Luyster et al., 2014; Parker & Nelson, 2005). This component is elicited in several different studies (Courchesne, Ganz, & Norcia, 1981; Striano, Reid, & Hoehl, 2006). Furthermore, Striano et al. (2006) observed that, in infants, the Nc component exhibited higher amplitude during the joint attention condition than in the non-joint attention condition. Therefore, the Nc component may be associated with mandatory attentional processing to a visual stimulus, but not specific to faces (Luyster et al., 2014).

In addition to ERPs, several lines of evidence imply that oscillatory brain activity participates significantly in social functioning. The extracranial EEG signals reflect the neuronal population activity and can be decomposed into different frequency ranges: delta (~2–4 Hz), theta (~4–8 Hz), alpha (~8–12 Hz), beta (~12–30 Hz), and gamma frequencies (~30–100 Hz) (Donner & Siegel, 2011).

The mu rhythm occurs in the alpha range between 8 and 12 Hz, and this rhythm has been implicated in social skills. The mu suppression occurs not only during movement execution and planning but also motor imitation and observation of others' goal-directed movement (Raymaekers, Wiersema, & Roeyers, 2009).

These findings suggest that the mu suppression can reflect a putative activity of the mirror neuron system (Rizzolatti & Sinigaglia, 2010). In addition, di Pellegrino, Fadiga, Fogassi, Gallese, and Rizzolatti (1992) discovered mirror neurons in the monkey premotor cortex. These neurons in the rostral part of the inferior premotor cortex in the monkey brain discharge during goal-directed hand movements such as grasping, holding, and tearing. Furthermore, several studies using fMRI or EEG reported evidence of the mirror neuron activity in the human brain (Iacoboni & Dapretto, 2006). However, the neural mechanism connecting mu suppression with mirror neurons is still unknown. In addition, only a few studies have investigated the mu rhythm in children (Lepage & Theoret, 2006; Oberman et al., 2013). Further studies are needed to elucidate the linkages between mu suppressions elicited by observing others' goal-directed movement and the mirror neuron system.

Neuroimaging Evidence of Social Skills

In recent years, a number of studies have investigated social skills using MRI and fMRI. Mills, Lalonde, Clasen, Giedd, and Blakemore (2014) have investigated structural trajectories of gray matter volume, cortical thickness, and surface area in a longitudinal sample of 288 participants (age: 7–30 years, 857 total scans). Specifically, they focused on trajectories of brain regions involved in the social brain (Blakemore, 2008): medial prefrontal cortex (mPFC), temporoparietal junction (TPJ), posterior superior temporal sulcus (pSTS), and anterior temporal cortex (ATC). The analyses of structural MRI data revealed that gray matter volume and cortical thickness in mPFC, TPJ, and pSTS decreased from childhood into the early twenties. These changes in brain and development can reflect the cortical specialization of the pre-existing cerebral structures and networks as a result of the expertise associated with exposure to social environment (Davidson & McEwen, 2012).

For fMRI evidence, Dapretto et al. (2006) observed that, in children from around 10 to 14 years old, the brain regions that were activated during the imitation of emotions were the bilateral striate and extra-striate cortices, primary motor and premotor regions, limbic structures (i.e., amygdala, ventral striatum, and insula), and the cerebellum. In addition, they found activation within the bilateral pars opercularis of the inferior frontal gyrus, with the strongest peaks in the right hemisphere. Although the number of fMRI studies in childhood is limited, these brain regions have been identified in adult humans (Buccino et al., 2001), suggesting a possible relationship among imitation and mirror neuron networks.

In addition, Saxe, Whitfield-Gabrieli, Scholz, and Pelphrey (2009) reported that, in children between 6 and 11 years of age, the bilateral TPJ were involved in perceiving and reasoning about other people. Interestingly, they found that only the right TPJ exhibited a significant correlation with age, suggesting a maturational selectivity for social information. In addition, they observed that brain regions that were involved in theory of mind processing did not overlap with brain regions dedicated to the perception of biological motion. Furthermore, the recruitment of the right pSTS was associated with the perception of biological motion, which is in line with previous findings on young adulthood (Pelphrey et al., 2003). These findings suggest that a theory of mind comprehension may rely on a distinct and later developed neural substrate.

Recently, Yang, Rosenblau, Keifer, and Pelphrey (2015) reviewed neural systems implicated in social perception, action observation, and theory of mind. Each neural system involves different brain regions: (1) a neural system for social perception involves fusiform gyrus (FG), amygdala, and orbitofrontal cortex, (2) a neural system for action observation involves inferior parietal lobule and inferior frontal gyrus (IFG), and (3) a neural network for theory of mind encompasses TPJ, mPFC, and posterior cingulate cortex (PCC). The authors then proposed an integrative model of social information processing and emphasized that the pSTS is the core brain region of the three neural systems underlying social information processing. Furthermore, they demonstrated that pSTS is functionally connected with all brain regions involved in the three neural systems (Yang et al., 2015), raising the possibility that functional connectivity between pSTS and other brain regions that are involved in social information processing could be a neuronal marker for estimating the development of social abilities.

Neural Correlates of Social Deficits in Children with ASD

ASD is an umbrella term for a wide variety of disorders that share common symptoms: (1) deficits in social interaction and social communication and (2) a restricted range of interests. These symptoms become evident after the third year of life. It is therefore necessary to establish reliable markers for this group of disorders, which would allow early diagnosis and more effective interventions. Here, we will first review the evidence from EEG and then review evidence from neuroimaging (i.e., MRI and fMRI) associated with social deficits in children with ASD.

EEG Evidence of Social Deficits

Multiple behavioral studies reported social deficits, including in the areas of face discrimination, recognition, and emotion perception, in children and adults with ASD (Boucher & Lewis, 1992; Liu, Li, & Yi, 2016), raising the possibility that aberrant neural activity during face processing in children with ASD could be a neural marker for deficits in social cognition. Dawson et al. (2002) demonstrated that, as evidenced by their P400 and Nc components, children with ASD did not differentiate between familiar and unfamiliar faces, although they did show differential response to unfamiliar objects compared to familiar ones. Furthermore, several studies reported alterations of early visual components related to face processing, such as the P1 and Nc components, in children with ASD (Baruth, Casanova, Sears, & Sokhadze, 2010; Hileman et al., 2011). Considering the amplitudes of these early components, Luyster et al. (2014) observed that, in autism, high-risk children between 6 and 36 months of age did not evidence a maturational alteration in P1, having similar mean amplitudes to children with low risk. However, they found between-group differences at later ages.

Another study also reported that children with ASD did not exhibit differential P1 amplitudes for upright and inverted faces (Hileman et al., 2011). It further observed that, while for neurotypical individuals, smaller P1 amplitudes were associated with fewer atypical social behaviors and better social cognitive skills, in individuals with ASD, there were no relations between the ERP components and atypical social behaviors and social cognition. These ERP differences might reflect a low specificity of neuronal and cognitive processes in children with ASD. To support this view, recent studies have reported aberrant functional organization in the ASD brain (Barttfeld et al., 2011). Further longitudinal studies are needed to elucidate the developmental trajectory of ERP components related to social deficits in individuals with ASD.

Neuroimaging Evidence of Social Skills

Using MRI and fMRI, several studies have reported morphological and functional abnormalities in children and adults with ASD (Abrams et al., 2013; Alaerts et al., 2015; Eyler, Pierce, & Courchesne, 2012; Philip et al., 2012; Wolff et al., 2015). As described in the previous section, brain regions that are involved in social cognition form a large-scale network known as the social brain (Blakemore, 2008). The pSTS, in particular, plays a central role in facilitating social information processing among different types of neural systems (i.e., social perception, action observation, and theory of mind) (Yang et al., 2015). The pSTS has been implicated in biological motion, eye gaze processing, face processing, and speech processing (Hein &

Knight, 2008; Redcay, 2008), which are acquired during infancy and early childhood (Courchesne et al., 1981; Jones & Klin, 2013). Thus, malfunction of the STS may underlie impaired social information processing, such as facial emotion recognition and affective prosody recognition, in individuals with ASD (Rosenblau, Kliemann, Dziobek, & Heekeren, 2016).

Interestingly, toddlers with ASD also failed to activate the left superior temporal gyrus (STG) in response to language (Eyler et al., 2012), while children with ASD failed to activate the bilateral STS in response to vocal sounds but exhibited a normal activation pattern in response to nonvocal sounds (Gervais et al., 2004). Furthermore, Alaerts et al. (2015) recently delineated developmental changes of functional connectivity between the pSTS and the other regions in the ASD brain using resting-state functional connectivity with a cross-sectional approach. In this study, individuals with ASD exhibited delayed maturation in functional connections between the pSTS and the neural system for action perception, while they also exhibited an atypical developmental trajectory in functional connections between the pSTS and neural system for social perception. These different developmental trajectories of distinct neural systems might reflect complex age-related changes in the social cognitive processes in the ASD brain. These insights will provide an opportunity to develop age-specific interventions in ASD.

Current Status and Future Directions

There has been extensive research on the early identification of ASD during the last two decades. Early detection and diagnosis are critical to the delivery of early intervention, which could positively impact both the developmental outcomes (directly) and the family outcome (indirectly) (Zwaigenbaum et al., 2007). Thus, developing effective approaches to the earliest possible diagnosis of ASD is necessary for the long-term effects and benefits of early intervention (Baranek, 1999).

There are screening measures and diagnostic measures in place in order to assess for children with ASD. Both kinds of measures are very important; however, each has a different role in assessment. The screening measures are never diagnostic, nor should they be used in place of a diagnostic evaluation. By the same token, the diagnosis evaluation measures are not used for screening.

Comprehensive support for children with ASD is important. In order to conduct this support, however, comprehensive assessment is necessary. Therefore, we have to engage in the assessment battery and ascertain the relation of the results of each assessment. For children with suspected ASD, we must carry out specific assessment such as ADI-R and ADOS-2. Also, we must assess for the many aspects of ASD in children, with the cognitive functioning and development levels including cognitive function, communication skill, comorbid developmental disorders, comorbid psychiatric symptoms, adaptive behavior, and psychosocial and environmental assessment.

In this chapter, we also discussed formal assessment of ASD symptoms. However, formal assessments cannot cover all aspects, including behavior and cognition, for each child. Informal assessments include developmental history, medical history, educational history (such as school records), observation of behavior in unstructured settings, etc. The informal assessments provide a lot of valuable information about ASD zymology, as do the formal assessments. Therefore, both formal assessments and informal assessments are necessary.

In the light of recent research on motor function, it could be concluded that children with ASD show a bias toward proprioceptive-based learning. Consequently, children with ASD are strongly associated with irregular patterns of motor function (Mache & Todd, 2016; McCleery et al., 2013). The neural mechanism that underlies the atypical development of motor skills (basic motor skill, dyspraxia, imitation, etc.) in children with ASD might be directly relevant to the neural basis of atypical development of social and communicative skills (Mostofsky, 2013).

Body awareness develops through proprioceptive, vestibular, and tactile senses. These sensory dimensions are essential for the development of motor control, posture, balance, spatial aptitude, and spatial perception (Baranek et al., 2006; Minshew et al., 2004). Spatial perception is fundamental for the development of basic grammar and language, sense of personal space, and social dimensions (proxemics). Self-awareness is a part of body image, and self-consciousness is said to be related more to language and communication. Body image develops through explicit mental representations of bodily functions and experiences in the central nervous system. Vertical, horizontal, and rotational space and movement inside (proprioceptive) and outside (spatial, physical, and social) world experiences help children to develop functional sensory and motor control. Sensorimotor-dominated movement interventions in combination with social-interactional therapeutic approaches should be included in the early intervention system for children at risk of ASD as "early" as possible. Early intervention programs should be achieved through individualized family support, parent education, and conjoint family approaches guided by professionals.

With respect to the effect of treatment in the inclusive classroom, various types of coordination between university and inclusive school settings, emotion regulation, and Social Stories™ are noteworthy. However, several rigorous lines of research, randomized clinical trials (RCTs), and definition of a particular disorder, along with patient samples, treatment manuals, and systematic reviews must be necessary in future treatment trials.

As for neural correlates of social skills in neurotypical children with ASD, previous behavioral, electrophysiological, and neuroimaging studies have provided the linkages between social deficits and neuronal alterations. Recent advances in machine learning techniques provide powerful tools to identify neuronal markers for ASD (Yahata et al., 2016). However, reliable neural and behavioral markers for early diagnosis are not yet established. Since the STS is implicated in several social skills, such as biological motion, face processing, and speech processing, it might be possible that the STS and its functional connectivity to other brain regions implicated in social cognition could be a predictor for maturation of social skills in children with and without ASD.

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Intellectual Disability and Social Skills

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Introduction

Intellectual disability, or mental retardation, refers to impairment of cognitive and adaptive behavioral functioning that negatively affects development and learning (National Center on Birth Defects and Developmental Disabilities, 2016). Cognitive impairments include subaverage intellectual ability, deficit knowledge base, and various attentional and memory problems (Kirk, Gray, Riby, & Cornish, 2015; O'Reilly & Carr, 2016). Adaptive functioning impairments include skill deficits and excess [problem] behavior (Lovaas, 2003). Skill deficits can occur across a number of areas or domains, such as the self-care, communication, leisure/recreation, and social skills domains. Excess behaviors (e.g., hyper-sociability, inappropriate hugging/touching, stereotyped movements, self-injury, aggression, and tantrums) are more frequent, severe, and persistent among children with intellectual disability than children without disabilities (Hoch et al., 2016; Sturmey & Didden, 2014; Wilde, Mitchell, & Oliver, 2016).

Intellectual disability is often suspected when the child shows delays in the acquisition of important developmental milestones, such as speech, socialization, peer interaction, and play skills. Delays are also often evident in the acquisition of self-care skills, such as feeding, dressing, and toileting (Patel, Greydanus, Merrick, & Rubin, 2016). At school, children with intellectual disability generally learn more slowly than typically developing peers and consequently learn less and achieve a lower overall level of academic proficiency (Nettelbeck & Wilson, 1997). However, despite their intellectual impairment and adaptive behavior deficits, children with intellectual disability can learn to function more effectively and participate more actively in society (Wehmeyer, Lee, & Shogren, 2016). To this end, the acquisition of appropriate social skills is critically important to effective functioning and participation in home, school, and community environments (Wilkins & Matson, 2007). Important clinical questions include how to assess and teach social skills to children with intellectual disability.

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Aim of This Chapter

The aim of this chapter is to attempt to address these questions by reviewing social skills assessments and interventions for children with intellectual disability. Improving the social behavior and social skills of children with intellectual disability represents a major treatment priority because impaired social functioning is one type of adaptive behavior deficit that is commonly observed in such children (Wilkins & Matson, 2007). Indeed, the presence of impaired social skills and related adaptive behavior deficits constitute a defining characteristic of intellectual disability (Schalock et al., 2010). In this chapter we review procedures for assessing social skills of children with intellectual disability. This is followed by a review of evidence-based interventions for addressing the social skill deficits and excess behavior of children with intellectual disability. Before reviewing assessment and intervention procedures, however, we provide background information on the definition, diagnosis, prevalence, and classification of intellectual disability.

Definition and Diagnosis of Intellectual Disability

Intellectual disability is characterized by significant limitations in cognitive ability and deficits in adaptive behavior functioning (Schalock et al., 2010). Intellectual and adaptive behavior impairments are core features of the definition of intellectual disability formulated by the American Association on Intellectual and Developmental Disabilities (AAIDD; Schalock et al., 2010). AAIDD's definition is largely consistent with other diagnostic manuals, specifically: (a) *The International Classification of Diseases, 10th edition* (ICD-10; World Health Organization, 2001) and (b) the fifth edition of the *Diagnostic and Statistical Manual of the Mental Disorders* (DSM-5; American Psychiatric Association, 2013). Carr and O'Reilly (2016) compared these three diagnostic systems and noted several differences in their respective terminology and emphases. Still, all three diagnostic systems list three main criteria for a diagnosis of intellectual disability. These criteria are (a) significantly subaverage intellectual functioning, (b) substantial deficits in adaptive behavior functioning, and (c) symptom manifestation during the developmental period. The developmental period is generally taken to mean the period prior to reaching adulthood (i.e., 0–18 years of age). The latter criterion makes it clear that intellectual disability is a type of developmental disability along with autism spectrum disorder and cerebral palsy (Center for Disease Control and Prevention, 2015).

Significant Limitations in Intellectual Functioning

The nature of human intelligence has been hotly debated, and there is considerable argument over its conceptualization, definition, and measurement (Fraser, 1995; Herrnstein & Murray, 1994; O'Reilly & Carr, 2016). While the nature of intelligence is controversial, there are clearly individuals whose intellectual functioning falls below the range considered typical or average (Nouwens, Lucas, Embregts, & van Nieuwenhuizen, 2017). If the level of intellectual functioning is significantly subaverage, then the individual would meet one of the criteria for a diagnosis of intellectual disability. Given that IQ is a strong predictor of academic achievement (Stetson & Stetson, 2001), it is important to identify individuals with low IQ so that remedial and specialized educational services can be initiated. Ideally these services would be provided in the mainstream classroom so as to promote social inclusion (Wehmeyer et al., 2016).

The latest (i.e., 11th) edition of AAIDD's diagnostic manual described intellectual functioning as a general mental capacity that affects learning, problem solving, and reasoning (Schalock et al., 2010). Intellectual functioning can be reasonably measured using standardized and individually administered intelligence (i.e., IQ) tests (Tylenda, Beckett, & Barrett, 2007). Significantly subaverage intellectual functioning based on intelligence testing is typically defined as an IQ score that falls two standard deviations or more below the mean (Carr & O'Reilly, 2016). Most intelligence tests are constructed with a mean of 100 and a standard deviation of 15 or 16. This means that the cutoff score for a possible diagnosis of intellectual disability is approximately 70–75 (Schalock et al., 2010). This five-point range allows for measurement error and acknowledges that the diagnosis of intellectual disability is not exclusively based on IQ scores but also requires concurrent deficits in adaptive behavior functioning (Carr & O'Reilly, 2016; Schalock et al., 2010).

A number of IQ tests can be used to assess intellectual functioning, and several recent reviews on the use of IQ tests in the diagnosis of intellectual disability are available (Carr & O'Reilly, 2016; Tylenda et al., 2007). With respect to making a diagnosis of intellectual disability, the main purpose of IQ testing is to determine whether or not the child's level or degree of intellectual functioning is significantly subaverage. As mentioned before, significantly subaverage means an IQ score that is below 70 or 75. To ensure the reliable and valid assessment, the IQ test must be appropriate for the child's age, culture, and abilities. In some cases, specialized IQ tests may be required. For example, children with delayed speech and language development may be more appropriately assessed using an IQ test that places less reliance on verbal responding, such as the *Test of Nonverbal Intelligence* (TONI-4; Brown, Sherbenou, & Johnsen, 2010).

It is sometimes the case that a child will score low on an IQ test and struggle academically but show few if any problems in everyday living. Reading might be a problem for the child but not dressing, feeding, and toileting. The child might struggle with arithmetic but have no trouble socializing with others, making friends, and playing appropriately with peers. In the past, such children were often labeled mentally retarded based on low IQ alone. These so-called 6-h retarded children (President's Committee on Mental Retardation, 1969) would not be labeled today because they would not meet the second major criterion for a diagnosis of intellectual disability, that is, significant deficits in adaptive behavior functioning.

Deficits in Adaptive Behavior Functioning

Although perhaps less controversial than debates surrounding the nature of intelligence, the definition, conceptualization, and measurement of adaptive behavior have proven to be somewhat contentious and rather complex (MacLean, Miller, & Bartsch, 2001; Staddon, 2016). Thus, deciding if a child does or does not meet the second major criterion for a diagnosis of intellectual disability (i.e., significant deficits in adaptive behavior functioning) is by no means a straightforward process. Despite some contention and complexity, the concept of adaptive behavior functioning is now a key component in how intellectual disability is "…understood, diagnosed, classified, and approached from an intervention perspective" (Buntinx, 2016, p. 107). Partly in response to a growing recognition that low IQ did not necessarily indicate presence of a disability, Heber (1959) argued for consideration of adaptive behavior functioning in the definition and diagnosis of intellectual disability. Since then a considerable amount of progress has been made with respect to refining the definition, conceptualization, and measurement of adaptive behavior functioning (Dixon, 2007).

Reflecting this progress, contemporary definitions and conceptualizations of adaptive behavior focus on the extent to which the individual has acquired the skills that are needed to cope with the demands of everyday living. The AAIDD (2013), for example, defined adaptive behavior functioning as "…the collection of conceptual, social, and practical skills that are learned and performed by people in their everyday lives" (para. 3). Conceptual skills refer to abilities related to self-direction, language, literacy, and numeracy. Social skills focus on interpersonal interaction and social responsibility, such as appropriate rule following, social problem solving, and maintaining a healthy degree of self-esteem. The extent to which the person is gullible and can avoid victimization is also an important aspect of adaptive behavior functioning. Practical skills cover self-care and daily living skills (washing, feeding, dressing, toileting, cleaning, and meal preparation), as well as community access and occupational skills, such as getting to and from school, following schedules and routines, and using everyday appliances and technology (e.g., the toaster and telephone). Additional examples of conceptual, social, and practical skills are listed in the DSM-5 (American Psychiatric Association, 2013, p. 37).

In addition to the conceptual, social, and practical taxonomy described above, adaptive skills have been arranged into a number of different conceptual schemes, areas, or domains. Sparrow, Cicchetti, and Sauinier (2016), for example, classified adaptive behavior functioning into five major domains: (a) communication, (b) daily living, (c) social skills and relationships, (d) physical activity, and (e) problem behavior. Each of these domains is then further divided into two or three sub-domains. The social skills and relationships domain, for example, comprises three subdomains (e.g., relating to others, playing and using leisure time, and adapting). Each subdomain, in turn, presents a series of specific age-graded skills. Adapting, for example, references skills such as (a) seeks comfort from a loved one when hurt or upset, (b) remembers to say please when asking for something, and (c) is willing to compromise to get along with others of his/her age. Bruininks, Woodcock, Weatherman, and Hill (1996) similarly grouped adaptive skills into a number of more specific domains, specifically: (a) gross motor, (b) fine motor, (c) social interaction, (d) language comprehension, (e) language expression, (f) eating and meal preparation, (g) toileting, (h) dressing, (i) personal self-care, (j) domestic skills, (k) time and punctuality, (l) money and value, (m) work skills, (n) home/community orientation, and (o) problem behavior. Regardless of how adaptive skills are categorized or classified, it is generally the case that the person must show substantial deficits in more than one area of adaptive behavior functioning. For example, the person would have to show deficits in their conceptual, social, and practical skills or, if using Sparrow et al.'s (2016) categories, across the communication, daily living, social skills and relationships, and physical activity domains.

Assessment of adaptive behavior functioning, in general, and social skills, in particular, are covered in more detail later in this chapter. For now it is important to note that any assessment of adaptive behavior functioning needs to consider the individual's age and sociocultural background. The environmental context (e.g., home, school, or community) and level of independence with which the individual is expected to function in those environments must also be considered (Cory, Dattilo, & Williams, 2006; Embregts, 2002). Wilkins and Matson (2007) noted that while [social] skill deficits are prevalent among individuals with intellectual disability, their deficits can result from several sources, such as "… lack of opportunity, knowledge, practice, feedback, and/or reinforcement" (p. 321). Identifying the source(s) of adaptive behavior deficits may assist in designing effective interventions to promote the conceptual, social, and practical skills that the person will need to cope with the demands of everyday living.

Prevalence

A meta-analytic review of 52 studies on the prevalence of intellectual disability (Maulik, Mascarenhas, Mathers, Dua, & Saxena, 2011) found an overall prevalence of 1% (i.e., 10.37 persons for every 1000 population). This 1% prevalence figure is consistent with the results of another systematic review of 18 prevalence studies (McKenzie, Milton, Smith, & Ouellette-Kuntz, 2016). However, it is important to note that Maulik et al. (2011) also found that estimates of prevalence varied depending on the location and nature of the sample population (e.g., western versus developing countries, rural versus urban, low versus high SES, and children versus adults). Prevalence estimates also varied depending on the diagnostic system that was applied (e.g., ICD-10 versus DSM-V) and type of study design (e.g., cohort versus cross-sectional).

With an overall prevalence estimate of approximately 1%, intellectual disability is nearly as common as autism spectrum disorder (ASD;

Centers for Disease Control and Prevention, 2016) and much more common than cerebral palsy (Maenner et al., 2016). However, it is important to note that many individuals with ASD and cerebral palsy also meet the diagnostic criteria for intellectual disability. Indeed, based on a review on the relation between ASD and intellectual disability, Matson and Shoemaker (2009) concluded that intellectual disability is "perhaps the most common co-occurring disorder with ASD…" (p. 1111).

This is significant because impairment of social interaction is a defining characteristic of ASD (American Psychiatric Association, 2013). Individuals with ASD and intellectual disability are therefore highly likely to experience significant social interaction problems and numerous social skill deficits. Children with cerebral palsy and intellectual disability are also likely to be assessed as having impaired social functioning, particularly if their motor impairments interfere with social interaction and the expression of social skills (Tan et al., 2016).

Classification

Intellectual disability has been classified in terms of (a) severity, (b) etiology, and (c) the levels of required support (Carr & O'Reilly, 2016; Schalock et al., 2010). These three approaches to classification are neither exhaustive nor mutually exclusive. Each can be helpful for a range of purposes, such as prevention, family planning, selecting appropriate assessments and interventions, and service delivery. Assessing a child's degree or severity of intellectual disability, for example, can assist in curriculum development, whereas etiological knowledge is relevant to prevention and family planning.

Severity

Intellectual disability has often been classified on the basis of IQ score (American Psychiatric Association, 2000). More recently, the determination of the severity includes consideration of the child's adaptive behavior functioning across the conceptual, social, and practical domains (American Psychiatric Association, 2013). In either case, four categories of severity have been delineated: (a) mild, (b) moderate, (c) severe, and (d) profound. These four levels of severity are used in both the ICD-10 (World Health Organization, 2001) and the DSM-5 (American Psychiatric Association, 2013) but are not part of AAIDD's classification system (Schalock et al., 2010).

Mild intellectual disability. Mild intellectual disability is associated with IQ scores ranging from 50–55 to approximately 70. While considered mild in terms of intellectual disability, this range of IQ scores is considered significantly subaverage, and children in this range are likely to make relatively slower academic progress and reach lower levels of academic proficiency than peers. However, the extent of academic achievement and development of adaptive skills will also depend on the quality of their educational experience. During early development and the preschool years, delays in reaching developmental milestones will occur, but these may be subtle and less apparent than for children with moderate and severe/profound intellectual disability (MacLean et al., 2001). Indeed, many cases of mild intellectual disability go undetected until the child enters school and begins to fail academically. Most children with mild intellectual disability can be expected to develop the speech and language skills that are foundational for many important social interactions, such as initiating and maintaining topical conversations and asking questions (Wilkins & Matson, 2007). Despite often having this foundation, Giuliani and El Korh (2016) delineated a number of more advanced social skills that appear to be problematic for individuals with mild intellectual disabilities. Their list included (a) assertiveness (e.g., refusing non-preferred activities), (b) knowing when and how to apologize, (c) sharing activities and materials, (d) recognizing and using humor and irony, and (e) responding to criticism.

Moderate intellectual disability. Moderate intellectual disability is associated with IQ scores that range from 34–40 to 50–55. An individual with an IQ score of 50 or 55 could be classified as having mild or moderate intellectual disability depending on the extent of his or her adaptive behavior deficits. Generally, children with moderate intellectual disability will be identified prior to entering school due to more obvious delays in reaching developmental milestones. At school these children may require an adapted educational curriculum that includes instruction on a range of functional, rather than purely academic, skills (Wehmeyer et al., 2016). Although individuals with moderate intellectual disabilities can be expected to acquire good speech and language skills (Sigafoos, O'Reilly, Lancioni, & Green, 2016), they are still likely to show a number of social skill deficits. For example, they may have difficulty making decisions, perceiving and interpreting others' speech and gestures, listening to others without interrupting, acquiring social etiquette (e.g., saying please and thank you), and detecting social cues (American Psychiatric Association, 2013; Giuliani & El Korh, 2016).

Severe and profound intellectual disability. Severe intellectual disability is associated with IQ scores of 20–25 to 35–40. Profound intellectual disability is associated with IQ scores below 20 or 25 (American Psychiatric Association, 2013). Cases of severe or profound intellectual disability can usually be identified within the first few months of life due to known etiology and significant developmental delay. Individuals with severe and profound intellectual disability also frequently present with additional impairments (e.g., physical, hearing, and vision impairment) and chronic medical problems (e.g., seizure disorder). These children often need an alternative curriculum (Wehmeyer et al., 2016) concentrating on developing age-appropriate leisure and self-care skills (e.g., feeding, dressing, toileting, playing with toys, self-help skills), increasing community access, promoting social participation, and enabling functional communication (e.g., requesting preferred objects and activities, rejecting non-preferred objects, labeling objects). Because most individuals with severe and profound intellectual disability fail to acquire any significant amount of speech and language (Sigafoos et al., 2016), alternative methods of communication (e.g., picture-based communication, manual signing, and/or speech-generating devices) are usually indicated (Beukelman & Mirenda, 2013). The social skills of children with severe or profound intellectual disability can be extremely rudimentary. They may indicate happiness and awareness of others through nonsymbolic means (e.g., facial expressions and body movements) but show deficits in making eye contact and being able to show a range of emotions, seek comfort, or show affection, at least in any conventional way (Calculator, 2015).

Etiology

The many and varied causes of intellectual disability include injury, illness, infections, genetic mutations, and environmental deprivation. Maulik and Harbour (2010) classified causes of intellectual disability into prenatal and postnatal factors. Prenatal factors included (a) genetic mutations/syndromes (e.g., Angelman syndrome, Fragile X syndrome), (b) congenital malformations (e.g., microcephaly), (c) maternal illness or infections during pregnancy (e.g., hepatitis, rubella, diabetes, cytomegalovirus, and toxoplasmosis), and (d) prenatal exposure to toxins (e.g., alcohol and radiation). Postnatal factors include (a) childhood illness and infections, (b) malnutrition, (c) trauma/physical abuse, and (d) environmental deprivation (e.g., unresponsive parenting, lack of environmental stimulation, and limited educational opportunities). These different classes of causes are not necessarily mutually exclusive. For example, genetic mutations can cause metabolic disorders, such as phenylketonuria or congenital hyperthyroidism. These metabolic disorders can, in turn, cause developmental delays or intellectual disability under certain environmental conditions, such as if the child's diet is high in phenylalanine or if the child fails to receive proper thyroid treatment soon after birth (Blau, 2016; Lain et al., 2016).

It is important to note that in many cases, the cause of a child's intellectual disability may remain unknown. Indeed, Maulik and Harbour (2010) suggested that etiology may remain unknown in up to 50% of cases. The percentage of cases with an unknown etiology does, however, seem to vary in relation to the degree or severity of intellectual disability. Harris (2005) estimated that while etiology is known in most (75%) cases of moderate to profound intellectual disability, it is likely to be known in only about 40% of cases of mild intellectual disability. Of course, these percentages are likely to change with the expected advances in genetic and biomedical research, leaving fewer cases with unknown etiology.

Etiology may have important implications for understanding children's social skill deficits and excesses, which could in turn inform the selection of assessment and intervention procedures. For example, certain genetic syndromes appear to be associated with specific cognitive and behavioral characteristics or behavioral phenotypes (Dykens, 1995; Kuczynski & Udwin, 2016). Children with Angelman syndrome, for example, often show intense social excitability that could be inappropriate and excessive in some contexts (Kuczynski & Udwin, 2016). Assessments that can capture and rate social excitability under different conditions and interventions, aimed at teaching such children to modulate the intensity of their social reaction across different environments, might therefore be indicated. In contrast, children with Fragile X syndrome tend toward social avoidance (Kuczynski & Udwin, 2016) and may therefore require assessment approaches that can reliably detect and/or rate social avoidance. Should the child's degree or extent of social avoidance prove problematic, then an intervention to increase specific social approach skills (e.g., orienting to social partners and making eye contact) and decrease social avoidance might be indicated.

In addition to phenotypic social reactivity and skill profiles, Wilde et al. (2016) provided data suggestive of syndrome-specific differences in social motivation. Their data came from structured observations of attention-seeking behavior (e.g., looking at, approaching, reaching for, and/or touching an adult) in 21 children with Smith-Magenis syndrome and 19 children with Down syndrome. Children were observed with a familiar and unfamiliar adult and under conditions of high versus low levels of attention. Compared to the children with Down syndrome, children with Smith-Magenis syndrome showed a preference for the familiar adult and showed more attention-seeking behavior under the low-attention condition. These results suggest syndrome-specific differences in social motivation and a possible need for differing levels and types of support to develop appropriate attention-seeking in these two groups of children.

Levels of Required Support

The AAIDD developed a classification system based on the types and amounts of supports required by the individual (Schalock et al., 2010). The four resulting levels or categories of support are (a) intermittent, (b) limited, (c) extensive, and (d) pervasive. These categories represent a continuum ranging from brief periods of targeted intervention (Intermittent) to constant, ongoing, and life-sustaining assistance (pervasive support) across all areas of functioning (Carr & O'Reilly, 2016). An example of intermittent supports might be a child who requires some help reconnecting with classmates after the summer holidays. Limited supports encompass situations where a child needs some consistent support in order to learn expected social skills but might only need that support when entering new environments, such as when transitioning from primary school to middle school. Extensive supports occur regularly and over the long term, such as ongoing support to ensure a child continues to make academic progress and maintains positive peer relations over the school years. However, with effective extensive support, it is often the case that the child will learn the required skills and become more independent over time. Pervasive supports are those that are required every day and throughout the person's life, such as for a person who requires complete assistance with dressing, feeding, and toileting and who is unlikely to become independent at such tasks.

It is important to note that a person's assessed level of support does not necessarily or consistently correspond to severity of intellectual disability. Instead, the level of required support could be expected to reflect the perceived range of needs at the time of the assessment, which may change over time (Harris, 2005). For example, a child with moderate intellectual disability might require a 20-h structured intervention (extensive support) to overcome a specific social skill deficit (e.g., lack of ability to effectively enter a peer group). After learning this skill, however, the child might then only require intermittent supports in order to successfully maintain that newly acquired social skill.

This system of classification represents a social-ecological model in which intellectual disability is conceptualized as a state of functioning, rather than as an inherent trait (Parmenter, 2011; Shogren et al., 2016). However, from a practical perspective, an important issue is the extent to which a child's level of required support for different environments and/or domains of functioning (e.g., home and school environmental and self-care and social skills functioning) can be identified. Toward this end, Shogren et al. (2016) developed the *Supports Intensity Scale-Children's Version* (SIS-C) to assess level of required support in 5- to 16-year-old children with developmental disabilities. The scale is administered by interviewing respondents who know the child well. During the interview, respondents are asked to provide information regarding the child's medical and behavioral support needs and indicate the type, frequency, and amount of time needed to support the child in participating in a range of home, community, school, health, and social activities. The social domain, for example, consists of nine items rated on a five-point scale (e.g., maintaining a conversation, coping with changes in routines, and transitioning across social situations). Shogren et al. (2016) evaluated the psychometric properties of the SIS-C from data obtained on 2124 children with autism and intellectual disability and 1861 children with intellectual disability only. Their results indicated that the SIS-C was reliable and valid for classification based on levels of required support. These positive psychometric properties suggest the SIS-C could be used for identifying the nature and type of required supports.

Assessment of Adaptive Behavior Functioning and Social Skills

A considerable amount of research has focused on developing reliable and valid approaches for assessing adaptive behavior, including the adaptive social skills, of children with intellectual disabilities (Matson, 2007). Reliable and valid measures of adaptive behavior are needed for a variety of purposes, including (a) diagnosis and classification, (b) studies of behavioral phenotypes, and (c) intervention planning and evaluation.

Ensuring a fit-for-purpose assessment of adaptive behavior requires consideration of a number of factors, such as the child's age, environmental demands, degree and types of disability, and, of course, the intended purpose of the assessment. For example, an assessment of a child's overall level of general adaptive behavior functioning might be sufficient for diagnostic and classification purposes but would be less useful for comprehensively identifying specific social skill deficits and excesses that could then form the basis for a social skill intervention curriculum. For example, the adaptive social skills of a 7-year-old child with moderate to severe intellectual disability and motor impairment may need to be assessed to identify whether the child can effectively recruit the attention of caregivers and, if so, how the child does that. In contrast, a useful assessment for a 9-year-old child with mild intellectual disabilities who is being socially rejected by peers might be one that explicitly focuses on identifying the social skills that would promote positive peer interactions.

Research into the assessment of individuals with intellectual disability (Matson, 2007) has led to the development of several rating scales that can provide a reliable and valid assessment of the social skill deficits and excesses of children with intellectual disabilities. Existing rating scales can be divided into those that provide a general assessment of adaptive behavior functioning across a number of domains (e.g., communication, self-care, motor, social, and community living) and those that focus more explicitly on the social skills domain (e.g., starting conversations, making friends, receiving criticism calmly, express feelings in appropriate ways).

Despite the differing emphases, both types of rating scales generally share a common approach to the collection of assessment data. That is, the assessment process involves interviewing third-party informants (parents, teachers, and/or caregivers) who know the child well and who have observed the child across a number of environments and over a significant period of time (e.g., at least 3 months). Informants meeting these criteria can generally provide a reliable indication of the extent to which a child displays specific behaviors. Interviewing third-party informants using standardized rating scales is generally the most time- and resource-efficient approach to social skills assessment (Wilkins & Matson, 2007). Comprehensive adaptive behavior scales that could be used for diagnostic, classification, and intervention planning purposes include the *Vineland Adaptive Behavior Scales* (Sparrow et al., 2016), *Checklist of Adaptive Living Skills* (Bruininks & Moreau, 2004), *Scales of Independent Behavior-Revised* (Bruininks et al., 1996), and the *Diagnostic Adaptive Behavior Scale* (Tassé, Schalock, Balboni, Spreat, & Navas, 2016). Commonly used rating scales for identifying specific social skill deficits and excesses include the *Matson Evaluation of Social Skills for Youngsters* (Matson, Rotatori, & Helsel, 1983), the *Matson Evaluation of Social Skills for Individuals with Severe Retardation* (Matson, 1995), and the *Social Skills Improvement System* (Gresham & Elliott, 2008) .

Vineland Adaptive Behavior Scales—Third Edition (Sparrow et al., 2016). The Vineland Adaptive Behavior Scales is the most commonly used assessment of adaptive behavior functioning (Dixon, 2007). Now in its third edition (Vineland-3), the Vineland-3 can be used to assess adaptive behavior functioning of individuals from birth to 90 years of age with a range of disabilities, including intellectual disability, autism spectrum disorder, and attention deficit hyperactivity disorder (Sparrow et al., 2016). As noted in the previous section on *Deficits in Adaptive Behavior Functioning*, the Vineland-3 covers five major domains: (a) communication, (b) daily living, (c) social skills and relationships, (d) physical activity, and (e) problem behavior, each of which has two or three sub-domains. Each sub-domain consists of from 33 to 46 age-graded items, and each item is scored on a three-point scale (0 = never, 1 = sometimes, and 2 = usually or often). Examples of increasingly more advanced items in the relating to others sub-domain include (a) recognizing family members or other people he/she knows well, (b) using words to express his/her emotions, and (c) starting conversations with others by talking about things they are interested in. Standardized scores are calculated to compare a child's performance to established norms. The discrepancy between a child's scores and the norms, if any, provides an indication of the child's degree or severity of adaptive functioning impairment, which is important for diagnosis and classification. The assessment can also be used to identify intervention targets. That is, intervention could focus on teaching and/or increasing specific social skills that were rated as occurring only sometimes or never. Interventions might also be needed to address problem behaviors (e.g., avoids interacting with others, stubborn or argumentative) if these occur too often.

Checklist of Adaptive Living Skills. The Checklist of Adaptive Living Skills (CALS) is a criterion-referenced measure of adaptive living skills with direct implications for intervention planning (Bruininks & Moreau, 2004). The CALS may be used for determining the skills that an individual has mastered and those that he or she might need to acquire in order to effectively function within specific environments. It is aimed for use with individuals with and without intellectual disability. It is suitable from infancy to adulthood. The CALS canvasses approximately 800 specific adaptive behaviors covering four domains (i.e., personal living skills, home living skills, community living skills, and employment skills). Information from the CALS is intended to assist parents, teachers, and clinicians in identifying the person's instructional needs, formulating individual training objectives, and monitoring progress toward those objectives. To this end, each behavioral item in the CALS has a corresponding instructional unit (instructional activity) in a parallel intervention curriculum known as the Adaptive Living Skills Curriculum (ALSC; Bruininks, Moreau, Gilman, & Anderson, 2004).

Scales of Independent Behavior-Revised. The Scales of Independent Behavior-Revised (SIB-R) is described as a comprehensive assessment of adaptive and maladaptive behavior (Bruininks et al., 1996). It can be used from infancy to old age (80+ years). These scales assess a large number of specific responses across 12 domains (i.e., gross motor, fine motor, language, eating and meal preparation, toileting, dressing, personal self-care, domestic, time and punctuality, money management, work, and home and community). There is also a section assessing the frequency and severity of eight types of problem behavior (e.g., hurtful to self, hurtful to others, and socially offensive behavior). As with the Vineland-3, the SIB-R is comprehensive and norm-referenced and could be used for diagnostic and classification purposes. The SIB-R includes items referencing basic and advanced social skills (e.g., turns head toward speaker when name is called, takes appropriate-sized portions from serving dishes, and touching others too much). It would therefore seem to be a useful tool for identifying specific objectives for beginning a social skills training program with individuals with mild to severe/profound intellectual disability.

Diagnostic Adaptive Behavior Scale. The Diagnostic Adaptive Behavior Scale (DABS) is a relatively new measure for assessing adaptive behavior functioning in individuals from 4 to 21 years of age. It is primarily intended for "… determining a diagnosis of intellectual disability" (Tassé et al., 2016, p. 80). The scale follows the conceptual model of adaptive behavior functioning delineated by the AAIDD. That is, functioning is conceptualized in terms of conceptual, social, and practical skills (Schalock et al., 2010). A useful feature of the scale with respect to social skills functioning is the inclusion of what might be seen as higher-level social skills, such as items that examine a person's degree of social responsibility, self-esteem, gullibility, and social problem-solving abilities. These skills can be particularly problematic for individuals with intellectual disability (Parmenter, 2011). Although research data is limited due to its newness, Tassé et al. (2016) reported strong reliability (i.e., test-retest and inter-rater) and convergent validity. DABS items also appear to be age-sensitive and seem to "maximally" differentiate between individuals with and without intellectual disability (Tassé et al., 2016, p. 86), which is arguably the most important consideration in a diagnostic assessment.

Matson Evaluation of Social Skills for Youngsters. The Matson Evaluation of Social Skills for Youngsters (MESSY) is intended to assess the degree of appropriate social behavior in children from 7 to 15 years of age (Matson et al., 1983). The scale consists of 64 items assessing a range of appropriate and problematic social behavior. Examples of the appropriate social behaviors in the scale include (a) makes others laugh, (b) helps a friend who is hurt, and (c) walks up and initiates conversations. Examples of problematic social behaviors include: (a) explains things more than necessary and (b) wants to get even with someone who hurt him/her. The MESSY includes a teacher-report form and a self-report form, but the latter form may not be appropriate for use by individuals with intellectual disabilities unless they have good comprehension skills and a sufficient degree of self-awareness. Scores on the MESSY were reported to be positively correlated with the results of teachers' ratings, with the children's popularity within the classroom, and with the children's ability to solve social dilemmas (Matson et al., 1983). MESSY scores are negatively correlated with symptoms of psychopathology such as anxiety and depression.

A factor analytic study (Méndez, Hidalgo, & Inglés, 2006) found that items in the MESSY formed four main domains: (a) aggressiveness/antisocial behavior, (b) social skills/assertiveness, (c) conceit/haughtiness, and (d) loneliness/social anxiety. The MESSY was recently renormed (MESSY-II; Matson et al., 2010), and research on the structure of this new scale with 886 typically developing children from 2 to 16 years of age found that scale items formed three factors: (a) hostile, (b) adaptive/appropriate, and (c) inappropriately assertive/overconfident (Matson, Neal, Worley, Kozlowski, & Fodstad, 2012). Matson et al. (2012) suggested that the MESSY-II could be used to identify a child's strengths and weaknesses with respect to social competence. They also suggested the scale could be administered repeatedly to monitor development and intervention effects.

Matson Evaluation of Social Skills for Individuals with Severe Retardation. The Matson Evaluation of Social Skills for Individuals with Severe Retardation (MESSIER) is intended for assessing individuals with severe and profound intellectual disability from childhood to adulthood (Matson, 1995; Wilkins & Matson, 2007). It has also been used to assess social skills in children with autism spectrum disorder (Matson, Hattier, & Turygin, 2012; Tureck & Matson, 2012). The scale contains 85 items derived mainly from the communication and socialization domains of an earlier edition of the Vineland Adaptive Behavior Scales (Sparrow, Balla, & Cicchetti, 1984) and from the MESSY (Matson et al., 1983). Additional items were nominated by experts (Wilkins & Matson, 2007). The areas of functioning assessed by the MESSIER are (a) positive nonverbal (e.g., discriminates between persons and addresses persons), (b) positive verbal (e.g., thanks others), (c) general positive (e.g., responds properly when meets others), (d) negative nonverbal (e.g., withdraws and isolates self), (e) negative verbal (e.g., makes awkward comments), and (f) general negative (e.g., has difficulties waiting to satisfy own needs). The MESSIER can be useful for identifying areas of relative strength and deficit in the social behavior of individuals with severe and profound intellectual disability who often have extremely limited social skills and who would therefore seem to require assessments that emphasize early and atypical social development.

The Social Skills Improvement System. The *Social Skills Improvement System* (SSIS; Gresham & Elliott, 2008) is a revised version of the Social Skills Rating System (SSRS-RS; Gresham & Elliott, 1990). It measures how often various types of social skills are exhibited by a child. A rating of the importance of each skill is also solicited from informants. Frequency is rated on a four-point scale (0 = never, 1 = seldom, 2 = often, and 3 = almost always). Importance is rated on a three-point scale (0 = not important, 1 = important, and 2 = critical). There are teacher, parent, and student versions covering ages 3–18 years. The scale consists of seven subscales: (a) communication (b) cooperation, (c) engagement, (d) assertion, (e) responsibility, (f) empathy, and (g) self-control. There are also five problem behavior sub-domains: (a) externalizing, (b) internalizing, (c) bullying, (d) hyperactivity/inattention, and (e) autism spectrum. Problem behavior items are also rated on a four-point frequency scale. The SSIS has been shown to reliably differentiate between typically developing children and those with disabilities, including children with intellectual disability, emotional disturbance, and communication impairment. Many of the specific items in the scale relate to teacher-student relationships in classroom settings, such as (a) following instructions, (b) participating in organized group activities, and (c) joining group activities without being told. The scale would therefore seem particularly useful for identifying school-based intervention targets. A considerable amount of research has provided evidence to support the use of this rating system for this purpose (Elliott, 2007).

Social Skills Intervention

Results from the types of adaptive behavior and social skills assessments described in the previous section will often reveal a number of specific skill deficits and excesses that could be targeted for intervention. Matson, Matson, and Rivet (2007) argued that target behaviors should be identified following a systematic assessment and that intervention targets should be prioritized in terms of (a) the potential impact on the child's overall adjustment, (b) ease of acquisition, (c) the extent to which skills form logical clusters, and (d) the extent to which the skill might replace problem behavior. To determine intervention priorities, systematic assessment data should be reviewed in light of such factors and in consultation with stakeholders (e.g., parents, teachers, peers). Once priorities have been established, evidence-based interventions—suited to the unique characteristics of the individual child—are identified and implemented.

With respect to setting intervention priorities, professionals and stakeholders should consider the extent to which achieving the target skill/objective would improve the child's overall quality of life. Improved quality of life is an important outcome to consider when evaluating the objectives, rationale, and effects of an intervention (Keith, 2016). Cummins (2005) argued that the quality of life concept has an objective component and a subjective component. The objective component includes potentially quantifiable aspects of a child's life, such as his or her (a) degree of independence and self-determination, (b) academic achievement, (c) participation in the home, school, and community, and (d) number and quality of friendships. The subjective component refers to the child's expressed degree of satisfaction with his or her (a) independence and self-determination, (b) academic achievement, (c) participation in the home, school, and community, and (d) friendships, for example. Certain types of social behavior and skills could conceivably increase one's objective and subjective quality of life. For example, teaching a child how to cooperate with peers during group-based learning activities in the classroom might improve objective quality of life by advancing the child academically and promoting positive peer relations. If the child found such changes valuable, then his or her subjective quality of life would also have been improved by teaching those social skills.

With respect to selecting and implementing interventions, practitioners should draw upon the best available research evidence regarding what works for improving the social behavior and skills of children with intellectual disabilities. That is, social skills intervention for children with intellectual disabilities should follow an evidence-based practice (EBP) approach. The EBP approach is a broad decision-making process that aims to make use of the best available research evidence to guide intervention (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). EBPs are specific techniques or procedures that have been shown, through a sufficient amount of high-quality experimental research, to be consistently effective (Cook, Tankersley, & Landrum, 2013).

When implementing EBPs to improve the social behavior and skills of children with intellectual disability, it is important to ensure that intervention procedures are implemented with fidelity (Johnson & McMaster, 2013). In addition, as Johnson and McMaster (2013) noted, EBPs will often need to be adapted to suit the child's unique characteristics, circumstances, and contexts. With respect to making such adaptations, practitioners could consider (a) the severity and etiology of intellectual disability, (b) the nature of the child's specific social skill deficits and/or excesses, (c) the child's culture and unique circumstances, (d) the environments in which he or she is and will be expected to function, and (e) the clinical expertise of the people who will be implementing intervention. Even well-established interventions are unlikely to work if they are not suited to the child's unique circumstances or cannot be implemented with fidelity. Given the need to consider such factors, the specifics of social skills intervention will vary considerably across children, even among children with the same degree or severity of intellectual disability, the same etiology and/or support needs, and the same or similar social skill profiles as indicated by the results of a social skills assessment.

Fortunately, researchers have developed a number of intervention approaches, techniques, and procedures that appear to be effective for improving the social behavior and skills of children with intellectual disability. These procedures also appear to have some generality in the sense that they have been successfully used to improve a range of social skill deficits and excesses with children of varying ages and with varying degrees and etiologies of intellectual and other developmental disabilities (Sturmey, 2014; Vaughn et al., 2003; Watkins et al., 2016). The range of established EBPs for improving the social behavior and skills of children with intellectual disabilities includes (a) systematic instruction, (b) Social Stories™ (Gray & Garand, 1993), (c) video modeling, (d) social problem-solving interventions, (e) computer-based instruction, and (f) assistive technology interventions.

Systematic Instruction. Systematic instruction is an umbrella term that covers a range of teaching procedures (Collins, 2012). Systematic instructional practices for children with intellectual disability are generally aimed at promoting acquisition and fluent use of clearly defined target behaviors via the provision of frequent and repeated learning opportunities. Examples of discrete social skills include (a) taking turns with the classroom computer, playground equipment, and toys, (b) initiating a conversation with peers, and (c) requesting help with difficult tasks. Systematic instruction can also be used to teach response chains, such as the sequence of behaviors used to initiate and then maintain a social interaction. For example: (a) gain the person's attention, (b) establish joint attention, (c) make a relevant comment, and (d) respond to the person's reply.

Storey and Miner (2011) provided a detailed description of the steps involved in using systematic instruction to teach functional skills to individuals with disabilities. Briefly, the teaching process typically involves creating or capturing learning opportunities and then ensuring the desired behavior occurs and is reinforced at each opportunity. Learning opportunities can be created by presenting structured discrete trials or by waiting for opportunities to arise naturally. Opportunities to teach a greeting response, for example, might be created by having several different adults approach and look expectantly at the child as he or she arrives in the classroom each morning. In contrast, opportunities to teach a child to initiate conversations with peers might be captured as they arise naturally during lunch time, recess, and during transitions within the school day.

Whether created or captured, learning opportunities begin with ensuring that natural cue/discriminative stimulus for responding is present. For example, the natural cue for greeting another is seeing that person for the first time each day. While the presence of the natural cue should set the occasion for the desired social response, this is not likely to be the case during the early stages of intervention. Therefore, the teacher will often need to prompt the occurrence of the response using various prompting strategies, such as telling the child what to do, using a gestural prompt, and/or modeling the desired response. Over time prompts are faded by waiting longer and longer before prompting and using less intense and intrusive prompts. Correct responding needs to be followed, at least occasionally by reinforcing consequences to promote acquisition and maintain performance.

Systematic instructional approaches have been successfully used to teach a range of functional skills, including a range of social skills, to children with intellectual disability (Storey & Miner, 2011). Cipani (2009), for example, described a systematic instructional approach for teaching children with severe intellectual disabilities to recruit attention. The approach begins with children who have already learned to make socially appropriate requests for preferred or needed objects. Opportunities to request are then created by withholding wanted or needed objects. Opportunities to teach attention recruitment are then built into these requesting opportunities by ensuring that the communication partner is not attending to the child at the time when a request needs to be made. The child is then prompted to recruit attention before making the request by tapping the partner on the shoulder. Depending on the culture and context, shoulder tapping could be considered a socially and culturally appropriate manner of gaining the attention of a communicative partner. This response might also be an efficient method for a child who does not have sufficient language skills to recruit attention via speech or vocalizations. Once the response occurs, which might require prompting, it is reinforced by the partner facing the child and attending to his or her subsequent request. Over time, the need for prompting is faded by waiting longer and longer before prompting and by gradually reducing the amount of prompting. In addition, the communication partner moves further and further away from the child to ensure the newly acquired attention-getting response remains functional in situations when a communication partner is not in the immediate vicinity of the child. Cipani (1990) demonstrated the effectiveness of this procedure for teaching a 7-year-old boy and a 10-year-old girl with severe intellectual disability. With intervention, both children acquired the social skill of approaching a non-attending adult, recruiting the adult's attention using the targeted attention-recruiting response, and then asking for a needed, but missing item. The attention-getting skill was maintained after the initial training phase, although the follow-up period was relatively short (i.e., 3 weeks).

The general success of systematic instructional procedures for teaching children with intellectual disabilities is perhaps not surprising given that the approach makes use of a number of empirically validated principles of learning derived from applied behavior analytic research (Collins, 2012; Storey & Miner, 2011). A review of social skills interventions (Gresham, 2016) concluded that interventions based on these principles appear to be the most effective strategies for teaching social skills. Many other approaches for teaching social skills to children with intellectual disability (e.g., video modeling, Social Stories™, assistive technology) incorporate systematic instructional procedures into the overall intervention package. The inclusion of systematic instructional procedures likely contributes to the effectiveness of these other approaches.

***Social Stories*™**. Social Stories™ is a widely used intervention approach for teaching social skills to children with autism spectrum disorder and other developmental disabilities (Gray & Garand, 1993; Karkhaneh et al., 2010). This approach involves developing a script describing specific social situations, concepts, and/or behaviors. The script is intended to facilitate the child's ability to adapt to and cope with potentially difficult social situations (Karkhaneh et al., 2010). Scripts usually contain four content areas (a) delineating and describing the discriminative stimuli that the child should attend to, (b) instructions regarding how to respond to these stimuli, (c) statements related to the behavior, thoughts, and feelings evoked or elicited by the social situation, and (d) additional descriptions about the setting and context that might help the child better understand the situation (Barry & Burlew, 2004, p. 45). A script for entering a peer group on the playground, for example, might consist of the following:

> When I am on the playground during recess, if I see my classmates playing on the swing or the slide, I will approach the group until I am near enough to touch them. I will wait for one of them to look at me and then I will smile and say *hi*. They are likely to say *hi* to me and then I will say *Can I play with you?* They will say *sure* and let me take a turn. I will take my turn and then let someone else have a turn. When I take my turn I will be happy. I am a good friend when I let others take their turn.

A number of studies have evaluated the effects of the use of Social Stories™ as an intervention for children with autism and other developmental disabilities (Karkhaneh et al., 2010; Reynhout & Carter, 2006). The overall results have generally been positive (Karkhaneh et al., 2010; Reynhout & Carter, 2006). The approach has been successfully used to teach a range of social skills, including (a) initiating verbal greetings (Reichow & Sabornie, 2009), (b) responding to the initiations of others (Scattone, 2008), and (c) continuing a social interaction (Delano & Snell, 2006; Sansosti & Powell-Smith, 2008).

However, Karkhaneh et al. (2010) noted that the positive outcomes reported in many studies into Social Stories™ interventions have often been confounded by the use of other procedures, such as response prompting and feedback. Still, Social Stories™ could be viewed as a promising component or adjunct to the use of systematic instruction for increasing the social skills and social interactions of children with developmental disability. Nonetheless, this approach might be best suited to individuals with sufficient language comprehension to understand the scripts. For children with more limited comprehension skills, Social Stories™ have been successfully presented using video modeling (Gül, 2016; Kagohara et al., 2013; Sansosti & Powell-Smith, 2008; Scattone, 2008).

Video modeling. Video modeling involves videotaping a person engaged in some behavior and then using this video as an instructional tool (Delano, 2007). A child might, for example, view a videotape of a peer greeting the teacher or playing alongside others. After watching the video, the child would then have an opportunity to perform the modeled behavior in the natural environment. Mason, Davis, Boles, and Goodwyn (2013) outlined several different configurations that have been used in video modeling studies. Specifically, the model could be the target child (video self-modeling), or another person, such as a peer or even an unfamiliar actor. In addition, the video could be filmed from the perspective of the actor (point-of-view video modeling) or from the perspective of a spectator (third-person perspective). Furthermore, the child might view the entire video before attempting to imitate the modeled behavior (video priming) or might view the video in a step-by-step sequence (video prompting). Each of these configurations can be effective depending on the child and the particular skill being modeled (McCoy & Hermansen, 2007). Achieving acquisition usually requires repeated viewings of the video and repeated opportunities to practice the modeled behavior. As with Social Stories™, additional instructional components (e.g., prompting, corrective feedback, and reinforcement) are often used in conjunction with video modeling.

Overall, video modeling can be an effective approach for teaching social skills to individuals with autism and intellectual disability (Mason et al., 2013; McCoy & Hermansen, 2007). Indeed, video modeling has been effectively applied to teach a range of social skills, such as (a) initiating a social interaction (Nikopoulos & Keenan, 2003), (b) using socially appropriate communication during peer play (Maione & Mirenda, 2006), (c) increasing social engagement (Bellini, Akullian, & Hopf, 2007), (d) greeting peers (Avcioglu, 2013), and (e) teaching appropriate intonation and facial expressions (Charlop, Dennis, Carpenter, & Greenberg, 2010). A potential prerequisite to effective use of video modeling appears to be the ability to attend to the video model. This might be difficult for children with more significant attention deficits and/or vision impairment.

Social problem-solving interventions. O'Reilly and colleagues (O'Reilly & Chadsey-Rusch, 1992; O'Reilly et al., 2004) evaluated the effects of a problem-solving approach for teaching social skills to individuals with intellectual disability. O'Reilly and Chadsey-Rusch (1992, p. 324) delineated four steps in the social problem-solving process. These four steps are (a) "discriminating salient social stimuli (decoding), (b) identifying alternative social behaviors and identifying the most appropriate social behavior for the social situation (deciding), (c) performing that social behavior (performing), and (d) evaluating the effectiveness of the social behavior once it has been performed (evaluating)."

This four-step process has been successfully taught to individuals with intellectual disabilities using systematic instructional procedures (O'Reilly & Chadsey-Rusch, 1992; O'Reilly et al., 2004). O'Reilly and Chadsey-Rusch (1992), for example, taught three adults (23–44 years of age) with moderate intellectual disability to use the problem-solving approach. Participants were first trained on the performance step (i.e., how to initiate a conversation by asking a question) and then received training on the decoding, decision, and evaluation steps. The training procedures made use of modeling appropriate responses and using illustrative photographs to highlight salient social cues. For example, to teach the performance step, the trainer modeled four questions that the person could use to initiate a conversation (e.g., *What do you think about the weather?*). The salient social cues for this social skill were illustrated in a series of photographs (e.g., a photograph of the person sitting next to a co-worker). The trainer also used verbal instruction related to the photograph (e.g., *When you are sitting next to a co-worker at lunch break, you could start a conversation by asking a question, such as what do you think about the weather?*). The results showed that these procedures were effective in training the individuals to follow the four-step process. Importantly, once these skills had been acquired, the participants also showed more social interaction with their co-workers, that is the effects of training generalized to the natural environment.

In a follow-up study, O'Reilly et al. (2004) compared the problem-solving approach to an alternative (external-control) approach for teaching two social skills (i.e., responding to corrective feedback and managing conflict). The study involved five adults with mild intellectual disability. The problem-solving intervention aimed to teach participants to follow the four-step process of decoding, deciding, performance, and evaluation. Training procedures included (a) providing the participants with a verbal explanation of the targeted social skills and the social situations in which these skills would be useful, (b) modeling use of the skills, and (c) role-playing practice with feedback. As part of this training, the participants were also taught to verbalize the social rules that they should follow with respect to responding to corrective feedback and managing conflict. The external-control intervention used similar procedures except the participants were not taught to verbalize the social rules. The results demonstrated that both approaches were effective in teaching the targeted social skills, although two participants made relatively less overall progress.

Overall the results of these two studies suggest that social problem-solving interventions are a promising approach for improving social skills of individuals with mild to moderate intellectual disability. A potential strength of this approach is the focus on teaching generic social rules, which are applicable to a range of environments and social situations and which might, therefore, facilitate generalization of social behavior (McFall, 1982). The approach would seem applicable to children as well as adults (Webster-Stratton, Reid, & Hammond, 2001) but might be best suited to individuals with the relatively good language comprehension abilities associated with mild to moderate intellectual disability as compared to severe/profound intellectual disability.

Computer-based instruction. Computer-based instruction makes use of personal computers and related devices (e.g., iPads®, iPods®) for instructional/educational purposes. In practice, a computer and associated instructional software is typically used to present instructional stimuli to the child and provide opportunities for him or her to make responses. Software programs used in conjunction with computer-based instruction also typically monitor the child's responses and provide reinforcing consequences or corrective feedback as necessary. Instructional stimuli can be presented in a variety of modes, such as via visual, auditory, and/or kinesthetic channels. Responses required of the child could include touching the computer screen, using speech to text software, and/or composing responses by typing out words or sentences with the computer keyboard.

Computer-based instruction has been successfully used to teach a range of social skills to individuals with developmental disabilities. Ramdoss et al. (2012), for example, identified 11 studies with 330 participants that used computer-based instruction to teach social and emotional skills to individuals with developmental disabilities. The range of social skills addressed included: (a) initiating conversations, (b) engaging in peer interactions, and (c) generating a solution to a social problem. The range of emotional skills included recognizing the emotions conveyed by a person's facial expressions or voice intonation.

Silver and Oakes (2001), for example, reported on the results of a randomized controlled trial involving two groups of 11 (12- to 18-year-old) children with autism spectrum disorder. One group received 5 h of computer-based instruction aimed at teaching them to predict the responses of others and identify their emotions. For this, they used a software program called *Emotion Trainer*, which presented pictures of faces, scenes, or objects and then presented the participant with relevant questions (e.g., If Carol wanted a pizza but got a hamburger, how do you think she would feel?). The target response was to identify the feelings of the characters in the scene. Compared to the children in the control group, those in the computer-based instruction group showed significant improvement in their ability to correctly identify emotions.

Another study (Bernard-Opitz, Sriram, & Nakhoda-Sapuan, 2001) provided computer-based instruction to eight children with autism. The software adopted for this intervention presented animated conflict scenarios (e.g., a child wanting to use playground equipment) and offered several response options (e.g., Should the child make a polite request or have a tantrum?). This instructional program produced modest improvements in the children's propensity to select the more appropriate response option, but generalization to real conflict scenarios in the natural environment was not assessed. It is therefore unclear if children would use the appropriate responses learned from the computer-based intervention when they encountered similar scenarios in the natural environment.

Although generalization to the natural environment could be an issue, there are data to suggest that computer-based instruction is a promising approach for teaching social skills and improving emotional recognition (Ramdoss et al., 2012). However, most of the participants in these types of studies appeared to have mild/moderate disability. It is therefore unclear if similar types of interventions would be effective for children with more severe intellectual disability and adaptive behavior deficits.

Assistive Technology. A number of studies have used various types of assistive technology to promote social skill development and social interaction among individuals with disabilities (Lancioni & Singh, 2014). A comprehensive survey of this literature suggests that such interventions can be effectively used with individuals with intellectual disability, including individuals with severe/profound intellectual disability (Lancioni, Sigafoos, O'Reilly, & Singh, 2013). Lancioni, Singh, O'Reilly, Sigafoos, and Oliva (2014), for example, reviewed studies that used microswitch technology to increase adaptive responses and reduce socially inappropriate behavior in individuals with severe/profound intellectual disability and physical and sensory impairments. Their review suggested that such interventions can be highly effective in promoting a range of adaptive social responses.

In one relevant study of this type, Lancioni et al. (2016) configured a microswitch program to enable nine individuals with multiple disabilities to access socially appropriate forms of stimulation (e.g., songs, video, and picture slides). Microswitches were also configured to enable the participants to initiate social conversations via text messaging and telephone calls. In addition to configuring the microswitch technology, the intervention included guided practice to familiarize each participant with the operation of the microswitches and the associated functions. With this technology and the intervention program in place, the participants were able to successfully access socially appropriate forms of stimulation and initiate social contact. In addition, the direct-care staff perceived the microswitch program as beneficial and enjoyable for the participants.

In addition to microswitches, speech-generating devices represent another type of technology that is often recommended for individuals with intellectual disability (Beukelman & Mirenda, 2013). Speech-generating devices typically include graphic symbols that the person selects from a display and corresponding synthetic or digitized speech output. Such devices are generally indicated as an augmentative or alternative mode of communication for individuals who present with unintelligible speech or insufficient speech and language development (Beukelman & Mirenda, 2013). The latter situation is prevalent among individuals with severe and profound intellectual disability (Pinborough-Zimmerman et al., 2007).

In a review of the literature on speech-generating devices, Rispoli et al. (2010) found that individuals with intellectual disabilities have been successfully taught to use this technology to engage in a range of social-communicative interactions, such as recruiting attention, initiating conversations, and requesting and protesting in socially acceptable ways. However, the mere provision of a speech-generating device is usually not sufficient to ensure functional use by individuals with intellectual disabilities. Rather, effective intervention will often also require implementation of systematic instructional procedures to teach the person how to use the technology for social-communication purposes.

Sigafoos et al. (2004), for example, used a systematic instructional approach to teach a 16-year-old male and 20-year-old woman to communicate requests for preferred objects in more socially acceptable ways. Both participants had intellectual disability and lacked speech. They communicated mainly by reaching for or leading the communication partner's hand to objects they wanted. However, these prelinguistic forms were considered problematic because reaching often went unnoticed, and leading others by the hand was viewed as socially unacceptable, especially in the community and with unfamiliar communication partners. The study therefore aimed to replace reaching and leading by teaching the participants to use a speech-generating device. Intervention made use of systematic instructional procedures (response prompting, prompt fading, and reinforcement) and occurred during structured snack times when the participants were highly likely to attempt to request the snacks by reaching and leading. During intervention, opportunities for teaching the use of the speech-generating device were created by sometimes having the communication partner ignore and remain unresponsive to the participants' prelinguistic communication attempts. At these times, participants were prompted to activate the speech-generating device, which was programmed to produce digitized speech output (i.e., "*I want more*."). Correct use of the speech-generating device was reinforced by giving participants access to more snacks. The results were positive in that the independent use of the speech-generating device increased to the 80–100% percent range within 18–24 learning opportunities. In addition, one participant also showed a decrease in reaching and leading. The other participant, however, mainly used the speech-generating device only when his initial attempts to communicate via reaching and/or leading were ignored. This latter pattern suggests the participant was sensitive to the joint attention status of the communication partner.

Overall, there is a considerable amount of data supporting the use of assistive technology interventions to promote socially appropriate leisure, social interaction, and communication among individuals with intellectual disability. Based on this literature, there appear to be three key components to the successful use of such technology. These are (a) configuring technology that will be easy for the person to activate using existing motor responses, (b) ensuring that microswitch activations lead to immediate reinforcing consequences, and (c) providing frequent opportunities for practice, which might also include an initial training phase in which the person is assisted to use the microswitch and experience the [reinforcing] consequences of doing so.

Summary and Conclusion

Intellectual disability is defined as significantly subaverage intellectual ability combined with deficits in adaptive behavior functioning. Children with intellectual disability often have significant social skill deficits and a high prevalence of problematic social behaviors. The nature and severity of their social skill deficits and excesses vary in relation to the severity and etiology of intellectual disability, opportunities for learning, and the effectiveness of intervention efforts.

A number of standardized measures have been developed to assess adaptive behavior functioning and social skill deficits and excesses. Assessments of this type are important for diagnosis and classification purposes and for selecting intervention priorities. A range of factors need to be considered in selecting intervention priorities, most importantly the potential impact on the child's overall quality of life.

Various intervention approaches have been developed for teaching social skills and addressing problematic social behaviors of children with intellectual disabilities. The range of interventions that have empirical support for improving the social behavior and skills of children with intellectual disabilities includes (a) systematic instruction, (b) Social Stories™ (Gray & Garand, 1993), (c) video modeling, (d) social problem-solving intervention, (e) computer-based instruction, and (f) assistive technology interventions. By combining valid assessment data with evidence-based instructional practices, children with intellectual disability can learn a range of meaningful social skills that will enable them to more effectively interact with others and participate in society.

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Attention-Deficit/Hyperactivity Disorder

Katy E. Tresco, Jessie L. Kessler, and Jennifer A. Mautone

Attention-deficit/hyperactivity disorder (ADHD) is among the most common psychiatric disorders in children (American Psychiatric Association [APA], 2013), with symptoms and impairment related to ADHD persisting into adolescence and adulthood. For example, adolescents with ADHD are at increased risk for school failure, involvement in the juvenile justice system, substance use problems, injury, increased health care costs, and employment problems (Bussing, Mason, Bell, Porter, & Garvan, 2010; Molina & Pelham, 2001; Winston, McDonald, & McGehee, 2013). There are three presentations of ADHD described by the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-5; APA, 2013). Clinically significant levels of hyperactivity/impulsivity and difficulties with attention and focus characterize ADHD, Combined Presentation. ADHD, Predominantly Inattentive Presentation refers to individuals with significant attention problems in the absence of clinically significant hyperactivity/impulsivity, and ADHD, Predominantly Hyperactive/Impulsive Presentation refers to the least common presentation, characterized by substantial hyperactive/impulsive symptoms without significant symptoms of inattention. Prevalence estimates of ADHD in school-age child samples in the United States range from 5 to 7% (Roberts, Milich, & Barkley, 2015). Survey research has consistently indicated that ADHD is more frequently identified in boys than girls, with estimates ranging from three times more likely in community samples to upwards of nine times more frequent in clinical samples (Roberts et al., 2015).

Children with ADHD typically experience problems related to academic performance (e.g., lower test scores, higher rates of grade retention) and social interactions, including family relationships, interactions with adults at school, and relationships with peers (Roberts et al., 2015). Because of challenging classroom behavior, including increased off-task behavior compared to peers, frequent violations of classroom rules, and failure to comply with instructions, teachers often spend a significant amount of time providing supports to children with ADHD, which may result in conflict in the student-teacher relationship (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). Also, due to behavioral difficulty at home, children with ADHD frequently have stressful and conflicting interactions with their parents, which negatively impact parent-child relationships (Johnston & Chronis-Tuscano, 2015). Finally, due to disruptive and inattentive

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behavior, children with ADHD often have difficulty developing and maintaining friendships with peers (Hoza, 2007).

Treatments to support children with ADHD include medication, primarily stimulants, and psychosocial interventions that are implemented at home and school. Psychosocial interventions address performance deficits (i.e., situations in which the child knows how to perform a particular skill but does not do so consistently) and skills deficits (i.e., situations in which the child does not yet possess a skill or performs the skill inadequately; Eiraldi, Mautone, & Power, 2012). Interventions aimed at performance deficits include behavioral strategies and environmental adaptations to intervene at the point of performance, such as strategies focused on contingency management (Pelham & Fabiano, 2008). Interventions to address skills deficits include direct instruction and increasing opportunities for repeated practice of new skills. The social deficits of children with ADHD might be the result of performance deficits, skills deficits, or a combination of the two.

The purpose of this chapter is to discuss the social impairments for children with ADHD and the current best practices with regard to assessment of and intervention for social difficulties. We acknowledge that children and adolescents with ADHD often have difficulties in their relationships with adults, as described above. The focus of this chapter, however, is on social behavior of children and adolescents with ADHD as it relates to interactions with peers and its effects on peer relationships and functioning. First, a detailed discussion of the social impairments of children with ADHD is provided. Then we review strategies for assessing social behavior in children with ADHD. Finally, the current research related to treatment of social problems in children with ADHD is discussed.

Social Impairment in ADHD

The impact of ADHD symptoms on the social functioning of children with ADHD has long been recognized (Pelham & Bender, 1982; Whalen & Henker, 1985). The peer-related difficulties that are most prominent in children with ADHD include peer victimization/bullying, rejection, lower friendship quality, and reputation bias (Hoza, 2007). Further, poor peer relationships among school-aged children with ADHD are predictive of later difficulties, such as substance abuse, delinquency, academic difficulties, and internalizing symptoms (Mikami & Hinshaw, 2006; Mrug et al., 2012). Additionally, children with ADHD have difficulty assessing their own social competence. This lack of insight (often called "positive illusory bias") often contributes to the social difficulties of children with ADHD. In the following sections, we discuss the relationship between ADHD symptoms/comorbid conditions and social functioning, and the specific domains of social impairment for children with ADHD (i.e., peer victimization/bullying, rejection and reputation bias, friendship quality, self-perceptions). In addition, gender and developmental differences are considered.

ADHD Symptoms, Comorbid Conditions, and Social Functioning

ADHD Symptoms

The symptom profile as identified by the *DSM-5* includes impulsive and disruptive behaviors that often are perceived negatively by peers (e.g., frequent interruption of conversations, excessive talking, difficulty waiting for turn) and inattentive behaviors (e.g., easily distracted, failure to listen carefully) that are likely to impact the ability of children with ADHD to engage appropriately during conversations with peers and in group activities (APA, 2013). The increased rates of negative verbalizations, rule breaking, complaining, teasing, and noncompliance associated with combined and hyperactive/impulsive presentations of ADHD further contribute to these children being perceived negatively by peers (Mrug, Hoza, Pelham, Gnagy, & Greiner, 2007; Pelham & Bender, 1982). In addition, children presenting as primarily inattentive have been described as shy, withdrawn, and less assertive as compared to children presenting with combined or hyperactive presentations (Hodgens, Cole, & Boldizar, 2000; Solanto, Pope-Boyd, Tryon, & Stepak, 2009). Associated difficulties, such as deficits in executive function skills, have also been associated with poor social outcomes (Miller & Hinshaw, 2010; Tseng & Gau, 2013).

Executive functioning deficits associated with ADHD (e.g., planning, organization, attention, memory, and response inhibition) have been explored as a potential underpinning for difficulties with application of social knowledge. Research suggests that executive functioning deficits are negatively associated with peer acceptance in adolescent girls, regardless of ADHD diagnosis (Miller & Hinshaw, 2010), and measures of working memory and planning are associated with parent and self-report ratings of social competence for children with ADHD (McQuade, Murray-Close, Shoulberg, & Hoza, 2013; Tseng & Gau, 2013). Findings of another study examining working memory and social competence suggested that the relationship between poor central executive working memory and lower levels of social competence may be due to difficulties in conflict resolution, which ultimately relates to increased rates of physical aggression (McQuade et al., 2013). In a study examining the relationship of executive functioning, social competence, and ADHD, however, measures of executive functioning did not mediate the relationship between ADHD and social performance (Huang-Pollock, Mikami, Pfiffner, & McBurnett, 2009). It should be noted that direct assessment of peer perceptions (i.e., sociometric nominations) was not included in any of the above studies. As such, the effect of poor executive functioning on peer rejection and victimization is unclear.

Comorbid Conditions

Children with ADHD are often diagnosed with comorbid conditions that might result in increased social impairment (Becker, Luebbe, & Langberg, 2012). Comorbid conditions commonly associated with ADHD include other externalizing disorders such as oppositional defiant disorder and conduct disorder, as well as internalizing disorders, predominantly anxiety. Estimates vary depending on source, but it is likely that between 40% and 84% of children with ADHD are diagnosed with a comorbid externalizing disorder, between 25% and 50% with an anxiety disorder, and between 20% and 30% with comorbid depression (Pliszka, 2015). Although children with ADHD have challenges with peer relationships regardless of the presence of comorbidities, poor social relationships may be exacerbated by the additional symptomology associated with comorbid disorders (Becker et al., 2012).

In a review of the literature examining the relationship between comorbid mental health disorders and social functioning in children with ADHD, Becker et al. (2012) found that depending on methodology, the presence of comorbid externalizing disorders had either no effect or exacerbated the peer relationship problems of children with ADHD. For example, children with ADHD and ODD or CD have been found to have poorer parent- and teacher-rated social competence than children with ADHD alone (Booster, DuPaul, Eiraldi, & Power, 2012), and the addition of conduct problems increases teacher ratings of peer rejection (Mikami & Lorenzi, 2011). In addition, the presence of oppositional and/or conduct-related behaviors comorbid with ADHD increases the likelihood of peer rejection and decreases the likelihood that an individual will be considered popular by their peers (Hoza et al., 2005). Finally, there is evidence to suggest that the behaviors related to ODD, rather than ADHD, contribute to engagement in bullying and relational aggression behaviors (Ohan & Johnston, 2007; Wiener & Mak, 2009).

Findings for internalizing disorders are less clear but also indicate either no effect or an exacerbation of social relationship problems (Becker et al., 2012). Specifically, anxiety has been found to be negatively associated with teacher-reported nominations of peer like and dislike but not on nominations by peers themselves (Hoza et al., 2005; Mikami, Ransone, & Calhoun, 2011). Mikami and colleagues hypothesize that this may be because peers do not consider the shy and nervous behaviors associated with anxiety to be as bothersome as they do the disruptive behaviors associated with ADHD. Parent and child ratings, however, also have suggested that children with

ADHD and anxiety have deficits in social competence (Becker, Langberg, Evans, Girio-Herrera, & Vaughn, 2015; Bowen, Chavira, Bailey, Stein, & Stein, 2008). A recent examination of self-reported anxiety symptoms in young adolescents with ADHD found increased social anxiety to be associated with poorer social skills and social acceptance (Becker et al., 2015).

Very few studies have examined the impact of comorbid depression and ADHD on social functioning, and results are mixed. In general, the limited findings available to date suggest that comorbid depression either has no impact or exacerbates the social problems of children with ADHD (Becker et al., 2012). Consistent with their findings on social anxiety, Becker et al. (2015) also found that depressive symptoms (i.e., anhedonia) were associated with poorer social skills and lower social acceptance. In addition, parent- and teacher-rated social skills such as assertion and self-control have been found to mediate the relationship between ADHD and the development of depressive symptoms (Feldman, Tung, & Lee, 2016). This suggests that poor social skills concurrent with ADHD may also increase risk for later depression. In addition, individuals with ADHD who have better awareness of their social standings are likely to experience increased depressive symptoms (McQuade et al., 2014).

Peer Victimization and Bullying

Children with ADHD are both more likely to be bullied or victimized by peers and to engage in bullying behaviors toward peers (Wiener & Mak, 2009). Among children and adolescents with ADHD who have been bullied or victimized, peer victimization includes physical, verbal (e.g., teasing), relational (e.g., exclusion from groups), and reputational aggression (e.g., rumors or gossip intended to damage social standing) with estimates as high as 57% of adolescents with ADHD being the victim of at least one of these at least once per week in the past year (Becker, Mehari, Langberg, & Evans, 2016). In an examination of peer victimization and bullying behaviors among 9–14-year-old children (including those that were identified as both victims and bullies), Wiener and Mak found that 40% of children with ADHD were identified as victims in comparison with 9% of non-ADHD comparison peers. Additionally, parents and teachers of children and adolescents with ADHD reported higher levels of bullying behaviors among this same sample of youth than among comparison peers without ADHD (31–10%). Notably, approximately four times as many children and adolescents with ADHD were identified as either a bully or a victim (or both) as compared to peers without ADHD (58% vs. 14%). It is important to note, however, that children with ADHD have also been found to under-represent their involvement in bullying and threatening behaviors; however, these children might be more accurate reporters when they are the recipient of peer victimization (Wiener & Mak, 2009).

Victimization by peers has been associated with social skills deficits, peer rejection, a lack of reciprocated friendships, and increased levels of comorbid symptoms in children and adolescents with ADHD (Scholte et al., 2009). Specifically, children who are victims are more likely to be rejected by peer groups, have fewer reciprocal friendships, and experience increased levels of internalizing and externalizing symptoms (Hodges, Boivin, Vitaro, & Bukowski, 1999; Scholte et al., 2009). Additionally, parent and self-reports of children with ADHD suggest links between victimization by peers, lower self-esteem, negative affect, anxiety, and depressive symptoms in children and adolescents with ADHD (Becker et al., 2016; Fogelman, Walerius, Rosen, & Leaberry, 2016; Roy, Hartman, Veenstra, & Oldehinkel, 2015). As such, it is possible that the poor social relationships of children with ADHD contribute to being rejected and victimized by peers and to the development of and/or exacerbation of comorbid internalizing and externalizing disorders. In addition, children with ADHD who have higher levels of comorbid internalizing and externalizing problems are more likely to be victimized by peers than those with ADHD alone, potentially leading to further impacts on self-esteem and depressive symptoms (Taylor, Saylor, Twyman, & Macias, 2010).

Peer Rejection and Reputation Bias

Peer rejection, although not often as overt as bullying/victimization, is also of concern for children with ADHD. Peer sociometric nominations (i.e., peers' indications of whether an individual is a friend or someone with whom they would not want to be friends) consistently reveal that children with ADHD are more often identified as individuals with whom classmates do not want to be friends. For example, in an examination of a subset of children with ADHD from the MTA study (MTA Cooperative Group, 1999) with sociometric nominations available, 52% were identified as being rejected by peers as compared to only 14% of same-aged classroom peers without ADHD (Hoza et al., 2005). Furthermore, over half of children with ADHD (56%) lacked a reciprocated friendship, that is, a friendship in which both children identify the other as a friend, in comparison with 32% of a group of children without ADHD. Also, only 9% of children with ADHD had reciprocal friendships with more than one person, in comparison with 22% for children without ADHD.

Additionally, children with ADHD often develop poor social reputations that begin early and, despite direct intervention, are difficult to change (Hoza, 2007; Hoza et al., 2005). Specifically, children and adolescents perceive peers with ADHD to be disruptive and recognize that these children often display challenging behavior in class. In a survey of stigma associated with ADHD, respondents (children ages 8 to 18 years), rated items about their attributions related to a fictional classmate with ADHD, with a health concern (i.e., asthma), or with an internalizing disorder (i.e., depression). Respondents indicated that the child with ADHD was likely to get into trouble more often than the child with a health concern or internalizing disorder (Walker, Coleman, Lee, Squire, & Friesen, 2008), thereby illustrating the development of a negative social reputation among children with ADHD. Additionally, research has suggested that, over time, peers continue to view children with ADHD negatively, regardless of whether the symptoms of ADHD contributing to social impairment are improved (Hoza, 2007). These findings suggest that the often negative reputations of children with ADHD might inhibit improvements in social standing, even if social competence improves.

Friendship Quality

The quality of the relationship between friends may be as important a consideration as the presence of friendships, particularly among children with ADHD. Friendship intimacy, for example, may mitigate the relationship between ADHD and social problems (Becker, Fite, Luebbe, Stoppelbein, & Greening, 2013). Specifically, Becker and colleagues found that levels of ADHD symptoms were not associated with social problems for children ages 5–13 years who self-reported higher ratings of friendship quality. Increased ADHD symptomology was associated with increased social problems, however, for children with ratings of low friendship quality.

Unfortunately, friendships involving a child with ADHD have been shown to be of poorer quality than friendships between children without ADHD, with evidence indicating that children with ADHD are more controlling, insensitive, and self-centered than their friends (Normand et al., 2011). In an effort to more fully understand friendships among children with ADHD, Normand et al. (2013) explored stability, quality, and satisfaction in friendship dyads and found that children with ADHD had less stable friendships over time. In addition, friends of children with ADHD reported fewer positive friendship features, more negative features, and indicated less satisfaction in their friendships than friends of children without ADHD. Children with ADHD have also been found to spend less time with friends outside of school (Marton, Wiener, Rogers, & Moore, 2015), potentially another indicator of the lack of intimacy in the relationships.

In addition to having lower quality friendships, children with ADHD appear to be more likely to develop friendships with other children with behavior difficulties. Specifically, evidence suggests that children who identify themselves as a friend of a child with ADHD are more likely to exhibit externalizing behavior problems (Normand et al., 2011). In one study, 43% of children with ADHD were identified as having friends with either externalizing or learning problems, as compared to 16% of peers without ADHD (Marton et al., 2015). It has been suggested that this results from the fact that children with similar behavioral difficulties are more willing to befriend a child with ADHD (McQuade & Hoza, 2015) and that children with ADHD are drawn to other children with similar characteristics (Normand et al., 2011). Further research is necessary to explore this association and its relationship to peer rejection, reputation bias, and peer victimization.

Children with ADHD also report being less satisfied in their friendships than peers without ADHD (Normand et al., 2013). Interestingly, findings from the same investigation suggested that children with ADHD are less likely than their friends without ADHD to recognize the deterioration of their friendships over time. This finding is consistent with previous research indicating that children with ADHD generally lack the ability to accurately evaluate their own social competence (see Hoza, Vaughn, Waschbusch, Murray-Close, & McCabe, 2012; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007).

The impact of mutual, quality friendships on healthy development is unquestionable. In children with ADHD, reciprocal friendships may mitigate the effects of peer victimization and have also been identified as protective factors, potentially lessening the likelihood of the development of internalizing and externalizing problems (Hodges et al., 1999; Laursen, Bukowski, Aunola, & Nurmi, 2007). Friendships have also been shown to be protective against peer victimization in girls (Cardoos & Hinshaw, 2011). Other evidence suggests, however, that peer rejection, not the presence or absence of reciprocal friendships, contributes to the likelihood of delinquency, anxiety, and general impairment in functioning (Mrug et al., 2012). In this latter study, however, quality of friendship was not evaluated nor were data collected regarding whether the identified reciprocal friends also exhibited externalizing problems. As such, future research should explore the association between friendship quality and peer rejection/peer victimization.

Self-Perceptions of Social Impairment (Positive Illusory Bias)

Children with ADHD often lack insight regarding both their social competence and the nature of their relationships with peers. With regard to social competence, children with ADHD often overestimate their skill more dramatically than do peers without ADHD (Owens et al., 2007), although some evidence exists to suggest that this may be less pronounced in children with ADHD inattentive presentation (Owens & Hoza, 2003). This "positive illusory bias" appears to be more prominent in children with ADHD than peers without ADHD (Hoza et al., 2004). Examinations of peer relationships have also shown that children with ADHD report a more positive view of their peers than their peers' report of them (Hoza et al., 2005), a further indication of a lack of awareness regarding how peers may perceive their behavior.

Children with ADHD have also been found to self-evaluate their social performance more positively than their teachers, despite the presence of an intervention designed to improve their ability to self-evaluate (Hoza et al., 2012). Interestingly, Hoza and colleagues found that the match between child and teacher evaluations was improved through the use of positive reinforcement as it related to academic and behavioral functioning, but not social competence. Whether this lack of improvement is an artifact of a lack of ability to accurately self-evaluate social competence or a difficulty admitting to poor social competence is in need of further exploration (McQuade & Hoza, 2015).

The positive illusory bias common to children with ADHD may also negatively impact response to treatment. For example, in a well-established summer treatment program for children with ADHD (e.g., Pelham & Hoza, 1996), Mikami and colleagues found that children's positive illusory bias was stable over time and that high levels of positive illusory bias were associated with increased conduct problems and increased dislike by peers at the end of the treatment cycle (Mikami, Calhoun, & Abikoff, 2010). Conversely, children who had lower levels of positive illusory bias improved in social preference and gained in friendship nominations over the course of treatment.

Evidence also suggests that the positive illusory bias associated with ADHD might serve as a protective factor, limiting the likelihood of development of depressive symptoms. That is, the overestimation of self-competence and peer status often found among children with ADHD may make them less sensitive to the detrimental effects of peer rejection and victimization (Mikami et al., 2010). An investigation utilizing data from the MTA study found that for individuals with lower peer preference (more negative nominations by peers than positive), increased self-identified social acceptance predicted lower scores on a self-report of depressive symptoms (McQuade et al., 2014). Conversely, McQuade and colleagues also found that lower levels of self-reported social acceptance were associated with higher levels of self-reported depression. These findings support the protective nature of the positive illusory bias of children and adolescents with ADHD but included only self-report measures of depression. As such, further investigation into the relationship between ADHD, peer rejection and victimization, positive illusory bias, and behaviors and outcomes associated with depression is warranted.

Impact of Gender

Boys and girls with ADHD both experience social impairment and are at risk for problems with peers, as noted above. Similarities among boys and girls with ADHD include a lack of reciprocated friendships and increased rates of peer rejection and victimization as compared to peers without ADHD (Becker et al., 2016; Hoza et al., 2005). Boys with ADHD, however, are more likely than girls with ADHD to (a) be victims of physical aggression (Becker et al., 2016), (b) self-report higher levels of bullying others, and (c) be identified by adults as engaging in bullying behaviors (Wiener & Mak, 2009). In addition, boys with ADHD may be more likely to be friends with peers with behavior problems than girls with ADHD, though both boys and girls with ADHD have a higher proportion of friends with behavior problems than peers (27%–10%; Marton et al., 2015).

Conversely, girls with ADHD may be more likely than boys with ADHD to be victimized by peers without ADHD (Wiener & Mak, 2009). In addition, studies of friendship quality among girls have indicated a higher rate of relational aggression for girls with ADHD than girls without ADHD (Zalecki & Hinshaw, 2004). Specifically, girls with ADHD are more likely to engage in behaviors that attempt to harm another's reputation, resulting in damage to their own relationships with peers (Zalecki & Hinshaw, 2004). This is likely because girls with ADHD tend to engage in these behaviors in a more overt manner than their peers without ADHD, and this overt behavior is less accepted by peers (Ohan & Johnston, 2007). Specifically, girls without ADHD were found to engage in less frequent but more directed, covert, and intense relational aggression than girls with ADHD. McQuade and Hoza (2015) suggest that the less skilled use of relational aggression may prevent girls with ADHD from obtaining the social benefit that has been found for skilled and covert uses of relational aggression in girls without ADHD (Heilbron & Prinstein, 2008).

Adolescence

Peer relationships become even more relevant and important in adolescence as youth develop increased independence from their families and typically spend more time with peers (Maccoby, 1992); however, the impairments in peer relationships common among children with ADHD have been shown to persist into adolescence. As a result, adolescents with ADHD may experience increased social difficulty as compared to younger children with ADHD. Peers tend to identify adolescents with ADHD as less well liked than peers without ADHD (Sibley, Evans, & Serpell, 2010). Additionally, when youth with ADHD, particularly girls, are rejected by peers, they are at increased risk for internalizing and externalizing problems, eating disorders, and lower levels of academic achievement (Mikami & Hinshaw, 2006).

In addition, adolescents with ADHD have been found to be at increased risk for engagement in problematic social behaviors, including drug and alcohol use, smoking, risky sexual behaviors, and association with deviant peers (Bussing et al., 2010; Flory, Molina, Pelham, Gnagy, & Smith, 2006; Marshal, Molina, & Pelham, 2003). Adolescents with ADHD who become associated with deviant peers are at additional risk for engaging in unsafe behaviors (Marshal & Molina, 2006). Furthermore, peer rejection increases risk for adolescent substance use and delinquency, beyond the risk found for ADHD alone (Mrug et al., 2012).

Social Media and Cyberbullying

Children and adolescents commonly interact with peers using social media; as youth increasingly have access to their own smartphones, it is challenging for parents and caregivers to carefully monitor social media use. Although the literature in this area is underdeveloped, initial investigations support the idea that the social deficits evident in face-to-face interpersonal interactions of youth with ADHD are likely to generalize to social media outlets (McQuade & Hoza, 2015). For example, online chat room behavior is similar to behavior observed during live social interactions; youth with ADHD engage in negative and aversive behaviors in both social situations (Mikami, Huang-Pollock, Pfiffner, McBurnett, & Hangai, 2007). Subtype differences that exist in live social interactions also appear to persist online. Children with ADHD combined presentation tend to exhibit more disruptive and hostile responses to peers, whereas children with ADHD inattentive presentation respond less frequently than children without ADHD (Mikami et al., 2007). In addition, the poor social judgment and impulsive behavior inherent in ADHD may lead to increased engagement in risky online behaviors such as interacting with unknown individuals and posting private pictures or information (McQuade & Hoza, 2015).

Cyberbullying is an increasingly common online occurrence, with estimates of victimization between 20% and 40% for all youth (Aboujaoude, Savage, Starcevic, & Salame, 2015). Given that children with ADHD are more likely than their peers without ADHD to be a victim and a perpetrator of peer victimization in face-to-face interactions (Wiener & Mak, 2009), it is likely that adolescents with ADHD also are involved in cyberbullying as victims and perpetrators at higher rates than peers without ADHD. Limited research suggests that conduct problems and hyperactivity have been associated with perpetrating cyberbullying, whereas having poor interpersonal skills has been linked with being the victim of cyberbullying for all youth (see Aboujaoude et al., 2015, for review). In an examination of cyberbullying in children with ADHD and Asperger syndrome (diagnosed according to DSM-IV TR; APA, 2000), Kowalski and Fedina (2011) found that 21% of respondents ages 10–20 years had been the victims of cyberbullying within the last 2 months and 6% indicated they had been a perpetrator during the same time period. The experiences of children and adolescents with ADHD alone were not investigated separately in the study. Although the rate of engagement in cyberbullying behavior as a perpetrator was relatively low, this investigation included only self-report. It is possible that the positive illusory bias that prevents children and adolescents with ADHD from recognizing social impairment may also lead to decreased self-recognition of cyberbullying behaviors.

Given the lack of literature in this area, the relationship of social media to peer interactions in children and adolescents with ADHD is in need of further investigation. Rates of victimization, bullying, and risky online behaviors, as well as their association with self-competence, positive illusory bias, and related social functioning, are all areas in need of additional study. The impact of these factors on adjustment and mental health should also be explored.

Assessment of Social Behavior in ADHD

When considering areas of impairment for children and adolescents with ADHD, assessment is a crucial first step in the development of treatment plans and refers to the process of evaluating, measuring, or documenting the nature or quality of a construct (Mash & Hunsley, 2005). Accurate assessment allows for improved selection of treatment options through the identification of patterns of strengths and weaknesses in social competence displayed by children and adolescents with ADHD. The goal of assessment is to gather qualitative and quantitative data in order to operationally define a problem or target behavior (e.g., frequency, duration, setting), identify corresponding skill or performance deficits, and highlight individual strengths that can be integrated in treatment. Thorough assessment practices thus allow for the development of a comprehensive treatment plan that capitalizes on strengths and includes individualized interventions that target specific areas of social performance (Mash & Hunsley, 2005; Thomas, Shapiro, DuPaul, Lutz, & Kern, 2011).

Due to the complex nature of social interactions, it is critical to collect a comprehensive sample of the child's behavior in order to accurately identify patterns of strengths and weaknesses. Best practices dictate multi-method, multi-informant assessment of social behavior (Odom, McConnell, & Brown, 2008; Timler & White, 2015). Multi-method refers to the integration of direct (i.e., assess behavior at the exact time it occurs) and indirect (i.e., assess behavior at a time or location detached from the original occurrence of the behavior) measures, whereas multi-informant refers to the need for input from a variety of respondents (e.g., parents, teachers, child; Odom et al., 2008; Timler & White, 2015). The following section reviews common practices in the assessment of social behaviors and relationships for children and adolescents with ADHD according to method (i.e., rating scale, sociometric nominations, and observation) and informant (i.e., adult, peer, and self-report).

Method

The primary methods used to assess social behaviors and relationships in ADHD include rating scales, peer sociometric nominations, and direct observations. A description of each, with specific examples commonly used in assessment of social impairment of children and adolescents with ADHD, is presented below. A further discussion of the importance of obtaining information from multiple informants and the relative value of obtaining information from each informant as it relates to specific social impairments described above will follow.

Rating Scale

Rating scales utilize a variety of structures and designs to measure the informant's perception of the degree to which an item is representative of the child's behavior (Thomas et al., 2011). Rating scales are used to gather quantitative information for the screening, diagnosis, and progress monitoring of social behavior in children with ADHD and allow the evaluator to assess a broad range of impairments including difficulties sustaining attention, hyperactivity, interpersonal relationships, emotional difficulties, and quality of life (Zavadenko et al., 2011). Equally important, rating scales can be administered across environments to assess natural variations in social behavior that occur in different contexts (e.g., a classroom with familiar peers and a community setting with novel children; Zavadenko et al., 2011). It is important to consider, however, that rating scales are indirect measures of behavior and are therefore susceptible to informant subjectivity and responder biases (Bordens & Horowitz, 2008; Thomas et al., 2011). Despite these criticisms, the relatively low cost combined with fairly straightforward administration, comparatively simplistic interpretation, and minimal completion time makes rating scales an efficient and desirable method of assessment (Thomas et al., 2011).

Published rating scales are typically norm referenced to allow the evaluator to compare the target child's performance with similar peers (e.g., based on age and gender; Thomas et al., 2011). Depending on the nature of the concern, there are several rating scales available to address relevant areas of social impairment associated with ADHD. Although a review of all rating scales with utility in the ADHD population is beyond the scope of this chapter, some examples that may be used to assess areas of social impairment include (a) the Social Skills Rating Scale (Gresham & Elliott, 1990), which includes parent, teacher, and self-report of general social skills; (b) the Revised Peer Experiences Questionnaire (Prinstein, Boergers, & Vernberg, 2001), which addresses peer victimization in adolescence; (c) the Self-Perception of Social Acceptance Scale (Harter, 2012) to assess self-awareness of social competence; and (d) the Social Competence Scales (Spence, 1995), which includes parent and child report of interactions and acceptance with peer groups. It is important to note that rating scales do not necessarily provide detailed information about specific social skills deficits; the majority of available scales focus instead on adult or self-awareness of social competence and acceptance. Given that children and adolescents with ADHD commonly experience peer rejection and reputation bias, it is often beneficial to obtain direct information regarding peer functioning.

Sociometric Nominations

Sociometric nominations are the direct assessment method most commonly used to explore peer status of children with ADHD. This method of evaluation is designed to evaluate peer acceptance and rejection and typically requires asking peers to identify classmates with whom they would like to be friends, as well as classmates with whom they would least like to be friends (Coie, Dodge, & Coppotelli, 1982). A score for each child is then determined by dividing the number of "most liked" nominations by the number of "least liked" nominations. Ratings can be used to categorize peers into "accepted" and "rejected" status, to identify social preference and social impact or visibility, as well as to identify reciprocal friends (i.e., when two students both identify each other as a student they "like"; see, e.g., Hoza et al., 2005). Sociometric nominations are also typically used to classify students into groups; most common group designations include "popular" (i.e., those with the most "liked" status), "rejected" (i.e., most "least liked"), "neglected" (i.e., neither most nor least liked), and "controversial" (i.e., equal numbers of most and least liked; Coie et al., 1982).

Although peer nominations can provide useful information related to the peer acceptance and social status of children with ADHD, this method can be rather cumbersome in that it requires obtaining information from a large group of children. Also, solely focusing on one classroom might not provide a comprehensive evaluation of a target child's social status, particularly for older children and adolescents, who often change classrooms throughout the school day and have varying amounts of contact with peers in each classroom. In addition, with increased social media use, children and adolescents are better able to maintain contact and develop friendships with individuals who do not attend the same schools, so it is challenging to accurately obtain sociometric data from peers outside of the school environment.

Observation

Observation is a direct assessment measure obtained from witnessing a behavior while it is occurring. Structured observations can use predetermined tasks (e.g., directing children to work together to complete a task), controlled social situations (e.g., child is placed with unfamiliar peers in a social setting), or observation templates (e.g., antecedent, behavior, and consequence) to measure and/or elicit specific behaviors such as the initiation of social interactions (Hunsley & Mash, 2007). For example, Normand et al. (2011; 2013) coded videotaped tasks in an effort to evaluate quality of social interactions for children with ADHD when paired with children without ADHD. Alternatively, Mikami et al. (2007) observed interactions between children with ADHD and simulated peers in an online chat room. This type of direct observation of social media use might become a much more relevant method of assessment of social interactions as research evaluating the social networking use of children and adolescents increases.

Observations do not require standardization or normative comparisons and, as such, can be conducted in natural environments (e.g., in classrooms, during extracurricular activities) as well as in contrived settings, such as a one-on-one testing session (Winner, 2002). Observation systems also allow evaluators to collect information regarding environmental factors, such as antecedents and consequences that may be reinforcing target behaviors (e.g., a child has an opportunity to see his friends in the hallway when he cuts class; LaRue, Sloman, Dashow, & Isenhower, 2015).

Despite the practicality, direct observation of social behavior has limitations. First, observations are subject to biases, such as observational bias (i.e., observers focus on areas where they think they will find desirable results) and confirmation bias (i.e., observers unintentionally interpret new information to support pre-existing beliefs; Bordens & Horowitz, 2008). In addition, in research studies using observation systems, the observations are often completed with a group of children with ADHD, in a clinic, summer program, or group treatment setting, thus preventing evaluation of social competence in natural environments, or with peers without ADHD.

Informant

Information regarding a child's social behavior can be obtained from a variety of respondents across multiple settings. The majority of children with ADHD interact with numerous people including family members, educational faculty, mental health service providers, and peers across a variety of environments, including home, school, and community settings. Given the complex nature of social impairment detailed earlier in this chapter, it is crucial that the assessment of social difficulties includes information provided by a sample of respondents familiar with the child's typical daily interactions. For the purposes of this chapter, respondents will be discussed in the three groups (i.e., adults, peers, and self) that are primary to the assessment of social behavior in children and adolescents with ADHD.

AdultSocial behaviors are most commonly assessed through information gathered from adult informants, typically through rating scales such as those described above (Mikami, 2015). Although the primary adult informants include parents and teachers, extended family members (e.g., grandparents), other educational professionals (e.g., classroom aides), and mental health providers (e.g., therapists, behavior specialists) can also provide valuable information. When obtaining information from adult informants, professionals traditionally favor input from teachers, as they generally have the most opportunity to observe the child interacting with peers; however, clinical and research best practices suggest the use of multiple informants to gather information about behaviors across home, school, and community settings (Mikami, 2015). It is also important to note that adult informants may be the most useful in the assessment of children, due to their often limited ability to accurately self-report, whereas self-report measures are often more valuable when assessing adolescents, who tend to spend more time with peers and less time in the presence of adults (Hunsley & Mash, 2007; Kramer et al., 2004). In addition, adult informants are likely unable to provide accurate information about peer regard, peer victimization, and social status, so if these are the primary targets of an assessment, additional sources of information are necessary.

Self

Self-report measures are particularly useful in the assessment of social competence for a variety of reasons. First, although behavior is relatively easy to observe and therefore measure, it is more challenging to assess an individual's cognitions or self-perception (Hunsley & Mash, 2007). That said, younger children generally do not have the self-awareness and metacognitive skills necessary to accurately self-report; these measures typically are most useful for the assessment of adolescents' social interactions. However, it must be noted that even adolescents with ADHD struggle to accurately self-report their social competence due to their tendency to overinflate their functioning (positive illusory bias). Although children and adolescents with ADHD may be able to self-report internalizing symptoms, evidence suggests that many overestimate their social competence and level of peer regard (Hoza et al., 2005; Owens et al., 2007). Self-report, however, might be a more accurate method when obtaining information regarding victimization by peers (Wiener & Mak, 2009).

Peer

Peer informants are valuable sources of information because they spend a large amount of time with other children and adolescents and are familiar with the acceptable social norms in situations involving other individuals who are similar in age (Newcomb, Bukowski, & Pattee, 1993). It has been suggested that peer reports are particularly essential to increase the accuracy of the assessment of the social behavior of children and adolescents with ADHD (Mikami, 2015). Given the positive illusory bias common among children and adolescents with ADHD, peer informants can provide valuable information on a variety of areas including: peer rejection, prosocial behavior, and friendships (see above section on sociometric nominations). Research supports the accuracy of peer informants; therefore, the inclusion of data collected from peers can enhance the comprehensiveness of an assessment (Renk & Phares, 2004). Nevertheless, similar to other indirect sources, evaluators need to be sensitive to the fact that peer reports can be influenced by numerous variables, including past experiences with the target child (Lauer & Renk, 2013).

In summary, each data collection method and informant is associated with corresponding benefits that uniquely contribute to understanding social behavior; however, each option also has limitations. The strengths and weaknesses of each method and informant vary depending on the nature of the social problem being assessed. The inclusion of multiple methodologies and informants through the use of the multi-method, multi-informant model allows for the most comprehensive representation of the multifaceted construct of social behavior in children and adolescents with ADHD (Thomas et al., 2011; Winner, 2002).

Treatment of Social Problems

Despite being considered one of the core areas of impairment for children and adolescents with ADHD, intervention research related to social functioning is relatively limited. Interventions for ADHD typically target symptom reduction, academic functioning, and behavior at home and school. If social impairment and functioning is examined at all, it typically is included as an ancillary part of the investigation. That is, social functioning may be measured but is generally not a direct target of intervention. Ideally, reductions in disruptive and intrusive behaviors common among children with ADHD and improvements in children's ability to attend to their environment translate to improvements in social behavior; however, this does not appear to be the case (de Boo & Prins, 2007; Hoza et al., 2005). Although several investigations have established that behavior management strategies are effective in addressing disruptive and inattentive behavior of children with ADHD (e.g., Evans, Owens, & Bunford, 2014; Pelham & Fabiano, 2008), reduction in social impairment and the development of quality friendships have rarely been included as a core component of intervention. Furthermore, findings from both behavioral and pharmacological treatment research generally indicate that although parent and teacher ratings of social competence might improve as a result of intervention (MTA, 1999), peer relationship deficits continue, despite improvements in behavioral functioning (e.g., Hoza et al., 2005).

Social Skills Training

The premise of most social skills training interventions is remediation of social skills deficits. Appropriate social responses are typically taught through direct instruction and practice; however, most programs do not attempt to intervene directly with a child's peers (Mikami, 2015). Evidence supporting the use of this type of clinic-based direct socials skills training for children with ADHD is limited. A number of intensive social skills training investigations, including those utilizing randomized assignments and/or no treatment control groups, have failed to demonstrate the effectiveness of social skills training in improving the adult- or peer-rated social performance of children with ADHD (see Evans et al., 2014 for review).

The presumed utility of social skills training is based on the underlying assumption that children with ADHD lack the social skills necessary to respond appropriately in specific situations. Although social cognitive deficits have been documented to exist in children with ADHD, there is little evidence that solely addressing these deficits will improve the social functioning of children with ADHD (Mikami, 2015). Some children with ADHD may exhibit deficits in their social skill knowledge; however, it is likely their ability to *apply* their social skills effectively and consistently that results in a mismatch between situation and response (de Boo & Prins, 2007). That is, rather than deficits in social knowledge, children with ADHD appear to have difficulty generalizing their knowledge to everyday peer interactions (Abikoff, 2009; Mikami, 2015). As such, traditional social skills training generally does not translate to improved social competence. Instead of traditional social skills training, which is typically offered in analog situations, it has been recommended that treatment be provided in vivo (i.e., in natural settings, such as schools and peer group activities, during actual peer interactions) and using different formats to address challenges with generalization (Abikoff, 2009). Specifically, when social skills training programs incorporate parent training to teach parents strategies to reinforce the use of appropriate social behaviors during social interactions in various settings, adult ratings of children's social skills show significant improvements as compared to skills training programs that only include the child as the target of intervention (Frankel, Myatt, Cantwell, & Feinberg, 1997; Pfiffner & McBurnett, 1997; Pfiffner et al., 2007).

It has also been posited that problems with generalization of social skills could be due to deficits inherent to ADHD (Abikoff, 2009). Children with ADHD have been shown to have difficulty modulating their social responses to specific situations (Milich-Reich, Campbell, Pelham, Connelly, & Geva, 1999). This may be a result of difficulties with attention that negatively impact the individual's ability to select appropriate social responses. Specifically, children with ADHD have been found to utilize the most recent social information in their interpretation of social situations rather than all relevant information from the entire interaction (Milich-Reich et al., 1999), indicating that these children likely are missing important information on which to base their response (McQuade & Hoza, 2015). In addition, the positive illusory bias that is prevalent among youth with ADHD might result in limited acknowledgment of their own social competence deficits, which might interfere with the success of skills-based interventions intended to improve social competence (Mikami et al., 2010).

Although direct skills training intervention with children appears, on the surface, to be a logical first step in improving peer relationships of children with ADHD, there currently is little empirical support for such interventions. Also, as noted above, peers' perceptions of children with ADHD are resistant to change, even when the target child's behavior improves after a course of behavioral or pharmacological intervention (Hoza, 2007; Mikami, Lerner, & Lun, 2010).

In addition, peers' negative behavior directed toward children with ADHD may further contribute to the poor social behaviors exhibited by children with ADHD (Mikami, 2015). Therefore, it is critical that interventions designed to improve the social impairment of children with ADHD include peers as a target of intervention. Given the benefit of directly involving parents in supporting children's appropriate use of social skills, and the difficulty in changing peers' perceptions of children with ADHD, it would follow that interventions involving important adults in the child's life and directly targeting peers might be more effective than traditional social skills training targeting the child with ADHD alone.

Peer and Friendship Interventions

Little research has been conducted on interventions specifically targeting the peer relationship problems of children and adolescents with ADHD. The inclusion of adults in improving the peer relationships of children with ADHD, although in need of further study, may potentially be an effective intervention. Parent-mediated interventions are promising; indeed, parental behavior appears to impact children's opportunities for, and behavior during, social interactions. A review of literature on parental influences on their children's peer relationships found that parents of children with ADHD arranged for fewer playdates, were more critical of interactions with peers, and had fewer prosocial skills themselves (Mikami, Jack, Emeh, & Stephens, 2010). Parents have been utilized as intervention agents to improve the friendships of children with ADHD, with findings indicating that the inclusion of parents in fostering relationships between children with ADHD and peers may be a promising practice (Frankel et al., 1997; Hoza, Mrug, Pelham, Greiner, & Gnagy, 2003; Mikami, Lerner, Griggs, McGrat, & Calhoun, 2010). Previous investigations have found that training parents to support the generalization of social skills learned during child-focused social skills training results in improvement in adult-rated social skills (Frankel et al., 1997) and that increasing the frequency of playdates might foster improved peer relationships (Hoza et al., 2003).

In a more recent investigation of a friendship intervention for children with ADHD known as parental friendship coaching (PFC), Mikami, Lerner, Griggs, et al. (2010) taught parents of children with ADHD to create social opportunities and to instruct their children on social skills before and during social interactions. Findings from this study indicated improved parent-rated social skills for children with ADHD who received the intervention as compared to children with ADHD assigned to a no treatment control group. Teacher ratings did not improve; however, teachers did rate children receiving the intervention as less disliked and more liked by peers. Parents also reported less conflict and disengagement from activities for children receiving the intervention as compared to controls. Observations of parental behaviors also indicated an increase in parents' facilitation of their children's appropriate behavior and a reduction in criticism during peer interactions. These results are intriguing; however, further investigation, including the addition of peer sociometric nominations, is warranted. Given the reputation bias of children with ADHD, and the detrimental effects of peer rejection and peer victimization, measures specifically addressing these constructs are vital to the evaluation of peer interventions for children with ADHD. Mikami and colleagues currently are conducting a randomized clinical trial to further examine the PFC intervention and have included sociometric nomination as part of their evaluation of peer relationships (Mikami, 2015).

Preliminary investigations have also been conducted utilizing teachers to specifically address acceptance into the peer group. To this end, Mikami et al. (2013) designed and implemented an intervention targeting teacher-student interactions, known as Making Socially Accepting Inclusive Classrooms (MOSAIC), compared to traditional evidence-based contingency management training. In MOSAIC, the role of the teacher is to interact positively with the children with ADHD in an effort to improve social reputation. In addition, teachers encourage inclusiveness of the peer group by not publically identifying those children who struggle to behave appropriately, specifically targeting working together, and publicly valuing aspects of individual children unrelated to their behavioral competence. Reprimands and acknowledgment of behavioral accomplishments or deficits are offered privately so as not to create a public identity of behavior problems for children with ADHD. Results from a 4-week summer program evaluation, including children with and without ADHD, were promising. Although children with ADHD did not receive more positive nominations from peers without ADHD, children receiving the MOSAIC intervention were less likely to receive negative nominations, had more reciprocated friendships, and received more positive comments from peers, as compared to children who received traditional behavioral treatment. The group differences in socially oriented measures occurred despite the fact that there were no differences between groups on measures of disruptive behavior (i.e., hyperactivity, inattention, oppositional behavior). In addition, as compared to peers without ADHD, findings were consistent with previous studies indicating that children with ADHD are less likely than peers to have reciprocated friendships; however, the group differences were smaller after participation in MOSAIC (13% for children without ADHD vs. 21% for children with ADHD) as compared to participation in standard behavioral intervention (13–50%).

Although the MOSAIC intervention (Mikami et al., 2013) appears to have influenced the peer acceptability of children with ADHD, the investigation took place during a summer program, in a controlled environment, with small classroom sizes, and novel peers without ADHD, and included trained coaches to support teachers' implementation of the intervention. It remains to be seen whether these outcomes could be replicated during the school year, in a classroom with peers already known to the child with ADHD, and with less consultative support from researchers.

Although these programs are promising in addressing social difficulties of school-aged children with ADHD, there is a considerable lack of literature on peer interventions for adolescents with ADHD. Findings from one study evaluating a middle school intervention addressing social skills, without incorporating peers without ADHD, for example, were not found to be effective in improving adult-rated interpersonal skills (Evans, Langberg, Schultz, Vaugn, & Altaye, 2015). Given the chronicity of social skills deficits and peer rejection among adolescents with ADHD and the resulting deleterious outcomes, including peer victimization, the development of internalizing disorders, and risk for increased substance use in adolescence, further investigations are necessary.

Conclusions

Children with ADHD experience significant social impairment affecting relationships with peers and adults. Findings to date indicate that children with ADHD are likely to experience increased peer rejection and victimization, have fewer friends, have less stable and shorter friendships, have lower quality friendships, and are more likely to have friends who also have externalizing behavior problems than peers (e.g., Becker et al., 2016; Hoza, 2007; Normand et al., 2011). Children with ADHD have also been found to be more likely to engage in bullying and relationally aggressive behaviors (Ohan & Johnston, 2007; Wiener & Mak, 2009). These deficits in face-to-face social interactions are also likely to translate into challenges during online interactions (McQuade & Hoza, 2015); however, less is known about how social media use impacts the social relationships of children and adolescents with ADHD.

Social impairment is considerable for both boys and girls with ADHD; however, the social relationships of boys are more likely to include physical aggression, whereas the social relationships of girls are more likely to include relational aggression (Wiener & Mak, 2009). In addition, poor peer relationships among youth with ADHD may both be exacerbated by the presence of comorbid externalizing and internalizing disorders and contribute to further emotional distress and poor self-esteem (Becker et al., 2016; Fogelman et al., 2016). Children and adolescents with ADHD also tend to have challenging relationships with adults, including parents and teachers (Roberts et al., 2015).

With a few exceptions (e.g., Hoza et al., 2005; Mrug et al., 2012; Normand et al., 2013), much of our knowledge about peer relationships and social functioning of children with ADHD is based on parent, teacher, and self-report. The literature suggests that self-report is more accurate than adult report of peer victimization; however, it is important to consider self-report data in light of the positive illusory bias common among youth with ADHD that impacts their ability to accurately identify their level of social competence and the extent to which they are liked by peers (Hoza et al., 2012; Owens et al., 2007). Direct report from peers of children with ADHD is likely the most accurate measure of peer-relationship information; however, these methods inherently require access to classmates and other peers and as such are often more difficult to obtain.

Evidence-based practices for treating ADHD include psychosocial strategies and medication management; however, these are typically targeted at the challenging behavior associated with ADHD and have been unsuccessful in improving social functioning (Hoza et al., 2005; 2012). Historically, the intervention literature focused on improving the social competence of children with ADHD has concentrated on social skills training; however, child-mediated, skills-focused interventions have been largely unsuccessful at impacting the social competence and peer relationships of children with ADHD. Results have generally indicated that these interventions are not sufficient to address children's social problems, as these problems likely are not solely due to skills deficits but also to a difficulty in applying social skills during actual interactions (de Boo & Prins, 2007; Evans et al., 2014). Interventions targeting improving the application of social skills, however, have also been shown to be minimally effective likely because children with ADHD tend to quickly develop poor reputations with peers that are difficult to alter. More recent investigations have provided some promising preliminary outcomes and suggest that including parents and teachers as intervention agents to directly address social skills application and peer regard can be an effective method by which to improve the peer relationships of elementary-aged children with ADHD (Mikami et al., 2010; 2013). Such interventions are, however, in early stages of development and evaluation; randomized controlled trials and implementation in natural environments under more realistic conditions are necessary.

Future Directions

There are four primary areas that should be of interest to future investigations into the social functioning of children and adolescents with ADHD. First, although peer group status and the presence of reciprocal friendships are associated with peer rejection and victimization, the role of friendship quality and its risk and protective nature related to peer status and associated mental health concerns has been largely unexplored for children and adolescents with ADHD. Second, given the increase in social media use and online interactions among youth with and without ADHD, the effects of social media on peer relationships, social competence, victimization, bullying, and adolescent risk taking behavior are an area in need of further investigation. In addition, these factors and their relationships to mental health should also be explored. Third, much of the research regarding social competence and ADHD has focused on impairment and the teaching of social skills; additional research is necessary to evaluate comprehensive peer and friendship interventions, including regular classroom-based interventions, interventions targeted at improving the ability of children with ADHD to generalize their social skills to various situations, and interventions addressing poor peer regard and reputation bias. Finally, as is the case for intervention research for adolescents with ADHD broadly, there is a significant need for the development and evaluation of interventions designed to improve the social functioning and peer relationships of adolescents with ADHD.

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Anxiety Disorders

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Introduction

According to the *Diagnostic and Statistical Manual of Mental Disorders*, *Fifth Edition* (*DSM-5*, American Psychiatric Association, 2013), there are nearly a dozen of anxiety disorders and phobias which can be diagnosed in children. Most of these disorders include a criterion requiring interference in social and academic situations or, as is the case of agoraphobia, interference from embarrassment or the need of a companion (cf. *DSM-5*). As a diagnostic group, anxiety disorders are associated with social withdrawal, shyness, problematic peer relations, parent-child interaction difficulties, skills deficits, impairments in developmental and cognitive abilities, and cognitive distortions (Davis, Hess, et al., 2011; Davis, Ollendick, & Nebel-Schwalm, 2008; Elizabeth et al., 2006; Gallagher & Cartwright-Hatton, 2008; Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004; Reijntjes, Kamphuis, Prinzie, & Telch, 2010; Rubin, 2014; Spence, Donovan, & Brechman-Toussaint, 1999). Children with anxiety disorders can also be subjected to negative stigma (Jorm & Wright, 2008; Wright, Jorm, & Mackinnon, 2011). Moreover, research has shown that children with anxiety disorders also suffer from discrimination and victimization (e.g., Storch et al., 2006), which can cause increased emotion dysregulation (McLaughlin, Hatzenbuehler, & Hilt, 2009). Anxiety has also been found to interact with social and communication skills in ways that impact other disorders (e.g., autism spectrum disorder; Davis et al., 2012). As a result, it is surprising that the assessment and treatment of social skills deficits and social behavior difficulties in children with anxiety disorders have received relatively little attention outside of social phobia. For example, a decade-old review of evidence-based treatments for child anxiety indicated social skills training was included in less than 10% of treatment protocols—the least included component of the 18 treatment strategies selected for review (Chorpita & Southam-Gerow, 2006). Moreover, in a recent review of the components of cognitive behavioral therapy related to outcome in child anxiety disorders, social skills training was not included (Ale, McCarthy, Rothschild, & Whiteside, 2015). Thus, this chapter will examine the interplay of anxiety disorders and social skills difficulties with a

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The authors would like to thank Melissa Munson for her assistance on a prior edition of this chapter. The terms "child" and "children" are used throughout and usually meant to include adolescents.

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particular focus on social anxiety disorder (social phobia), given its relevance to the theme of this volume and the pertinent research that has occurred in that area. Topics to be reviewed include the unique impact of social skills problems on individuals with anxiety disorders, as well as the assessment and treatment of social skills deficits in anxiety-disordered children.

Definition of the Population

A brief discussion of emotion and emotional responding is essential to a thorough understanding of the interplay of anxiety and social behavior. Anxiety is an emotion composed of several constructs which are influenced by one's memories. In essence, when vast associative networks of information contained in long-term memory are stimulated, they cue an "action disposition" or emotion (Lang, Cuthbert, & Bradley, 1998, p. 656; Salzman & Fusi, 2010). These networks are subdivided into associations between stimulus, response, and meaning units of information (Drobes & Lang, 1995; Foa & Kozak, 1998; Lang et al., 1998). Essentially, emotion is a consolidation of properties which are based on sensations associated with the stimulus, our potential responses, and the meaning attributed to the stimulus or situation which serves to further connect the stimulus and response units. Overall, these associative networks broadly guide our approach or avoidance of stimuli and situations based on the information activated.

Given this, anxiety and fear can be conceived of as a neural pattern that facilitates emotional responding or changes in physiology, behavior, and cognition (Foa & Kozak, 1986; Lang, 1979; for a review, see Shin & Liberzon, 2010). As a result, pathological fear or worry differs from the typical and more normative experiences by cueing a maladaptive network that incorporates exaggerated emotional responses—catastrophic cognitions and inaccurate views of the world, unwarranted or excessive behavioral avoidance, and physiologic discomfort (misinterpretation of physiological sensations)—that is, problematic and resistant to change (Foa & Kozak, 1986, 1998). Conceived of in this way, children having problems with social difficulties have a maladaptive response pattern which likely incorporates catastrophic thoughts about or misinterpretations of social situations, avoidance of social situations or people, and panic-like physiological symptoms to social stimuli that are often interpreted as problematic. These responses, and the prognosis for therapeutic benefit, likely depend upon the child's unique presentation and the potentiation of the associative network (see sections below on etiology and developmental psychopathology). A child with anxiety and social difficulties, then, is a child with emotional difficulties rooted in myriad developmental, biological, environmental, and experiential factors. Further, this process is dynamic and reciprocal (Davis, 2009). For example, a socially anxious child may display maladaptive responses when entering a new playgroup (e.g., thinking "other children won't like me," acting behaviorally avoidant by hovering awkwardly outside of the group—not engaging in conversations, and experiencing an elevated heart rate that he or she interprets as scary). These emotional responses are then observed by his or her peers, which often leads to neutral, negative, or even punitive responses. The peer group's responses are then taken in by the child and further influence maladaptive emotional responding while potentially confirming distorted thinking and expectations about social situations and so on reciprocally (McLaughlin et al., 2009). In addition, the child may be negatively reinforced for future avoidance as social withdrawal and shyness may allow the child to avoid or reduce aversive physiology and cognition, and the entire experience may be associated with a sense of helplessness and uncontrollability (Mineka & Zinbarg, 2006).

Children with anxiety and fear related to any of the *DSM*-5 anxiety diagnoses are likely to experience social difficulties and peer rejection (see Social Skills Problems Unique to the Population below). Most relevant and widely studied, however, is the diagnosis of social anxiety disorder (also called social phobia). In children, social phobia is characterized by a marked and persistent fear of social performance or evaluation when being observed by children and adults alike (i.e., not just fear with authority figures or adults; *DSM-5*). Exposure to a feared situation typically provokes a maladaptive emotional response similar to that described above (Beidel & Turner, 2007). A physiological response, possibly even a panic attack, may be present. Behaviorally, the child may withdraw, cry, tantrum, or avoid social situations, or when avoidance is not possible, the child may endure exposure with significant discomfort (*DSM-5*). Cognitively, anxious apprehension or distress must interfere with the child's functioning and social relationships, and the child may believe the fearful response is warranted (i.e., no recognition that the emotional response is severe, excessive, or unreasonable; *DSM-5*). For a child, the fear must endure and be present for at least 6 months in an effort to avoid pathologizing developmentally appropriate social fears. In addition, one can now specify if the fear is restricted to perform or speak in public only by indicating "performance only" (e.g., public speaking; *DSM-5*).

While social phobia may seem to be the most pertinent diagnostic consideration, social concerns related to other anxiety disorders should be examined as well (e.g., Schniering, Hudson, & Rapee, 2000). With separation anxiety disorder, a child is overly concerned about separation from a parent, a guardian, or the home and may experience social disruption or embarrassment about leaving friends' houses or needing close proximity to caregivers; such a child not only suffers from the symptoms of the disorder but also does not experience positive socialization experiences (*DSM-5*). These symptoms may also hinder the typical social developmental trajectory. In cases of generalized anxiety disorder, the child worries about performances, social situations, peer relations, and possible embarrassment, even in the absence of evaluation (note: the absence of social evaluation is one factor that distinguishes it from social phobia; *DSM-5*). Similarly, with agoraphobia and panic, the fear and worry over embarrassment persist even into situations in which there is no evaluative component (*DSM-5*). As well, the lack of social engagement and interaction from the newest addition to the anxiety disorders, selective mutism, can also cause an array of social problems (*DSM-5*). While it is recommended for many of these disorders that one should examine the use of a safety companion in diagnostic determinations, this is likely to be of less value with children who frequently have parents or caregivers nearby anyway.

Etiology and Prevalence

Etiology

Anxiety disorders have generally been theorized to come about through four possible mechanisms, usually in combination: a classical conditioning, modeling, negative information transfer, and nonassociative mechanism (for more detailed reviews, see Fisak & Grills-Taquechel, 2007; Mineka & Oehlberg, 2008; Muris, Merckelbach, de Jong, & Ollendick, 2002). Anxiety is thought to be transmitted through associative means by either experiencing a negative event directly, by seeing someone else behave anxiously or afraid, or by hearing or reading about being anxious or afraid (Mineka & Zinbarg, 2006). Nonassociative considerations point to people having an innate, inborn biological (e.g., genetic) predisposition to fear and anxiety (or potentially just not being able to recall associative events, e.g., "I don't know; I've always been afraid"). From these basic mechanisms, the etiology of anxiety has been broadly understood to be a consideration of how much association (i.e., classical conditioning, modeling, and/or negative information transfer) to a stimulus is necessary to bring about a disorder given one's innate predisposition (Marks, 2002). Even so, the interaction of these four etiological mechanisms is poorly understood, and their description of coalescing into an anxiety disorder is greatly simplified.

A complete understanding of how anxiety disorders emerge likely incorporates various etiological processes that lead to one or more aspects of the maladaptive emotional response, as opposed to the entire complex emotional response. These etiological risks then might accumulate and interact over time. Such an occurrence might be supported by notions of desynchrony in which only partial emotional responses (e.g., low arousal but high distress) occur in response to an anxiety-provoking situation or stimulus (Allen, Allen, Austin, Waldron, & Ollendick, 2015; Rachman & Hodgson, 1974). Even so, etiological models of anxiety need to incorporate current progress in the understanding of developmental psychology and developmental psychopathology. It has long been observed that many children have similar experiences but develop different psychological trajectories and that children with differing experiences can come to the same developmental trajectory (Cicchetti & Rogosch, 1996). For example, two children both have negative social experiences (e.g., getting teased and bullied), yet only one develops an anxiety disorder or both develop different anxiety disorders. These observations represent multifinality (i.e., a single developmental event can have multiple outcomes) and equifinality (i.e., different developmental trajectories can lead to the same outcome; cf. Ollendick & Hirshfeld-Becker, 2002). As a result, the goal of both research and clinical practice has been to personalize assessment and treatment to better understand each child as an individual with his or her unique predispositions, learning histories, strengths, weaknesses, coping abilities, etc. at a particular point in time (Davis, 2009).

Developmental psychopathology seeks to understand the "developmental and psychological disturbances in children as the result of complex interactions over the course of development between the biology of brain maturation and the multidimensional nature of experience" (Mash & Dozois, 2003, p. 5). Increasingly, multifinality and equifinality influence etiological models through providing information on developmental trajectories along with the recognition that psychopathology is influenced by both when a child is observed (e.g., developmental milestones negotiated, age, situation) and who is evaluating the child's behavior (e.g., the observer's perspective, orientation, and biases; Mash & Dozois, 2003). Child psychopathology is then a multifaceted construct which ties together environmental factors, factors within the child, as well as the impressions of those around him or her. Further, a child's behavior may or may not be maladaptive, but the caregivers' accommodation of disorder, intolerance, or misinterpretation of typical child behaviors may deny that a child needed help or potentially contribute to the development of dysfunction (Thompson-Hollands, Kerns, Pincus, & Comer, 2014).

As a result, adequate etiological models of anxiety disorders increasingly need to incorporate developmental milestones—in the case of this chapter, social development. Theorists have attempted to do just that, and integrated etiological theories have emerged in which known mechanisms have been framed within a developmental psychology framework. For example, etiological discussions of anxiety and social problems now commonly include the topics of genetics, temperament, child-rearing and parenting, and negative social experiences as well as a variety of other factors (Elizabeth et al., 2006; Ollendick & Hirshfeld-Becker, 2002; Rapee, Schniering, & Hudson, 2009; Rapee & Spence, 2004) and increasingly lend themselves toward a discussion of possible transdiagnostic constructs. Social anxiety has been conceptualized as a continuum with a child's risk for or resiliency to disorder being described as how developmental and environmental factors move a child up or down the continuum from a certain initial innate set point (Rapee & Spence, 2004). Several of these influential factors will be reviewed briefly below.

Genetics. Genetics has been tentatively linked to a variety of social developmental aspects including emotionality, sociability, and broad internalizing tendencies (for a review, see Gregory & Eley, 2007). In particular, genetic research has pointed to the role of both broad vulnerabilities (i.e., internalizing disorders) and specific vulnerabilities (e.g., social anxiety) but also does not discount the impact of environmental influences (e.g., Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004; Shimada-Sugimoto, Otowa, & Hettema, 2015). For example, social phobia has been found to be more common among first-degree relatives (e.g., Fyer, 1993; Fyer, Mannuzza, Chapman, Martin, & Klein, 1995). Moreover, heritability estimates of approximately .48 have been found for broader social anxiety constructs like the fear of negative evaluation (Stein, Jang, & Livesley, 2002). Interestingly, there is evidence that the broader, more generalized type of social phobia may be more heritable than the specific type (Mannuzza et al., 1995; Stein, Chartier, Kozak, King, & Kennedy, 1998). Unfortunately, research in this area has been hampered by polygenetic influences with limited impact, and in the end, the genetic component may be more useful for determining psychopathological risk than response to treatment (Gregory & Eley, 2007). Moreover, a recent genome-wide association study was not able to find any associations, and attempts to replicate the top associations did not yield significant results (Trzaskowski et al., 2013). In addition, even genes must be understood as residing in cellular environments which can act to switch them "on" or "off," an area of investigation termed epigenetics (e.g., Szyf, McGowan, & Meaney, 2008).

Temperament. For decades children have been understood to have different temperaments. A child's temperament is understood to involve several dimensions that include, but are not limited to, his or her emotionality, activity, and sociability (Buss & Plomin, 1984). For example, children classified into groups such as "easy" or "difficult" find that children receiving difficult classifications (e.g., children with poor adaptability, withdrawal from novelty, intense reactivity) are more strongly associated with anxiety and behavior problems (Thomas & Chess, 1977; Thomas, Chess, & Birch, 1968). In contrast, children classified as "easy" are less likely to be associated with emotional dysregulation later in life. Subsequent refinements have found the related concept of behavioral inhibition to be a particularly important temperamental construct, and risk factor, for social anxiety and social withdrawal. Behavioral inhibition refers to a relatively stable pattern of behavioral and emotional responses in which a child is tentative, shy, and withdrawn in strange or novel situations (Kagan, Reznick, Clarke, Snidman, & Garcia Coll, 1984; Rapee & Spence, 2004). During early childhood, approximately 15% of young children exhibit "behavioral inhibition" (Costello, Egger, Copeland, Erkanli, & Angold, 2011). These children are thought to have a low threshold and tolerance for arousal in novel, uncertain situations (Kagan, Reznick, & Snidman, 1987). It may not be surprising then that behaviorally inhibited children are more susceptible to develop social phobia (Biederman et al., 2001; Rapee et al., 2009).

Parent-child interaction. Researchers to date have failed to determine if socially anxious and inhibited children are the result of particular parenting styles or elicit those parenting behaviors (for a review, see McLeod, Wood, & Weisz, 2007; Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004). It is likely a bidirectional interaction of both possibilities, where a child and parent dyads impact each other reciprocally, with other variables such as temperament, environmental factors, and genetics having long-standing contributions as well. Even so, in examining non-retrospective studies, Wood, McLeod, Sigman, Hwang, and Chu (2003) found that anxious children had parents who were observed to be less accepting, more critical, overcontrolling, and overprotective. Moreover, parents who are more likely to model anxiety tend to have children with increased anxiety; however, such observations make it difficult to tease apart genetic contribution. Also, parents are frequently influential in arranging and supervising play, with socially phobic parents potentially less proficient at these tasks themselves (Masia & Morris, 1998; Ollendick & Hirshfeld-Becker, 2002). Parents of anxious children have been observed to interact with their children in ways that present the world as hostile, dangerous, and anxiety provoking while also demanding compliance and being less accepting and more critical for deviation from their directives (Ollendick & Benoit, 2012). Moreover, these parents often provide maladaptive social modeling as well as an inherited genetic component. Such interactions may be most impairing as risk factors for younger children who have other diatheses (Ollendick & Horsch, 2007); as a result, there is likely an unfortunate interaction of multiple familial factors that increase the likelihood of a child developing social anxiety (e.g., inherited traits which affect parents and children alike, parenting styles, modeling, socioeconomic status, etc.).

Prevalence

Prevalence estimates of anxiety disorders in children have considerable variability, ranging from roughly 3 to 32% of children depending on the disorders included, sample, methodology, and time period (Cartwright-Hatton, McNicol, & Doubleday, 2006; Merikangas et al., 2010). According to one group of researchers, 36.7% of children will meet the criteria for at least one *DSM-IV* disorder, and 10% will have an anxiety disorder by 16 years of age, with the 3-month prevalence of anxiety disorders being 2.4% (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). Also, in 22.8% of cases, children reporting "childhood fears" had a diagnosable anxiety disorder (Muris, Merkelbach, Mayer, & Prins, 2000). High comorbidity with other disorders (including anxiety disorders) also has been consistently found (e.g., 41% comorbid, Beidel, Turner, & Morris, 2000; 54% comorbid, Spence, Donovan, & Brechman-Toussaint, 2000; 72% comorbid, Silverman et al., 1999). Research on the prevalence rates of anxiety disorders with the new edition of the *DSM* has yet to be published.

Relevant to this chapter, the 3-month prevalence of social anxiety disorder in the general population has been found to be 0.5% for a younger sample of children and adolescents (Costello et al., 2003; 9–13 years initially), while 1-year prevalence estimates of child and adolescent social phobia have been suggested to be 6.8% in primary care facilities (Chavira, Stein, Bailey, & Stein, 2004). Similarly, the adult 1-year prevalence in the population has been found to be 6.8–7.4%, the second most prevalent mental disorder (Kessler, Chiu, Demler, & Walters, 2005; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Overall, lifetime prevalence rates for children and adolescents have been suggested to vary between 5 and 15% (Heimberg, Stein, Hiripi, & Kessler, 2000). Behaviorally inhibited preschoolers are twice as likely to develop social anxiety disorder, with a lifetime prevalence of 28% versus 14% (Hirshfeld-Becker et al., 2007). Age of onset is usually in preadolescence to adolescence with more generalized social worries beginning earlier (Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004). Also suggesting a later onset, a review of preadolescent children (defined to be under 12 years of age) has found prevalence rates to be less than 1% (Cartwright-Hatton et al., 2006), similar to the slightly younger-aged sample in Costello et al. (2003).

Social Skills Problems Unique to the Population

As alluded to above, children with anxiety disorders and phobias experience a variety of social problems that interact bidirectionally with psychopathology, further complicating both. Moreover, a threat-related attentional bias may exacerbate avoidance and the perception of situations as potentially anxiety provoking (Puliafico & Kendall, 2006). Childhood anxiety has been associated with numerous risks including social withdrawal, social skills deficits, peer rejection and neglect, dysfunctional parent-child interactions, maladaptive social strategies, and cognitive distortions (e.g., Elizabeth et al., 2006; Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004; Sondaite & Zukauskiene, 2005; Spence et al., 1999; Strauss, Lease, Kazdin, Dulcan, & Last, 1989). Moreover, an attention bias toward threat is linked to behavioral inhibition in young children, which is more likely to lead to social withdrawal over time (Pérez-Edgar et al., 2011). As a result, anxious children have been somewhat consistently described as being socially maladjusted by parents, teachers, peers, and even the children themselves (e.g., Strauss et al., 1989; Verduin & Kendall, 2008). These factors may be placed them upon a developmental trajectory toward further social withdrawal and dysfunction (Oh et al., 2008). Unfortunately, social anxiety has been described as moderately stable across the life-span (Chronis-Tuscano et al., 2009; Rapee & Spence, 2004).

The influence of peers and their relationships have been one of the larger areas investigated by researchers. Shy children have been suggested to be as likely to have friends as other children; however, there are important differences in these relationships (Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006). Examinations of adolescents with social anxiety have suggested friendships may be impacted—particularly for girls (Erath, Flanagan, & Bierman, 2007; La Greca & Lopez, 1998). According to Rubin et al. (2006), withdrawn children's friends were more likely to be withdrawn and victimized themselves by peers, and the quality of these friendships was poorer than control children's relationships. La Greca and Lopez (1998) found that socially anxious adolescent boys and girls reported feeling less supported, accepted by, and attractive to peers; girls especially were found to report fewer friendships and less intimacy and support in existing relationships. Moreover, social anxiety and loneliness have been found to impact online communication (Bonetti, Campbell, & Gilmore, 2010). Generally, it has been surmised that social anxiety in children is associated with long-standing social and peer problems which lead children to experience peer rejection, neglect, and exclusion (Rapee & Spence, 2004). Similarly, Rudy, May, Matthews, and Davis (2013) found through structural equation modeling that the frequency of youth negative self-statements was associated with less social self-efficacy. The expected relationship was also found: more frequent negative self-statements were associated with less social self-efficacy. However, this relationship was only held for the youth's sense of social self-efficacy with peers and adults, not strangers.

Examinations of social functioning, relationships, and competence in children with other anxiety disorder diagnoses are more limited, but findings have been similar to those obtained with socially anxious children. For example, Strauss, Lahey, Frick, Frame, and Hynd (1988) used a peer nomination procedure (i.e., children wrote down the names of the three children they liked most and the three children they liked least) to determine peer social status among anxiety-disordered, conduct-disordered, and non-referred control children. Broadly, they found that children with anxiety and conduct disorder were similarly disliked compared to a group of typically functioning peers. Children with anxiety disorders were also more likely to be classified as socially neglected (i.e., few "like most" or "like least" nominations; Strauss et al., 1988). Additionally, Strauss et al. (1989) found that, compared to typically developing peers, anxious children reported more loneliness and less social competence. Parents and teachers reported that the anxious children were more withdrawn, maladjusted, socially deficient, and lacking in social skills (Strauss et al., 1989).

Examining the differences between two groups of anxious children, Ginsburg, La Greca, and Silverman (1998) found that children diagnosed with an anxiety disorder with high social anxiety, compared to anxious children with low social anxiety, had more negative peer interactions and lower self-esteem and social acceptance. Children diagnosed with social phobia in particular have also been found to have deficits in their social skills and social competence and to engage in a more negative self-talk in socially evaluative situations when compared to a matched group of typically developing children (Spence et al., 1999). Also, direct observations of children interacting with peers at school have determined that children with social phobia experience similar percentages of interaction that were negative or in which the child was ignored but fewer peer social interactions with positive outcomes (Spence et al., 1999).

Verduin and Kendall (2008) examined children's ratings of videotaped anxious and typically developing children. Child raters were able to perceive anxiety in videotaped children, as indicated by positive correlations between the raters' ratings of anxiety in the videotaped children and the videotaped children's ratings of themselves. The effect was stronger for ratings of children diagnosed with an anxiety disorder than those children without an anxiety disorder. Children rated anxious children as significantly less likeable; however, further analyses indicated that these differences were "wholly attributable to the presence of" social phobia and not diagnoses of generalized anxiety disorder or separation anxiety disorder (p. 465). Socially anxious children were even rated less likeable when the peer-raters' ratings of anxiety were controlled—in other words, socially phobic children were disliked even if they were not perceived to be anxious (Verduin & Kendall, 2008). As a result, it would seem that the combination of anxiety and social problems causes peer difficulties for children independent of the overt presentation of anxious symptomatology.

There is evidence that anxious children's problems with peer relations may even be stigmatizing and associated with victimization by peers. Jorm and Wright (2008) surveyed 3746 children, adolescents, and young adults as well as 2005 parents in Australia by phone. Participants were interviewed after being read several vignettes of hypothetical clinically diagnosed 15-year-olds—one of which described the hypothetical teen as having symptoms of social phobia. Youth's ratings of the teen with social phobia were associated with higher scores on scales stigmatizing the teen as "weak not sick" and "stigma perceived in others" indicating perceptions that the hypothetical teen was weak-minded, stigmatized, and to be avoided (Jorm & Wright, 2008). Moreover, youth "weak not sick" beliefs were associated with parents' increased "weak not sick" beliefs and decreased "stigma perceived in others" beliefs. Overall, the authors concluded that "social phobia was more likely to be seen as a weakness rather than a sickness and was perceived as being more stigmatised [sic] by others in society" (p. 147).

Peer victimization is also a problem for children with anxiety and anxiety-related disorders (e.g., obsessive-compulsive disorder). For example, Storch, Masia-Warner, Crisp, and Klein (2005) and Storch et al. (2006) examined the victimization of adolescents with social anxiety and children and adolescents with obsessive-compulsive disorder. Victimization was defined as both overt (e.g., hitting, yelling) and relational (e.g., spreading rumors and gossip, using relationships to isolate individuals) peer aggression (Storch et al., 2005, 2006). A longitudinal investigation found that relational victimization predicted social phobia symptoms appearing at 1 year, but not the reverse, and also did not predict more general symptoms of social anxiety (Storch et al. 2005). These results suggest a unidirectional influence of relational aggression; however, it may be that socially anxious children are already avoidant and excluded to the extent that little more relational aggression can occur. In contrast, Siegel, La Greca, and Harrison (2009) found peer victimization was both a predictor and consequence of social anxiety over time using a 2-month prospective research design. It is clear that more research is needed to better understand the interplay between social anxiety and peer victimization. Storch et al. (2006) found that children with obsessive-compulsive disorder were victimized more than controlled children or even the children with diabetes who were included. Victimization was associated with a number of factors including depression and loneliness and has fully or partially mediated the effects between obsessive-compulsive disorder severity and depression, externalizing behaviors, and loneliness. Boys with comorbid social anxiety and depression have been shown to have the highest rates of both overt and covert victimization, whereas girls had the highest rate of covert victimization (Ranta, Kaltiala-Heino, Pelkonen, & Marttunen, 2009). Taken together, it may be that socially anxious and awkward children are identified, disliked, and targeted for victimization by peers, even before they show significant overt symptoms of anxiety (cf. Storch et al., 2005; Verduin & Kendall, 2008), and it is possible that this victimization leads to an exacerbation of social anxiety symptomatology (Siegel et al., 2009). Moreover, the social and anxiety problems these children experience may be viewed by peers and adults as abnormal and indicative of weakness instead of as symptoms of a treatable psychiatric condition (cf. Jorm & Wright, 2008; Storch et al., 2006).

From this review, it is apparent that children with comorbid anxiety and social problems face a difficult and multifaceted developmental trajectory. Children experiencing loneliness, a lack of friendship or stability in friendships, and peer exclusion have been found to be on a trajectory of increasing social withdrawal, as well as other mood disorders, across the preadolescent to early adolescent years (Chronis-Tuscano et al., 2009; Oh et al., 2008). Moreover, in significant percentages of adolescents, avoidant and helpless social strategies have been observed which may serve to maintain social problems and anxiety (Gazelle, Workman, & Allan, 2010; Sondaite & Zukauskiene, 2005). Even so, the principles of developmental psychopathology need to be taken into consideration, and trajectories should not be viewed as absolute or even themselves single faceted. For example, high levels of familial stress have been associated with shyness, anxiety, and social skills deficits in urban youth; however, additional factors such as parental warmth and strong familial support have been suggested to be protective factors even in families experiencing high stress (for a review on resiliency factors, see Benzies & Mychasiuk, 2009; McCabe, Clark, & Barnett, 1999). Overall, though, children with anxiety are subjected to many socially related difficulties (i.e., peer issues, stigma, parent-child interaction factors, deficits/distortions, and more), and these problems extend beyond anxiety symptoms and varied diagnostic criteria. In addition, more research examining the extent to which social skills difficulties represent actual social skills deficits and production deficits (the child has the skill but does not implement it), or the interaction of the two, would provide a much needed clarification about the underlying psychopathology as well as possible avenues for intervention. As a result, a complex multi-method, multi-informant, evidence-based assessment of both anxiety and comorbid disorders, as well as peer relations and social skills, is important when working with anxious children, especially when determining the best evidence-based treatment approach (for a review, see Silverman & Hinshaw, 2008; Davis, May, & Whiting, 2011; Silverman & Ollendick, 2005). Such an assessment needs to examine both the child's symptomatology and the possible presence of social skills deficits (both the lack of a particular skill and the possibility of just a lack of implementation).

Assessment

Anxiety disorders do not generally seem to improve over time (Beidel, Fink, & Turner, 1996), and they often lead to long-term problems for children having moderate to high detrimental impacts on their functioning (Demyttenaere et al., 2004; Kendall, Safford, Flannery-Schroeder, & Webb, 2004). As a result, proper diagnosis is essential to ensure that the correct treatments are initiated and appropriate supplements are included as soon as possible. To this end, accurate assessment using evidence-based measures is crucial to ensure that the correct diagnosis is made (Silverman & Ollendick, 2005). Researchers have made a great deal of progress in the development and validation of evidence-based measures of anxiety (see Silverman & Ollendick, 2005 for a more complete review), and the current best-practice strategy for assessment is a multi-method, multi-informant approach to provide the most comprehensive diagnostic picture possible. This type of evaluation also ensures that important areas of emotional functioning or differing physical environments are not overlooked (see De Los Reyes, 2011 for a review; Achenbach, McConaughy, & Howell, 1987).

Even so, the lingering issue of multi-informant agreement, and more so disagreement, is a complex problem for child practitioners (Davis, 2009). There has commonly been a problem of multi-informant disagreement as to the presence and severity of child anxiety disorders (e.g., Brown-Jacobsen, Wallace, & Whiteside, 2011; Grills & Ollendick, 2003; Jenson et al., 1999; Silverman & Ollendick, 2005). While discussion of this issue is beyond the space allotted, it is important to note that disagreements should be taken seriously and fully considered. For example, Muris and Merkelbach (2000) found that almost 20% of children with parent-reported "childhood fears" met the full criteria for specific phobia, while 23% of children reporting their own "childhood fears" met the criteria for an anxiety disorder (Muris et al., 2000). Moreover, DiBartolo and Grills (2006) had children, parents, and teachers completed measures of social anxiety in an effort to predict children's anxiety during a social evaluation task. Results indicated poor agreement across informants; only children's report predicted their own anxious feelings on a social evaluation task. Further, verification of diagnostic information from parents and children by trained clinicians has indicated that children were accurate in reporting anxiety disorders, while their parents did not and vice versa in 59% and 65% of cases, respectively (Jenson et al., 1999). As a result, careful attention should be paid to the discrepant information, and a thorough assessment is strongly recommended.

Common methods of assessment in anxiety include structured and semi-structured interviews, self-reports, parent and other reports, and analogue behavior observation methods (ABO; for a review of ABO methods, see Mori & Armendariz, 2001). Assessments should also be constructed to probe the different components of the anxiety response (i.e., physiology, behavior, and cognition; Davis, 2009; Davis, May, et al., 2011; Davis & Ollendick, 2005). The following brief review will include information on several commonly used measures from each of these categories. While several of the measures discussed include measurement of social functioning, few actually measure social skills. Therefore, a separate discussion of measures of social skills commonly used in anxiety is also included. More information on the assessment of social skills is also included in other chapters in this volume.

Structured Diagnostic Interviews

The most widely employed assessment method is likely the open, clinical interview (Lyneham, Abbott, & Rapee, 2007; Ollendick & Hersen, 1993; Silverman, 1994; Silverman & Ollendick, 2005); however, a variety of problems and limitations are associated with their use (e.g., reliability, validity, diagnostic specificity, and comprehensiveness; cf. Brown-Jacobsen et al., 2011). Hence, several structured and semi-structured interviews have been developed to address many of the challenges posed by clinical interviews (i.e., asking a set of scripted questions in the same way, in the same order to each individual as opposed to open, unscripted, free-flowing interviews). Several of these commonly used interviews are detailed in Table 1. The *Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Versions* (ADIS: C/P; Silverman & Albano, 1996) is generally considered the most popular by anxiety researchers (Silverman & Ollendick, 2005); however, at the time of this chapter, the updated edition for *DSM-5* is not widely available. The ADIS contains separate modules for each of the anxiety disorders (e.g., separation anxiety disorder, specific phobia, generalized anxiety disorder, social anxiety disorder) and other common psychological disorders and problems in youth (e.g., attention deficit hyperactivity disorder, oppositional defiant disorder, major depressive disorder). Also included are a number of abbreviated screening modules for other problems (e.g., eating disorders, pervasive developmental disorders, schizophrenia, enuresis). The ADIS offers a great deal of flexibility in its administration as the entire interview can be given or selected modules may be given to probe specific disorders only. The questions in each module closely model the *DSM-IV* criteria, and most of the modules have the child rate fear and avoidance for various situations that are commonly problematic on a scale from 0 (no problems or fear) to 8 (very severe or disturbing). Youth also rates the overall interference that each disorder is causing using a 0–8 scale. A visual fear thermometer with numeric and qualitative descriptors helps younger children grasp the scale and allows for developmentally sensitive responses. At the end of the interview, the clinician also assigns clinical severity ratings on the 0 (none) to 8 (very severely disturbing/impairing) scale to each of the disorders that were endorsed based on the information provided by the informant, with clinical significance indicated by scores of 4 or higher.

While the ADIS does not include a scored assessment of social skills per se, there are a number of portions that assess similar and/or relevant content. For example, there is a screener

Table 1 Diagnostic interviews

Instrument	Description	Psychometric properties
Anxiety Disorders Interview Schedule – Child/Parent Schedules (ADIS-C/P; Silverman & Albano, 1996; Silverman, Saavedra, & Pina, 2001)	A semi-structured clinical interview designed for use with children ages 6 to 18 years, used to diagnose a range of internalizing and externalizing disorders	Kappa coefficients for the anxiety disorders from parent and child combined assessment are as follows: GAD = 0.80, SAD = 0.84, SOP = 0.92, SP = 0.81. Kappa coefficients from the mood disorders and externalizing disorders range from 0.62 to 1.00
NIMH Diagnostic Interview Schedule for Children Version IV (NIMH DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000)	A structured clinical interview designed for use with children ages 9–17 years, used to diagnose a range of internalizing and externalizing disorders	Kappa coefficients for the anxiety disorders from parent and child combined assessment are as follows: GAD = 0.58, SAD = 0.51, SOP = 0.48, SP = 0.86. Kappa coefficients from the mood disorders and externalizing disorders range from 0.55 to 0.86
Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS; Ambrosini, 2000; Current Version: K-SADS-PL 2009 Working Draft; Axelson, Birmaher, Zelazny, Kaufman, & Gill, 2009)	A semi-structured clinical interview designed for use with children ages 6–18 years, used to diagnose a range of internalizing and externalizing disorders	Kappa coefficients range from 0.55 to 0.80 for specific anxiety disorders from parent and child combined assessment (Ambrosini, 2000)

Note: *GAD* generalized anxiety disorder, *SAD* separation anxiety disorder, *SOP* social phobia, *SP* specific phobia

that inquires of the extent and quality of the interpersonal relationships of the child. This section includes questions such as “Compared to other kids, do you feel you have more friends, less friends, or about the same,” “Do you have a best friend,” and “Given the choice, would you prefer to spend most of your time alone or with other kids?” There are also questions in the social phobia and school refusal modules that ask the child to rate fear and avoidance of specific social situations, including starting or joining in on a conversation, working or playing in a group, and having difficulties with assertiveness. It is unclear, however, whether these problems are due to a lack of skill or just a general fear of negative evaluation.

Self-Report and Other Report Questionnaires

Parent-, teacher-, and self-report questionnaires offer another expedient method of assessment to aid in the diagnosis of anxiety disorders and social skills/abilities. These instruments are often collected through a multi-informant approach, typically including parents and teachers along with the child’s self-report. Many of the most frequently used questionnaires are presented in Table 2. Questionnaires have several advantages over interviews including being easier and cheaper to administer and providing the opportunity to collect more information from multiple informants in an efficient manner. The speed and efficiency of questionnaires make them valuable as screening tools and can add to the cost-effectiveness of services (Silverman & Ollendick, 2005). A multi-informant approach whereby a clinician includes parents and teachers may be particularly important for very young children or children with social skills deficits—these children may be unable to fully express their symptoms or concerns, and so other informants may help complete a profile of the child’s symptoms (Choudhury, Pimentel, & Kendall, 2003).

Table 2 Self-, parent-, and other report questionnaires for anxiety assessment

Measure	Description	Subscales	Psychometric properties
Behavior Assessment System for Children, 3rd ed. (BASC-3; Reynolds & Kamphaus, 2015)	A 175-item parent report measure of adaptive functioning and behavior problems in children aged 2–21 years	Clinical scales (aggression, anxiety, attention problems, atypicality, conduct problems, depression, hyperactivity, learning problems, somatization, and withdrawal), adaptive scales (activities of daily living, adaptability, functional communication, leadership, social skills, and study skills), and content scales (anger control, bullying, developmental social disorders, emotional self-control, executive functioning, negative emotionality, and resiliency)	Internal consistency ranges from 0.84 to 0.89
Child Anxiety Sensitivity Index (CASI; Silverman, Fleisig, Rabian, & Peterson, 1991)	An 18-item questionnaire for children aged 6–17 that has the child rate how disturbing various anxiety symptoms are to them	Disease concerns, unsteady concerns, mental incapacitation concerns, and social concerns	Internal consistency for the total score = 0.87. Test-retest reliability for the total score = 0.76
Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001)	A 120-item measure that asks parents to rate the frequency of various problem behaviors that their child (age 6–18) may experience	Two broad scales (internalizing and externalizing problems) and eight subscales (withdrawn/depressed, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior)	Internal consistency for the subscales ranges from 0.78 to 0.97. Test-retest reliability ranges from 0.82 to 0.92
Children's Automatic Thoughts Scale (CATS; Schniering & Rapee, 2002)	A 40-item questionnaire for children aged 7–16 that asks the child to rate the frequency of each automatic thought about physical threat, personal failure, and hostility in the last week		Internal consistency = 0.94. Test-retest reliability = 0.79
Fear Survey Schedule for Children – Revised (FSS-R; Ollendick, 1983)	An 80-item measure for children aged 7–18 that has the child stating the amount of fear they experience for each object or situation	Fear of failure and criticism, fear of the unknown, fear of danger and death, medical fears, and small animals	Internal consistency for the subscales ranges from 0.92 to 0.95. Test-retest reliability for the total scale = 0.82. Has been shown to be able to discriminate between the different types of phobias (Weems, Silverman, Saavedra, Pina, & Lumpkin, 1999)

(continued)

Table 2 (continued)

Measure	Description	Subscales	Psychometric properties
Multidimensional Anxiety Scale for Children, 2nd ed. (MASC-2; March, 2013)	A 50-item measure for children age 8–19 that measures a range of anxiety symptoms	Total score and subscales for separation anxiety, GAD, OCD, harm avoidance, physical symptoms (panic and tense/restlessness), social anxiety (humiliation/rejection and performance fears), and an inconsistency index	Internal consistency for the total score = 0.89. Test-retest for the total score and the subscales range from 0.80 to 0.94. Good convergent validity. Excellent discriminative validity
Negative Affect Self-Statement Questionnaire (Ronan, Kendall, & Rowe, 1994)	A 31-item measure for children aged 7–15 that assesses how often the child experiences negative automatic thoughts		Internal consistency for the total score ranges from 0.89 to 0.96. Test-retest reliability ranges from 0.78 to 0.96
Penn State Worry Questionnaire for Children (PSWQ; Chorpita, Tracey, Brown, Collica, & Barlow, 1997)	A 14-item questionnaire that has children aged 6–18 rate the frequency and controllability of worry		Internal consistency = 0.89. Test-retest reliability = 0.92
Revised Children's Manifest Anxiety Scale, 2nd ed. (RCMAS-2; Reynolds & Richmond, 2008)	A 49-item measure for children aged 6–19 that assesses anxiety symptoms in a yes/no format	Total anxiety, physiological anxiety, worry, social anxiety, defensiveness, and inconsistent responding index	Internal consistency for total score and subscales range from 0.68 to 0.89
Screen for Child Anxiety Related Emotional Disorders (Birmaher et al., 1997, 1999)	A 38-item measure for children aged 9–18 that measures symptoms of separation anxiety disorder, general anxiety disorder, social phobia, and school phobia	Somatic/panic, general anxiety, separation anxiety, social phobia, and school phobia	Internal consistency ranges from 0.74 to 0.93. Test-retest reliability ranges from 0.70 to 0.90. Good discriminant validity
Screen for Child Anxiety Related Emotional Disorders – Revised (SCARED-R; Muris, Merckelbach, Schmidt, & Mayer, 1999; Muris & Steerneman, 2001)	A 66-item measure for children aged 6–18 that measures symptoms of anxiety disorders based on the DSM-IV	Separation anxiety disorder, generalized anxiety disorder, panic disorder, social phobia, obsessive-compulsive disorder, traumatic stress disorder, and specific phobias	Internal consistency = 0.94. Good convergent and discriminate validity
Social Anxiety Scale for Children (SAS-C; La Greca, Dandes, Wick, Shaw, & Stone, 1988)	A 26-item measure that asks children aged 8–18 to rate how true each experience of social anxiety is for them	Fear of negative evaluation, social avoidance and distress in new situations, and general social avoidance and distress	Internal consistency for the subscales ranges from 0.69 to 0.86. Test-retest reliability ranges from 0.69 to 0.86

(continued)

Table 2 (continued)

Measure	Description	Subscales	Psychometric properties
Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner, & Morris, 1995)	A 26-item measure for children aged 8–14 years that measures physiological, cognitive, and behavioral symptoms of social phobia on a 3-point Likert scale	Assertiveness/general conversation, traditional social encounters, and public performance	Good internal consistency, test-retest reliability
The Social Worries Questionnaire (SWQ; Spence, 1995)	A measure of the degree of worry the child experiences in various social situations. A 10-item parent version and a 13-item pupil version are available		Internal consistency for the parent version = 0.82. Internal consistency for the pupil version = 0.85
State-Trait Anxiety Inventory for Children (STAI-C; Spielberger, 1973)	A 20-item measure for children aged 8–15 that measures chronic and transitory symptoms of anxiety	Anxiety trait, anxiety state	Internal consistency for the subscales ranges from 0.80 to 0.90. Test-retest reliability ranges from 0.31 to 0.71
Teacher Report Form (TRF; Achenbach & Rescorla, 2001)	A 120-item teacher report measure that is comparable to the CBCL described above	Two broad scales (internalizing and externalizing problems) and eight subscales (withdrawn/depressed, somatic complaints, anxious/depressed, social problems, thought problems, attention problems, rule-breaking behavior, and aggressive behavior)	Internal consistency for the subscales ranges from 0.72 to 0.95. Test-retest reliability ranges from 0.60 to 0.96

Analogue Behavioral Observation (ABO)

ABO is another important method of assessment with children, as it provides a direct opportunity to objectively view how the child responds in various situations. A variety of behavioral assessment methods and tasks have been developed and include many techniques such as role-plays, interaction tasks, think-aloud procedures, functional assessments, and behavioral avoidance tasks (BATs; Haynes, 2001). ABOs can also be conducted in multiple settings, allowing observation of a child's behavior in various contexts (e.g., in school classrooms, psychiatric facilities, research settings, and the home). For example, the BAT involves asking the child to engage in some feared behavior or situation (e.g., touching a spider, riding an elevator) and then measuring the extent to which the child complies and usually other variables as well—for example, subjective units of distress the child experiences during the task, heart rate, etc. (Castagna, Davis, & Lilly, 2016; Davis et al., 2013). This task is commonly used in phobia research (Ollendick, Davis, & Muris, 2004) but has also been used in the assessment of obsessive-compulsive disorder (Barrett, Healy, & March, 2003) and social phobia (Coles & Heimberg, 2000). An adaptation of this task to a role-play format has also been used to measure social skills directly on the Revised Behavioral Assertiveness Test for Children (BAT-CR; Ollendick, 1981). The BAT-CR involves asking the child to participate in a series of role-plays of both positive and negative social situations. They can then be coded on things such as eye contact, latency of response, and length of response. This task has been used to evaluate the social skills of children with social phobia (Spence et al., 1999). Similarly, BATs have been developed that incorporate parents and caregivers to observe the degree to which their social influence may affect a child's performance (Ollendick, Lewis, Cowart, & Davis, 2012).

In addition, other types of direct observations of behavior are commonly used to assess anxiety. These protocols allow the observer to view the anxious behaviors in the child's natural environment (i.e., home, classroom) and are coded based on the protocol being used (e.g., Glennon & Weisz, 1978). Other forms of ABO also provide valuable information. For example, families can be asked to complete interaction tasks in which they are observed talking freely about a prescribed topic or situation; these paradigms can aid in determining how parental influence or patterns of dysfunctional interaction may contribute to a disorder (Haynes, 2001). Functional assessments are also useful in which the potential operant maintaining factors of anxiety are observed, codified, recorded (Davis, 2009; Haynes, 2001), or discussed indirectly through detailed interviewing with the child and/or parent (Davis, 2009; Nebel-Schwalm & Davis, 2011; Ollendick et al., 2004). Overall, direct observation procedures allow the clinician an opportunity to directly observe how a child behaves in certain anxiety-provoking and/or social situations, and while at times difficult to arrange, they can generate a great deal of useful information.

Measures Specific to Social Skills/Social Competence

In addition to instruments and paradigms discussed to this point, it is also important to note that there are several instruments designed specifically to assess social skills or social competence (see Table 3 for more detailed descriptions). The Matson Evaluation of Social Skills for Youngsters (MESSY; Matson, Rotatori, & Helsel, 1983) and the Social Skills Rating System Child and Parent Version (SSRS; Gresham & Elliot, 1990) are two of the most frequently used of these measures (and their updates to newer editions). Both are described in greater detail in the broader social skills assessment chapters of this volume. Other less frequently used measures include the Social Skills Questionnaire (Parent) (SSQ-P, Spence, 1995), the Social Competence Questionnaire (Parent) (SCQ-P; Spence, 1995), the Friendship Questionnaire (Bierman & McCauley, 1987), and the Children's Assertive Behavior Scale (CABS; Michelson & Wood, 1982).

Summary and Recommendations for Assessment

For assessment, an evidence-based, multicomponent (i.e., physiology, behavior, and cognition), multi-method (e.g., questionnaires, analogue behavioral observations, clinical interviews), and multi-informant (e.g., self, parent, teacher, other caregivers) assessment is crucial. Given the numerous instruments and methods available to assess anxiety (cf. Silverman & Ollendick, 2005), it is difficult to create a single, one-size-fits-all battery, and generally a clinician is better served pulling together the various methodologies and instruments based on a particular client's needs. Finally, clinicians remain aware of the influence that the assessment process itself can have on a client: i.e., the social anxiety, deficits, and difficulties they are attempting to assess and treat may be exacerbated by the actual assessment and

Table 3 Measures of social skills and social competence

Instrument	Description	Psychometric properties
The Children's Assertive Behavior Scale (CABS; Michelson & Wood, 1982)	A 27-item child-report measure of social behavior. Each item represents a social situation, and children indicate how they would respond on a 5-point scale from passive to aggressive	Internal consistency = 0.78. Test-retest reliability = 0.86. Good discriminant and convergent validity
The Friendship Questionnaire (Bierman & McCauley, 1987)	A 40-item child-report measure of peer interactions. Includes three subscales: Positive interactions, negative interactions, and extensiveness of peer network	Internal consistency ranges from 0.72 to 0.82
The Matson Evaluation of Social Skills for Youngsters, 2nd ed. (MESSY-II; Matson et al. 2010; Matson, Neal, Worley, Kozlowski, & Fodstad, 2012)	A 64-item parent- and teacher-report measure of social skills in children aged 2–16. Various social behaviors are listed, and respondents indicate how often the behavior is performed on a scale from 1 ("not at all") to 5 ("very much"). The scale yields three factors, hostile, adaptive/appropriate, and inappropriately assertive/overconfident	Internal consistency ranged from 0.86 to 0.92 for the factors. Has been found to have good convergent and discriminant validity
The Social Competence Questionnaire – Parent (Spence, 1995)	Contains nine items in which parents rate a child's social competence with peers from 0 (not true) to 2 (mostly true)	Guttman split-half reliability has been reported to be 0.87
The Social Skills Questionnaire – Parent (Spence, 1995)	Contains 30 items in which parents assess a child's perceived social skills	Split-half reliability has been reported to be 0.90
The Social Skills Rating System Child and Parent Version (SSRS; Gresham & Elliot, 1990; Updated to the Social Skills Improvement System-Rating Scales, SSIS-RS; Gresham & Elliott, 2008)	The SSRS (used the most with anxiety) includes parent, teacher, and child (grade 3 and above) measures of social skills and problem behaviors. There are five social skills factors: cooperation, assertion, responsibility, empathy, and self-control	Internal consistency ranges from 0.65 to 0.95. Test-retest reliability ranges from 0.65 to 0.87. Has been shown to have good construct and criterion validity

treatment process (e.g., a child with selective mutism may have more difficulty participating in assessment and treatment until becoming comfortable with the clinician). As a result, clinicians should be mindful to allow more time to develop rapport and be especially mindful of the child's progress, anxiety, and frustration (Davis, 2009).

Treatment

Currently, a variety of efficacious treatment techniques have been examined for use with anxious children (Davis, May et al., 2011; Davis & Ollendick, 2005; Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2016; and e.g., Ollendick et al., 2009; Walkup et al., 2008). Over time, these various techniques, while therapeutic and researched in their own rights, have been combined into increasingly efficacious behavioral and cognitive-behavioral therapies (CBT). These treatment techniques include exposure, systematic desensitization, modeling, and contingency management. Each of these procedures is explained and evaluated below regarding its use in the treatment of symptoms of anxiety and in particular for the treatment of social skills problems in children with anxiety. Additionally, a particular focus will be the commonly used combination of behavioral and cognitive-behavioral treatments for child social anxiety. Overall, however, it is important to remember that efficacious treatments for child anxiety have typically been designed to alleviate anxious symptomatology and not necessary social problems per se. While progress has been made, many child treatments still need to account for child development and developmental psychopathology more thoroughly, and the field should be wary of overly simplistic downward extensions of adult therapies (Barrett, 2000; Davis, 2012). Also, the newcomer to the anxiety disorders, selective mutism, seems well fitted to the diagnostic category, but its rarity has meant that research into its symptoms, assessment, and treatment still lags comparatively behind many of the other disorders (Muris & Ollendick, 2015). While space prohibits a full review of the research that does exist for this disorder in particular, CBT and its techniques seem to be very promising, and so it does lend itself to the sections that follow as well (e.g., Bergman, Gonzalez, Piacentini, & Keller, 2013; Reuther, Davis, Moree, & Matson, 2011; for a review, see Muris & Ollendick, 2015). Overall, given the reciprocal influence of anxiety and social skills, the treatment of both problematic anxiety and social skills deficits or social skills production deficits may be necessary and advisable, even in children having anxiety disorders other than social anxiety disorder.

Exposure

Exposure-based therapy involves the anxious child experiencing their fear either in vivo or imaginally. This ideally involves remaining exposed until the anxiety or fear decreases significantly. In in vivo exposure, the child is exposed to the actual feared stimulus, for example, being around a lizard or interacting with a stranger (e.g., who is a therapist's confederate). In imaginal exposure, the therapist guides the child through imagining the feared stimulus or situation, for example, imagining what would happen if the child were to talk with a stranger at a restaurant or have a confrontation with peers at school. In vivo exposure is commonly included in the treatment of child anxiety disorders, and as many as 90–100% of anxiety treatments incorporate exposure (Chorpita & Southam-Gerow, 2006). Exposure can also be adjusted as to the intensity of the experience. It can be administered all at once (e.g., flooding or implosive therapy) using the most feared situation; however, exposure is more commonly implemented by gradually creating a hierarchy with the child and moving up that list of steps from the least to most fearful stimuli or situations. The decision to move on to the next step typically occurs when fear and anxiety have decreased significantly and the child becomes comfortable with moving forward (i.e., the progression through steps is not forced). This gradual progression is considered the more humane of the two doses of exposure and is preferred by most clients, parents, and professionals (King & Gullone, 1990). Controlled exposure is believed to provide safe experiences with the feared stimulus or situation allowing for habituation and extinction of fear anxiety. New learning occurs as well which competes with the previous fearful responding, and exposure sessions provide a structured environment in which to practice and develop coping skills and competency (Davis, 2009). In addition, recent research has suggested that approaches which incorporate inhibitory learning may enhance the outcomes of exposure (Craske, Treanor, Conway, Zbozinek, & Vervliet, 2014).

Systematic Desensitization

As developed by Wolpe (1958), systematic desensitization is one form of treatment that utilizes exposure. At its inception, this treatment was grounded in classical conditioning and founded on the idea that fear could be counterconditioned by pairing the feared stimulus with an activity that is reciprocal to and incongruent with anxiety. As theory and research have advanced, these processes are better understood and currently described as the creation of context-specific learning that competes with previous information instead of the idea that new learning actually overwrites the old (Bouton, 2004). Even so, the actual procedure remains largely unchanged. The competing activity most often by researchers and practitioners alike is progressive muscle relaxation (PMR) and diaphragmatic breathing: it should be noted, however, that in theory any behavior or act could be used as long as the response is incompatible with anxiety (e.g., holding a favorite toy or eating). After relaxation skills are taught, a fear hierarchy is developed ranging from the least or easiest exposure to the most feared stimulus or situation. The client then begins to engage in the competing activity (becomes relaxed) and is then gradually exposed to situations on the hierarchy. If implemented correctly, the client should remain relaxed and *should not* become anxious in the situation. Under these circumstances, according to classical conditioning theory, the association between the stimulus and the fearful response should decrease, and the client's fear of the stimulus should also decrease. Systematic desensitization can be administered either in vivo or imaginally. A slight modification for imaginal exposures usually involves some sort of safety signal (e.g., raising a hand or a finger) during the progression along the hierarchy to designate when an individual begins to experience fear or anxiety and the exposure needs to be paused or slightly decreased.

Modeling

Modeling is grounded in social learning theory and involves the child observing another person (e.g., therapist, peers, parent, or other confederates) demonstrating non-fearful or appropriate behavior in the feared situation (either on video or directly) to promote imitation. A model may perform a variety of behaviors to be learned including conversation skills, ordering food at a restaurant, or asking a teacher questions in class. Models can also be broken into two types: mastery models demonstrate mastery of interacting in the situation with ease, and coping models evince initial anxiety in the situation but overcome their fear and worry (Chorpita & Southam-Gerow, 2006). In a different, classic variation, Ritter (1965, 1968) developed participant modeling. In participant modeling, the model demonstrates appropriate behavior for the child and then goes a step further by interacting with the child to help him perform the skills. An example of this would be having a child watch a peer introduce himself on the playground and then having that peer go with the child to introduce himself. Subsequently, the effectiveness of models during child treatment has been suggested to increase across media/experience from using filmed models to live models, to participant modeling (Ollendick, 1979).

Contingency Management

In contingency management (also known as reinforced practice), children are reinforced for desirable behavior in anxiety-provoking situations. Reinforcers can be tangible items or even verbal praise from therapists or caregivers. Silverman et al. (1999) examined the efficacy of contingency management in children with anxiety disorders. In this study, the children's parents provided reinforcement for completing tasks on a fear hierarchy. Parents were also educated in basic behavioral principles such as positive and negative reinforcement and extinction. Subsequently, children showed significant improvement on outcome measures assessing fear, anxiety, and depression, and 55% of children who received contingency management treatment no longer met the criteria for an anxiety disorder (Silverman et al., 1999).

Behavioral and Cognitive-Behavioral Techniques

Behavioral treatments make use of a variety of techniques previously discussed and are based upon operant and classical conditioning. Cognitive-behavioral treatments (CBT) further combine techniques such as cognitive restructuring and changing expectations about what will happen in a feared situation combined with behavioral techniques like exposure, contingency management, or social skills training. A 50-year review of research on child and adolescent anxiety treatment done by Higa-McMillan et al. (2016) reported that CBT and exposure-based therapy continue to be the most well-established treatments for this population. CBT has been found to have strong effect sizes for reducing social anxiety and moderate effect sizes for increasing social competence (Segool & Carlson, 2008). As a result, several of the more popular behavioral and cognitive-behavioral treatments are discussed below.

Coping Cat. The *Coping Cat* program is a manualized childhood anxiety treatment (Kendall, Kane, Howard, & Siqueland, 1990). There is a therapist manual and also a *Coping Cat Workbook* that is given to children and used in each session (Kendall, 1990). The treatment consists of 16 individual sessions, 2 of which are parent meetings with the therapist. The first eight sessions focus on psychoeducation, cognitive skills, and healthy coping skills; the last eight sessions focus on working through an exposure hierarchy (Kendall et al., 1990). Overall, the program uses techniques such as relaxation, cognitive restructuring, problem-solving, and exposure tasks in an effort to help youth learn to identify and cope with their anxious arousal (Podell, Mychailyszyn, Edmunds, Puleo, & Kendall, 2010).

Several RCTs have been conducted evaluating the *Coping Cat* program (Kendall, 1994, 1997; Kendall et al., 2008). In the first RCT, Kendall (1994) evaluated the effectiveness of this program for children ages 9–13 years, with primary anxiety disorder diagnoses including overanxious disorder, separation anxiety disorder, and avoidant disorder. Children who received the *Coping Cat* treatment were compared with a wait-list control group. Diagnostically, at post-treatment 64% of children in the *Coping Cat* group no longer met the criteria for an anxiety disorder, compared with 5% of children in the wait-list group (Kendall, 1994). The children who received the *Coping Cat* treatment also improved on a number of measures assessing anxiety (i.e., both self- and parent-report measures and behavioral observations); these results were maintained at 1-year follow-up (Kendall, 1994). Similar results for treatment outcome were found by Kendall (1997) in another RCT comparing the *Coping Cat* to wait-list control. Further, Kendall (1994) also included the social competency scale of the CBCL as an outcome measure. Children in the treatment group showed significant improvement in ratings on this scale compared to the wait-list group, and these effects were maintained at 1-year follow-up (Kendall, 1994). Additionally, an adaptation of *Coping Cat* was used in one of the largest trials to date, the Child/Adolescent Anxiety Multimodal Treatment Study (CAMS). Results from this comparison of CBT to sertraline, their combination, or placebo suggested 80.7% improvement on the combination therapy, 59.7% on CBT, 54.9% on sertraline, and 23.7% on placebo (Walkup et al., 2008). Similarly, Settipani and Kendall (2013) found that poorer social functioning was associated with a more severe anxiety in children and that poor response to CBT may be associated with poor social competence.

It has also been suggested that flexible applications of the manual-based treatment can be implemented (see Podell et al., 2010 for review). Several authors have examined whether adding a family component increases efficacy of the treatment (Barrett, 1998; Barrett, Dadds, & Rapee, 1996; Kendall, Hudson, et al., 2008; Nauta, Scholing, Emmelkamp, & Minderaa, 2003). Some results indicated that there may be a marginal effect of adding parent training and parent education components to the *Coping Cat* and that these changes will have a greater efficacy with younger treatment clients than adolescents (Barrett, 1998; Barrett et al., 1996), while Nauta et al. (2003) found no outcome differences between treatment groups with and without parent training components. Kendall et al. (2008) reported that individual treatment outperformed family treatment on teacher reports of child anxiety, while family treatment outperformed the individual treatment when both parents had an anxiety disorder. The *Coping Cat* has also been implemented successfully in group formats, showing that it is superior to a psychological placebo procedure and wait-list control (Muris, Meesters, & van Melick, 2002). When compared with individual treatment, few differences were found, and both treatments were superior to the wait-list control (Flannery-Schroeder & Kendall, 2000). Flannery-Schroeder and Kendall (2000) included several measures of social skills in an RCT comparing an individual treatment, a group treatment, and a wait-list control. This study failed to show, however, that the treatment groups differed from the wait-list control at posttreatment on both child and parent measures of social skills (Flannery-Schroeder & Kendall, 2000).

FRIENDS. The FRIENDS program is a group format CBT procedure for children ages 6–16 years with anxiety disorders. FRIENDS is an acronym for the coping skills taught in the treatment (i.e., F, feeling worried?; R, relax and feel good; I, inner thoughts; E, explore plans; N, nice work so reward yourself; D, don't forget to practice; S, stay calm, you know how to cope now). The treatment consists of ten child group sessions, two booster sessions, and ten parent sessions. The treatment is similar to the *Coping Cat* in that it includes cognitive and coping skills, training in family management and communication skills to facilitate practice of the skills children learn in the session, and a peer component in which children are taught basic social skills including how to make friends (Shortt, Barrett, & Fox, 2001). The program includes a therapist manual, children's workbook, and parent booklet. Shortt et al. (2001) examined the efficacy of the FRIENDS treatment in an RCT with a wait-list control. Children in the study met the criteria for a primary anxiety disorder diagnosis (including generalized anxiety disorder, separation anxiety disorder, or social phobia). At posttreatment, 69% of children in the FRIENDS group no longer met the diagnosis, compared with 6% of children in the wait-list control. These treatment effects were maintained at 1-year follow-up, with 68% of children who received treatment no longer meeting the diagnosis for a primary anxiety disorder (Shortt et al., 2001).

Social Effectiveness Therapy for Children (SET-C). SET-C is a behavioral group treatment for social anxiety disorder in children and adolescents. The treatment includes group sessions for education and social skills training which includes conversation skills, skills for joining groups, assertiveness, and telephone skills. The treatment also incorporates peer generalization sessions, so anxious and non-anxious children can engage in social activities and individual in vivo exposure to feared social situations (Beidel et al., 2000). In an RCT, Beidel et al. (2000) compared SET-C to an attentional control called Testbusters. Children in the Testbusters group were taught study skills and test-taking strategies for similar amounts of time. At posttreatment, 67% of children in the SET-C group no longer met the criteria for social phobia, compared to 5% in the Testbusters group (Beidel et al., 2000). Children in the SET-C group were also rated as being more skilled during a role-play task and read-aloud task than children in the Testbusters group by independent observers posttreatment. At 6-month follow-up, 80% of children who received SET-C no longer met the criteria for social phobia (Beidel et al., 2000), and at 3-year follow-up, 72% of children who received SET-C no longer met the criteria for social phobia. Ratings of children's skills during the role-play task decreased to pretreatment levels following the posttreatment assessment, but effectiveness in performance during the read-aloud task was maintained (Beidel, Turner, Young, & Paulson, 2005). Another trial of SET-C by Scharfstein, Beidel, Finnell, Distler, and Carter (2011) compared SET-C to fluoxetine and pill placebo. Their conclusions were that SET-C led to important, lasting improvements across several social skills not seen in the fluoxetine or placebo conditions. Also, children treated with fluoxetine did not differ in pragmatic or paralinguistic skills compared to placebo. In addition, Öst, Cederlund, and Reuterskiöld (2015) found that parent education training did not improve treatment outcomes.

Skills for Academic and Social Success (SASS). Fisher, Masia-Warner, and Klein (2004) studied a school-based social skills intervention for adolescents with social phobia. Skills for Academic and Social Success (SASS) is a cognitive-behavioral treatment group composed of psychoeducation, cognitive skills, social skills training (including conversation skills), listening skills, and assertiveness, gradual exposure, and relapse prevention. It was developed from Social Effectiveness Therapy for Children (SET-C). Treatment was administered as 12 weekly group meetings at school, 2 individual meetings, social events (including the use of peer assistants who were non-anxious adolescent classmates who assisted group members at school events), 2 parent meetings which included education about social anxiety, and 2 teacher meetings which included education about anxiety and aid in setting up and working through the fear hierarchy for students (Fisher et al., 2004). Masia-Warner, Fisher, Shrout, Rathor, and Klein (2007) examined the efficacy of SASS in a randomized clinical trial (RCT) comparing it to an attention control (Masia-Warner et al., 2007). Results indicated that after treatment, 59% of the SASS treatment group no longer met the criteria for social phobia, compared to 0% of the attention control group, with gains maintained at 6-month follow-up (Masia-Warner et al., 2007).

Cognitive-Behavioral Group Treatment for Adolescents (CBGT-A) and Other Group CBTs. CBGT-A is a treatment for social anxiety disorder in adolescents. It was developed from an adult treatment for social phobia that followed a similar format (Albano & Barlow, 1996). The treatment was administered in 16 group sessions with the first 8 sessions focused on education, skill building including cognitive restructuring, social skills including those necessary for maintaining social relationships, and problem-solving. The last eight sessions focused on exposure to feared social situations. Parents were also educated about the disorder and helped with exposure exercises (Albano & Barlow, 1996). Albano, Marten, Holt, Heimberg, and Barlow (1995) tested the efficacy of the protocol in five adolescents who met the criteria for social phobia. At 3-month follow-up, four of the five participants no longer met the criteria for social phobia, and at 12-month follow-up, none of the five participants met the criteria for social phobia (Albano et al., 1995). Hayward et al. (2000) tested the efficacy of the treatment on a larger scale. These authors included 35 adolescent females who met the criteria for social phobia. Half of the participants were assigned to CBGT-A, and the other half were assigned to a no treatment control group. Following treatment, 45% of girls in the CBGT-A group no longer met the criteria for social phobia, compared to only 4% of those in the no treatment control group (Hayward et al., 2000). At 1-year follow-up, however, there was no statistical difference between the CBGT-A group and the no treatment control group. The treatment group continued to improve, and the control group improved as well. The authors suggested that this effect might have been due to children in the control group receiving community treatment (Hayward et al., 2000). Similarly, a study of a CBT group for social anxiety disorder led to the finding that children with higher social anxiety prior to treatment had the greatest treatment gains, with reductions in self-consciousness and poor anxiety regulation predicting reductions in social anxiety (Kley, Heinrichs, Bender, & Tuschen-Caffier, 2012).

Cognitive-Behavioral Treatment with and Without Parent Involvement. Spence et al. (2000) used a social skills-based cognitive-behavioral treatment (CBT) to treat children ages 7–14 with social phobia. The children were divided into three treatment groups—CBT with parent involvement, CBT without parent involvement, and wait-list control. Treatment consisted of 12 group sessions, followed by a half hour of games, so children could practice their skills with peers. The treatment included social skills training that included conversation skills, listening skills, and identifying social cues in others, and the children were assigned with weekly homework tasks. Parents observed their children's group sessions and were taught about modeling and reinforcement. This treatment successfully reduced anxiety symptoms—87.5% of CBT with parent involvement and 58% of CBT without parent involvement no longer met the criteria at post-treatment compared with 7% of children in the wait-list group. Importantly, the authors also examined social skills, using the Social Skills Questionnaire, parent version (SSQ-P); Social Competence Questionnaire, parent version (SCQ-P); direct observation of social skills in the classroom and on the playground; and the Revised Behavioral Assertiveness Test for Children (BAT-CR). Parent report of social competence (SCQ-P) and performance in role-play tasks for the BAT-CR improved for both treatment groups as well as the wait-list control group. Ratings of competence from direct observation by independent observers did not differ between the treatment groups and the wait-list control and did not improve over time (Spence et al., 2000). At 6- and 12-month follow-up assessments, treatment gains were maintained (Spence et al., 2000).

Brief Group Cognitive-Behavioral Treatment for Social Phobia. Similar to other CBT studies, Gallagher, Rabian, and McCloskey (2004) examined the effects of a small group CBT intervention composed of psychoeducation, cognitive strategies, and exposure in 23 children with social phobia. Children were either assigned to a wait-list or to small groups of five to seven children for three 3-h sessions of CBT. At a 3-week follow-up, children treated with CBT generally showed improvement over those in the wait-list condition; however, no change in social competence was evident as measured by the CBCL (Gallagher et al., 2004).

Modular Treatment of Anxiety. Modular CBT for anxiety is an individual treatment for anxiety disorders in children (Chorpita, Taylor, Francis, Moffitt, & Austin, 2004). It consists of 13 modules that therapists can pick and choose from and arrange to meet the needs of their clients. There are four core modules that all children receive: self-monitoring (fear ladder), psychoeducation, exposure, and maintenance/relapse prevention. These modules were thought to be essential principles in the treatment of childhood anxiety (Chorpita et al., 2004). Depending on the needs of the individual child, therapists can choose to include other modules: cognitive restructuring, social skills training, rewards, differential reinforcement, and time-out. The order of use for the modules is indicated by a flowchart in which modules for the basic skills of self-monitoring and psychoeducation are done first, then other optional modules are completed for behaviors that may interfere with exposure, and then exposure and relapse prevention modules are completed. To the extent that parents or other adults are involved in the maintenance of the disorder, they are also involved in treatment such as the differential reinforcement and reward modules (Chorpita et al., 2004). A pilot study examining the efficacy of this treatment was conducted with seven children suffering from primary diagnoses of anxiety disorders. Following their individual treatments, none of the children met the criteria for their primary anxiety diagnoses. These effects were maintained at a 6-month follow-up (Chorpita et al., 2004). Modular treatment has also been suggested for disorders other than anxiety such as depression (Chorpita, Daleiden, & Weisz, 2005) and has been used successfully with selective mutism (Reuther et al., 2011).

Summary and Caution

It is encouraging that there are many treatment options available for childhood anxiety in general and childhood social anxiety disorder in particular. Many of these interventions are often focused on reducing the symptoms of fear and anxiety, but unfortunately several ignore the social skills and production deficits common to children with these problems. Not surprisingly then, behavioral and cognitive-behavioral packages have been found to be particularly effective at treating anxiety disorder diagnoses and symptoms. While it depends on the evidence-based criteria used to summarize the treatment effects, CBT has been found to meet well-established criteria for alleviating anxiety disorders, and both behavioral and cognitive-behavioral programs have been found to be effective for social anxiety disorder (i.e., Davis, 2009; Davis, May et al., 2011). Unfortunately, there is still a sizeable minority of children who do not respond to even the best interventions present at this time. Even for treatments that do include social skills training as a component in treatment, and similar to the conclusions drawn in this chapter in 2009 (Davis, Munson, & Tarcza), few RCTs include outcome measures of social skills or social competency, and those that do suggest it is unclear whether social skills improvements are evident (e.g., Flannery-Schroeder & Kendall, 2000; Gallagher et al., 2004) or maintained over time (Beidel et al., 2000, 2005; Spence et al., 2000). Because impairments in social skills often impact the lives of children with anxiety disorders, RCTs for childhood anxiety should include outcome measures of social skills. Social skills training should also be included in the treatment of anxiety to the extent that it is relevant for individual cases (i.e., if social skills are deficient versus if there is a production deficit—children have the skills but do not use them). More recent explorations of the moderators and mediators of treatment outcomes have born this out, as social anxiety disorder has repeatedly been found to be a stumbling block to anxiety treatment outcome. Across recent efficacy and effectiveness trials for childhood anxiety and across different anxiety disorders, the presence of social anxiety disorder has consistently been found to be associated with poorer outcomes (e.g., Compton et al., 2015; Hudson, Keers et al., 2015; Hudson, Rapee et al., 2015; Wergeland et al., 2016).

Conclusion and Future Directions

Children with anxiety suffer from a variety of difficulties that extend beyond their anxiety symptoms including strained peer relationships, stigma, and victimization. Given the debilitating interaction of anxiety and social problems, it is surprising that as few as 10% of child anxiety treatment protocols include a social skills component (Chorpita & Southam-Gerow, 2006). Similar to the conclusions drawn many years ago, anxiety treatments still seem geared toward alleviating anxious emotional responding and even then targeting behavioral symptoms in particular (Davis, Munson, & Tarcza, 2009; cf. Davis & Ollendick, 2005; Davis, May et al., 2011). While assessing avoidant and dysfunctional behavior is important, more research should be conducted using a comprehensive assessment of anxiety symptoms (i.e., physiology, behavior, and cognition; Davis & Ollendick, 2005) as well as indicators of social functioning across a child's day-to-day environments (e.g., school, home, peers), even with the existing multiple-informant disagreements.

Specifically, more research and work need to target the interference and impairment in social relationships and functioning, as it is possible that these have long-lasting effects beyond the end of treatment and may possibly be one reason that outcomes for children with social anxiety disorder are consistently poorer. Researchers should be encouraged to include measures of social functioning child anxiety treatment studies and then report on those outcomes. The literature on peer relations and social anxiety should increasingly be infused into broader treatment strategies to continue to develop comprehensive treatment packages or, as is the case with the work by Chorpita, modular options which can be included as needed. Some of this push has come to fruition since our initial conclusions in Davis et al. (2009). Transdiagnostic CBT for children emphasizes the underlying mechanisms which may influence outcome as common targets for intervention across disorders (Ehrenreich-May & Chu, 2014). Additionally, researchers should continue to target the potential moderators and mediators of treatment outcome as well and further illuminate the means by which social anxiety seems to be associated with poorer outcomes. For example, incorporating parents into treatment may be important, but parental influence may be greatest for certain genders or ages (e.g., Ollendick & Horsch, 2007), and this may help explain the lack of consistent findings for including parents. Finally, treatments should still incorporate development and developmental psychopathology into assessment and treatment methods, eschewing the one-size-fits-all approach.

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Evidence-Based Methods of Dealing with Social Difficulties in Conduct Disorder

Kimberly Renk, J'Nelle Stephenson, Maria Khan, and Annelise Cunningham

A significant number of children are diagnosed with Conduct Disorder today, with each of these children experiencing significant difficulties in their emotional and behavioral functioning and in their social relationships. Estimates suggest that the incidence of Conduct Disorder in young children may be as high as 35% (Webster-Stratton & Hammond, 1998). A significant percentage of older children and adolescents also are affected (2–3%, Maughan, Rowe, Messer, Goodman, & Meltzer, 2004; 9.5%, Nock, Kazdin, Hiripi, & Kessler, 2006; 2–10%, APA, 2013), with males showing higher rates of diagnosis than females (12% of males versus 7.1% of females; APA, 2013; Nock et al., 2006). Given the emotional, behavioral, and social difficulties that accompany Conduct Disorder, this diagnosis often is cited as the most common reason for mental health service referrals (e.g., in preschoolers, Luby & Morgan, 1997; in school-age children, Foster, Kelsch, Kamradt, Sosna, & Yang, 2001). Of even greater clinical significance, the behaviors that are associated with Conduct Disorder (e.g., aggression) show significant stability over time (Frick, 2016; Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998; Keenan et al., 2011; Kim-Cohen et al., 2009).

Given the difficulties that are associated with Conduct Disorder, health service providers should have several goals in mind when they work with families who have a child with Conduct Disorder. First, health service providers must understand the diagnostic criteria used to identify Conduct Disorder. Next, health service providers should use appropriate assessment measures to identify Conduct Disorder. Finally, health service providers should implement interventions that have the strongest evidence base as they work to achieve positive outcomes for children with Conduct Disorder. Given the importance of these goals for bettering the outcomes of children with Conduct Disorder, this chapter will examine the diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition* (APA, 2013) that are used to identify Conduct Disorder. Also, we briefly survey etiological factors that may contribute to conduct problems in children and adolescents, highlight relevant assessment instruments for making a diagnosis of Conduct Disorder, and identify the interventions that can be used to promote the best emotional, behavioral, and psychosocial outcomes for children and adolescents with Conduct Disorder.

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Conduct Disorder Diagnostic Criteria

As described in the most recent version of the *Diagnostic and Statistical Manual of Mental Disorders*, *Fifth Edition* (*DSM-5*; APA, 2013), Conduct Disorder consists of a repetitive or persistent pattern of behavior in which the basic rights of others and/or major age-appropriate societal norms or rules are violated. Given this description, difficulties with emotional and behavioral functioning and in social relationships are inherent in a Conduct Disorder diagnosis. More specifically, to meet criteria for Conduct Disorder, the *DSM-5* requires that children exhibit at least 3 of 15 criteria. These criteria fall into four categories, including aggressive behavior that threatens or causes physical harm to other individuals or animals (e.g., bullying, threatening, or intimidating other individuals; initiating physical fights; using weapons to cause physical harm; being physically cruel to animals and/or to other individuals; engaging in confrontational stealing; forcing another individual into sexual activity), destruction of property (e.g., deliberately engaging in fire setting, deliberately destroying others' property), deceitfulness or theft (e.g., breaking into another individual's home or property, lying to obtain goods or avoid obligations, stealing items without confrontation), and serious rule violations (e.g., staying out at night despite parental prohibitions, running away from home, being truant; APA, 2013). These criteria must occur persistently, being present for at least 12 months and with at least one criterion occurring in the past 6 months. The presence of these criteria also must cause clinically significant difficulty in social, academic, or occupational functioning (APA, 2013), suggesting inherent impairments in the social interactions of children and adolescents.

When identifying Conduct Disorder, age is an important consideration. In particular, the *DSM-5* states that, if the individual is 18 years of age or older, the individual being diagnosed with Conduct Disorder must not meet criteria for Antisocial Personality Disorder (i.e., a personality disorder diagnosed in individuals who are 18 years of age and older when behaviors demonstrating a persistent disregard for and violation of the rights of others are present; APA, 2013). When making a Conduct Disorder diagnosis in a child or adolescent, age is also important when considering descriptive specifiers for the Conduct Disorder diagnosis. In fact, specific Conduct Disorder subtypes describe the age when symptoms are first manifested. A Childhood-Onset Type of Conduct Disorder is diagnosed when children display at least one criterion prior to the age of 10 years, whereas an Adolescent-Onset Type of Conduct Disorder is diagnosed when children do not exhibit any of the criteria prior to the age of 10 years. Further, an Unspecified-Onset Type of Conduct Disorder is diagnosed when the age of criteria onset is unknown (APA, 2013). Generally, research suggests that those who are diagnosed with the Childhood-Onset Type of Conduct Disorder exhibit a more problematic course of aggressive and violent symptoms as well as a poorer outcome over time relative to those who are diagnosed with the Adolescent-Onset Type (Dandreaux & Frick, 2009; Frick & Loney, 1999; Moffitt, 1993; Moffitt & Caspi, 2001).

When diagnosing Conduct Disorder, the severity of the disorder also is specified. Conduct Disorder is considered to be "mild" if few conduct problems are exhibited in excess of those required to make the diagnosis and if these problems cause only minor harm to other individuals. In contrast, Conduct Disorder is considered to be "moderate" if the number of conduct problems and their effect on other individuals are between mild and severe. Lastly, Conduct Disorder is considered to be "severe" if many conduct problems are exhibited in excess of those required to make the diagnosis and if these problems cause considerable harm to other individuals (APA, 2013). Thus, children's impact on other individuals is critical in determining the degree of Conduct Disorder severity.

Finally, a specifier for callous-unemotional traits (i.e., "With Limited Prosocial Emotions") now is included with the *DSM-5* Conduct Disorder criteria (APA, 2013). To be assigned this specifier, the child or adolescent must display at least two of four specific criteria over the last 12 months, with these criteria occurring across multiple relationships and settings. These criteria include lack of remorse or guilt (e.g., the individual shows a general lack of concern about the negative consequences of his or her actions), callous lack of empathy (e.g., the individual is more concerned about the effects of his or her actions on himself or herself, rather than on others), being unconcerned about performance (e.g., the individual does not put forth the effort necessary to perform well or blames others for his or her performance), and showing shallow or deficient affect (e.g., the individual does not express feelings or show emotions to others). Individuals who meet criteria for this specifier are thought to have a more severe and aggressive form of Conduct Disorder (APA, 2013) and to be at greater risk for poorer developmental outcomes (Frick, Ray, Thornton, & Kahn, 2014). Although studies still are needed to determine the utility of this new specifier, some studies are noting some limited incremental utility for predicting reactive aggression (i.e., 7% of the variance; Jambroes et al., 2016). Nonetheless, with the addition of this specifier to the Conduct Disorder criteria, the social functioning of children and adolescents has become even more crucial for understanding the Conduct Disorder diagnosis.

Conduct Disorder Etiology

Although health service providers must be knowledgeable about Conduct Disorder criteria to make an accurate diagnosis, they also should seek to understand the potential etiological factors that may promote conduct problems in children and adolescents. In fact, several biological, individual, and psychosocial risk factors associated with the etiology of Conduct Disorder have been identified (e.g., see Frick, 2004a, for a review). In considering these factors, it is important to note that the etiology of Conduct Disorder usually involves several interacting factors (Frick & Ellis, 1999), rather than one simple underlying mechanism. The most common etiological factors associated with Conduct Disorder are discussed briefly here.

As part of this discussion, it is important to note that etiological factors may interact differentially with the age of symptom onset and with sex (Silverthorn & Frick, 1999). For example, biological makeup and individual characteristics (e.g., temperament) as well as psychosocial factors (e.g., familial dysfunction, poverty) are associated with the development of the Childhood-Onset Type of Conduct Disorder (Moffitt & Caspi, 2001). As a result, the behaviors associated with the Childhood-Onset Type are more likely to increase during the adolescent years and to persist into adulthood (Moffitt, 1993; Moffitt & Caspi, 2001). In contrast, the Adolescent-Onset Type of Conduct Disorder is associated with increased socialization with deviant peers and the need to gain autonomy (Frick, 2004a; Moffitt, 1993; Moffitt & Caspi, 2001). As a result, children with the Adolescent-Onset Type may benefit more so from interventions that are designed to improve their social skills. Further, research suggests that Conduct Disorder is diagnosed rarely in girls during childhood (Silverthorn & Frick, 1999). Although girls may not display behavior that is consistent with Conduct Disorder until adolescence, their risk factors are similar to those of the Childhood-Onset Type (Moffitt & Caspi, 2001). Given such findings, age and sex may be important considerations for identifying potential etiological mechanisms, identifying helpful assessment instruments, and selecting the most effective interventions.

Biological Factors

Genetics. Genetic factors are key in understanding the etiology of Conduct Disorder. Although it can be difficult to separate genetic contributions from psychosocial risk factors, research suggests that genetic factors account for a considerable amount of variance in the development of Conduct Disorder (Arseneault et al., 2003; Holmes, Slaughter, & Kashani, 2001; Silberg, Maes, & Eaves, 2012). For example, research examining Conduct Disorder symptoms in twins indicates that monozygotic twins display more similarities in the degree of their conduct problems and antisocial behavior relative to dizygotic twins (Reid, Dorr, Walker, & Bonner, 1986; Rhee & Waldman, 2002). Similarly, Arseneault et al. (2003) describe a stronger genetic contribution for the severe, pervasive conduct problems of 5-year-old children relative to those of children with an older age of onset. A more recent study (i.e., Children of Twins) also suggests that there is a strong genetic relationship between parents' antisocial behavior and children's conduct problems, even after controlling for a variety of other genetic influences and environmental factors (Silberg et al., 2012). Collectively, research documents a significant genetic contribution for conduct problems, particularly when those problems have an early onset.

Neurophysiological Factors. The contribution of neurophysiological factors to the development of conduct problems also has been examined (e.g., Kim-Cohen et al., 2006; Manuck et al., 1999), particularly with regard to the relationship between the neurotransmitter serotonin and displays of aggression. For example, Kruesi et al. (1990) report that children who exhibit conduct problems and physical aggression have low levels of 5-hydroxyindoleacetic acid (5-HIAA; a metabolite of serotonin) in their cerebrospinal fluid (CSF). Further, CSF 5-HIAA levels predict the severity of children's subsequent physical aggression (i.e., 2 years later; Kruesi et al., 1992). There also are conflicting results related to CSF 5-HIAA and aggression (Duke, Begue, Bell, & Eisenlohr-Moul, 2013), however, suggesting that serotonin's role in conduct problems may depend on other child-specific factors.

Other neurotransmitters may be important in predicting conduct problems as well. For example, research suggests that low monoamine oxidase A (MAO-A) appears to act as a biological risk factor for the development of conduct problems (e.g., Caspi et al., 2002; Fergusson, Boden, Horwood, Miller, & Kennedy, 2011; Godar, Fite, McFarlin, & Bortolato, 2016; Kim-Cohen et al., 2003). MAO-A only is implicated as a risk factor when combined with psychosocial factors, such as child abuse or neglect, however (Caspi et al., 2002; Fergusson et al., 2011; Ficks & Waldman, 2014). Research suggests that adrenal androgen functioning also may be higher in children who exhibit the oppositional behaviors (Shenk et al., 2012; van Goozen et al., 2000) that may be related to conduct problems.

Further, the relationship between specific neuroanatomical structures and the development of Conduct Disorder has been examined as well. For example, research documents differences in gray matter volume between children with Conduct Disorder and those who do not have such a diagnosis (Fairchild et al., 2011, 2015; Matthys, Vanderschuren, Schutter, & Lochman, 2012). Specifically, research describes cortical thinning in the superior temporal gyrus, increased insula cortical folding, and reduced orbitofrontal cortex (OFC) surface area, with OFC surface area being correlated negatively with the number of Conduct Disorder symptoms that are exhibited (Fairchild et al., 2015). Further, differences in white matter structure also have been documented. For example, Passamonti et al. (2012) note a relationship between Conduct Disorder and abnormalities in the uncinate fascicle (i.e., the anatomical tract that connects the amygdala to the orbitofrontal cortex). Such findings may suggest that maturation of white matter pathways (i.e., those that are critical for emotional and behavioral regulation) is atypical (Passamonti et al., 2012). Overall, research suggests a complex picture for the neurophysiological factors that may contribute to Conduct Disorder.

Prenatal Exposure to Substances. Exposure to certain substances in the prenatal environment has been linked to the development of Conduct Disorder as well (Dodge & Pettit, 2003). Research suggests that fetal exposure to opiates or methadone in utero may lead to conduct problems 10 to 13 years later (de Cubas & Field, 1993). Maternal smoking during pregnancy also has been examined, with a link between smoking during pregnancy and child conduct problems being noted consistently (Desrosiers et al., 2013; Fergusson, Woodward, & Horwood, 1998; Gaysina et al., 2013; Knopik, 2009). For example, Gatzke-Kopp and Beauchaine (2007) report that mothers who smoke and those who are exposed to environmental tobacco smoke during pregnancy (but who do not smoke themselves) tend to have children with more Conduct Disorder symptoms. Further, prenatal exposure to alcohol, marijuana, and/or tobacco places the fetus at a considerably higher risk for developing Conduct Disorder in the future (relative to those who are not exposed to these substances prenatally; Day, Richardson, Goldschmidt, & Cornelius, 2000).

The consumption of alcohol during pregnancy, in particular, has been associated with an early onset of persistent conduct problems in children (D'Onofrio et al., 2007; Murray et al., 2015). In other words, when comparing children with prenatal alcohol exposure to children who would be considered typically developing, higher rates of Oppositional Defiant Disorder and Conduct Disorder have been found in those children with prenatal exposure (Ware et al., 2013). The effects of prenatal exposure to substances must be considered in relation to the development of cognitive deficits associated with each substance, however (Dodge & Pettit, 2003). Such findings highlight the critical importance of the prenatal period for the development of Conduct Disorder.

Children's Individual Characteristics

Temperament. Temperament, or biologically based behavioral approaches and emotional dispositions that appear early in life (Bates, 2001; Calkins, Hungerford, & Dedmon, 2004), also may be important to consider in relation to Conduct Disorder. In fact, research suggests that children with difficult temperaments are at greater risk for developing conduct problems and aggression in childhood (Frick & Viding, 2009), adolescence (Frick, 2012), and the future (see Frick & Morris, 2004, for a review; Shaw, Owens, Giovannelli, & Winslow, 2001). Generally, children with difficult temperaments are characterized as irritable, highly active, rigid, unaffectionate, and aversive (Shaw et al., 2001). They also are at greater risk for later behavior problems due to their increased tendency to be in unsafe and novel situations and due to their difficulty with managing impulses and regulating emotions (Yaman, Mesman, van Ijzendoorn, & Bakermans-Kranenburg, 2010). Further, a 12-year longitudinal study suggests that the characteristics of children with difficult temperaments at the ages of 3 and 5 years predict adolescent behaviors that are consistent with Conduct Disorder (Caspi, Henry, McGee, Moffitt, & Silva, 1995). Although the link between difficult temperament and later conduct problems may be indirect (e.g., dependent on psychosocial factors), these characteristics continually are noted as risk factors for later conduct problems (see Frick & Morris, 2004, for a review).

Callous-Unemotional Traits. Research long has suggested that children who exhibit callous-unemotional (CU) traits (e.g., a lack of empathy and guilt) are more likely to develop severe conduct problems in childhood (hence, the addition of the new "With Limited Prosocial Emotions" specifier to the current Conduct Disorder criteria). In fact, it has been estimated that 10–46% and 21–59% of children and adolescents with Conduct Disorder have CU traits in community and clinic samples, respectively (Kahn, Frick, Youngstrom, Findling, & Youngstrom, 2012; Kolko & Pardini, 2010; Pardini & Frick, 2013). Further, CU traits are linked to severe and persistent behavior problems, suggesting an increased likelihood for the symptoms to continue 1 year later (Dadds, Fraser, Frost, & Hawes, 2005) and into adolescence and adulthood (Frick, Cornell, Barry, Bodin, & Dane, 2003; Pardini & Frick, 2013). For example, Frick et al. (2003) indicate that children who exhibit both conduct problems and CU traits show greater levels of conduct problems, aggression, and delinquent acts 1 year later relative to children who exhibit conduct problems alone. Accordingly, CU traits are a strong predictor of the development, severity, and persistence of Conduct Disorder.

Low Verbal Intelligence. Children who display poorer language skills also have been identified to be at risk for developing externalizing behavior problems (Menting, Van Lier, & Koot, 2011). Research further indicates that children with Conduct Disorder exhibit poor performance on standardized tests of verbal ability as well as poor verbal scores on intelligence tests (Moffitt & Lynam, 1994). These performance difficulties extend to more generalized measures as well, with children who have conduct problems exhibiting a higher likelihood of deficits in their general verbal skills (Lynam & Henry, 2001) and pragmatic use of language (Gilmour, Hill, Place, & Skuse, 2004). Research also suggests that boys with conduct problems have the greatest deficits in both verbal skills and verbal memory and are more likely to perform poorly on tests of verbal intelligence beginning at the age of 5 years (relative to boys without conduct problems; Moffitt, 1990, 1993). Relative to children who do not exhibit conduct problems, the verbal intelligence scores of children with Conduct Disorder are notably lower, even when variables such as socioeconomic status, academic achievement, and motivation are controlled (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Pajer et al., 2008).

Although verbal deficits may result from conduct problems, verbal deficits also may contribute to the development of children's conduct problems. For example, Murray and Farrington (2010) suggest that poor manipulation of abstract concepts may be the underlying connection between low intelligence test scores and delinquent behavior, with children who perform poorly on intelligence tests also struggling with being able to foresee the consequences of their actions. Likewise, verbal deficits have been linked to peer rejection, suggesting another explanation for the link between verbal ability and subsequent conduct problems (Menting et al., 2011). As a result of such findings, Frick (2012) suggests that the combination of verbal ability deficits with poor socializing could create problems with delaying gratification, anticipation of negative consequences, and difficulties with the executive control of behavior.

Comorbid Psychological Factors. Research further suggests that inattention, impulsivity, and hyperactivity can be prominent factors in the development of conduct problems (see Holmes et al., 2001, for a review). For example, Larson, Russ, Kahn, and Halfon (2011) report that 27.4% of children with Attention-Deficit/Hyperactivity Disorder (ADHD) meet criteria for Conduct Disorder (relative to 1.8% of children without ADHD). Moreover, relative to children who exhibit only conduct problems, children who exhibit comorbid conduct problems and ADHD symptoms are at greater risk for developing more severe, persistent conduct problems (Lynam, 1998) and later antisocial behavior (Mordre, Groholt, Kjelsberg, Sandstad, & Myhre, 2011).

Beyond ADHD symptoms, children who exhibit conduct problems display symptoms commonly associated with anxiety and depressive disorders as well (Miller-Johnson, Lochman, Coie, Terry, & Hyman, 1998; Polier, Vloet, Herpertz-Dahlmann, Laurens, & Hodgins, 2012). Based on longitudinal studies, conduct problems that co-occur with mood disorders appear stable over time and are linked to a variety of risk factors, including poor social skills and poor academic achievement (Ingoldsby, Kohl, McMahon, Lengua, & Conduct Problems Prevention Research Group, 2006; Olsson, 2009; Polier et al., 2012). Thus, identifying and treating comorbid concerns in children with Conduct Disorder may be beneficial to remediating their conduct symptoms.

Psychosocial Factors

Family. The relationship that children have with their parents is associated closely with children's behavior in general (Madigan, Atkinson, Laurin, & Benoit, 2013; Patterson, 1982) and to the development of Conduct Disorder in particular (see Pardini, Waller, & Hawes, 2015, for a review of different family variables). For example, research indicates that children's high levels of CU traits and early conduct problems are associated with disorganized attachment with parents (Pasalich, Dadds, Hawes, & Brennan, 2012). In contrast, stronger emotional connections between adolescents and their parents predict a reduced risk of antisocial behavior (Sousa et al., 2011). Given these findings, it may be that children with conduct problems may begin experiencing difficulties in their social relationships very early, as problematic attachment with parents sets the stage for difficult social interactions as children proceed through development.

Specific parenting behaviors and practices also have been related to conduct problems in children and adolescents. For example, parents' warmth and positive, proactive parenting (e.g., parents and children spending time playing together) may diminish children's risk of developing CU traits and conduct problems over time (Gardner, Ward, Burton, & Wilson, 2003; Kroneman, Hipwell, Loeber, Koot, & Pardini, 2011; Waller et al., 2014). Research also suggests that problematic parenting behaviors, such as harsh or erratic discipline, low warmth, coercion, and poor supervision or minimal involvement, contribute greatly to children's development of Conduct Disorder (e.g., Barker, Oliver, Viding, Salekin, & Maughan, 2011; Murray & Farrington, 2010; Pasalich, Dadds, Hawes, & Brennan, 2011; Patterson, 1982; Stormshak, Bierman, McMahon, Lengua, & Conduct Problems Prevention Research Group, 2000). For example, Patterson (1982) indicates that parents of children with Conduct Disorder (relative to those of typically developing children) are more inconsistent, use harsher commands, are less involved in their parenting practices, and are more likely to engage in coercive processes when interacting with their children. More recently, Barker et al. (2011) suggest that harsh parenting practices when children are 4 years of age predict CU traits and conduct problems in children at 13 years of age. Similarly, lower levels of positive reinforcement from a primary adoptive parent are associated with CU traits in adopted children (Waller et al., 2014). In particular, negative reinforcement of children's conduct problems may maintain and exacerbate these problems.

Child maltreatment (i.e., abuse and neglect) also contributes to the development of Conduct Disorder symptoms. For example, Johnson et al. (2002) demonstrate that children who experience child abuse early in life display heightened levels of conduct problems and aggression. Other research demonstrates that childhood emotional, physical, and sexual maltreatment is associated significantly with Conduct Disorder, even after controlling for sociodemographic factors (Afifi, McMillan, Asmundson, Pietrzak, & Sareen, 2011; Maniglio, 2015). Children who experience multiple forms of childhood maltreatment may be at the greatest risk for exhibiting violently delinquent behavior (Crooks, Scott, Wolfe, Chiodo, & Killip, 2007). Further, research indicates that children who experience abuse or neglect have a 50% increased probability of engaging in future criminal behavior (Widom, 1989, 1997). For example, adolescents who experience childhood maltreatment are 2.19 times more likely to commit a felony assault, 2.67 times more likely to commit minor assault, 2.47 times more likely to commit delinquency, and 4.57 times more likely to commit a status offense relative to those with no exposure to childhood maltreatment (Sousa et al., 2011). Other forms of familial discord [e.g., domestic violence (Sousa et al., 2011), inconsistent parental figures (Ackerman, Brown, D'Eramo, & Izard, 2002), marital conflict (Rutter, Giller, & Hagell, 1998), parental incarceration, familial stress (Campbell, Pierce, Moore, Marakovitz, & Newby, 1996; Murray, Farrington, & Sekol, 2012)] also place children at a heightened risk for the development of Conduct Disorder.

Further, parents' own emotional and behavioral functioning is an area of concern when examining the development of Conduct Disorder. For example, having a parent who exhibits antisocial behavior greatly increases the likelihood that children will develop Conduct Disorder (Murray & Farrington, 2010; Tiet et al., 2001). Research also suggests that parents' alcohol and substance abuse (Loeber, Green, Keenan, & Lahey, 1995; Marmorstein, Iacono, & McGue, 2009) and psychological symptoms (e.g., depression; Barker et al., 2011; Campbell, 1990) are each associated with CU traits and conduct problems in children. Thus, familial factors, in addition to children's individual characteristics, should be considered when Conduct Disorder is a concern.

Peers. In addition to family characteristics, social relationships with peers are an important factor to consider in the development of Conduct Disorder. In particular, research indicates that the development of conduct problems is associated with early peer rejection and increased socialization with peers with conduct problems or antisocial behavior (Gooren, van Lier, Stegge, Terwogt, & Koot, 2011; Murray & Farrington, 2010; Poulin & Boivin, 2000; Vitaro, Brendgen, & Tremblay, 2000). Consistently, children who are aggressive are more likely to be rejected by their peers and to display increasing conduct problems over time (Kim & Cicchetti, 2010; Vitaro et al., 2000). Further, following rejection from their nondeviant peers, children who are aggressive are more likely to associate with peers who also are aggressive (Poulin & Boivin, 2000). Attention from such peers often acts as a reinforcer for conduct problems (Kiesner, Dishion, & Poulin, 2001), allowing children's conduct problems to be maintained and exacerbated (Vitaro et al., 2000). Thus, overall, these problems occur partly because of the rejection that children experience from their nondeviant peers (Vitaro et al., 2000) and partly because of increased socialization with peers who are aggressive. Associations with peers such as those described here are related most closely to the Adolescent-Onset Type of Conduct Disorder (Frick, 2016; Moffitt, 2003). It also is noteworthy that children who are aggressive tend to interpret ambiguous situations in hostile ways, suggesting that they maintain a hostile attribution bias. Unfortunately, this bias may exacerbate children's aggressive behaviors and negative feelings, resulting in further peer rejection (MacBrayer, Milich, & Hundley, 2003).

Neighborhood. Although peers may contribute to the development of Conduct Disorder, the neighborhoods in which children reside may make a contribution as well. For example, research suggests that children who live in impoverished neighborhoods with a lower socioeconomic status (SES) are at a heightened risk for developing conduct problems (Leventhal & Brooks-Gunn, 2000; Murray & Farrington, 2010). In particular, research indicates that these children are more likely to be exposed to higher rates of criminal acts and violence in their neighborhoods, both of which are predictors of Conduct Disorder in adolescents (Frick, 2016; McCabe, Lucchini, Hough, Yeh, & Hazen, 2005; Murray & Farrington, 2010). For example, Gorman-Smith and Tolan (1998) report that 65% of boys from a low SES neighborhood described exposure to severe violence and significant increases in their level of aggression during the course of a year. Moreover, residing in high-crime neighborhoods may desensitize children's cognitions regarding violent behavior and place them at a greater risk for associating with deviant peers (Frick, 2012). For example, Mrug and Windle (2010) report that 79% of adolescents from a low SES neighborhood witnessed violence and experience increased aggression and delinquency during the course of a year. It is important to note that, although poverty is associated with conduct problems in children, it also is associated with familial conflict and parenting problems (e.g., Pinderhughes et al., 2001; Zhang & Anderson, 2010). Thus, neighborhood events and families' subsequent responses may contribute to Conduct Disorder.

Summary of Etiological Factors

Taken together, there are various etiological factors that may promote the development of Conduct Disorder in children and adolescents. In fact, much research combines these factors into multifactorial models that describe the etiology of conduct problems, as it is unlikely that any single risk factor is a necessary or sufficient cause (Rockhill, Collett, McClellan, & Speltz, 2006). For example, Liaw and Brooks-Gunn (1994) examine 13 risk factors in conjunction with children's behavior problems, with it being noted that the incidence of behavior problems increases as the number of risk factors increases. Further, Greenberg, Speltz, DeKlyen, and Jones (2001) use many different factors (i.e., child characteristics, parenting practices, parent-child attachment, and family ecology variables) to differentiate families seeking services for boys who meet criteria for Oppositional Defiant Disorder, a diagnosis that is related to Conduct Disorder (Borduin, Henggeler, & Manley, 1995), from matched comparison boys. This model boasts 81% sensitivity and 85% specificity, and a dramatic increase in clinical status occurs when three or more risk factors are present.

Rather than examining only the number of risk factors that children experience, other models are beginning to examine the implications of interactions among etiological factors. For example, McKinney and Renk (2007) propose the Interactional-Developmental-Etiological Approach to understanding the etiology of disruptive behavior disorders. This approach considers a variety of pathways to conduct problems, including genetic factors, dispositional factors, and environmental factors, each of which may interact to promote the occurrence of conduct problems at different stages of development. Given the implications of such models, it may be more important for future research to examine the manner in which etiological factors interact to promote the development of Conduct Disorder and how such interactions may be related to implementation of successful interventions for children and adolescents with Conduct Disorder. The following sections will review useful tools for the assessment of Conduct Disorder and interventions that have been designed to treat Conduct Disorder.

Rationale for Assessment and Intervention with Conduct Disorder

Although it is important for health service providers to understand the diagnostic criteria and etiological factors related to Conduct Disorder, the practicalities of working with children and adolescents with Conduct Disorder will require a good understanding of assessment measures that can be used to identify symptoms and the ability to implement evidence-based interventions. Given that externalizing behavior problems, such as those involving conduct problems (e.g., defiance, anger, noncompliance), are primary reasons for children to be referred for mental health services (e.g., in preschool age; Gadow, Sprafkin, & Nolan, 2001; Renk, 2005), it is likely that health service providers will encounter children and adolescents with Conduct Disorder. Further, conduct problems are likely to be persistent over time (e.g., Smith et al., 2014). For example, Christophersen and Mortweet (2002) suggest that 73% of boys, compared to 48% of girls, when assessed at 4 years of age continue to have persistent and severe symptoms when they are 8 years of age. Such a persistent Conduct Disorder symptom profile would suggest the importance of identifying and intervening early and over time.

Effective assessment and intervention for Conduct Disorder becomes even more important when the costs of Conduct Disorder are considered in terms of psychosocial and financial expenditures. With regard to psychosocial costs, Conduct Disorder is related to criminal activities, use and abuse of illegal substances (Brook, Whiteman, Finch, & Cohen, 1996; see Bukstein, 2015, for a discussion), and consequences of early sexual activity (e.g., unwanted pregnancy; Capaldi, Crosby, & Stoolmiller, 1996; Conduct Problems Prevention Research Group, 2014). Certainly, such costs have implications for the emotional and behavioral functioning and for the social relationships of children and adolescents with Conduct Disorder. In addition to these psychosocial costs, the financial expenditures of the services provided to children and adolescents with Conduct Disorder also can be great. In fact, some estimates suggest a cost of $130,000 or more per child over the course of a 6-month period (Foster et al., 2001). Other researchers (e.g., Cohen, 1998) estimate that children who follow the path of the Childhood-Onset Type of Conduct Disorder and who persist in their criminal behavior may cost society at least $1.3 million per child. Thus, the costs of Conduct Disorder are quite great.

Another important rationale for improving health service providers' knowledge of effective assessment and intervention for Conduct Disorder is the usual rate of service usage by children and adolescents with Conduct Disorder. In a study examining the public expenditures of Conduct Disorder, findings suggest that children with Conduct Disorder have a high rate of service usage (i.e., 5% receive inpatient services, 15% receive outpatient services, 18% receive special education, and 21% have contact with the police;

Foster, Jones, & Conduct Problems Prevention Research Group, 2005). In addition, children with Conduct Disorder incur a significantly higher average total cost for services by the time they graduate from high school (i.e., exceeding $140,000 for the average child with Conduct Disorder or a cost that is over six times greater than that for the average child who does not have Conduct Disorder). In particular, inpatient and outpatient mental health costs account for approximately 70% of the difference in costs for those with Conduct Disorder versus those without Conduct Disorder (Foster et al., 2005). Given these estimates, it is imperative that Conduct Disorder be identified accurately with appropriate assessment instruments, be addressed effectively with evidence-based interventions, and be prevented when possible.

Assessment of Conduct Disorder

An evidence-based comprehensive assessment is a crucial first step in diagnosing and effectively treating Conduct Disorder (McMahon & Frick, 2005). In general, evaluations of children and adolescents who exhibit conduct problems should assess the topography of these behaviors (Rockhill et al., 2006). The following section describes the overarching goals for assessment of Conduct Disorder as well as multiple methods that can be used to diagnose Conduct Disorder. In addition, several diagnostic considerations will be noted, including comorbidity, age and sex considerations, risk factors, and effects of a Conduct Disorder diagnosis.

Purposes of Assessment in the Context of Intervention

Clinical assessment is a tool used for obtaining a clear picture of clients' emotional and behavioral functioning in the context of complex systems. In general and as applied to the assessment of Conduct Disorder, the purposes of clinical assessment are to describe clients' current functioning, confirm clients' diagnoses, and inform intervention (Meyer et al., 2001). Further, a comprehensive assessment can provide predictive information regarding prognosis and the likelihood of intervention success (Meyer et al., 2001). As Conduct Disorder develops through several different pathways and manifests in many forms, conceptualization of this disorder is difficult but vital to intervention planning (McMahon & Frick, 2005). When assessing children for Conduct Disorder, the examiner must ask several questions: (1) How many symptoms does the child exhibit?, (2) What types of problematic behaviors does the child exhibit?, (3) To what degree is the child's functioning impaired?, and (4) How appropriate is this referral? (McMahon & Frick, 2005). Such questions will help health service providers to select appropriate assessment methods, to include important considerations in their thinking about Conduct Disorder, and to plan effectively for future intervention efforts.

Methods of Assessment

Several methods exist for the assessment of conduct problems, including clinical interviews, behavior rating scales, and behavior observations, among other methods. It is important to note that, although each method is described independently and distinctly, the use of multiple assessment methods is the norm when assessing for Conduct Disorder and is particularly important given the complexity of the symptoms described throughout this chapter (McMahon & Frick, 2005).

Clinical Interviews. Clinical interviews provide an important avenue through which a large amount of information about children's conduct problems can be collected. In particular, clinical interviews allow for the gathering of information about the types of behaviors that children are manifesting and their severity, the level of impairment in functioning that children are experiencing, and the nature of typical parent-child interactions (McMahon & Frick, 2005). Further, clinical interviews also allow for information about children's medical, academic, and social history to be gathered, and they facilitate the use of clinical expertise and judgment about children's level of impairment (Hartung, McCarthy, Milich, & Martin, 2005). In addition, such interviews are useful in obtaining a precise picture of children's clinical diagnosis and a description of the clinical course and severity of children's symptoms (Rockhill et al., 2006). It also is noteworthy that interviews can be used for assessing children's social skills (Merrell, 2001).

Clinical interviews may vary in the structure and level of flexibility used. They can be used with parents, children and adolescents, and teachers (in some cases). They also can be structured, semi-structured, or unstructured. Structured interviews provide an organized method for obtaining information (McMahon & Frick, 2005), are designed typically to collect information in such a way that *DSM* (APA, 2013) diagnoses can be made, and are often comprehensive enough to allow for the assessment of comorbid disorders. Given these characteristics, structured clinical interviews are considered to be the premiere method of assessment for Conduct Disorder because they have adequate convergent validity across informants (e.g., children and parents) and are considered to have superior reliability and validity when compared to rating scales (Hartung et al., 2005). The *Diagnostic Interview Schedule for Children* (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000) and the *Diagnostic Interview for Children and Adolescents* (Reich, 2000) are two widely used structured clinical interviews that can be helpful in the diagnosis of Conduct Disorder. In addition, the *Kiddie Schedule of Affective Disorders and Schizophrenia* (Kaufman, Birmaher, Brent, & Rao, 1997) is a semi-structured interview (i.e., an interview that has more flexibility but that still thoroughly assesses diagnostic criteria) that can be used with children and parents and that is helpful for differential diagnosis.

Interviews also may be helpful for assessing the social relationships and social skills of children and adolescents with Conduct Disorder. In particular, it may be helpful to assess children's responses to hypothetical social situations (Renshaw & Asher, 1983) and their goals and social strategies for approaching these situations, with the assumption that social objectives and problem-solving techniques would differ for children who are popular versus those who are not (Landau & Milich, 1990). Consistently, children who are more popular tend to have spontaneous social strategies that are more friendly, positive, and outgoing relative to children who hold a lower status among their peers (Landau & Milich, 1990). Interviews regarding social skills also can provide information about the environment in which children's behavior problems occur, providing a more direct linkage to intervention (Merrell, 2001).

Although structured clinical interviews are considered a vital part of a Conduct Disorder assessment, they are not without limitations. Aside from being time-consuming to administer, structured clinical interviews typically do not include normative data. Further, as the interview proceeds, informants tend to report fewer and fewer symptoms (Jensen, Watanabe, & Richters, 1999). In other words, informants tend to report more symptoms earlier in the interview and then decrease the number of symptoms that are reported later in the interview. This response pattern tends to occur regardless of the order in which symptoms are assessed. It also is important to note that children under the age of 9 years are not considered reliable informants when clinical interviews are administered (Loney & Frick, 2003).

Rating Scales. A second method of assessment for Conduct Disorder is the use of behavior rating scales (McMahon & Frick, 2005). Behavior rating scales cover an extensive range of conduct problems and are helpful as screening devices because they are brief. Some evidence even suggests that self-report behavior rating scales may converge with clinical interviews when considering the rank order of Conduct Disorder symptom severity. In particular, self-report behavior rating scales may provide more information about Conduct Disorder at low levels of severity (although clinical interviews appear to provide more information at high levels of severity; Kelley et al., 2016). They also can assist in the assessment of other adjustment problems and often are accompanied by normative data, allowing for comparison to peers of the same age.

In addition, behavior rating scales generally allow for the inclusion of multiple informants, with parents, children and adolescents, and teachers being able to complete such scales. For example, the Child Behavior Checklist, Youth Self-Report, and Teacher's Report Form are three premiere broad-based behavior rating scales that can be administered to parents, adolescents, and teachers, respectively. In addition to measuring broad-based internalizing, externalizing, and total behavior problems, these scales measure more specific narrow-band and DSM-oriented behavior problem domains relevant to conduct problems as well as scales addressing areas of competence (Achenbach & Rescorla, 2001).

Beyond measuring emotional and behavioral difficulties, attention is now being given to ratings meant to identify children and adolescents who should be assigned the "With Limited Prosocial Emotions" specifier. In particular, some research has begun to examine the use of item response theory to identify the best method for distinguishing children and adolescents who exhibit CU traits. For example, Kimonis et al. (2015) suggest that considering the most extreme responses for the presence of CU traits may provide the best discrimination, show reasonable prevalence rates for this particular specifier, and identify those who are high in antisocial characteristics. When assessing CU traits, the use of multiple informants also may be helpful, as different informants may emphasize different constellations of CU traits. For example, Gao and Zhang (2016) suggest that confirmatory factor analyses of self-reports provided by 8- to 10-year-olds on the Inventory of Callous-Unemotional Traits (Frick, 2004b) appear to result in uncaring and callousness factors but that confirmatory factor analyses of parent reports on this measure appear to result in uncaring, callousness, and unemotional factors. Thus, parents may have insights into other characteristics relevant to the CU traits important to this new specifier.

Rating scales also can be used to assess the social relationships and social skills of children and adolescents. In fact, Merrell (2001) suggests that rating scales should be considered a first-line choice for social skills assessment. Although there is less research on the utility of self-reports for social skills assessment (relative to that for self-reports of emotional and behavioral functioning; Merrell, 2001; Renk & Phares, 2004), Gresham & Elliott's, 1990 Social Skills Rating System is a well-researched, cross-informant measure of children's social skills that can be completed by teachers, parents, and children themselves. Certainly, there are a variety of measures that can be used generally to assess children's social skills and competence, such as sociometric measures (Hymel, 1983) and the Self-Perception Profile for Children (Harter, 1985). Other measures of children's social skills are designed specifically for assessing performance in school settings. For example, teachers can complete many measures, including the Social Competence Scale (Kohn & Rosman, 1972), the Social Behavior Assessment-Revised (Byrne & Schneider, 1985), the Social Competence and Behavior Evaluation Scale (LaFrenière, Dumas, Capuano, & Dubeau, 1992), the School Social Behavior Scales (Merrell, 1993), and the Walker-McConnell Scales of Social Competence and School Adjustment (Walker & McConnell, 1995). Given that there is only small to moderate agreement across informants in ratings of children's social skills and competence (Renk & Phares, 2004), there may be occasions when it would be helpful to collect information about children's social skills from multiple informants. In these cases, measures specific to particular informants could be used, such as the Teacher Rating of Social Skills-Children (a measure completed by teachers regarding children's social skills; Clark, Gresham, & Elliott, 1985) or Harter's (1985) Rating Scale of Actual Behavior (a measure that can be completed by teachers and/or parents and linked to the Self-Perception Profile for Children).

Observations. Finally, behavior observations allow for behavior to be observed in a natural or immediate environment (McMahon & Frick, 2005), allowing for valuable conclusions to be made about children and adolescents separately from the reports of other informants (e.g., parents, teachers; McMahon & Frick, 2005). Such observations may be particularly important for examining social skills, especially when children can be observed in settings where they interact with peers (e.g., school; Merrell, 2001). When conducting behavior observations, it is helpful to use the same observer across multiple observations and to minimize conspicuous recording equipment (Aspland & Gardner, 2003). The Dyadic Parent-Child Coding System II (Robinson & Eyberg, 1981) is an example of a structured coding system for behavior observations in which children and their parents are observed engaging in a series of structured play tasks. For classroom observations, Achenbach and Rescorla (2001) have developed the Direct Observation Form to assist in coding teacher-child interactions as well as the amount of time that a student engages in academic activity and on-task versus off-task behaviors.

With regard to observing children's social skills, the Peer Social Behavior Code (part of the Systematic Screening for Behavior Disorders; Walker & Severson, 1992) can be used to categorize children's social behaviors (e.g., social engagement, parallel play) during free play situations. Further, some may use observations of role-play situations to assess children's social skills. In such situations, children are presented with a standard set of situations that involve social interactions and are asked to respond to a provided prompt as if the situations were real. One such role-play situation is the role-play test (Hughes et al., 1989).

A possible limitation of behavior observation is the reactivity (i.e., changes in behaviors resulting from being observed) that children (or parents) may experience during the observation. As long as the children (or parents) are given ample time to become accustomed to the observation procedure, however, reactivity is typically not a problem (McMahon & Frick, 2005). It also may be difficult or unrealistic for health service providers to conduct extensive behavior observations of the children (or parents) being assessed. To address this particular limitation, adults who have regular contact with the children being assessed (e.g., parents, teachers) can be trained to make observations of the children. Observing covert behaviors also may be a challenge (McMahon & Frick, 2005) unless special procedures are used. For example, temptation-provocation tasks can be used to measure covert behaviors (Hinshaw, Zupan, Simmel, Nigg, & Melnick, 1997). Otherwise, health service providers will have to use alternative assessment methods to gain information regarding covert behaviors.

Important Considerations in Assessment of Conduct Disorder

Dimensions of Conduct Disorder. In order to make a valid diagnosis of Conduct Disorder and in order to most effectively inform intervention, an understanding of the dimensions of Conduct Disorder is helpful (McMahon & Frick, 2005). First, conduct problems manifest in either an overt or covert fashion (or both). Overt behaviors are confrontational in nature and include bullying, arguing with adults, and being aggressive toward other individuals and/or animals, among other things. In contrast, covert behaviors are considered nonconfrontational (e.g., stealing, truancy). Second, behaviors can be divided into those that are destructive and those that are not destructive. This dimension can be combined with the overt-covert dimension to form four categories: overt-destructive (e.g., physical aggression), overt-nondestructive (e.g., oppositional behaviors), covert-destructive (e.g., destruction of property), and covert-nondestructive (e.g., substance use). See McMahon and Frick (2005) for a comprehensive review. Further, Nock et al. (2006) provide an alternative, yet similar, conceptualization that may prove helpful in developing intervention plans. This conceptualization includes five subtypes of Conduct Disorder, three specialized subtypes (i.e., rule violations, deceit/theft, and aggression) and two more general but severe subtypes (i.e., severe covert and pervasive).

McMahon and Frick (2005) point out that these dimensions of conduct problems are important for several reasons. First, conduct problems are associated strongly with delinquency and involvement with the criminal justice system (Moffitt, 1993). Therefore, the congruence between the psychological and criminal justice schools of thought can be helpful in allowing communication to occur across professionals in the mental health and criminal justice fields. Second, it is helpful to note whether children are exhibiting behaviors consistent with only one conduct dimension or are more variable in their pattern of conduct problems. In particular, children who exhibit a more heterogeneous pattern of conduct problems tend to experience worse outcomes than those who only exhibit one dimension of conduct problems (Frick & Loney, 1999; Loeber et al., 1993). Finally, these dimensions can provide important clues regarding the role of genetics in the development of children's difficulties. In particular, research shows that destructive behaviors are likely inherited, whereas nondestructive behaviors are not (Simonoff, Pickles, Meyer, Silberg, & Maes, 1998). This distinction may be important as more stable or inherited traits will likely require different types of intervention than those traits that are learned.

An equally important dimension to examine when assessing children with conduct problems is whether or not they possess CU traits (e.g., lacking empathy or guilt), particularly with the addition of the "With Limited Prosocial Emotions" specifier. Such traits are associated with increasingly severe conduct problems and aggression (Frick et al., 2003). Children who possess CU traits and who exhibit conduct problems also tend to experience more life stressors (e.g., peer rejection, family dysfunction, harsh and inconsistent discipline) and a more stable, severe pattern of conduct problems (Frick & Dantagnan, 2005). They also are at greater risk for a variety of individual, behavioral, and contextual problems, including symptoms of anxiety and depression, narcissism, proactive and reactive aggression, and low self-esteem (Eisenbarth, Demetriou, Kyranides, & Fanti, 2016). Interestingly, children with CU traits tend to associate less with deviant peer groups, suggesting that these children experience a greater level of social rejection than those in other groups (Frick & Dantagnan, 2005). Further, longitudinal research finds that antisocial traits and detachment are moderately stable over time and may be predictive of a more severe life-course persistent pattern of antisocial behavior (Loney, Taylor, Butler, & Iacono, 2007). Given the importance of CU traits to the course of Conduct Disorder, it is recommended that CU traits be examined early in the assessment process so that the remainder of the assessment can be structured accordingly (McMahon & Frick, 2005). In particular, gaining information about CU traits will allow for the prediction of later emotional, behavioral, and social difficulties. This information also will be important for confirming a diagnosis of Conduct Disorder as well as for planning for intervention (Loney et al., 2007; McMahon & Frick, 2005).

Comorbidity. In addition to assessing the different dimension of Conduct Disorder, it is important to note any comorbid diagnoses that may be present. In particular, intervention implications may differ depending on the diagnoses that are comorbid with Conduct Disorder (McMahon & Frick, 2005). Specifically, it is important to assess for Attention-Deficit/Hyperactivity Disorder, anxiety disorders, and mood disorders (i.e., disorders that most commonly co-occur with Conduct Disorder; Waschbusch, 2002). Substance use also is associated highly with Conduct Disorder (Hawkins, Catalono, & Miller, 1992) and should be noted during the assessment process. Most structured clinical interviews and many behavior rating scales can facilitate the assessment of these comorbid diagnoses.

Age Considerations. It also is important to note children's age at the onset of their conduct problems, as this information can be helpful in the development of assessment guidelines and in designing an intervention plan that will be suitable for their individual needs (McMahon & Frick, 2005). As noted previously, children who begin exhibiting conduct problems before the age of 10 years tend to have more severe conduct problems in adolescence and are more likely to continue to display such problems into adulthood (Frick & Loney, 1999; Moffitt & Caspi, 2001). This early age of onset tends to be associated with children's stable temperament and often is related to criminal behavior and involvement with the criminal justice system. Further, the development of symptoms before the age of 10 years (i.e., the Child-Onset Type of Conduct Disorder) is correlated with other stable risk factors as well (e.g., lower intellectual functioning, family dysfunction; McMahon & Frick, 2005). In contrast, children who begin showing symptoms after the age of 10 years (i.e., the Adolescent-Onset Type of Conduct Disorder) are more likely to develop conduct problems as a result of their affiliation with deviant peers and are more likely to be described as conflicting with authority or as being "rebellious" (Moffitt & Caspi, 2001; Moffitt, Caspi, Dickinson, Silva, & Stanton, 1996). Given this information, the age at the onset for conduct problems can provide helpful information about the measures that should be used in the assessment process, probable components of effective interventions, and a likely prognosis.

Sex Considerations. In addition, it is important to note that boys and girls who are diagnosed ultimately with Conduct Disorder may manifest different types of conduct problems. First, girls are more likely to engage in relational forms of aggression (e.g., gossip, slander) as opposed to overt aggression (e.g., fighting, cruelty; Frick, O'Brien, Wootton, & McBurnett, 1994; Xie, Cairns, & Cairns, 2005). As a result, McMahon and Frick (2005) suggest that a measure of relational aggression should be administered during the assessment process, so as to not "miss" girls who meet Conduct Disorder criteria. Second, girls with conduct problems are at higher risk for comorbid anxiety and depression diagnoses. Therefore, it is important for health service providers to closely screen for such disorders so that the most effective and comprehensive intervention can be implemented (McMahon & Frick, 2005).

Risk Factors. The assessment of risk factors also is important for informing future interventions. For example, as discussed previously, language impairments and lower intellectual functioning commonly co-occur with Conduct Disorder (Lynam & Henry, 2001; Lynam et al., 1993). As a result, it is helpful to administer tests of intellectual functioning (e.g., using the *Wechsler Intelligence Scale for Children-Fifth Edition*; Wechsler, 2014) and academic achievement (e.g., using the *Woodcock-Johnson Tests of Academic Achievement-Fourth Edition*; Schrank, Mather, & McGrew, 2014) when assessing children for Conduct Disorder. Collecting information regarding children's intellectual and academic functioning may prove useful in predicting a prognosis for children's conduct problems, as lower intellectual functioning is associated with the persistence of conduct problems and is predictive of adolescent delinquency (Frick & Loney, 1999). Further, the presence or absence of CU traits may be particularly informative for the type of intervention that is pursued (McKinney & Renk, 2006). Coercive parent-child relationships, family factors (e.g., marital and financial stress; McMahon & Estes, 1997), and peer relationships (e.g., association with deviant peers; Fergusson, Swain-Campbell, & Horwood, 2004) are several additional factors associated with the development of Conduct Disorder that should be assessed. In particular, observation of the parent-child relationship is vital, as understanding this relationship can help determine whether the focus of intervention should be on children's individual characteristics, on parent-child interactions, and/or on parenting practices (McMahon & Frick, 2005).

Effects of Labeling. Unfortunately, labeling children with antisocial characteristics may lead to unnecessary stigmatization and to adults making punitive decisions regarding these children (e.g., the type of intervention that may be required, the types of punishment that may be warranted for conduct problems; Rockett, Murie, & Boccaccini, 2007). Therefore, Conduct Disorder-related terminology should be used cautiously and conservatively when describing children and should always be presented in the context of children's developmental, social, familial, and academic experiences.

Assessment Summary

Although assessment and intervention are two distinct processes, the assessment process is an essential, therapeutic part of intervention (Meyer et al., 2001). Assessment can be a time when all family members are allowed to provide input, and it even may be the first time that all family members are able to talk about or process their experiences and difficulties in a safe, validating environment. Assessment also allows family members to work with health service providers in a collaborative way to ameliorate the negative effects that children's conduct problems may be having on the children themselves, the family, and other individuals in the community (McMahon & Frick, 2005). Further, receiving assessment-based feedback often is relieving and therapeutic for these children and their families, especially if the family's initial attempts to decrease children's conduct problems have failed (Meyer et al., 2001).

In general, when conducting assessments for children and adolescents with conduct problems, the assessment process should be flexible, should use multiple methods and multiple informants, and should examine the conduct problems, comorbid conditions, risk factors, and other characteristics. By conducting assessments in this fashion, interventions can be selected carefully and informatively so that the best possible outcomes can occur for these children and adolescents and their families.

Interventions for Conduct Disorder

Clearly, children and adolescents with conduct problems are a challenge for parents, teachers, and health service providers given their usual behaviors (e.g., disruptive behavior, noncompliance, defiance, aggression, oppositionality, social deficits). As a result, identifying effective interventions for these children and adolescents is difficult. Further, a lack of replicable findings and generalized intervention effects (Eyberg, Nelson, & Boggs, 2008), as well as a myriad of confounding factors (e.g., comorbid disorders and symptoms, individual differences in presenting symptoms, parents' psychological symptoms, poor parenting practices), have not allowed one particular intervention to be identified as best or most efficacious (Frick, 2001). Further, some interventions are effective in some studies but not others, with some even resulting in iatrogenic effects (Dishion, McCord, & Poulin, 1999). Thus, even after carefully identifying the presence of Conduct Disorder criteria, considering the etiological factors that may be present, and conducting a careful assessment of children and adolescents with conduct problems, it still may be difficult to identify the intervention that may be most beneficial for remediating Conduct Disorder symptoms. To provide an overview of interventions that are available, the next section will discuss those interventions that have empirical support and those interventions that may prove problematic for children and adolescents with conduct problems.

Interventions with Empirical Support

To better understand the wide range of possible interventions for Conduct Disorder, several reviews discuss a number of evidence-based psychosocial treatments (EBTs) that address the emotional, behavioral, and social difficulties experienced by children with Conduct Disorder and other disruptive behavior disorders (Bakker, Greven, Buitelaar, & Glennon, 2016; Brestan & Eyberg, 1998; Eyberg et al., 2008; Frick, 2001; McCart & Sheidow, 2016). These reviews indicate that identified EBTs are effective for specific age groups and vary based on the method of delivery (e.g., individual versus group intervention, the degree to which the intervention is child-focused versus parent-focused) although most fall within behavior, cognitive-behavioral, and family systems orientations (e.g., McCart & Sheidow, 2016). Although it is clear that more research is needed to better address gaps in the current literature regarding interventions for children with Conduct Disorder, useful information is currently available to health service providers as they select interventions. Some of this information is provided here, but readers are encouraged to examine the review papers noted above.

As an example, a recent meta-analytic review of 17 studies published between 2004 and 2014 that examined 19 psychological and nonpharmacological interventions for Conduct Disorder suggests that many studies are of poor to fair quality (Bakker et al., 2016). Based on the studies examined (which included many of the interventions discussed below), parent-reported outcomes, teacher-reported outcomes, and blind observer outcomes following intervention resulted in small, significant effects, but self-reported outcomes resulted in nonsignificant effects. Given the findings of this meta-analysis, no one intervention was identified as better than all the others (Bakker et al., 2016). Another recent review of EBTs for children who have disruptive behavior (McCart & Sheidow, 2016) identifies ten EBTs (two *well-established,* three *probably efficacious*, and five *possibly efficacious* interventions) for children and adolescents involved with the justice system. This review examines the literature from 2007 to 2014 as well as all adolescent-focused articles that were included in two previous reviews (Brestan & Eyberg, 1998; Eyberg et al., 2008). The EBTs identified in this review are categorized using established criteria for identifying well-established, probably efficacious, and possibly efficacious interventions (for a complete review of the criteria used to identify these interventions, see Chambless & Hollon, 1998, or Chambless & Ollendick, 2001).

Further, reviews of the literature identify many moderators that may prove beneficial when choosing interventions. For example, Frick (2001) suggests that the developmental trajectory of conduct problems differs as a function of children's age at the time of their symptom onset. As already noted, conduct problems consistent with the Child-Onset Type of Conduct Disorder may reflect a more severe and pervasive disturbance, whereas symptoms developing in adolescence (i.e., those consistent with the Adolescent-Onset Type of Conduct Disorder) may reflect a negative exaggeration of typical adolescent behaviors or situational factors (Frick, 2001). Differences in children's ages at the time of their symptom onset may be one reason that parent-focused interventions, or child-focused interventions with accompanying parent components, tend to be more effective with younger children (Eyberg et al., 2008; Kazdin & Weisz, 2003). In fact, Eyberg et al. (2008) suggest that parent-focused interventions be used first for younger children and that more individually focused cognitive-behavioral interventions be used with adolescents. As children often do not receive immediate services for conduct problems, children's ages when they begin an intervention also should be considered. Various interventions are effective, but their effectiveness is often specific to the ages of children and adolescents at the time of intervention and to the intervention formats that are used (Eyberg et al., 2008). As a result, children's ages will be used as an organizer for the interventions described briefly here.

Interventions for Young Children

When intervening on behalf of young children with conduct problems, the inclusion of parents in the intervention is vital. For example, *Parent-Child Interaction Therapy* (PCIT; Hembree-Kigin & McNeil, 1995) is a *probably efficacious* intervention for young children (i.e., children who are 2–7 years of age; based on Eyberg et al., 2008) that focuses particularly on parenting skills and parent-child interactions. Specifically, the tenets of this program are based in both attachment theory (Herschell, Calzada, Eyberg, & McNeil, 2002) and operant conditioning (Shillingsburg, 2005). As a result, this program provides parents the opportunity to learn responsive parenting skills as they meet the needs of their young children, to positively attend to appropriate child behaviors, and to actively ignore negative child behaviors. Parents and their young children attend sessions together, allowing for in vivo training to occur. In other words, parents practice child behavior management skills with their young children while being provided feedback from a health service provider

(Brinkmeyer & Eyberg, 2003; Kazdin, 2005). Parents also are expected to continue practicing these skills at home, allowing for the generalization and mastery of these skills (Capage, Foote, McNeil, & Eyberg, 1998).

As part of PCIT, parents and their young children participate in two sequential treatment modules. First, parents and their young children participate in a Child-Directed module where parents are coached in how to interact attentively with their young children. This module is similar to play therapy (Eyberg, 2003), in that parents are asked to engage in special playtime with their young children. During this playtime, parents describe, imitate, and praise their young children's appropriate behavior, while they use appropriate speech, ignore inappropriate behavior, and avoid criticism, commands, and questions (Greco, Sorrell, & McNeil, 2001). Overall, the purpose of this module is to improve parent-young child interactions by fostering a more nurturing relationship (Eyberg & Bussing, 2010). Second, parents and their young children participate in a Parent-Directed module where parents are coached in effective contingency management skills that can be used to manage child noncompliance (Hembree-Kigin & McNeil, 1995). In particular, the purpose of this module is to help parents increase their young children's prosocial behaviors and decrease their young children's problematic behavior (Eisenstadt, Eyberg, McNeil, Newcomb, & Funderburk, 1993; Eyberg & Bussing, 2010). Generally, PCIT is designed to improve young children's social relationships (particularly parent-young child relationships), mothers and fathers' parenting skills, and young children's emotional and behavioral functioning.

Overall, research suggests that PCIT meets these goals. In particular, research shows that PCIT is effective in improving parent-young child interactions and in decreasing young children's behavior problems (Eyberg & Robinson, 1982; Eyberg et al., 2001; Herschell et al., 2002). Further, PCIT is effective in decreasing children's conduct problems across a variety of settings (e.g., school; Eyberg, Boggs, & Algina, 1995; McNeil, Eyberg, Eisenstadt, Newcomb, & Funderburk, 1991) and with a variety of formats (e.g., group therapy; Niec, Barnett, Prewett, & Shanley Chatham, 2016) over time (i.e., 3–6 years; Hood & Eyberg, 2003). It also is effective in decreasing the likelihood that children will meet criteria for their initially diagnosed disorders upon completion of the intervention (Boggs et al., 2005). Given this support for PCIT's effectiveness, this intervention would likely benefit families who have young children with conduct problems.

Another useful intervention is the *Helping the Noncompliant Child* (*HNC*; Forehand & McMahon, 1981) program. Similar to PCIT, HNC is a *probably efficacious* intervention for addressing the conduct problems of young children who are between 3 and 8 years of age (Eyberg et al., 2008). HNC focuses on parenting behaviors that are similar to those targeted by PCIT (e.g., attending to positive child behaviors, ignoring negative child behaviors, employing effective discipline). HNC also utilizes in vivo strategies, where parents and young children are seen together in the clinic or at home (McMahon & Forehand, 2003). There are two phases included in this program as well. During the first phase, differential attention, parents learn to increase the frequency and range of their social attention to their children, to decrease the frequency of their competing verbal behaviors, and to ignore minor inappropriate behaviors. To reach these goals, parents are assisted in creating positive and mutually reinforcing relationships with their young children by practicing skills in session and at home during 10–15minute time periods (i.e., Child's Game; McMahon & Forehand, 2003). During the second phase, compliance training, parents are coached in the use of appropriate commands so that their young children's compliance can be increased (i.e., Parent's Game). Parents also are coached in the use of standing rules as a supplement to clear instructions both in and out of the home (McMahon & Forehand, 2003).

Similar to PCIT, HNC is designed to improve young children's social relationships (particularly the parent-young child relationship), mothers and fathers' parenting skills, and young children's emotional and behavioral functioning.

McMahon and Forehand (2003) summarize many of the outcome studies that examine the HNC program, with these studies providing support for this program (e.g., Forehand & King, 1974, 1977). For example, previous controlled studies find that HNC is effective in increasing young children's compliance in response to parents' demands and in improving secondary conduct problems (e.g., aggression, tantrums; Wells, Forehand, & Griest, 1980). Given these findings, the HNC program also would benefit young children with conduct problems and their families.

A third intervention, the *Incredible Years* (Webster-Stratton & Reid, 2003) program, is also *probably efficacious* for parents and their young children (based on Eyberg et al., 2008). Similar to the first two programs described in this section, this program includes a parent intervention component. In addition, other components can be included for young children (i.e., social skills training) and for teachers (Reid & Webster-Stratton, 2001; Webster-Stratton, 2001). The Incredible Years Parent Training (IY-PT) component utilizes videotaped model vignettes teach parents about positive parent-child interactions, effective discipline techniques, and the fostering of appropriate problem-solving skills and spur discussion. Parents then complete homework assignments to practice these skills (Webster-Stratton, 1981b). A supplemental component of IY-PT (ADVANCE) often is offered at the completion of the BASIC parent program. This ADVANCE program allows parents to learn more effective communication, self-control, and problem-solving skills for use in their marital relationship and encourages parents to strengthen their social support network (Webster-Stratton & Reid, 2003).

Although typically administered in conjunction with IY-PT, the Incredible Years Child Training (IY-CT; Webster-Stratton & Reid, 2003) component is *probably efficacious* as an individual treatment (as is IY-PT; based on Eyberg et al., 2008). Similar to IY-PT, IY-CT employs the use of videotaped vignettes; however, with IY-CT, the videotaped vignettes depict social situations that young children are likely to encounter at home and at school. In small groups (i.e., six to seven children), young children who are between the ages of 3 and 8 years discuss how they would feel during the videotaped situations and provide suggestions for appropriate responses. Modeling and feedback are utilized through a variety of games, activities, and role-playing, with the goal of teaching young children the basic skills of empathy, communication, friendship, anger control, and problem-solving (Webster-Stratton & Reid, 2003). Thus, IY-CT focuses specifically on the social deficits that young children with conduct problems exhibit.

When compared to young children participating in other programs and to those serving as wait list controls, young children who participate in IY-CT demonstrate significant improvements in aggressive and noncompliant behavior (Webster-Stratton, Reid, & Hammond, 2001) and reductions in oppositionality and conduct problems over time (i.e., at 1-year follow-up, Hobbel & Drugli, 2013; McGilloway et al., 2014; Webster-Stratton & Hammond, 1997; up to 2-year follow-up, Posthumus, Raajmakers, Maassen, van Engeland, & Matthys, 2012; Trotter & Rafferty, 2014). Further, when used in conjunction with the Incredible Years Teacher Training program, young children exhibit more social competence, more emotional self-regulation, and lower levels of conduct problems (Webster-Stratton, Reid, & Stoolmiller, 2008). The combination of IY-PT and IY-CT also results in improvements in young children's social competence (Brotman et al., 2005; Drugli, Larsson, & Clifford, 2007).

These findings for young children may be promoted by changes noted for mothers, who tend to decrease their directive behaviors (Webster-Stratton, 1981b, 1982), demonstrate increased confidence (Webster-Stratton, 1981a), and show more positive and significantly less negative interactions with their young children (Webster-Stratton, 1981b, 1982) in conjunction with this intervention. With regard to the ADVANCE IY-PT program, significant reductions in the behavior problems of young children and improvements in the prosocial behaviors of young children have been shown to be related to improved parent communication, collaboration, and problem-solving skills. Results also suggest that improvements in parents' marital relationship, as a result of better communication and support skills, is related to improvements in young children's conduct problems (Webster-Stratton & Reid, 2003). In particular, young children whose parents participate in this program exhibit decreases in negative affect and submissive behavior and increases in positive affect (Webster-Stratton, 1981b, 1982). These findings suggest that the Incredible Years program would provide benefits to young children and their families as well.

Interventions for Children

Similar to the interventions described for young children, interventions for school-age children address mothers and fathers' parenting strategies. For example, the *Positive Parenting Program* (*Triple P*; Sanders, 1999) offers two parent-focused approaches that are considered to be *probably efficacious* EBTs (based on Eyberg et al., 2008) and five levels of preventive intervention for children who are 12 years of age and younger. These levels increase in intensity, ranging from the dissemination of basic information on parenting strategies to individual and group training sessions for parents of children who have severe behavior problems.

With the availability of these different levels of intervention, this intervention can be individualized for different families and their children with conduct problems. As an example, the Triple P Standard Individualized Treatment (i.e., level 4) is a ten-session program that utilizes modeling, rehearsal, and feedback to teach parents core parenting skills (e.g., managing misbehavior, preventing problematic behavior, teaching and encouraging new and appropriate behaviors, improving the parent-child relationship). Further, the Triple P Enhanced Treatment is the most intensive level of treatment (i.e., level 5) and incorporates home visits where therapists attempt to improve characteristics of the home environment (e.g., parenting stress, communication, coping, mood management, partner support) and increase effective parenting (Sanders, 1999). This program also can be offered in a group format (Group Triple P; Sanders, 1999) and now is being examined in an online format (Triple P Online; Sanders, Baker, & Turner, 2012). In the group format, which also is a *possibly efficacious* treatment intervention (based on Eyberg et al., 2008), parents practice newly acquired parenting skills in small groups.

These different levels of Triple P result in fewer child disruptive behaviors, greater parenting competence, and less dysfunctional parenting over time (e.g., at 1-year follow-up, Sanders, Markie-Dadds, Tully, & Bor, 2000; at 3-year follow-up, Sanders, Bor, & Morawska, 2007). Other studies suggest that Triple P is beneficial in reducing children's problematic behaviors, even when confounding factors (e.g., mothers' psychological symptoms, marital discord) are present (Sanders, 1999). Although the focus of this intervention is on improving mothers and fathers' parenting behaviors, it is likely that resulting improvements in children's conduct problems will promote improvements in these children's social relationships as well.

Another *well-established* parent-focused intervention (Eyberg et al., 2008) for parents of children who are 12 years of age and younger is the *Parent Management Training Oregon Model* (*PMTO*; Patterson, Reid, Jones, & Conger, 1975). PMTO appears to be a variant of a previously well-established treatment called *Living with Children* (Patterson & Gullion, 1968). This intervention employs behavior modification techniques that are based on tenets of operant conditioning (Brestan & Eyberg, 1998). PMTO, like other parent programs, teaches parents basic behavior modification principles, such as how to better monitor children's behaviors and implement effective discipline. Based on a long history of research regarding Conduct Disorder and antisocial behavior, PMTO accounts for individualized differences in children's symptoms, children's developmental trajectory, and basic principles of positive and negative reinforcement (Patterson, Reid, & Eddy, 2002). Previous controlled studies indicate that PMTO is effective in reducing deviant behaviors in children who are younger than 12 years of age (Patterson, Chamberlain, & Reid, 1982) and can reduce conduct problems whether or not symptoms of attention-deficit/hyperactivity disorder are present (Bjømebekk, Kjøbli, & Ogden, 2015). Given these findings, PMTO also may have secondary benefits for children's social relationships.

For school-age children, individual and group therapy programs also become an option. For example, *Problem Solving Skills Training* (*PSST*; Kazdin, 2003, 2010) is labeled as a *probably efficacious* intervention (based on Eyberg et al., 2008). PSST is a cognitive approach that teaches children with conduct problems to use problem-solving skills meant to foster accurate appraisals of social situations. Intervention strategies include the modeling of appropriate behaviors, games, activities, role-playing, and the use of a token economy reward system (Kazdin, 1996, 2003, 2010). The original PSST also may be complemented with an in vivo component, a combination that also is labeled as being *probably efficacious* (based Eyberg et al., 2008). As part of this combined program (which also is called *Supersolvers*), parents, who also learn the problem-solving steps taught to their children, help their children apply these skills in everyday situations (Kazdin, 1996, 2003, 2010).

A third variation of PSST includes *Parent Management Training* (PMT; Kazdin, 2003, 2005, 2010). PMT uses operant conditioning principles to change parents' behavior, children's adaptive functioning, and parent-child interactions. In particular, parents learn to better identify problem behaviors and implement effective reinforcement and discipline. Randomized control trials of this program describe statistically significant changes following intervention (Kazdin, 2005), with approximately 79% of clinically referred children and adolescents who complete the program making changes that their parents label as being important (Kazdin & Wassell, 1998). In particular, research suggests that the use of PSST and PMT decreases children's antisocial behavior and increases their prosocial behavior. These changes also seem to be maintained for 1–2 years following intervention (Kazdin, 2005). Based on several controlled studies, PMT is effective (Kazdin, 1996) and is described as *probably efficacious* when combined with PSST (based on Eyberg et al., 2008). Further, the simultaneous combination of PSST and PMT is superior to either program alone (Kazdin, 2003, 2010; Kazdin, Siegel, & Bass, 1992), suggesting that this intervention would benefit school-age children with conduct problems.

A number of group interventions also are described as EBTs for the reduction of conduct problems in school-age children. These group interventions vary in the amount of involvement expected from children and their parents. For example, *Anger Control Training* (Lochman, Barry, & Pardini, 2003) is a child-focused group intervention that can be completed in school. This intervention was labeled as being *probably efficacious* previously (Eyberg et al., 2008) but listed as an *experimental treatment* in a more recent review (McCart & Sheidow, 2016). This program allows children to discuss social situations, identify the potential social cues and motives of the individuals in each situation, and practice appropriate problem-solving strategies. Through discussion, role-playing, and the videotaping of practice interactions, children learn to identify how they feel in social situations and to better control their feelings while being provided with feedback on their performance (Lochman, 1992; Lochman et al., 2003). In general, anger coping programs improve self-esteem and problem-solving skills, decrease substance use, and have long-term benefits (i.e., 3-year follow-up; Lochman, 1992). Thus, such interventions directly address the social difficulties of children with conduct problems.

Interventions for Adolescents

Currently, more research is being done to identify individualized interventions specifically for adolescents with conduct problems and related social difficulties. One group intervention, *Group Assertiveness Training* (Huey & Rank, 1984), was labeled previously as being *probably efficacious* for African American adolescents in the eighth and ninth grades (Eyberg et al., 2008) but was listed as *experimental* in a more recent review (McCart & Sheidow, 2016). Group Assertiveness Training is a highly structured, short school-based program (i.e., consisting of eight 1-hour sessions provided over the course of a 4-week period). As part of this program, trained counselors or peers lead reflective group discussions on a variety of topics (e.g., anger, aggression, rules) for adolescents with conduct problems and maintain a strong emphasis on emotional awareness and feelings (Huey & Rank, 1984). Research suggests that this program is more effective than group discussion in reducing classroom aggression (Huey & Rank, 1984).

The *Rational-Emotive Mental Health Program* (REHM; Block, 1978) is a second school-based EBT that was labeled previously as *probably efficacious* for older adolescents (i.e., Hispanic and African American adolescents in the 11th and 12th grades; Eyberg et al., 2008) but now is listed as *experimental* in a more recent review (McCart & Sheidow, 2016). REHM is a highly structured and directive group program that is based on the rational-emotive therapy model and that uses specific cognitive-behavioral techniques (e.g., in vivo activities, group discussion, homework assignments). With this program, students are taught to be introspective and self-aware as they practice the rational appraisal of social situations. Relative to Group Assertiveness Training, REHM is a longer, more intensive program, with adolescents meeting 5 days per week for 12 weeks (Block, 1978). Research suggests that REHM promotes improvements in adolescents' grade point averages and decreases their truancy and disruptive behavior over time (i.e., at 4-month follow-up; Block, 1978). Overall, these programs address directly the social difficulties of adolescents with conduct problems.

Multisystemic Therapy (*MST*; Henggeler & Lee, 2003) is a third EBT that is used with adolescents who exhibit severe antisocial and delinquent behavior. This program has been labeled consistently as *probably efficacious* (Eyberg et al., 2008; McCart & Sheidow, 2016). MST is a very intensive but flexible program that utilizes a variety of established interventions (e.g., cognitive-behavioral therapies, parenting, pharmacological interventions). MST is based on ecological and family systems theories, supporting the idea that interventions should incorporate and generalize to children and adolescents' many interconnected systems (e.g., families, peers, neighborhoods, schools, larger community contexts). Services often are provided in multiple settings (e.g., at home, in the school setting).

The core principles of MST involve tailoring interventions to meet the needs of the children and adolescents being treated, focusing on positive aspects of family involvement, evaluating gains continually and making modifications as they are needed, and generalizing the positive effects of the interventions that are being used across various settings (Eyberg et al., 2008; Henggeler & Lee, 2003). Thus, MST interventions are individualized to meet the needs of children and adolescents and their families. Controlled studies report that MST is more effective than individual therapy in reducing behavior problems, increasing family relationships, and preventing criminal behavior 4 years following treatment (Borduin, Mann, & Cone, 1995). MST is a well-established intervention (van der Stouwe, Asscher, Stams, Deković, & van der Laan, 2014; Zajac, Randall, & Swenson, 2015). Given the comprehensive nature of MST, it would benefit children and adolescents with significant conduct problems.

Other Interventions (Not Based on Age)

Another example of a well-respected EBT is *Multidimensional Treatment Foster Care* (*MTFC*; Chamberlain & Smith, 2003; Smith & Chamberlain, 2010; now known as Treatment Foster Care Oregon, McCart & Sheidow, 2016). MTFC is a community-based intensive program for children of all ages with disruptive and antisocial behavior problems. As part of this program, children are placed in foster care for 6–9 months with foster parents who are provided training in the use of positive reinforcement, discipline practices, positive feedback for appropriate behavior, and daily behavior management via token economy procedures. During the foster placement, children in MTFC attend individual therapy sessions designed to improve their anger management, problem-solving, and social skills (Chamberlain & Smith, 2003; Smith & Chamberlain, 2010). These children also are provided with in vivo training in the community so that they can practice their prosocial behaviors while being provided with direct reinforcement and feedback. Finally, during the foster placement, biological parents are provided with intensive parent management training where they learn and practice effective communication, parenting, and disciplining skills (Chamberlain & Smith, 2003; Smith & Chamberlain, 2010).

Research suggests that several core components of MTFC account for the effectiveness of this intervention. These components include the children being closely supervised by and having a close relationship with an adult (i.e., their foster parents), foster parents setting clear limits for the children during foster placement, and foster parents preventing children's interactions with deviant peers (Chamberlain, Leve, & DeGarmo, 2007). In addition, biological parents are provided with intensive intervention, while trained foster parents care for their children. Controlled studies of MTFC indicate that this intervention is more effective than group care for adolescent boys (Chamberlain & Reid, 1998) and girls (Chamberlain et al., 2007), resulting in fewer criminal and delinquent acts in 1- and 2-year follow-up periods. Given these findings, positive outcomes are promoted by providing intensive training to biological parents and addressing the behavioral and social deficits of children with conduct problems.

Although many consider *psychotropic medications* to be an effective intervention for children with conduct problems, there is less research available on these medications than for psychosocial interventions (Farmer, Compton, Burns, & Robertson, 2005). Although no psychotropic medications are approved for conduct problems and aggression at this time (Rockhill et al., 2006), psychostimulants are used regularly and are effective in reducing symptoms of attention-deficit/hyperactivity disorder (ADHD; Farmer et al., 2005; Pelham, 1993). As there is overlap in the symptoms exhibited by children with ADHD and those with Conduct Disorder (e.g., impulsivity, noncompliance, verbal and physical aggression), psychostimulants also may be beneficial in treating some conduct problems present with Conduct Disorder (Frick, 2001; Gurnani, Ivanov, & Newcorn, 2016). Further, a reduction in such conduct problems may improve other behaviors that are associated tangentially with Conduct Disorder (e.g., poor peer interactions, problem-solving skills; Frick, 2001).

Beyond psychostimulants, other medications, such as alpha-2 adrenoreceptor agonists, mood stabilizers, and antipsychotic medications, sometimes are used to treat aggression in children (Steiner, Saxena, & Chang, 2003). For example, Olfson, Blanco, Liu, Moreno, and Laje (2006) examine trends in the usage of antipsychotic medications as part of outpatient visits for children in the United States. This study documents an increase in the use of antipsychotic medications from 1993 to 2003, particularly in visits for males and with regard to disruptive behavior disorders. As these medications are indicated for use with adults only, any use of these medications in children would be considered off label, with limited research noting their utility (Findling, 2003). As some suggest that the more severe symptoms of Conduct Disorder require more intensive psychosocial interventions (Eyberg et al., 2008), psychotropic medications may be beneficial as a supplement to psychosocial interventions for some children or when psychosocial interventions are unsuccessful (Eyberg et al., 2008; Frick, 2001; Pelham, 1993). Overall, use of psychotropic medications as part of Conduct Disorder interventions should be examined further.

Finally, there are other interventions that show promise but that require more research regarding their effectiveness for the treatment of Conduct Disorder. For example, Barkley (1997) developed the *Defiant Children* program for parents of children up to the age of 12 years. This program focuses on improving parents' management skills when dealing with their children's behavior problems, improving parents' knowledge of the potential causes for their children's behavior problems, improving children's compliance with parents' commands and rules, and increasing family harmony. A second but related program, the *Defiant Teen* program (Barkley, Edwards, & Robin, 1999), adapts the *Defiant Children* program for use with adolescents and includes problem-solving communication training. Although these programs do not have extensive outcome research, the skills taught to parents as part of these programs have received extensive research support (McMahon & Forehand, 2003).

In addition, comprehensive classroom-based interventions may hold promise for reducing the conduct problems and social difficulties of children and adolescents over the long term. Most notably, comprehensive preschool programs (e.g., Head Start) promote decreases in behavior problems and juvenile delinquency (Yoshikawa, 1994). Other research supports classroom-based interventions that include behavior training and consultation for teachers as well as implementation of token economy systems and response-cost interventions (Filcheck, McNeil, Greco, & Bernard, 2004). Given these preliminary findings, future research should examine the utility of these school-based interventions for decreasing the conduct problems and social difficulties of children and adolescents.

Prevention

Prevention programs, particularly if they are initiated early enough and are designed to address multiple etiologies, also may prove beneficial children and adolescents with conduct problems (Bernat, August, Hektner, & Bloomquist, 2007; Slough, McMahon, & Conduct Problems Prevention Research Group, 2008). The *Fast Track Project*, a multisite, collaborative research project examining a comprehensive, multicomponent intervention for preventing serious conduct problems, is one such prevention program (Slough et al., 2008). Fast Track includes many different components depending on the age and needs of the child or adolescent, including the provision of a curriculum that promotes social and emotional competence, positive family-school relationships, and effective communication and discipline skills. Thus far, studies indicate that Fast Track promotes positive outcomes for children and adolescents (e.g., improvements in child behavior, social skills, emotion recognition, social problem-solving, and language skills) and for parents (e.g., less use of physical punishment, improvements in parenting behaviors and satisfaction; Pasalich, Witkiewitz, McMahon, Pinderhughes, & Conduct Problems Prevention Research Group, 2016; Slough et al., 2008). Further, Fast Track appears to be cost-effective in terms of reducing the diagnosis of Conduct Disorder in children who are at the highest risk (Foster, Jones, & Conduct Problems Prevention Research Group, 2006).

A second prevention program that has positive results thus far is *the Early Risers Preventive Intervention* program (Bernat et al., 2007; Hektner, August, Bloomquist, Lee, & Klimes-Dougan, 2014). As part of this program, kindergartners in 23 elementary schools were screened for aggressive behavior and then were assigned randomly to either the Early Risers program or a control condition. Those who were assigned to the program were provided an intensive intervention in their kindergarten year through the summer after their third grade year. These children then participated in a booster phase in the fourth and fifth grades. The preventive intervention consisted of five components, including a 6-day summer wilderness program emphasizing community building and peer support activities, a "Circle of Friends" group in which children met independently in 6 monthly groups per year, a Family Skills parent group in which expert speakers presented topics and tips to parents, and Monitoring and Mentoring School Support and Family Support programs (Bernat et al., 2007). Children who participate in this program experience significant increases in their academic achievement as well as in their cognitive competence and concentration (as rated by teachers) following the first 2 years of participation and into the third program year (August, Realmuto, Hektner, & Bloomquist, 2001). Children who participated in the intervention show lower rates of conduct problems at the end of their sixth grade year (Bernat et al., 2007) and when they are in high school (Hektner et al., 2014). In particular, participation in this program appears to decrease nondeviant peer relations and improve social skills. These improvements then are related to decreases in children's symptoms (Bernat et al., 2007). Thus, preventive interventions may have benefits for the emotional, behavioral, and social functioning of children and adolescents.

Commonalities Among EBTs: Why Are They Effective?

The EBTs described here for children and adolescents with conduct problems may differ in format but overlap greatly in terms of the skills being taught and the behaviors being addressed. For children and adolescents with conduct problems, it appears that parents need to take an active role in the interventions provided (Eyberg et al., 2008; Kazdin & Weisz, 2003), particularly when it is noted that parent-child dyads are at significant risk for negative interactions (Frick, 1998). Accordingly, all the effective parent-focused interventions described here teach effective parenting skills while encouraging positive parent-child interactions, consistency, and structure. They also encourage or implement modeling and active practice of newly learned behaviors, thereby creating opportunities for positive parent-child interactions.

Although there are some promising child-focused interventions, the most effective interventions at this time are those that provide parent-focused components and/or that encourage parent involvement. In other words, child-focused interventions that teach problem-solving, anger management, and social skills seem to be enhanced when parents are taught how to foster these skills in their children and adolescents at home, making them generalizable across settings. Thus, a second commonality among the EBTs described here is that they target the identified deficits often found with conduct problems. For example, children and adolescents with conduct problems often have difficulty in social situations and with handling conflict because they lack the ability to appropriately appraise these situations and to identify their own feelings and those of others (Kazdin, 2003, 2005). As a result, these children often are impulsive and unable to predict the consequences of their actions, responding with negative problem-solving skills (Kazdin, 2005). Thus, all the child-focused interventions described previously address social and/or problem-solving skills. Overall, the important component related to effectiveness may be the inclusion of emotional awareness and increasing accurate perceptions of social situations.

Potentially Problematic Treatments

As described previously, EBTs for adolescents often utilize a group format and are employed in school settings. The group interventions that incorporate social skills training are considered an effective means of treating adolescents with Conduct Disorder (Eyberg et al., 2008). Therefore, it would make sense that the most economical and convenient way to conduct interventions for adolescents would be to always use a group format. Research on group interventions provides mixed results, however. Although a meta-analysis by Weiss et al. (2005) suggests that group interventions are generally not iatrogenic, other studies suggest that group interventions may actually cause more harm than benefit.

Many theories may explain why many group interventions, especially with older children and adolescents, may have iatrogenic effects. For example, De-Haan and MacDermid (1999) posit that the general stigma of receiving interventions and the resulting influence on adolescents' self-concepts may be related to increases in conduct problems. Iatrogenic effects also may be amplified by "deviancy training" or the reinforcement of deviant behavior by other group members (Dishion et al., 1999). In particular, social skills interventions with high-risk youth may increase the amount of contact that individuals have with deviant peers, further contributing to maladjustment (Dishion & Andrews, 1995).

Given the cost-effectiveness and convenience of group interventions but the mixed findings regarding their effectiveness and/or potential harm to children and adolescents with conduct problems, certain factors should be considered before implementing group interventions. First, deviancy training is likely to be most concerning for adolescents (Dishion et al., 1999), as adolescents are progressing from primarily identifying with their family to seeking an identity through peer relationships. Second, iatrogenic effects are likely to occur when group interventions are lacking structure (Dodge, 1999). Third, low-risk children or children who do not have a history of antisocial behavior are considered the most vulnerable to deviancy training influences (Dishion et al., 1999). These children may have experienced overall peer rejection but have not associated with deviant peers until participating in such group interventions (Weiss et al., 2005). Further, Mager, Millich, Harris, and Howard (2005) indicate that group interventions that include both high- and low-risk children may have greater iatrogenic effects and poorer outcomes than group interventions that include only adolescents who are at high risk. It may be that group leaders unknowingly provide a greater amount of preferential treatment and positive reinforcement to those adolescents who are at low risk. This differential treatment may lead high-risk adolescents to mentally or emotionally withdraw from the group process and form a minority out-group in which reinforcement is sought from deviant peers rather than from positive influences (Mager et al., 2005).

In contrast, the interventions described here appear to be effective with very small groups (i.e., six to eight adolescents) and with specific targeted populations (e.g., Assertiveness Training for adolescents who are in the eighth and ninth grades; REMH for adolescents in the 11th and 12th grades). Further, adolescents may benefit from more direct interventions as opposed to parenting programs (Eyberg et al., 2008). Thus, with these group interventions, it appears that highly structured, very small groups are most effective. It is important, however, to consider children's age at the onset of their symptoms. For those children whose problematic behaviors do not emerge until adolescence, less intense group interventions may be enough to produce changes in behavior (Eyberg et al., 2008). For adolescents with a long history of conduct problems, however, early problematic behaviors have the chance to worsen over time, likely resulting in poor parent-child relationships. As a result, incorporating parents into interventions may be necessary to counteract this history of conduct problems, as evidenced by more intensive programs, such as MST and MTFC (Eyberg et al., 2008).

Beyond the controversy regarding group interventions, other interventions also have problematic results, such as Scared Straight programs, drug abuse resistance education, and boot camp programs (see Lilienfeld, 2007). Scared Straight programs expose children who are at high risk for conduct problems to prison conditions in the hope that such an experience would be upsetting enough to deter them from committing acts of delinquency and crime in the future. Results indicate that children who take part in this type of program experience a significantly higher likelihood of offending and a significant increase in arrests, however (Lilienfeld, 2007; Petrosino, Turpin-Petrosino, & Buehler, 2003). Similarly, drug abuse resistance education, such as that included in the DARE program, are counterproductive. For example, Werch and Owen (2002) indicate that such programs are ineffective in teaching the social skills needed to resist peer pressure to use drugs and are related to increased substance intake. Finally, boot camp interventions have mixed results regarding their effectiveness. These particular social skills programs emphasize discipline and obedience but are associated with a number of deaths and other related problems (e.g., dehydration; Lilienfeld, 2007). Thus, these interventions are not recommended.

Considerations for Successful Interventions

Although effective EBTs are described for children and adolescents with conduct problems, many of these interventions only are efficacious with specific age groups and in specific formats.

Further, these interventions may decrease, but not always eliminate, conduct and related problems. Therefore, other confounding factors must be considered when choosing the most appropriate interventions for children and adolescents with conduct problems. Age is an important confounding factor to consider. As already noted, the developmental trajectories for children with the Child-Onset Type of Conduct Disorder versus those with the Adolescent-Onset Type of Conduct Disorder vary greatly, resulting in individual differences in presenting symptoms (Frick, 2001). As noted previously, the Child-Onset Type of Conduct Disorder tends to be more chronic in nature and is linked to more severe, disruptive, and antisocial behaviors. Further, early conduct problems, when untreated, often are met with coercive, ineffective parenting strategies, leading to a deterioration of the parent-child relationship and a worsening of children's behavior. Over time, this coercive cycle may be an impetus for more severe antisocial and delinquent behaviors (Reid & Patterson, 1989). Although the Adolescent-Onset Type of Conduct Disorder may be situational or more normative in nature (Frick, 2001), presenting conduct problems still are concerning. Further, adolescence is a period marked by a striving for autonomy as well as a need to belong (Vander Zanden, Crandell, & Crandell, 2006). As such, deviant adolescent peer groups may lead to a worsening of symptoms, including engagement in dangerous, illegal activities with grave repercussions.

Therefore, although the Child-Onset Type and the Adolescent-Onset Type of Conduct Disorder may differ in presentation, they both require early, structured intervention to prevent degradation of children's behavior, degradation of the parent-child relationship, and the prevention of deviant peer networks. As such, the most effective interventions for children with long histories of conduct problems appear to be those that include a parent-focused component (Eyberg et al., 2008; Kazdin & Weisz, 2003). In these cases, individualized interventions may be a beneficial supplement to many parent-focused interventions. Finally, when utilized, group interventions should be small and highly structured and should prevent the formation of deviant peer networks with reinforcement for negative behavior (Dodge, 1999).

Second, children who have conduct problems vary greatly in their presenting symptoms, with a large number of children experiencing other comorbid disorders (e.g., ADHD, ODD; Kazdin, 1996). As a result, these children often have a myriad of co-occurring symptoms and other behavior problems (e.g., impulsivity, inattention, oppositionality, poor peer relationships) that complicate intervention. By treating only the symptoms of Conduct Disorder and not children's individualized presentation, problematic behaviors may not be treated fully and/or ineffective interventions may be implemented. As the EBTs described here are noted to decrease specific conduct problems that are characteristic of Conduct Disorder (e.g., noncompliance, disruptive behavior, aggression, oppositionality, delinquency), rather than addressing multiple diagnoses, these interventions may not always be the most beneficial for children and adolescents with comorbid conditions. In contrast, Kazdin and Whitley (2006) examine the effectiveness of PMT, PSST, or both (both categorized as *probably efficacious* treatments by Eyberg et al., 2008) in children and adolescents with comorbid conditions. Their results indicate that children and adolescents with Conduct Disorder or ODD and with up to four additional diagnoses (i.e., comorbid conditions) actually have greater behavior changes relative to children with Conduct Disorder or ODD alone (i.e., no additional diagnoses). Thus, comorbid conditions may complicate intervention, but positive effects are still possible when an appropriate intervention is used.

Finally, confounding variables related to the environments of children and adolescents may interfere with their gains. For example, a number of confounding variables moderate or mediate the effects of psychosocial interventions (e.g., parents' psychological symptoms and substance abuse, parents' marital adjustment, harsh and ineffective parenting practices; Beauchaine, Webster-Stratton, & Reid, 2005). Stressors in the home environment (e.g., low SES, poor educational opportunities, living in high-risk neighborhoods) likely are related to the effectiveness of various interventions and the generalization of gains across settings (Frick, 1998, 2001). Parents' negative attitudes also decrease the effectiveness of interventions (Kazdin & Whitley, 2006). Overall, these factors are important to consider, especially with families who exhibit many of these characteristics and who have lost hope that the conduct problems exhibited by their child or adolescent will improve.

Conclusions

Based on the various characteristics of children and adolescents with conduct problems, the assessment options that are available, and the evidence-based interventions that are beneficial for these children and adolescents, it appears that no one approach will be best for all families who seek intervention for their children and adolescents with conduct problems. It is clear, however, that children and adolescents with conduct problems likely will benefit from early interventions that are tailored individually to their specific needs and those of their families. As a result, it behooves the field to move in the direction of matching the characteristics of families who present for intervention for the conduct problems of their children and adolescents to the interventions that they actually receive. Research should examine these issues carefully so as to maximize the effectiveness of the interventions that are implemented. As the research literature continues to develop this area of interest, special considerations should be given to age of onset for conduct problems and for commencement of intervention, the presence of comorbid disorders, and other potential barriers to potential intervention effectiveness (e.g., parents' psychological symptoms, ineffective parenting, high degree of daily stressors, parents' attitudes toward intervention) as assessment and intervention protocols are selected and implemented.

Once the most appropriate intervention is identified and implemented, gains should be monitored continually so that health service providers can remain flexible and open to alternative and/or supplemental methods of intervention. As part of this endeavor, future research should examine the differential effectiveness of the many components included in the interventions described here as well as the utility of using different intensities of intervention (e.g., intervention length, inclusion of one versus many system levels). Finally, research should continue to develop and examine evidence-based prevention programs so that families and the communities in which they live can foster environments that enrich the experiences of their children and adolescents. In this way, children and adolescents who are at risk for or who already are exhibiting conduct problems can show the greatest improvements in their emotional and behavioral functioning and their social relationships.

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Depression and (Hypo)mania

Patrick Pössel and Thomas D. Meyer

Introduction

Mood disorders including depression and (hypo) mania are among the most prevalent mental health problems which often start early and cause a lot of impairment and disability, even if symptoms might not reach diagnostic threshold for a formal diagnosis. Furthermore during adolescence, there is a steep increase in prevalence which is especially pronounced for depressive symptoms and in girls. The latter has been discussed potentially related to specific interpersonal roles and expectations that girls and women are faced which increase the likelihood of experiencing stress. Furthermore, there have been theoretical models which saw the origins of depression rooted in interpersonal problems, such as skill deficits, loss of social reinforcements, or role transitions (e.g., Hammen & Shih, 2014; Mundt, Goldstein, Hahlweg, & Fiedler, 1996).

In light of these facts, it seems justified to review the literature about social skills and competency focusing on minors diagnosed with a mood disorder. The following review is not aiming to be fully systematic but to highlight some research trends and to show gaps in our knowledge.

Definition of the Population

Contrary to hypomania and mania, the core symptoms of depression impair more the internal experiences, emotions, and affect of an individual. Depression is therefore often difficult to recognize from the outside and to identify by external sources (e.g., friends, relatives, teachers). Thus, depression in children and adolescents is one of the "internalizing" disorders. Hypomania and mania, however, are usually first recognized by others, especially in younger people. Furthermore, while symptoms of (hypo)mania are more closely related to what is usually labeled as "externalizing" such as distractibility, psychomotor activation, or irritability, the associated formal diagnosis of a bipolar disorder (BD) has traditionally not been categorized in that way. One reason is that until recently BD was not diagnosed in young people, especially prepubertal children.

Following the DSM-5 (American Psychiatric Association, 2013), the core symptoms of depression or more precisely an episode of major

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depression is (1) depressed—in minors also irritable and cranky—mood and/or (2) loss of interest or pleasure. Additional symptoms of depression are:

1. Significant weight loss or decrease in appetite (more than 5% of body weight in a month or failure to meet expected weight gains)
2. Insomnia or hypersomnia
3. Psychomotor agitation or retardation
4. Fatigue or lack of energy
5. Feelings of worthlessness or guilt
6. Decreased concentration or indecisiveness
7. Recurrent thoughts of death or suicide

While the symptoms for depression in adults and minors are generally identical, age and development influence the clinical presentation of depression in children and adolescents (Fu-I & Pang Wang, 2008). For example, an epidemiological study of symptom profiles in clinically depressed youth ages 7–14 found that irritability was the most prevalent symptom (84%; Liu et al., 2006) but closely followed by depressed mood (78.1%), diminished ability to concentrate (76.5%), fatigue (71.6%), insomnia (63.7%), and feelings of worthlessness (62.7%) which are typical for depression in older age groups as well. In the same study, about the half of the children aged 7–10 had recurrent thoughts of death (Liu et al., 2006). In a study of boys ages 6–11 at a child psychiatric center, 59% of depressed patients report sadness, with 71% reporting suicidal ideation, highlighting the severity of distress these children are experiencing (Breton et al., 2012).

The DSM-5 considers the impact of age and development on the expression of depression (APA, 2013). The possibility that not sadness but irritable or cranky mood is a core symptom in minors was already mentioned above. Further, the duration of a persistent depressive disorder (PDD, formerly known as dysthymia), a less severe (only two symptoms are required) but longer-lasting depressive disorder, is reduced from 2 years in adults to 1 year in children and adolescents.

When it comes to hypomania and mania, the description of symptoms of both syndromes is fairly similar in the DSM-5 (APA, 2013). An episode of persistent elevated, expansive, or irritable mood must be present which is accompanied by an increased level of energy or activity. Additional symptoms of hypomania and mania are:

1. Increased self-esteem or grandiosity
2. Decreased need for sleep but still feeling rested
3. Being more talkative than usual or pressure to keep talking
4. Flight of ideas or subjective experience that thoughts are racing
5. Distractibility
6. Increase in goal-directed activity or psychomotor activation
7. Excessive involvement in activities that have a high potential for painful consequences

As pointed out before, hypomania and mania do not differ so much in the kind of symptoms but in the minimum duration of the episodes and severity of impairment. Hypomanic episodes formally need to last at least 4 days, and mania is diagnosed if the symptoms last at least 1 week or shorter if a hospitalization is required. From a clinical point of view, the severity of impairment is more relevant for differentiating hypomania and mania. Hypomania is diagnosed if the distinct episode of altered mood and energy level is observed by others (e.g., friends, relatives, teachers) and would be described as unusual and uncharacteristic for the individual's personality. However, there is no significant or severe impairment in social, occupational, or other areas of functioning. The latter is, however, required to give a diagnosis of mania.

As mentioned above, irritability can be an expression of depression in minors, but irritability is also seen a lot in children with mania. Furthermore, compared to mania in adults, irritability is much more prevalent than euphoria in children (Geller et al., 2002; Serra et al., 2016). Van Meter, Burke, Kowatch, Findling, and Youngstrom (2016) looked meta-analytically at the frequency of symptoms of mania in minors diagnosed with BD. As the most common symptoms, they cited increased distractibility, energy, goal-directed activity, irritability, and mood lability with each being present in over 70% of cases; euphoric mood was observed on average in 64%. However, they also raise the issue of a large heterogeneity between studies.

While the validity of a diagnosis of (hypo) mania in adolescence is not really controversial, the situation is slightly different when it comes to prepubertal children. One unresolved issue is the reliability of the diagnosis of mania and hypomania in children, especially outside of specialty clinics. There has been a debate whether mania or more generally BD should even be diagnosed, especially when there is a lack of distinct episodes, when irritability is the predominant mood and/or when daily ultra-ultra-rapid cycling of symptoms (i.e., extreme mood instability—sometimes within minutes) is observed (Baroni, Lunsford, Luckenbaugh, Towbin, & Leibenluft, 2009; Roy, Lopes, & Klein, 2014; Youngstrom, Findling, Youngstrom, & Calabrese, 2005). As a side note, compared to the USA, European studies suggest that this diagnosis is hardly ever given in children (Holtmann, Boelte, & Poustka, 2008; Meyer, Koßmann-Böhm, & Schlottke, 2004; Reichart, Nolen, Wals, & Hillegers, 2000). Contrary to younger children, the presentation of mania in adolescence is similar to the one in adults, and the application of the clinical criteria as outlined in DSM-5 for adults (APA, 2013) is justified in individuals on this developmental stage.

Some of this discussion about the validity of a diagnosis of BD in children, especially with regard to repeated outburst of anger and chronic irritability, has led the authors of DSM-5 to introduce the new category of "disruptive mood dysregulation disorder (DMDD)" in the chapter of "depressive disorders" (Roy et al., 2014). This diagnosis also acknowledges the significant overlap between depression and externalizing symptoms in children and adolescents to an age of up to 12 years. A DMDD is characterized by severe and recurrent temper outbursts that are out of proportion in intensity or duration to the situation. These outbursts occur, on average, three or more times each week for 1 year or more. Between outbursts, minors with DMDD display a persistently irritable or angry mood, most of the day and nearly every day, which is observable by parents, teachers, or peers. It is likely that—before this category was introduced—some studies about mania in minors were including individuals who would now qualify for this new diagnosis using the former label "BD not otherwise specified (NOS)." However, Althoff et al. (2016) assume that mood dysregulation disorder is a rare condition in the community and highly comorbid with other conditions.

The terms (hypo)mania and BD will often be used interchangeably throughout this chapter. The reason is that a diagnosis of BD is primarily based on the presence of a hypomanic or manic episode. This is especially the case in bipolar I disorder where only one lifetime episode of mania but no additional episode of depression is required (APA, 2013). Contrary, for a diagnosis of bipolar II disorder, at least one episode of depression must have been observed in addition to a hypomanic episode. Especially in minors, formerly a DSM-4 diagnosis of "BD, not otherwise specified" was not uncommon which often meant that either the duration or number of symptoms for (hypo)mania has not reached the formal threshold. In DSM-5 these can either be diagnosed as "other specified BD" (e.g., "short-duration hypomanic episodes") or "unspecified BD."

Prevalence, Comorbidity, and Consequences

Research suggests that depressive disorders do exist in children as young as age 3 and that the prevalence rate for depression in preschoolers may be as high as 3% (Bufferd, Dougherty, Carlson, Rose, & Klein, 2012; Egger & Angold, 2006; Luby, Belden, Pautschen, Si, & Spitznagel, 2009). In school-aged children, the prevalence rate increases significantly, particularly around ages 9–11 years, and up to 9% of youth experience a minimum of one depressive episode by the age of 14 (Abela & Hankin, 2008; Mash & Barkley, 2006). This number further increases to approximately 20% by the age of 18 (Hankin et al., 1998).

Depressive disorders and even the so-called subsyndromal depression are associated with risk for recurring depressive episodes throughout life (Georgiades, Lewinsohn, Monroe, & Seeley, 2006; Rutter, Caspi, & Moffitt, 2003). Early onset of depression also comes with a host of additional problems. For example, depression in minors is associated with decreased quality of life, serious emotional disturbances, and poor to severe functional impairment (Bertha & Balázs, 2013; Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012). Adolescents with depressive symptoms have been shown to have higher suicidality, academic failure, delinquency, interpersonal distress, substance abuse, and unemployment (Klein, Torpey, & Bufferd, 2008; Patel, Flisher, Hetrick, & McGorry, 2007).

Before talking about prevalence, comorbidity, and consequences of (hypo)mania in childhood and adolescence, it seems necessary to emphasize some points which are highly relevant for the research and evidence presented in the context of BD in general. First of all, much of the research done in the area of depression in minors might be applicable and relevant to BD because more than half of the adults diagnosed with BD were in their youths diagnosed with other mental health problems (Duffy, 2014; Goodwin & Jamison, 2007). The diagnosis most often found in the records of those adults is one of (unipolar) depression (Drancourt et al., 2013; Vedel Kessing, Vradi, & Kragh Andersen, 2015). Second, although it is known that yearly about 1–2% of individuals with depression need to be re-diagnosed as having BD (Angst, Sellaro, Stassen, & Gamma, 2005; Ostergaard et al., 2014) and that early onset of recurrent depression increases the likelihood of a future diagnosis of BD (Goodwin & Jamison, 2007), currently we cannot reliably predict who will develop BD over time. While variables such as family history of BD or emotional dysregulation have been found to be predictive (Ostergaard et al., 2014; Uchida et al., 2015), they are not sensitive and specific enough. This means that many of the results found in depressed children and adolescents apply as well to those who will develop a BD. Third, even when there seems to be an obvious genetic vulnerability for hypomania and mania, many children of individuals with BD remain healthy, some develop anxiety and depression, and only about 10% will develop mania and therefore BD themselves (Goodwin & Jamison, 2007). Some of the studies we will include explicitly refer to mania and BD in minors but actually look at "high-risk" samples and especially offspring of patients with BD. Therefore, the research question of those studies is often whether social competency and related skills are different in at-risk individuals from what would be expected in people who are not affected by a family history of a mood disorder. We decided to include such studies because in these studies often a substantial proportion of those offspring have already been diagnosed with depression or even a subthreshold BD (Vance, Jones, Espie, Bentall, & Tai, 2008; Whitney et al., 2013). Therefore, they will provide evidence whether social skills and behavior are affected across the different forms and stages of (hypo)mania.

Reliable data about the prevalence of BD in children in epidemiological and clinical populations is still not available (Serra et al., 2016). This is partially due to the high overlap with symptoms of other conditions and comorbidity with such conditions. Especially comorbidity with ADHD, conduct disorder, and substance use problems is often estimated to be high (Marangoni, De Chiara, & Faedda, 2015; Serra et al., 2016). There is an almost twofold increase in prevalence of BD during adolescence (Merikangas et al., 2012) which might explain the wide range in prevalence estimates for BD in adolescence between 1% and 3% across studies (Kim-Cohen et al., 2003; Lewinsohn, Klein, & Seeley, 2000; Merikangas et al., 2010). If one counts subsyndromal manifestations, the prevalence rates are even higher (Lewinsohn et al., 2000). However, there is also some evidence from epidemiological studies that stability of BD diagnoses in adolescence over time might be low and that those who have recurrent episodes are a very specific subgroup (Shankman et al., 2009; Tijssen et al., 2010). Although the stability of the diagnosis seems to be low, those who have recurrent episodes report more suicide attempts and other indicators of psychosocial impairment (Lewinsohn et al., 2000; Merikangas et al., 2012).

Definition of Social Skills and Behavior

Social skills can be defined in very different ways. From a behavioral perspective, they might be defined as the ability to maximize the positive interactions (positive reinforcement) and minimize negative interactions (negative reinforcement, punishment) with others (Libet & Lewinsohn, 1973). Other definitions focus more on the ability to express feelings and/or interests and desires toward others (Liberman, King, DeRisi, & McCann, 1975) without pushing others away (Hersen & Bellack, 1977). Segrin (2000) highlights that the common core of all definitions of social skills is that they describe the ability to interact with others in an appropriate and effective way. Following Segrin, "appropriateness" means that an individual does not violate social expectations, norms, and values or in other words interaction partners of the individual do not see their behavior as negative or odd. "Effectiveness" means that an individual reaches his or her goals[1] in that interaction (Segrin, 2000).

This definition of social skills raises the question of how verbal and nonverbal social behaviors are related to mood symptoms. Regarding verbal social behavior, individuals with depression show in conversations more negative self-statements than their peers without depressive symptoms (Gibbons, 1987; Gurtman, 1987; Jacobson & Anderson, 1982), particularly after an interaction partner self-disclosed. Segrin (2000) interprets this pattern as indication that individuals with depression not only self-disclose more negatively than individuals without depression but that the timing of the self-disclosures is inappropriate. This pattern is crucial as self-disclosures of individuals with depression are a key reason why they get rejected by their interaction partners (Gurtman, 1987). In addition, individuals with depression seem to interpret topics that make persons unhappy and uncomfortable and lead to negative interactions more likely as appropriate topics than individuals without depression (Kuiper & McCabe, 1985), while there is no difference between both groups regarding their interpretation of the appropriateness of topics that make persons comfortable and lead to positive interactions (see also Breznitz, 1992). This pattern of verbal social behavior seems to be particularly pronounced when individuals with depression interact with intimate interaction partners (Hautzinger, Linden, & Hoffman, 1982; Ruscher & Gotlib, 1988; Segrin & Flora, 1998).

Studies regarding nonverbal social behavior demonstrate that children with depression are more often alone, initiate fewer interactions, and show more aggressive and negative behaviors than their peers without depression (Altmann & Gotlib, 1988). On an even more molecular level, minors with depression demonstrate more frowning, longer response times, and less smiling in interactions with adults than their peers without depressive symptoms (Kazdin, Sherick, Esveldt-Dawson, & Rancurello, 1985).

Social Support, Skills, and Behavior and Their Associations with Mood Symptoms

The association between social support and depression in minors is clearly supported by a recent meta-analysis that summarizes and integrates 342 studies with 273,430 participants (Rueger, Malecki, Pyun, Aycock, & Coyle, 2016). Rueger and colleagues found an *r* of .29 in cross-sectional and .17 in longitudinal studies between social support and depression in minors. Similarly the connection between social skills and behavior on the one hand and depression on the other hand in youth has been established. For example, minors with depression experience themselves as lacking social skills; to be more precise, they report to be less able to provide emotional support, make friends, and solve conflicts (Hammen, Shih, & Brennan, 2004; Rudolph, Kurlakowsky, & Conley, 2001; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Further, children and adolescents who rate themselves as socially incompetent are more likely to report depressive symptoms (Chan, 1997; Cole, Martin, Powers, & Truglio, 1996), and both parent and teacher ratings of social competence have been found to be lower for children and adolescents who are depressed (or self-report depression) compared with those who are not depressed (Dalley, Bolocofsky, & Karlin, 1994; Hamilton, Asarnow, & Thompson, 1997; Shah & Morgan, 1996). Thus, the nature of the associations between social support, skills, and behavior and depression seems to be more interesting than the fact that such association exists.

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[1] It should to be pointed out that many, if not all, social trainings help the clients to select the "right" goals (e.g., Pössel et al., 2004). For example, having the goal of "getting" what one wants (e.g., someone else's love, being allowed to stay up the whole night on a school day) is unrealistic and inappropriate. Worse, such a goal might even contribute to the depression if it is not reached. A more realistic and appropriate goal is the expression of one's own desires, feelings, and interests.

The associations between social skills and behavior and depression are to be expected which becomes even obvious when one looks at the above-described diagnostic criteria for depressive disorders following DSM-5 (APA, 2013). In the DSM-5, the severity of a depressive episode can be quantified in symptoms like withdrawal, reduced verbal communication, and decreased socialization. Similarly, hypomania and mania affect interpersonal behavior which is also reflected in their diagnostic criteria. Individuals are more talkative and show increased interest in goal-directed activities which especially involve social and sexual interactions. While the actual behavior can be damaging to the individual themselves (e.g., spending a lot of money for phone calls, gifts for others, sexually transmitted diseases), it will depend on the predominant mood (euphoria vs. irritability) and the severity of the episode (hypomanic vs. manic) how much this will in the short and long term affect their relationships (Bowie et al., 2010). Vulnerability for hypomania or mania can be associated with increased or decreased social skills perceived by the person and others (being funny or more flirtatious versus being hostile, Wolkenstein & Meyer, 2010). Hypersexuality is a symptom often observed in adolescents with BD, and when additional substance use problems are present, this often is linked with increased unplanned pregnancies (Basco & Cells-de Hoyos, 2012; Geller et al., 2002; Goldstein, Strober, et al., 2008).

Beyond the classification of social behavior as symptom of depression and (hypo)mania, a lack of social skills has been conceptualized as a crucial vulnerability for depression for some time (Lewinsohn, Weinstein, & Shaw, 1969). To be more specific, from a behavioral perspective, a lack of social skills is responsible for low rates of positive interactions with others (positive reinforcement), which is one form of social support and causes depression. Segrin and Abramson (1994) branded this proposed association as the "social skill-stress hypothesis." This hypothesis is supported by a longitudinal study demonstrating that individuals with a lack of social skills experience chronic interpersonal stressors (Herzberg et al., 1998), and meta-analysis mentioned before also underscores the negative association between social support and depression in youth (Rueger et al., 2016). However, a variety of other longitudinal studies examining the temporal relationship between social skills and depression did not find that a lack of social skills predicted later depression (Lewinsohn et al., 1994; Segrin, 1996, 1999). Consistent with this seemingly inconsistent picture in minors, Cole et al. (1996) found that social skills predicted depression in sixth graders but not in third graders. Thus, the age or developmental level of youth might play an important role regarding social behavior being a vulnerability for depression or not.

Further, a lack of social support and/or social skills and behavior might also be a consequence of depression. For example, psychomotor retardation (including long response latencies, reduced eye contact, and slowed speech) is another symptom of depression, and those psychomotor behaviors can easily be interpreted by others as indicators of a lack of social skills (Ellgring & Scherer, 1996; Segrin, 1992; Talavera, Saiz-Ruiz, & Garcia-Toro, 1994; for a summary of the research with youth, see Rudolph

& Clark, 2001). Further, other symptoms of depression like feelings of worthlessness and decreased concentration or indecisiveness can interrupt social behavior and decreased the motivation to even interact with others (Segrin, 2000). In addition, when they do not withdraw, depressed individuals tend to continuously demand reassurance from others to substantiate their sense of self-worth and verify that others care about them (Joiner & Metalsky, 2001). This continuous demand may cause others to avoid interacting with them and therefore diminish social support. Thus, it seems obvious that depression is capable of affecting social skills and behavior and even social support in a negative way. However, empirical findings regarding depression diminishing social support and causing a lack or the impression of a lack of social skills are inconsistent. To be more precise, depression does not seem to impact social support by adults like parents (Stice, Ragan, & Randall, 2004) and teachers (Pössel, Rudasill, Sawyer, Spence, & Bjerg, 2013; Reddy, Rhodes, & Mulhall, 2003) but by peers (Prinstein, Borelli, Cheah, Simon, & Aikins, 2005; Stice et al., 2004). Regarding social skills, Cole et al. (1996) found in the already abovementioned longitudinal study no significant associations between depression and later social skills in third or sixth graders, therefore also questioning whether social skill problems are a long-lasting consequence in youth.

When looking at BD and (hypo)mania less, research has so far focused on social skills and behavior in general and in minors with BD in particular. Furthermore, since both depression and (hypo)mania can be present, it is often not clear whether any associations with social skills and behaviors are correlates of current depressive or (hypo)manic symptoms, are a consequence of having experienced mood episodes, or are reflecting an underlying vulnerability to (hypo)mania or to depression. Extrapolating from research done in adults with BD, only a subgroup shows social skill deficits. If patients had social skill deficits, this increased the negative effect depressive symptoms (not manic symptoms) had on social functioning (Depp et al., 2010). This shows the complexity because getting into a (hypo) manic state can actually enhance perceived social skills and behavior in persons who are, for example, very shy and socially anxious, while depression is likely to exacerbate shyness and social anxiety into more social withdrawal. Prospectively, depressive symptoms in BD show a moderate but stable relationship with interpersonal behavior over time, but once again this is so far only examined in adults with BD (Morriss et al., 2013). Looking at offspring of individuals with BD of which 70% are currently qualified for a diagnosis of depression and 23% for a bipolar spectrum disorder, Whitney et al. (2013) found significant impairment in social reciprocity, including impairments in social awareness, communication, and social motivation based on their parents' ratings but not in objective measures. There is evidence that almost 50% of patients with BD fully recovered socially and this is specifically related to younger age and reporting fewer depressive symptoms (Wingo, Baldessarini, Compton, & Harvey, 2010). Siegel et al. (2015) also found that in youth with BD, interpersonal relationships were generally good and described as "poor" or worse in less than 20% when it came to peers, siblings, or parents. Furthermore, they reported that overall interpersonal functioning remained fairly stable over time and did only change before and after the onset of (hypo)mania but not depression. However, in another study, parents observed that the onset of BD in their children had a detrimental effect on social functioning with their kids losing confidence and feeling alienated from others (Crowe et al., 2011). Furthermore, Quackenbush, Kutcher, Robertson, Boulos, and Chapan (1996) found that peer relationships at school declined after onset of the disorder among bipolar adolescents, potentially indicating a change related to the onset of BD. Kutcher, Robertson, and Bird (1998) also found that according to parents and school reports, premorbid academic performance and peer relationships were overall good to excellent before the onset of bipolar I disorder in adolescents. Obviously, the onset of current symptoms changes things because Lewinsohn, Klein, and Seeley (1995) found that (a) adolescents with bipolar, unipolar, and subsyndromal bipolar disorders reported comparable levels of social impairment during episodes of mood disorders, but (b) prospectively there was a decline in social functioning as well in all groups. However, it might also depend on the current mood state, because Goldstein et al. (2009) found that interpersonal functioning was especially impaired when there were manic and psychotic symptoms present. Despite the latter result, it seems more that depression, rather than (hypo)mania, is associated with social deficits.

Developmental Changes and Gender Differences in Social Support, Behavior, and Skills and Their Associations with Mood Symptoms

When examining the relationships between social support, behavior, and skills and mood symptoms in youth, developmental changes need to be considered. First, social skills become more relevant when nonparental adults and peers become more important in the lives of minors. To be more specific, nonparental adults become important sources of social support in middle childhood, same-gender peers become more important during the transition into early adolescence (Buhrmester, 1996; Levitt, Guacci-Franco, & Levitt, 1993), and in late adolescence romantic partners become relevant sources of social support (Collins & Laursen, 2004). However, it should be pointed out that this does not mean that social support from adults is diminished as peer sources grow in importance (Colarossi & Eccles, 2003; Rueger, Malecki, & Demaray, 2010). Nevertheless, while parents might forgive a lack of social skills, impaired or dysfunctional social skills are likely to be answered with peer rejection (Murray-Close et al., 2010).

Second, parallel to the increased focus on peer relationships during puberty, rates of depression in female adolescents increase and more so than in males (Angold, Erkanli, Silberg, Eaves, & Costello, 2002; Ge, Conger, & Elder, 2001; Hankin, Mermelstein, & Roesch, 2007). Thus, one explanation discussed in the literature for this increased risk for adolescent girls to develop depression is that they start to depend more heavily on peer relationships for their self-esteem (Nolen-Hoecksema & Girgus, 1994). Further, Rose and Rudolph (2006) propose based on their review of the literature to gender differences in peer relationships that girls tend to be more self-disclose and show stronger interpersonal engagement and greater concerns about their relationship status. However, while gender differences in various aspects of peer relationships are supported, evidence for gender differences in the association between social support and depression is less clear. To be more specific, Rueger and colleagues found in their recent meta-analysis (2016) that social support is significantly related with depressive symptoms in both male and female youth but also that there was a significant difference between boys and girls. However, the difference is so small that the authors of the meta-analysis suggest that the difference is only statistically significant due to the large number of studies they could include in their meta-analysis rather than representing a real gender difference in youth.

Assessment of Social Support and Social Skills and Behavior

Based on the above-reported associations of social support and social skills and behavior with mood disorders in minors, in particular in the context of depressive symptoms, it becomes clear how important the assessment of social support and social skills and behavior is. Their assessment should be an integral part whenever studying or working therapeutically with children and adolescents with depression or (hypo)mania.

We are not aware of formal assessments that are exclusively designed to measure social relationships or social skills and behavior in minors with depression and (hypo)mania. However, a variety of instruments to measure social support and social skills and behavior in children and adolescents from the general population are used in research with youth with mood disorders.

Social Support

Based on Rueger et al.'s (2016) meta-analysis, most studies about social support and depression in minors used one of the following seven instruments measuring social support (Table 1): Child and Adolescent Social Support Scale (CASSS, Malecki, Demaray, & Elliott, 2000), Multidimensional Scale of Perceived Social Support (MSPSS, Zimet, Dahlem, Zimet, & Farley, 1988), Network of Relationships Inventory (NRI, Furman & Buhrmester, 1985), Perceived Social Support Scale (PSSS, Procidano & Heller, 1983), Social Support Questionnaire (SSQ; Sarason, Levine, Basham, & Sarason, 1983), Social Support Scale for Children and Adolescents (SSSCA, Harter, 1986), and Survey of Children's Social Support (SOCSS, Dubow & Ullman, 1989).

Summarized, all seven instruments are self-report tools for youth and measure multiple sources of support. The number of different sources ranges from two in the PSSS (Procidano & Heller, 1983) and the SSQ (Sarason et al., 1983) to eight in the NRI (Furman & Buhrmester, 1985). This range of measured sources of support goes hand in hand with the abovementioned changes in relevance of different sources of social support with the age of the youth. Associated with that, the age range for which the individual instruments are evaluated varies widely with the CASSS (Malecki et al., 2000), SSSCA (Harter, 1986), and SOCSS (Dubow & Ullman, 1989) covering the widest range from grades 3 to 12 and ages 8 to 18 years. Further, while only four of the instruments were originally developed for minors (CASSS, Malecki et al., 2000; NRI, Furman & Buhrmester, 1985; SSSCA, Harter,

Table 1 Most commonly used instruments of social support including age range of validation samples, number of items, sources of support, and whether network size is measured based on Rueger et al. (2016)

Instrument and authors	Age range	No. of items	Sources of support/network
Child and Adolescent Social Support Scale (CASSS; Malecki et al., 2000)	Developed and validated for use in grades 3–12	60	Classmate, close friend, parent, school, teacher
Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988)	Developed for adults Validated for use with youth (mean age 15.8 years)	12	Family, friend, significant other
Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985)	Developed and validated for use in ages 11–13 years	249	Mother, father, sibling, relative, boy/girlfriend, other-sex friend, another individual
Perceived Social Support Scale (PSSS; Procidano & Heller, 1983)	Developed for adults Validated for use in ages 12–18	40	Family, friends
Social Support Questionnaire (SSQ; Sarason et al., 1983)	Developed for adults Validated for use in grades 8 and 11	27	Family Network
Social support scale for children and adolescents (SSSCA; Harter, 1986)	Developed and validated for use in ages 8–18 years	24	Classmates, friends, parents, teachers
Survey of Children's social support (SOCSS; Dubow & Ullman, 1989)	Developed and validated for use in grade 3 and higher	72	Family, peers, teacher Network

Based on Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycock, C., & Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychological Bulletin, 142*, 1017–1067. Published by APA and adapted

1986; SOCSS, Dubow & Ullman, 1989), all seven were evaluated in minors. Finally, only three instruments assess the size of the social network (NRI, Furman & Buhrmester, 1985; SSQ; Sarason et al., 1983; SOCSS, Dubow & Ullman, 1989). Besides selecting the instrument that best fits the purpose of the research and the age group studied, when designing a study, the lengths of the selected instrument are crucial to avoid overburden the participants and to allow to measure all necessary constructs. Thus, that the number of items ranges from 12 items in the MSPSS (Zimet et al., 1988) to 249 in the NRI (Furman & Buhrmester, 1985) is likely relevant for many clinicians and researchers.

Social Skills and Behavior

Before we can examine instruments to assess social skills and behavior in minors with depression or (hypo)mania, we need to discuss another crucial topic. Compared to individuals without depression, depressed individuals evaluate their own social skills more negatively, and currently hypomanic individuals will likely overestimate their social skills and be disinhibited (Benarous, Mikita, Goodman, & Stringaris, 2016). A meta-analysis quantified the difference in self-ratings of social skills between depressed and non-depressed adults as $r = .30–.61$ (Segrin, 1990). This difference in self-ratings is also consistently found in depressed and non-depressed minors (Chan, 1997; Dalley et al., 1994). This points to a negative self-evaluation bias in adults and minors with depression. This might raise the question whether such a bias can completely explain the repeatedly found deficits in self-reported social skills in depressed individuals. However, according to Dykman, Horowitz, Abramson, and Usher (1991), the negative self-ratings of social skills by depressed individuals reflect both the described self-evaluation bias and an actual lack in social skills. This hypothesis is supported by the already abovementioned meta-analysis. In this meta-analysis, Segrin (1990) quantified the effect for depressed-non-depressed differences in other ratings of social skills as $r = .22$ (Segrin, 1990). While weaker than the difference in self-reports by depressed and non-depressed adults, this difference is still significant reflecting a "real" difference in social skills between depressed and non-depressed individuals. A "real" lack of social skills seems to exist in youth as well because parents (Hamilton et al., 1997), peers (Kennedy, Spence, & Hensley, 1989), teachers (Dalley et al., 1994; Shah & Morgan, 1996), and trained observers (Fauber, Forehand, Long, Burke, & Faust, 1987) all report a lack of social skills in depressed minors.

Related to this topic, studies comparing self- and other reports of social skills and behavior by depressed and non-depressed individuals found significant differences between self- and other reports of social skills, but not social behavior (Ducharme & Bachelor, 1993; for a review, see Segrin & Dillard, 1993). However, it should be mentioned that Ducharme and Bachelor (1993) found the following: when trying to differentiate between depressed and non-depressed clients of a university counseling center by looking at verbal (amount of speech, ratio of time spent talking about interaction partner vs. self) and nonverbal social behavior (eye contact, smiling), neither the self-ratings of the clients nor the ratings of their interaction partners or external observers are allowed to do so. In other words, they found no differences in social behavior between college students with and without depression. Thus, it is possible that the overall lack of significant findings regarding social behavior is responsible for the similarities between self- and other ratings in regard to social behavior in this study.

When focusing on adolescents with BD, Goldstein, Miklowitz, and Mullen (2008) differentiate between social skill knowledge and actual social skill performance and argue that this could be especially relevant in the context of experiencing different mood states and showing different behaviors (e.g., socially withdrawn when depressed, people seeking when hypo(manic)). Adolescents with BD who were experiencing minimal symptoms at the time of testing as well as their parents were interviewed. Compared to adolescents without BD, adolescents with BD did not differ in their social skill knowledge, but they reported more social skill deficits. For example, they rated themselves as more inappropriately assertive, impulsive, jealous, withdrawn, and overconfident than their peers without BD. Consistently, with the rating of the adolescents, parents of adolescents with BD rated their offspring as being more socially impaired. However, ratings of social interactions with the interviewers could not differentiate between adolescents with and without BD. Based on the findings presented here, it seems advisable for researchers and clinicians to consider both self- and other ratings when measuring social skills in depressed minors, while self-ratings might be sufficient when assessing social behavior. The same might be highly informative in currently (hypo)manic minors, but it might be more difficult to get valid self-reports from manic patients depending on the severity of the mania.

Irrespective of the value of self-reports in depressed minors, social skills and behavior can be assessed formally and informally, depending on the purpose of the assessment and the setting. The different forms of evidence-based psychotherapy which are effective in minors with mood disorders, especially depression (e.g., behavioral therapy, cognitive behavioral therapy, interpersonal psychotherapy; for a more detailed description, see Implications for Treatment), might focus on different aspects of social skills and behavior, but they usually involve how to establish relationships with others and how to behave more effectively in interpersonal situations. When it comes to (hypo)mania and BD, the same applies, but often the parents or the families are involved in the treatment, and one of the core themes is on communication skills in families (Fristad & MacPherson, 2014; Miklowtiz, 2016). Thus, those areas should be the main focus when assessing social behavior and social skills in minors, no matter if the assessment is formal or informal.

While formal assessments of social skills and behavior could be used within psychotherapy, informal assessments are more common. Informal assessments sometimes include observations of the client in real-world settings like schools but are more often focused on the specific behavior of a client in role-plays with the therapist or—in case of a group therapy—with a peer. Those informal assessments of social skills and behavior translate almost immediately into the training of social skills and behavior that therapist and client see as in need of improvement (for therapy manuals demonstrating this, see Clarke, Lewinsohn, & Hops, 1990; Pössel, Horn, Seemann, & Hautzinger, 2004).

Before summarizing the information presented in Table 2, two details regarding the listed instruments need to be discussed. First, the original Matson Evaluation of Social Skills with Youngsters-II (MESSY-II; Matson, Rotatori, & Helsel, 1983; Matson, Neal, Hess, et al., 2010; Matson, Neal, Worley, Kozlowski, & Fodstad, 2012) had separated versions for adolescents, parents, and teachers. The MESSY-II, however, solely includes a scale for parents/caregivers. As Matson et al. (2010) point out, the version for the minors themselves was dropped from the MESSY-II due to low insight of the subgroups of minors that are usually asked to fill out the MESSY (e.g., minors with developmental disability, intellectual disability, mental health issues). Further, the teacher scale was not included in the MESSY-II; it was mainly used in community and clinic settings, and teachers were barely asked to fill out the MESSY.

In summary, six out of the seven instruments measuring youths' social skills and behaviors (including original MESSY) are or include a version for the youths themselves. Four instruments include versions for parents and two (including the original MESSY) for teachers, and one is an instrument asking classmates for the social skills and behaviors of their peers. Unfortunately, there is no instrument using all four sources of information. Furthermore, one of the two instruments that includes information from three sources dropped two sources in the most recent updates, leaving the Social Skills Improvement System, Social Skills subscale (SSIS; Gresham & Elliott, 2008) as the only instrument utilizing information from the youths themselves, parents, and teachers. Contrary to the instruments measuring social support, all instruments measuring social skills and behaviors are developed for minors. However, all but the MESSY-II (Matson, Neal,

Table 2 Instruments to measure social skills and behavior previously used in relationship with depressive and/or (hypo)manic symptoms in youth including age range of validation samples, number of items, and sources of information

Instrument and authors	Age range	No. of items	Subscales	Sources of information
Adjustment Scales for Sociometric Evaluation of Secondary-School Students (ASSESS; Prinz, Swan, Liebert, Weintraub, & Neale, 1978)	Validated for use in grades 9–12	41	Academic difficulty, aggression-disruptiveness, anxiety, social competence, withdrawal	Classmates
Children's Self-Report Social Skills Scale (CS; Danielson & Phelps, 2003)	Validated for use in grades 4–6	21	Likeability, social ingenuousness, social rules	Self
Interpersonal Competence Questionnaire (ICQ; Buhrmester, Furman, Wittenberg, & Reis, 1988)	Validated for use with youth (age range 16–19; mean age 18.3 years)	40	Conflict management, emotional supportiveness, initiation of relationships, negative assertion, self-disclosure	Self
Matson Evaluation of Social Skills with Youngsters-II (MESSY-II; Matson et al., 1983; Matson, Neal, Hess, et al., 2010; Matson, Neal, Worley, Kozlowski, & Fodstad, 2012)	Validated for use in ages 2–16 years (MESSY), 4–18 years (MESSY-II)	62 (S), 64 (P, T)	MESSY: Appropriate social skills, inappropriate assertiveness MESSY-II: Adaptive/appropriate, hostile, inappropriate assertive/overconfident	Parents, MESSY only: Self, teachers
Social Competence with Peers Questionnaire (SCPS; Spence, 1995)	Validated for use in ages 12–19 years	9 (S), 10 (P)	No subscales	Self, parents
Social Skills Improvement System, Social Skills subscale (SSIS; Gresham & Elliott, 2008)	Validated for use in ages 3–18 years; self-report, 8–18 years	46	Assertion, communication, cooperation, empathy (S only), engagement, responsibility (P only), self-control	Self, parents, teachers
Social Skills Questionnaire (SSQ; Spence, 1995)	Validated for use in ages 12–19 years	30	No subscales	Self, parents

Worley, et al., 2012) and the SSIS (Gresham & Elliott, 2008) are evaluated for a relatively narrow age range. In addition, all instruments with a narrow age range are developed for adolescents but not for children. Finally, as discussed regarding the instruments to measure social support, when designing a study, the lengths of the selected instrument are crucial to avoid overburdening the participants and to allow to measure all necessary constructs. Thus, that the number of items ranges from 9 items in the SCPS (Spence, 1995) to 62/64 in the MESSY-II (Matson, Neal, Worley, et al., 2012) is likely relevant for many clinicians and researchers.

Fodstad and Matson (2009) point out how important direct behavioral observations of social behavior of a minor with depression can be to understand the underlying problems and to monitor the progress of a treatment. Thus, they suggest a more formal assessment in which the target behavior is operationally defined, and this behavior is broken down into discrete, observable (overt), and simple to be described behaviors which can be reliably observed by multiple observers. Further, Fodstad and Matson (2009) highlight the importance of selecting the most appropriate settings in which the social behavior should be observed. Finally, ways to conduct independent and reliable assessments of the targeted social behavior need to be established. Typical methods to measure behavior include duration recording (measuring the time for how long the targeted social behavior occurred), event recording (counting the number of times the targeted social behavior occurred in a predefined time span), and time sampling (indicating whether or not the targeted social behavior occurred during a predefined time span). As a good starting point for observation systems developed for a particular patient or research study, Fodstad and Matson (2009) recommend a system developed by Kazdin (1990), as this observation system (a) includes affect-related expression, social activity, and solitary behavior as broad categories of social behavior which are relevant for minors with depression and (b) can be adapted for the use in a wide range of settings including but not limited to classroom behavior, lunch time, and leisure time activities. Affect-related expression includes frowning, smiling, arguing, and complaining. Social activity includes interaction with staff during a conversation or play activity as well as talking, playing a game, and participating in a group activity with peers. Finally, solitary behavior includes grooming oneself, listening and watching, playing a game alone, straightening the own room, and working on an academic task (Kazdin, 1990). Obviously, this kind of observation can be done regardless of whether the mood of the minor is depressed, (hypo)manic, or euthymic to identify the triggers, maintaining factors, or consequences of behaviors.

Kazdin's (1990) observation system clearly highlights some of the challenges that are associated with measures of actual social behaviors as can be seen on the example of affect-related expression. Frowning and smiling basically measure (simple) facial expressions, while arguing and complaining measure verbal expression of negative emotions toward someone else. Thus, the level and complexity of assessed behavior are very different. Obviously, other behavioral observation systems have to handle similar challenges.

Implications for Treatment

As stated above, the different forms of evidence-based psychotherapy for minors with mood disorders (e.g., behavioral therapy, cognitive behavioral therapy, interpersonal psychotherapy) all consider social support and social skills and behavior as relevant. They usually focus on how to establish relationships with others and how to behave more effectively in interpersonal situations. When it comes to BD and (hypo)mania, interpersonal issues are likely to be addressed alongside other core topics such as sleep-wake rhythms, medication, and so on, and furthermore when the focus is on interpersonal situations, it is mainly on interactions with and within the family.

There are multiple variables described in this chapter that should be considered by clinicians. First, the associations between social support, skills, and behavior and depression seem to be bidirectional. In other words, a lack of social support, skills, and behavior seems to be risk factors for the development but also symptoms and consequences of depression. Thus, a lack of social support, skills, and behavior does not only increase the likelihood of developing depression but also worsens a current depression and increases the likelihood of a relapse after recovering from depression. Thus, working on social support, skills, and behavior seems to be a promising target on all stages of intervention (primary prevention, treatment, relapse prevention of depression). Although most of the evidence is based on patients who experienced only depressive symptoms, the assumption of bidirectionality is most likely to be true for bipolar depression as well (e.g., Johnson, Meyer, Winett, & Small, 2000).

Second, when a clinician considers working with their client on improving their social support by others, the age of the client is crucial. The age will affect the sources of social support they can and want to focus on. While parents seem to be an important source of social support throughout childhood and adolescence (Colarossi & Eccles, 2003; Rueger et al., 2010), other sources come and go. To be more precise, same-gender peers become important during early adolescence (Buhrmester, 1996; Levitt et al., 1993), and romantic partners become relevant sources of social support in late adolescence (Collins & Laursen, 2004). Thus, while working on improving social support by parents seems appropriate in all age groups, a clinician should consider that impaired or dysfunctional social skills are likely to be answered with peer rejection (Murray-Close et al., 2010). Thus, social support by peers might be more lacking than social support by parents. Therefore, a clinician might want to focus on working on social skills and behavior that are relevant in interactions with peers.

Third, when measuring the social support, skills, and behavior of a client, a clinician should consider how to assess those variables. While youth with mood disorders have been shown to have problems regarding social support, skills, and behavior, they themselves will likely evaluate their own social skills more negatively when currently depressed and overestimate their social skills when (hypo)manic (Benarous et al., 2016). However, this self-evaluation bias seems not to impact the self-description of social behavior (Ducharme & Bachelor, 1993; for a review, see Segrin & Dillard, 1993). While there is not much research with regard to the self-evaluation bias and social support, it is likely that the self-evaluation bias impacts the self-rating of social support as well. Thus, it seems clinicians might want to consider using both self- and other ratings when measuring social support and skills, while self-ratings might be sufficient when assessing social behavior.

Forth, and as Segrin (2000) points out, the definition of social skills as the ability to interact with others in an appropriate and effective way has implications for the assessment of social skills but also for the prevention and therapy of depression. One limitation all definitions listed above seem to have is that they assume that social behavior is solely determined by the ability of the individual. One other important factor why individuals do not always behave to the best of their abilities is that they may not have the motivation to do so and, thus, they might not appear as skilled as they are. This is relevant for the treatment of depression as reduced motivation or better loss of interest is one of the core symptoms of depression. This leads us back to the question of how to measure social skills as only self-report, but not other report or external behavioral observations allow separating out if a youth lacks social skills or the motivation to use available skills. A further factor impacting the actually demonstrated social behavior is the emotional dysregulation or reactivity to situational cues in some individuals vulnerable to mood disorders. This dysregulation or reactivity might inhibit the display of the most appropriate social behavior in favor of a more emotionally influenced reaction. In conclusion, a social skill training is not in all cases the method of choice for the treatment of depression. This hypothesis is also supported by research demonstrating that interventions including a social skill component not always show effects on depressive symptoms, even when they improve social outcome variables (Pössel, Horn, & Hautzinger, 2003).

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