Chapter 4
Social Skills Training for Adolescents and Adults with Autism Spectrum Disorder

Elizabeth A. Laugeson and Ruth Ellingsen

Introduction

Deficits in social skills are the common impairment shared by all individuals on the autism spectrum, regardless of cognitive or intellectual functioning. It is widely known that individuals with autism spectrum disorder (ASD) typically have great difficulty in the social arena; in fact, Laushey and Heflin (2000) have even proposed that poor social functioning is the most profound and defining issue for individuals with ASD. While social difficulties are certainly present in childhood, adolescents and adults with ASD face increasingly complex social situations and higher expectations for social adeptness that may make their social challenges even more pronounced and profound.

Despite the pervasiveness of social deficits commonly experienced among individuals with ASD, social skills are comparatively much less studied than other aspects of ASD and research examining social skills interventions for adolescents and adults with ASD are especially rare. In a best evidence synthesis of 66 studies of social skills interventions for individuals with ASD published between 2001 and 2008, only three studies contained adolescent or adult participants (Reichow & Volkmar, 2010). Fortunately, the annual publication of peer-reviewed studies examining social skills interventions for individuals with ASD is steadily increasing (Reichow & Volkmar, 2010). Nevertheless, while progress is being made, there are several limitations in ASD social skills research that need to be considered, including areas in which to target treatment.

E.A. Laugeson (✉) • R. Ellingsen
University of California, Los Angeles, Los Angeles, CA, USA
e-mail: elaugeson@mednet.ucla.edu; RuthEllingsen@ucla.edu

F.R. Volkmar et al. (eds.), *Adolescents and Adults with Autism Spectrum Disorders*,
DOI 10.1007/978-1-4939-0506-5_4, © Springer Science+Business Media New York 2014

Social Deficits in Adolescents and Adults with ASD

Social deficits are typically a major source of impairment for individuals with ASD, regardless of cognitive or language ability (Carter, Davis, Klin, & Volkmar, 2005). However, the considerable heterogeneity in the level of cognitive functioning and language ability among individuals with ASD may affect the presentation of social deficits. For example, Bauminger, Shulman, and Agam (2003) found that higher-functioning adolescents initiate social interaction with peers more frequently than do their lower-functioning peers; yet, their interactions are often awkward and sometimes even intrusive or offensive. In fact, high functioning adolescents may be no less affected by social deficits than those with cognitive limitations; rather, their heightened self-awareness and false appearance of being less impaired may actually increase the severity of their social limitations and motivation, perhaps increasing the likelihood of peer rejection and neglect. Consequences of poor social skills often manifest in the form of peer rejection, peer victimization, poor social support, and isolation. Consequently, individuals with ASD generally report higher levels of loneliness and poorer quality of friendships than same aged typically developing peers (Bauminger & Kasari, 2000; Capps, Sigman, & Yirmija, 1996; Humphrey & Symes, 2010). Thus, the importance of social skills training for individuals across the spectrum cannot be underestimated.

When considering the impact and relevance of social skills training, it is important to consider the specific social deficits often shared by individuals with ASD, which contribute to poor social outcomes. Broadly, social deficits often observed across the spectrum and throughout the lifespan include poor social communication, impaired social cognition, and lack of understanding of social cues. These deficits do not appear to improve as a result of development or maturation alone (White, Keonig, & Scahill, 2007); in fact, they may increase as children with ASD enter adolescence, when the social milieu becomes more complex and demanding.

Poor social communication is often exhibited through one-sided conversational patterns, in which the individual with ASD may perseverate on specific topics of personal interest (usually restricted interests), exhibiting difficulty changing conversational topics (Elder, Caterino, Chao, Shacknai, & De Simone, 2006). This inability to carry out a bidirectional conversation and take turns in conversations (Church, Alisanski, & Amanullah, 2000; Klin & Volkmar, 2003) makes it difficult for adolescents with ASD to trade information with social partners and find common interests (Laugeson & Frankel, 2010). One consequence of this failure to identify common ground with peers is that it becomes difficult to form friendships, particularly since friendships are often based upon common interests (Laugeson & Frankel, 2010). Consequently, enhancing social communication might be considered an essential element of social skills training for individuals with ASD, particularly upon reaching adolescence when the social demand for conversational skills increases.

The tendency to be overly verbose in conversations with peers is yet another social error often exhibited by individuals with ASD (Elder et al., 2006), with

conversations typically focused on the restricted interests of the person with ASD, paying little regard to the interests of the other person. Poor speech prosody, which includes the natural rising and falling of voice pitch and inflection that occurs during speech, has also been identified as a communication deficit in individuals with ASD (Starr, Szatmari, Bryson, & Zwaigenbaum, 2003). This atypical pattern of speech can often manifest itself in the adolescent or adult with ASD sounding robotic and somewhat pedantic in their manner of talking. Parents often describe their adolescent or adult child as sounding like a robot or a computer (rather than a person), which can be rather odd and even jarring to the listener, making it difficult to interact with neurotypical peers. While atypical patterns of speech might be more appropriately addressed through speech and language therapy, one might argue that remediation of hyper-verbosity and focus on restricted interests in conversations is an appropriate and necessary element of social skills training for adolescents and adults with ASD.

Individuals with ASD are also known to think in very concrete and literal terms, which may impact their social functioning in a variety of ways. Research indicates that youth with ASD often have difficulty understanding and using humor appropriately (Winter, 2003), for example. Social challenges may include difficulty in understanding punch lines to jokes (Emerich, Creaghead, Grether, Murray, & Grasha, 2003) or telling jokes that are socially immature (Van Bourgondien & Mesibov, 1987), often with little regard to the reaction of the audience. Other forms of nonliteral language such as understanding sarcasm, analogies, metaphors, and figurative use of language have also been shown to be problematic for those with ASD (Kerbel & Grunwell, 1998; Starr et al., 2003). Therefore, targeted interventions to teach social skills to adolescents and adults with ASD might address the appropriate use of humor, while avoiding the use of figurative language during instruction.

Impaired social cognition, also known as Theory of Mind, is another hallmark feature of ASD and often includes difficulties in expressing emotions, understanding the feelings of others, and empathizing (Baron-Cohen, 1995; Frith, 2004; Klin & Volkmar, 2003; Krasny, Williams, Provencal, & Ozonoff, 2003; Travis & Sigman, 1998), as well as an overall lack of understanding of social causality (Baron-Cohen, Leslie, & Frith, 1985). Such deficits make it very difficult to make sense of or predict the behavior of others. Consequently, incorporating perspective taking into social skills training is critical to improving social cognition.

Lack of understanding of social cues is another hallmark feature of ASD and manifests in many ways, including difficulty understanding the value and meaning of nonverbal elements of social interaction (Volkmar & Klin, 1998). For example, the use of social touch, gestures, and eye contact are often impaired in adolescents with ASD. Inability to interpret these social cues, assess the formality of social events, and act accordingly also appears to be in deficit (Griffin, Griffin, Fitch, Albera, & Gingras, 2006). Thus, social skills training programs would do well to include the interpretation of nonverbal forms of communication as a target of intervention.

Although most social skills training programs tend to focus on children with ASD (and to a lesser extent on adolescents), deficits in social communication, social cognition, and understanding of social cues remain prevalent for adults with ASD and may even exacerbate, leading to problems with friendships, romantic relationships, skills of daily living, and vocational success (Barnhill, 2007; Howlin, 2000). Although research suggests that social and behavioral symptoms may improve with some consistency in children and adolescents with ASD (Shattuck et al., 2007), this progress tends to slow as these individuals enter adulthood (Taylor & Seltzner, 2010). In fact social challenges specific to ASD may be greatest upon entering adulthood, possibly due to the greater salience and complexity of peer relationships, growing drive toward identity exploration, lack of availability and knowledge about appropriate services, and uncertainty about the balance of responsibility between the individuals themselves and those who support them (Tantam, 2003). Accordingly, adults with ASD often present with more depression and anxiety than their adolescent counterparts (Shtayermann, 2007). Interestingly, higher-functioning adults with greater intelligence and less autistic symptomatology tend to experience more depression, anxiety, social isolation, withdrawal, and peer victimization (Shtayermann, 2007; Sterling, Dawson, Estes, & Greenson, 2008) than lower-functioning individuals. This may be due in part to greater social expectations often placed on higher-functioning adults occurring as a result of placement in less protective and more inclusive settings. With higher-functioning adults with ASD often giving the appearance of seeming more "odd" than disabled by their peers, these individuals may be more susceptible to peer rejection, and consequently greater negative socioemotional outcomes like depression and anxiety. Furthermore, greater self-awareness about peer rejection and "differentness" more likely found in higher-functioning adults with ASD may also contribute to greater depression and anxiety (Sterling et al., 2008). Although outcomes for higher-functioning adults may be less optimistic, research does suggest that having good social skills and adequate social support relate to better quality of life in adults with ASD (Jennes-Coussens, Magill-Evans, & Koning, 2006; Wing, 1983). Thus, the need for effective social skills training programs is of great importance for this highly vulnerable population.

Having good social skills may not only improve quality of life and lessen the risk of depression and anxiety, good social functioning may also predict the ability to form romantic relationships for individuals with ASD, whose romantic functioning generally compares unfavorably to neurotypical peers (Stokes, Newton, & Kaur, 2007). Even though individuals with ASD report sharing similar interests in forming intimate relationships as typically developing individuals, those with ASD often lack the social skills knowledge and competence to appropriately pursue and engage in successful romantic relationships (Mehzabin & Stokes, 2011). For example, individuals with ASD have been known to naively behave in an intrusive manner with potential romantic partners, which may even be perceived as stalking behavior (Stokes et al., 2007). Consequently, instruction in appropriate dating behavior would be an important treatment priority for adults and older adolescents receiving social skills training.

Social Skills Interventions for Adolescents and Adults with ASD

Given the pervasive social deficits seen among adolescents and adults with ASD, it is not surprising that social skills training is an increasingly popular method of treatment for this population. Although typically developing individuals often learn basic rules of social etiquette through observation of peers and/or through instruction from parents in nonclinical settings (Gralinski & Kopp, 1993; Rubin & Sloman, 1984), adolescents and adults with ASD often require additional support and assistance.

Before examining the growing literature base in social skills training for adolescents and adults with ASD, perhaps it is wise to explain why there is such a desperate need for effective social skills interventions. Social skills are an important component of an individual's behavior, affecting multiple areas of functioning. Orsmond, Krauss, and Selzter (2004) found that adolescents and adults with ASD who possessed well-developed social skills were more likely to participate in various social and recreational activities; the benefit of which includes access to peers and potential friends. The development and maintenance of friendships should not be undervalued. Having one or two close friends may positively impact later adjustment, buffer the impact of stressful life events (Miller & Ingham, 1976), improve self-esteem, and decrease anxious and depressive symptoms (Buhrmester, 1990). On the other hand, poor interpersonal skills are linked with academic and occupational difficulties, rejection by peers, delinquency, early withdrawal from school, and later mental health and adjustment problems (Buhrmester, 1990; Howlin & Goode, 1998; Myles, Bock, & Simpson, 2001; Tantam, 2003). Despite their apparent social difficulties, individuals with ASD often desire friendships and even express concern about their peer relationships (Church et al., 2000), which typically lack closeness and security, often leading to extreme loneliness (Bauminger & Kasari, 2000). Thus, there is a great need for adolescents and adults with ASD to learn the skills necessary for developing and maintaining relationships and to build the social competence required to function successfully in broader social contexts. Given that adolescents and adults with ASD typically desire social interactions, but are lacking the appropriate proficiency, training in appropriate social skills is a logical and necessary approach.

While social skills training has been utilized for decades and is not a particularly unique or novel treatment for individuals with ASD, the research literature suggests that these approaches have not been tremendously effective in improving the social functioning of individuals on the autism spectrum (Rao, Beidel, & Murray, 2008; White et al., 2007). However, certain empirically supported methods of treatment delivery have been identified, which may lead to more successful treatment outcomes. Targeting interventions to focus on common social deficits shared among individuals with ASD, while using evidence-based methods of social skills instruction, may make intervention more effective with this population. Treatment focusing on areas such as social communication, social cognition, friendship skills,

understanding social cues, and strategies for handling peer rejection and conflict would fill a large gap. Within these targeted areas, crucial skills for adolescents and adults with ASD might include:

- Reciprocity in conversations in order to develop meaningful relationships and maintain gainful employment.
- Promoting skills to expand the individual's social network.
- Abating the effects of the individual's negative reputation within the current peer group through instruction in the rules of social etiquette.
- Instructing how to promote more successful peer interactions leading to higher quality relationships.
- Avoiding continuing provocation from peers by improving the individual's competence at handling peer rejection and conflict.
- Enhancing the individual's understanding of verbal and nonverbal social cues through behavioral feedback.
- Teaching perspective taking to improve social cognition and emotion recognition.
- Improving emotion regulation in order to more effectively handle social conflict, frustration, and rejection.

While these are just a few of the targeted areas in which social skills instruction might be focused, the level of functioning, cognitive abilities, and treatment goals of the individuals must also be considered when identifying an appropriate social skills program. Above all else, the skills that are taught through social skills instruction should be relevant to the population being served, and the skills must be ecologically valid.

Ecologically valid social skills are those behaviors that are naturally exhibited by socially accepted adolescents or adults in a given social context. Far too often, social skills instruction includes rules of social etiquette deemed appropriate by adults, clinicians, or researchers, rather than those rules established by the dominant peer group. The problem with this method of social skills instruction is that if the goal is for the adolescent or adult to be accepted by the dominant peer group, teaching the wrong set of social behaviors is futile and ineffective. For example, consider the strategies often taught for handling verbal bullying. What do most adults tell adolescents to do in response to teasing? In our clinical experience, the vast majority of adolescents will say they are told to ignore the person, walk away, or tell an adult. However, if you ask adolescents whether these strategies work, they will often say they do not. Perhaps this is because these strategies are not ecologically valid. Instead, socially accepted teens will often take a very different tactic toward handling verbal teasing. This tactic typically involves giving a short comeback that suggests that what the teaser said did not bother them (Laugeson & Frankel, 2010). For example, the adolescent being teased might respond by saying, "Whatever" or "Anyway" or "Yeah, and?" or "Am I supposed to care?" or any other number of comments that show the teaser they were unaffected. This ecologically valid approach makes the teasing less fun for the teaser and thus, less reinforcing. Consequently, because the teaser finds the experience of teasing less enjoyable, he

or she will be less likely to target this individual after repeated failure to elicit the desired response. This strategy for handling verbal bullying is a good example of the importance of teaching ecologically valid skills during social skills instruction. Teaching strategies for handling challenging social situations simply because the skills "appear" to be appropriate is less likely to result in positive social outcomes. Instead, teaching social skills naturally utilized by socially accepted individuals will be more likely to lead to improved social functioning and peer acceptance.

An example of teaching ecologically valid social skills relevant to adults with ASD relates to handling peer pressure. If you were to ask adults with ASD what they are typically told to do in response to peer pressure, they might say they have been told to *just say no*; a popular catch phrase from the 1980s anti-drug movement, but not particularly ecologically valid. Anecdotally, if you were to inquire as to how adults with ASD often respond to peer pressure, they will often report a tendency to *police* the person offering the unwanted pressure. For example, they might point out the illegality of offering alcohol to a minor, or taking drugs without a prescription. Even worse, they might accept unwanted offers of peer pressure out of naiveté or lack of effective strategies for turning down such offers. Furthermore, instances of peer pressure might actually result in the termination of a friendship, or the gaining of a bad reputation among the peer group. Thus, *just saying no*, *policing*, or accepting unwanted offers are not particularly effective or ecologically valid social skills for handling peer pressure. Instead, if you were to observe the social skills exhibited by socially savvy youth when confronted with peer pressure, you would find a variety of far more effective strategies that would not necessarily result in the termination of a friendship or the acquisition of a bad reputation. For example, effective strategies for declining alcohol or drugs might include (Gantman, Kapp, Orenski, & Laugeson, 2012): making an excuse (e.g., "I have to get up early tomorrow," or "Alcohol makes me feel sick," or "I have to drive," or "My work does random drug testing"); stalling (e.g., "Maybe later," or "Maybe another time"); or in cases of extreme and persistent pressure, reversing the peer pressure (e.g., "Why do you care so much if I drink?").

The bottom line is that whatever skills are targeted for treatment, social skills training programs must be adapted to include instruction in ecologically valid social skills. The practice of therapists designing their own curriculum based on their own personal beliefs about what good social skills should include are not likely to lead to positive outcomes. If the goal is to teach socially motivated adolescents and adults with ASD how to interact effectively in a neurotypical world, then understanding the ecologically valid social customs of the dominant peer group is essential.

Effective Treatment Delivery Methods for Teaching Social Skills

The social deficits that characterize adolescents and adults with ASD should not only influence which skills are taught, but *how* they are taught. Research suggests

that there are several key ingredients needed to successfully teach social skills. Effective treatment delivery methods for teaching social skills include:

- Behavioral modeling and role-playing demonstrations.
- Behavioral rehearsal exercises in which the participants practice newly learned skills.
- Coaching with performance feedback in a small-group setting.
- Use of social stories and scripts.
- Use of multimedia software.
- Video modeling and video self-modeling.
- Self-monitoring and self-management.

Behavioral Modeling and Role-Playing Demonstrations

One critical component to social skills training includes the use of behavioral modeling, or role-playing demonstrations. This method involves acting out certain targeted behaviors. For example, adults with ASD receiving instruction about strategies for handling peer pressure would more successfully synthesize this information by visually observing these tactics in action either in person by two social coaches, or by watching a video demonstration of these strategies (video modeling). This method of instruction is particularly important in social skills training as it brings life to the lesson being taught; making concepts that might be viewed as theoretical or conceptual, more real and concrete.

Behavioral Rehearsal Using Coaching with Performance Feedback

Another important approach to teaching social skills involves the use of behavioral rehearsal with performance feedback through coaching. It is recommended that adolescents and adults with ASD practice newly learned social skills with peer mentors or other group members before practicing these skills outside of the treatment setting. For example, in the case of peer pressure, adults would surely benefit from rehearsal of this newly learned skill in the protective setting of a social skills group, while receiving feedback from trained coaches on their application of the strategies during teachable moments.

There are multiple benefits to in-group behavioral rehearsal. For one, the individual can practice the new skill in a comfortable and supportive environment, thus easing the initial anxiety of using the skill outside of the group setting. Also, it is important for group facilitators to witness the individual's understanding of and ability to implement the skills they have been taught to avoid misunderstanding or misuse of newly learned skills. Providing performance feedback through coaching during sessions is crucial to troubleshoot difficulty with acquisition and application

of skills. Having multiple trainers or coaches in the group to prompt the individual and provide feedback is useful in ensuring that the adolescent or adult does not become dependent on any one person to provide social cues (White, 2011). Given that adolescents and adults with ASD have likely experienced fewer successes in their social lives, it can also be helpful to set up behavioral rehearsals early in the intervention that will guarantee at least some degree of achievement (White, 2011).

Social Stories and Scripts

Another popular method for teaching social skills to younger children with ASD involves the use of social stories. This technique involves describing a social situation or concept in terms of relevant social cues, perspectives, and common responses in a specifically defined style and format (Gray & Garand, 1993). The goal of social stories is not necessarily to change the individual's behavior, but to improve understanding of events and social expectations, which may lead to more effective responses (Gray & Garand, 1993; Swaggart et al., 1995). While social stories are frequently used in social skills interventions for younger children with ASD, the utility of these approaches is fairly unknown for adolescents and adults with ASD. A review of social skills interventions by Reichow and Volkmar (2010) suggested that these visual supports can be effective methods for enhancing social skills in preschool and school-aged children, but the utility of using these approaches with older individuals with ASD is unknown. Thus, more research needs to be conducted on the use of these techniques with adolescents and adults on the autism spectrum.

Multi-Media Software

Scientists are beginning to discover new ways to mesh advances in technology with the implementation and delivery of social skills treatment. For example, Golan and Baron-Cohen (2006) evaluated an interactive systematic guide to emotions, called *Mind Reading* for its effectiveness in teaching adults with ASD to recognize complex emotions in faces and voices. The multi-media software explores over 400 emotions through the use of video clip demonstrations delivered by a wide range of people, along with definitions and stories for each emotion. Results showed that following 10–20 h of software use over a period of 10–15 weeks, users significantly improved their ability to recognize complex emotions and mental states from both faces and voices. While improvement following the intervention was limited to faces and voices taken from the *Mind Reading* software, and not tasks of distant generalization, researchers suggest that longer exposure to the software might increase generalization (Golan & Baron-Cohen, 2006). This research illustrates the potential benefit of teaching particular aspects of social skills through augmentative interventions using multi-media software or other technology-based approaches.

Video Modeling and Video Self-Modeling

While the use of video modeling as a type of intervention for younger children with ASD is becoming more popular as it is easy to incorporate into existing social skills interventions, the benefit of using this approach with older adolescents and adults is still unknown. Video modeling is a form of observational learning in which targeted behaviors are learned by watching a video demonstration and then imitating the behavior of the model. For instance, using the peer pressure example, the adult with ASD might watch a video of a person successfully handling peer pressure, then practice the skill in an imitative manner. Similarly, video self-modeling involves individuals observing themselves performing a targeted behavior successfully on video, and then imitating the targeted behavior. Although a review of video modeling research by Bellini and Akullian (2007) found this type of intervention to be most effective in teaching adaptive skills, they also noted some evidence for targeting social communication and problem behaviors. While visually based learning strategies used in video modeling may be more easily understood by individuals with ASD than material that is presented verbally (Buggey, 2005; Hodgdon, 1995; Quill, 1997), the true benefit and generalization of these strategies with adolescents and adults with ASD is uncertain as video modeling studies are often conducted using single subject designs, resulting in very small sample sizes. Moreover, the use of video modeling and video self-modeling has not been widely tested with older adolescents and adults with ASD. Therefore, assumptions regarding generalization of findings to the broader ASD population (particularly older individuals on the spectrum) are limited, and additional research on these interventions is warranted.

Self-Monitoring and Self-Management

Several studies have shown self-monitoring to be efficacious in increasing social skills in children and adolescents with autism (Koegel, Koegel, Hurley, & Frea, 1992; Morrison, Kamps, Garcia, & Parker, 2001; Newman, Reinecke, & Meinberg, 2000; Strain, Kohler, Storey, & Danko, 1994), though little is known about the efficacy of using this method with adults with ASD. Self-monitoring involves teaching a person to recognize a target behavior and notice and record its occurrence or lack thereof (Kamps & Tankersley, 1996), while self-management involves techniques to modify one's own behavior. For instance, using the strategy identified for handling verbal bullying, the individual might observe and record the frequency and manner in which they handle teasing (self-monitoring), while adapting their teasing strategies to fit the ecologically valid tactic of giving a brief comeback that reflects lack of upset (self-management). Research suggests that self-monitoring followed by self-management can increase independence in individuals with ASD because this method does not rely on continued assistance from parents, educators, and

professionals (Hume, Loftin, & Lantz, 2009). While initial findings for self-monitoring and self-management are encouraging for younger individuals with ASD, the benefit of this method may have limited applicability to a wider range of functioning in that it may be best suited to those with greater self-awareness, as well as higher intellectual abilities.

Other Considerations for Treatment Delivery and Format

Other key features thought to enhance treatment outcome for adolescents and adults with ASD include the use of evidence-based treatment manuals, didactic instruction presented using concrete rules and steps of social behavior, in vivo socialization homework assignments, and structured involvement of parents, caregivers, peer coaches, and/or teachers in treatment (Gantman et al., 2012; Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012; Laugeson, Frankel, Mogil, & Dillon, 2009; White et al., 2007). Yet, the heterogeneity among individuals with ASD, specifically in levels of cognitive functioning, should always be a factor when considering how treatment is to be delivered. Approaches used to teach adolescents and adults with significant cognitive and verbal limitations may require intensive prompting, augmentative communication devices, visually based teaching strategies, and tangible reinforcers. Approaches tailored to higher-functioning adolescents and adults, on the other hand, will likely include verbally mediated strategies, instructor modeling, and self-reinforcement.

Use of evidence-based treatment manuals. The use of evidence-based treatment manuals may help to ensure that adolescents and adults in community settings achieve comparable treatment gains as research participants upon which the evidence is based. Using treatment manuals may also help to standardize interventions, although actual treatment delivery may still vary (Smith et al., 2007). Measurements of treatment fidelity or adherence to original guidelines for delivering the intervention are commonly not reported in ASD treatment research, and may be particularly important for interventions delivered by parents or less experienced or credentialed mental health professionals (Matson, 2007). To minimize variation in treatment delivery, protocols should be in place to ensure treatment fidelity. For example, clinicians might receive training on a particular intervention until they have achieved reliability in their delivery of the intervention. However, this option may not be feasible due to the extensive time and financial costs involved in training clinicians. Perhaps a more practical option for maintaining treatment fidelity would be to have an assistant or coach monitor a checklist of targeted points to be covered during delivery of treatment sessions to ensure that all elements are covered. As long as treatment fidelity is maintained, the use of evidence-based treatment manuals is helpful toward effective dissemination and replication of empirically supported treatments in community settings.

Duration of intervention. Some social skills training interventions involve instruction over a short period of time, such as a couple of weeks, while other time-limited training programs involve instruction for 3–6 months or more. On-going social skills instruction with no predetermined time line is also a popular method of treatment delivery in the community, but has not been studied thoroughly thus far. Little is known about the advantage or disadvantage of time-limited approaches to social skills instruction, but due to the constraints of managed healthcare, it is likely that time-limited social skills interventions for adolescents and adults with ASD will be more widespread and commonplace in the future. Whatever the case may be, duration of intervention is an important consideration to make when designing the format of a social skills intervention, and should be based upon the needs of the individuals under consideration, as well as the aims of the program.

Small group format. Group instruction is an intuitive method for social skills training, as it allows the opportunity to interact with and practice newly learned social skills with peers. Of course, there are several considerations that should be made before conducting group social skills training. First, group facilitators should have a shared understanding of each group member's history and specific needs. This is necessary in order to develop a sense of group cohesion and support. Perhaps most important is considering the level of functioning, including language ability, maturity level, and amount and degree of inappropriate behavior. Heterogeneity of the group should be limited in order to aid learning and group cohesion (White, 2011). Even with these considerations, it is likely that the facilitator will have to deal with some disruption from group members; therefore, a small group size (7–10 group members) is ideal for being able to troubleshoot these issues when they arise. It is further suggested that social skills groups for adolescents and adults only include those members who are motivated to participate in treatment (Laugeson & Frankel, 2010), thereby improving the likelihood of success and reducing the negative impact of treatment resistance and negative group contagion.

Another important consideration when forming social skills groups relates to the gender and age range of the group members. Although gender and age of group members ought to be considered when forming groups, it may be difficult to create groups with equal gender balance given that many more males than females are diagnosed with ASD. Furthermore, the interests of adolescent girls and boys can sometimes be very different, and there is some evidence to suggest that being the only girl in a group for adolescents with ASD can be an uncomfortable and isolating experience (Barnhill, Cook, Tebbenkanmp, & Myles, 2002). However, assuming the facilitator is mindful of gender differences, it still may be useful to have a mixed-gender group, since this reflects the natural setting for most adolescents and adults outside of the treatment setting (White, 2011). It is also helpful to keep the age range of group members as homogenous as possible, with particular attention paid to the context of the social setting. For example, segregating groups based on school or work setting (i.e., middle school, high school, college, or work) would be more advantageous than creating groups based on a specific age range. A 10-year-old boy in grade school and an 11-year-old boy in middle school may share less in common than 11- and 14-year-old boys both attending middle school.

Given the fact that many adolescents and adults with ASD have a history of peer rejection, an environment that provides support and caring among group members and facilitators is particularly important for any social skills intervention for individuals with ASD (White, 2011), and another reason to teach social skills in a group format. Although it should be noted, a group format is not always the most appropriate setting for adolescents and adults who exhibit severe maladaptive behaviors (e.g., severe anxiety, unprovoked aggression) that could make interacting with group members aversive or unsafe (White, 2011).

Didactic instruction. The use of structured lesson plans to teach social skills using concrete rules and steps of social behavior is also key to the development and successful implementation of an effective social skills program. Structured lesson plans ensure that a core set of skills will be taught. Many community-based social skills programs attempt to teach social skills through "process groups" in which individuals are asked to give a recount of their week, while therapists and other group members attempt to troubleshoot potential problems and brainstorm how to behave in a more socially constructive manner. The benefit of these types of process groups is unknown, but the risk of possibly failing to teach a core set of skills necessary to function adaptively in the social world may outweigh any benefits. The use of structured didactic lessons is recommended to ensure that some predetermined core set of skills in learned.

Additionally, when providing social skills instruction to adolescents and adults with ASD, it is important to consider the unique manner in which information is processed. For example, individuals with ASD typically think in very concrete and literal terms. Therefore, it is essential that when providing social skills instruction, didactic lessons be presented using concrete rules and steps of social etiquette, while avoiding the use of metaphors, analogies and other forms of figurative language, which those with ASD often struggle to comprehend (Kerbel & Grunwell, 1998; Starr et al., 2003). This manner of teaching will enhance comprehension of complicated abstract social behaviors in a more easy to understand way. For example, consider how one might teach strategies for entering a conversation. The steps involved in conversational peer entry are complicated and difficult to untangle from abstract thought, particularly for adolescents or adults with ASD. However, when broken down into concrete steps, this complex social behavior becomes more manageable. The three basic steps involved in conversational peer entry include: watch/listen, wait, and join (Laugeson & Frankel, 2010). First, we watch and listen to the conversation. This step involves listening to the conversation to determine what the group is talking about and whether we share a common interest, while watching inconspicuously from a short distance and making periodic casual eye-contact. Second, we wait for a brief pause in the conversation or some sign of receptiveness from the group. This step helps us to avoid being intrusive during peer entry and allows for a more natural and unobtrusive entrance into the conversation. Third, we join the conversation by moving closer and making a comment or asking a question that is on topic. This step involves *joining* the conversation by adding to it, rather than hijacking the conversation by being off-topic. While this sophisticated social behavior related to peer entry might seem abstract at first, when broken down to

its concrete parts, it becomes quite manageable for the individual with ASD, and provides a good example of the necessity for teaching social skills using concrete rules and steps during didactic instruction.

Parent or caregiver-assisted interventions. Parents and caregivers (e.g., grandparents, aunts/uncles, adult siblings, job coaches) can have significant effects upon acquisition of social skills for adolescents and adults with ASD, both in terms of direct instruction and supervision, as well as supporting the development of an appropriate peer network (Gantman et al., 2012; Laugeson et al., 2012; Laugeson et al., 2009). The use of a parent-assisted (also known as parent-mediated) model for social skills training was first introduced by Frankel and Myatt (2003) through the Children's Friendship Training Program (CFT), which has been shown to be effective in improving friendship skills for elementary-aged children with ASD (Frankel et al., 2010). The effectiveness of using parent/caregiver-assistance has also been demonstrated for adolescents and young adults through the Program for the Education and Enrichment of Relational Skills (PEERS; Laugeson & Frankel, 2010), an evidence-based social skills intervention, targeting friendship and relationship skills for individuals with ASD (Laugeson et al., 2012; Gantman et al., 2012, Laugeson et al., 2009).

Parent or caregiver involvement in treatment may be crucial to help adolescents and adults with ASD improve their social skills (Orsmond et al., 2004), as these individuals are often quite dependent on their parents or other caregivers for support. As an example, PEERS incorporates significant parental or caregiver involvement to ensure practice and generalization of social skills outside of the treatment setting. Parents and caregivers assist and monitor adolescents or adults in their completion of weekly homework assignments to practice using social skills taught during previous treatment sessions. Parents and caregivers are also taught to act as social coaches to adolescents and adults when appropriate in order to promote the generalization of skills to other settings such as the home and community. Involvement of parents and caregivers in the intervention is also critical to the expansion or enhancement of a peer social network. Parents and caregivers are taught to work with the adolescent or adult on identifying appropriate extracurricular activities and social hobbies where they might meet potential friends with common interests (Laugeson & Frankel, 2010). Findings from clinical research trials with adolescents and young adults reveal significant gains in social skills across raters and settings, as well as increased frequency of social interactions in adolescent and adult participants (Gantman et al., 2012, Laugeson et al. 2009, 2012). Results of follow-up assessments further revealed maintenance of treatment gains at least 14 weeks after the completion of treatment (Laugeson et al., 2012) and as long as 1–5 years post-intervention (Mandelberg et al., 2014), strongly supporting the use of parents and caregivers in treatment.

While findings from parent and caregiver-assisted interventions are encouraging and suggest generalization of skills and maintenance of treatment gains where others do not, few social skills interventions incorporate a parent or caregiver component. Yet parents and caregivers are arguably the one factor in an adolescent's or adult's life that will remain consistent across time.

School-based interventions. The use of school-based social skills interventions is not uncommon; in fact, many school districts require instruction in social skills through Individualized Education Plans (IEPs) for students with special needs, like those with ASD. Despite the widespread use of school-based social skills instruction, the effectiveness of this approach has been tested very little. Most social skills interventions provided in the schools are taught by speech and language pathologists, special education teachers, and school psychologists, many of whom develop their own programs based on an amalgam of existing interventions. Lack of adherence to evidence-based treatments is most likely due to short supply of empirically supported school-based curricula. However, the use of evidence-based social skills interventions in the school setting has been studied to a limited extent and has been shown to be effective for middle and high school adolescents with ASD (Laugeson, 2014). The notion that teachers can effectively teach social skills in the classroom, much like teaching math or science, is a novel approach, but is slowly gaining research evidence (Laugeson, Ellingsen, Bates, & Sanderson, 2013). The use of teachers as social skills facilitators may be a nice alternative to traditional social skills interventions as this method of treatment delivery has the capacity to reach a greater number of adolescents with ASD, while teaching social skills in a more natural social environment.

Peer-mediated interventions. While peer-mediated interventions have been used for preschool and school-aged children with ASD (Reichow & Volkmar, 2010), there is little evidence supporting the effectiveness of using this method for adolescents or adults. However, given the promising results from younger children with ASD (Reichow & Volkmar, 2010), peer involvement in social skills interventions for adolescents and adults with ASD may be helpful in teaching, modeling, and reinforcing age-appropriate skills. For example, White, Koenig, and Scahill (2010) implemented a social skills intervention for adolescents with a peer tutor component. Peer tutors would perform such tasks as modeling specific social skills and engaging group members as they practiced the newly learned skill. Results indicate that the intervention was helpful for some participants, but the improvement was not consistent across group members. While these early findings are encouraging, efficacy for peer-mediated social skills interventions should be further evaluated for adolescents and adults with ASD in larger randomized controlled trials (RCTs).

Socialization homework assignments. One of the common criticisms of social skills training programs is that the skills taught do not generalize to other settings. To facilitate generalization of newly learned skills, adolescents and adults should be assigned in vivo homework between sessions to practice the skills outside of the treatment setting. For example, in the case of conversational peer entry, the individual with ASD might be given a homework assignment to practice the steps for peer entry (i.e., watch/listen, wait, join) in a more natural environment like school or work. A portion of each session (ideally at the beginning) should also be used to review the completion of homework assignments and troubleshoot any issues that may have come up. Homework review is also a nice opportunity to individualize the treatment to the specific needs of the adolescent or adult with ASD (Laugeson & Frankel, 2010); therefore, considerable time should be allotted for reviewing these assignments.

Limitations of Social Skills Training Interventions

While social skills training has increasingly become a popular method for helping individuals with ASD adapt to their social environment (Laugeson et al., 2012; Attwood, 2000, 2003; Gantman et al., 2012; Krasny et al., 2003, Laugeson et al., 2009; Myles et al., 2001; Tse, Strulovitch, Tagalakis, Meng, & Fombonne, 2007), a review of the research literature suggests there are very few evidence-based social skills interventions for adolescents and adults with ASD (White et al., 2007). With emphasis on early intervention, most social skills treatment studies have targeted younger children on the autism spectrum, with few clinical research trials focusing on adolescents or adults with ASD. Among the limited number of social skills intervention studies conducted with this population, most have not been formally tested in terms of their efficacy in improving social competence or the development of close friendships, nor do they examine the maintenance of treatment gains months or years after the intervention has ended.

Studies investigating the effectiveness of social skills training for individuals with ASD indicate that intervention during adolescence is critical; however, much of the literature on social skills training for youth with ASD has been far from encouraging. In a review of the social skills treatment literature, White et al. (2007) identified 14 studies that used group-based social skills training for children and adolescents with ASD. Among these studies, only one used a randomized control group design (Provencal, 2003), two identified the use of a manualized treatment (Barnhill et al., 2002; Webb, Miller, Pierce, Strawser, & Jones, 2004), and only four focused on adolescents 12 years of age or older (Barnhill et al., 2002; Mesibov, 1984; Provencal, 2003; Webb et al., 2004). None of these studies examined the maintenance or trajectory of improvement in social competency over time, nor did they use parent-assisted or peer-mediated models of social skills instruction to improve outcome.

Even fewer studies have focused on social skills treatment for adults with ASD. To date, only three published studies appear to have tested the effectiveness of a social skills intervention for adults with ASD. Turner-Brown, Perry, Dichter, Bodfish, and Penn (2008) implemented a program developed for adults with psychotic disorders to perform social cognition and interaction training with a group of adults with ASD ages 25–55. The intervention improved participant's social cognition, but not social functioning. Hillier, Fish, Coppert, and Beversdorf (2007) reported that only empathy improved after an 8-week social and vocational program for young adults. Only one intervention study for adults with ASD used a RCT design and found significant improvement in overall social and psychosocial functioning post-intervention (Gantman et al., 2012).

Problems with Defining Social Skills

In reviewing the existing research literature on social skills interventions for individuals with ASD, the difficulty in comparing the efficacy of one intervention to another quickly becomes apparent. Each of the many different groups of

professionals within the mental health field (i.e., psychologists, psychiatrists, psychiatric and pediatric nurses, speech and language pathologists, etc.) may espouse different theoretical orientations and approaches to social skills training, with different goals or frames of reference. Even within a single discipline, such as psychology, researchers may differ significantly according to the specific social skills that are targeted, the method for teaching the selected skills, the measurement of skill attainment, as well as many other factors.

Perhaps the most notable difficulty in comparing one social skills intervention to another is the lack of a common definition of social skills. Although it is widely accepted that a core feature of ASD includes deficits in social interaction and social communication, scientists continue to debate which particular social abilities are impacted in individuals with ASD and which of these social deficits is most debilitating. This has resulted in social skills training interventions targeting a wide range of skills, including initiating social communication and speech, recognizing emotions and/or facial expressions, providing empathic responses, developing friendships, and many more.

Since social skills are quite broad and can range from ordering a meal in a restaurant to developing meaningful and long-lasting reciprocal relationships, providing a definition of targeted social skills is fundamental and primary to any treatment study or clinical intervention. One would imagine that prior to treatment a particular set of social skills would be chosen and targeted for intervention based on the needs of the individuals being served; however, research studies and clinical programs often fail to explain why a particular set of social skills were targeted in a given intervention, and in many cases even fail to specify what these skills include. This not only complicates the identification of treatment goals and priorities, but also compounds the difficulty in properly measuring treatment success in social skills training.

Problems Assessing Treatment Outcome

The method of measuring treatment outcome can vary greatly from one study or clinical program to another. Treatment outcome may involve collecting quantitative measures, such as frequency ratings of a particular behavior, or standard scores on various psychometric assessments, or qualitative assessments, which seek to uncover more in-depth understanding of treatment outcome (often used in single-case designs). Few interventions use valid and reliable standardized assessment measures to evaluate treatment efficacy.

One commonly cited problem with assessments aimed at measuring social functioning is that they tend to be rather subjective. To combat this criticism, more objective methods of measurement might include observational behavior data taken by raters who are blind to research conditions. The use of objective tests using standardized measures of social functioning that include norm-referenced scores, which allow the researcher to compare the scores of a given participant to a larger population, might also be used. Examples of standardized measures of social functioning

include the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), which is the updated version of the SSRS, and the Social Responsiveness Scale (SRS; Constantino, 2005), which is an autism screening questionnaire that includes assessment of several social domains. Arguably, a good battery of social skills treatment outcome measures should involve a combination of standardized and behavioral ratings from a variety of reporters, including independent rater who are blind to the conditions under investigation (i.e., do not know whether the adolescent or adult is receiving treatment).

Another method of assessing social functioning involves measures of social validity. This includes information regarding how typically developing peers perform in relation to the experimental group following treatment (Matson, 2007). Social validity can be achieved by testing typically developing adolescents or adults on the same target behaviors during post-test assessment, or by calculating the percentage of individuals in the experimental group who score in the "typical" or "normal" range during post-test assessment (Matson, 2007). Although an interesting and useful form of information gathering, researchers often neglect to include measures of social validity in treatment intervention studies.

Another consideration in the assessment of social skills treatment outcome relates to choice in raters. Just as with the measurements themselves, the raters chosen to report treatment outcome can be quite varied. Raters might include the adolescent or adult participants themselves, parents, caregivers, teachers, clinicians, peers, members of the research team, or any combination of others. While no one particular rater is best, the difficulty with including adolescent or adult participants in the measurement of treatment outcome is that there is no guarantee the participant will be a good reporter or free from bias. The dilemma with including parents, caregivers, teachers, clinicians, or peers in the assessment of treatment outcome is that they may be less sensitive to the immediate changes in the social functioning of the adolescent or adult. The problem with including members of the research team in measuring treatment outcome is that experimenter expectations may bias the findings. One way to remedy these difficulties is to include multiple raters in the assessment process.

Although the use of multiple raters would seem to be a logical choice to address some of the issues surrounding the assessment of social skills treatment outcome, few studies use multiple raters to assess treatment efficacy. Among those that do, consistency across raters is often poor, complicating the clinical picture. A recent study showed that although parents and teachers showed moderate agreement on overall social skills rating scores for individuals with ASD, they often rated the individuals differently on specific items, suggesting that certain social skills may be exhibited differently according to the context (Murray, Ruble, Willis, & Molloy, 2009). Although research clearly supports the use of certain standardized instruments with a single rater, such as the SRS (Constantino, 2005), many researchers agree that a more complete picture of an individual's social functioning can be achieved with multiple raters (Rapin, 1999).

Another form of assessment in social skills intervention studies involves the use of blind raters (i.e., those who are unaware of the conditions under investigation). When raters are blind to the treatment condition (control versus treatment), there is a reduced chance of collecting biased ratings. Although it may not be feasible to have parents or caregivers of individuals participating in social skills interventions blind to the treatment condition, researchers coding target behaviors and other individuals (e.g., teachers, peers) who observe the individual's social functioning may represent an unbiased and perhaps more accurate picture of the adolescent or adult if they are kept blind to treatment conditions.

Lack of Randomized Controlled Trials

The use of RCTs is an essential ingredient to testing the efficacy or effectiveness of an intervention. The key distinguishing feature of a RCT is that participants are randomly assigned to receive one or other of a particular treatment after being assessed for eligibility. Method of random assignment varies, but conceptually, the process is like flipping a coin. After randomization, participants are treated in the same manner, the only difference being the treatment they receive. The benefit of using RCTs in the evaluation of treatment outcome is that they minimize selection bias, promote the comparison of equivalent groups, and allow the researcher to examine the true benefit of an intervention with fewer confounding variables. Within the ASD treatment research literature, there is a particular need for more RCTs of social skills interventions. Only 4 of the 14 studies White et al. (2007) included in their review employed a RCT with a control group. In a similar review of social skills training interventions for children and adolescents with ASD, Rao et al. (2008) found that 9 out of 10 reviewed studies did not use a RCT as their research design.

Poor Generalization of Treatment Findings

Another factor that should be considered when evaluating social skills training interventions is generalizability, which is the extent to which the findings from a given study can be generalized to a larger population. Regrettably, most social skills intervention studies are limited in their ability to generalize research findings to other settings and other populations of adolescents and adults with ASD. Two of the biggest offenders to generalization relate to sample size and participant characteristics. Most social skills training intervention studies for adolescents and adults with ASD have small sample sizes (often single-case designs), which may include a very heterogeneous group of individuals with developmental disabilities. The problem with using single-case designs is that it becomes difficult to generalize findings to a larger population; yet, single-case experimental designs with approximately three

or four participants appear to be the most common research design employed within social skills training studies. Consequently, group research designs with larger sample sizes and well-characterized populations are recommended to better assess treatment efficacy and improve generalizability (Matson, Matson, & Rivet, 2007).

Lack of Maintenance of Treatment Gains

Whether or not targeted social skills are adequately maintained over time is another important consideration for social skills training. Assessment of maintenance of skill acquisition is rarely targeted in treatment studies or clinical programs, calling into question how beneficial these programs are over time. A recent study investigating the maintenance of treatment gains for high-functioning adolescents with ASD found that teens receiving the PEERS intervention maintained positive outcomes in the areas of social responsiveness and social skills, frequency of peer interactions, and social skills knowledge 1–5 years post-treatment (Mandelberg et al., 2014). While these findings are promising for maintenance of treatment gains in an intervention utilizing parent-assistance, little is known about the social trajectories of adolescents and adults following other types of social skills treatment.

Conclusions

While deficits in social skills are clearly a hallmark feature of ASD, affecting individuals across the spectrum and throughout the lifespan, literature examining the effectiveness of social skills interventions for adolescents and adults with ASD is relatively limited and not particularly promising thus far. While the field has a long way to go before we can definitively recommend certain interventions over others, there do appear to be effective treatment components and strategies that enhance treatment benefit, which might be utilized with this population. These treatment components include: behavioral modeling or role-playing demonstrations; behavioral rehearsal exercises; coaching with performance feedback in a small-group setting; social stories or scripts; the use of multimedia software; video modeling or video self-modeling; and self-monitoring or self-management.

In order to clarify and build upon limited positive results, recommendations for future researchers conducting social skills intervention studies for adolescents and adults with ASD include: the use of randomized controlled trails as the standard for examining the efficacy and effectiveness of social skills interventions; assessment of treatment outcome using a combination of standardized outcome measures and behavioral observations with multiple independent raters; and long-term follow-up assessment to examine the maintenance of treatment gains over time.

In conclusion, as the empirical support for social skills training for adolescents and adults with ASD slowly develops, the need for evidence-based treatments for

this growing population increases exponentially. With nearly 70 % of currently identified individuals with ASD under the age of 14 (Gerhardt & Lainer, 2011) and soon to enter adolescence, the demand for effective social skills interventions for adolescents and adults has never been greater.

References

Attwood, T. (2000). Strategies for improving the social integration of children with Asperger syndrome. *Autism, 4*, 85–100.

Attwood, T. (2003). Frameworks for behavioral interventions. *Child and Adolescent Psychiatric Clinics of North America, 12*, 65–86.

Barnhill, G. P. (2007). Outcomes in adults with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities, 22*, 116–126.

Barnhill, G. P., Cook, K. T., Tebbenkanmp, K., & Myles, B. S. (2002). The effectiveness of social skills intervention targeting nonverbal communication for adolescents with Asperger syndrome and related pervasive developmental delays. *Focus on Autism and Other Developmental Disabilities, 17*, 112–118.

Baron-Cohen, S. (1995). *Mindblindness: An essay on autism and theory of mind*. Cambridge, MA: The MIT Press.

Baron-Cohen, S., Leslie, A. M., & Frith, U. (1985). Does the autistic child have a "theory of mind"? *Cognition, 21*, 37–46.

Bauminger, N., & Kasari, C. (2000). Loneliness and friendship in high-functioning children with autism. *Child Development, 71*, 447–456.

Bauminger, N., Shulman, C., & Agam, G. (2003). Peer interaction and loneliness in high-functioning children with autism. *Journal of Autism and Developmental Disorders, 33*, 489–507.

Bellini, S., & Akullian, J. (2007). A meta-analysis of video modeling and video self-modeling interventions for children and adolescents with autism spectrum disorders. *Exceptional Children, 73*, 264–287.

Buggey, T. (2005). Video self-modeling applications with students with autism spectrum disorder in a small private school setting. *Focus on Autism and Other Developmental Disabilities, 20*, 52–63.

Buhrmester, D. (1990). Intimacy of friendship, interpersonal competence, and adjustment during preadolescence and adolescence. *Child Development, 61*, 1101–1111.

Capps, L., Sigman, M., & Yirmija, N. (1996). Self-competence and emotional understanding in high-functioning children with autism. In M.E. Hertzig & E.A. Farber (Eds.), *Annual progress in child psychiatry and child development* (pp. 260–279). Hard, UK: Psychgology Press.

Carter, A. S., Davis, N. O., Klin, A., & Volkmar, F. R. (2005). Social development in autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders* (pp. 312–334). Hoboken, NJ: Wiley.

Church, C., Alisanski, S., & Amanullah, S. (2000). The social, behavioral, and academic experiences of children with Asperger syndrome. *Focus on Autism and Other Developmental Disabilities, 15*, 12–20.

Constantino, J. N. (2005). *Social responsiveness scale*. Los Angeles: Western Psychological Services.

Elder, L. M., Caterino, L. C., Chao, J., Shacknai, D., & De Simone, G. (2006). The efficacy of social skills treatment for children with Asperger syndrome. *Education & Treatment of Children, 29*, 635–663.

Emerich, D. M., Creaghead, N. A., Grether, S. M., Murray, D., & Grasha, C. (2003). The comprehension of humorous materials by adolescents with high-functioning autism and Asperger's Syndrome. *Journal of Autism and Developmental Disorders, 33*, 253–257.

Frankel, F., & Myatt, R. (2003). *Children's friendship training*. New York: Brunner-Routledge.

Frankel, F., Myatt, R., Sugar, C., Whitham, C., Gorospe, C. M., & Laugeson, E. (2010). A randomized controlled study of parent-assisted children's friendship training with children having autism spectrum disorders. *Journal of Autism and Developmental Disorders, 40*, 827–842.

Frith, U. (2004). Emanuel Miller lecture: Confusions and controversies about Asperger syndrome. *Journal of Child Psychology and Psychiatry, 45*, 672–686.

Gantman, A., Kapp, S., Orenski, K., & Laugeson, E. A. (2012). Social skills training for young adults with autism spectrum disorders: A randomized controlled intervention study. *Journal for Autism and Developmental Disorders, 42*(6), 1094–1103.

Gerhardt, P. F., & Lainer, I. (2011). Addressing the needs of adolescents and adults with autism: A crisis on the horizon. *Journal of Contemporary Psychotherapy, 41*, 37–45.

Golan, O., & Baron-Cohen, S. (2006). Systemizing empathy: Teaching adults with Asperger syndrome or high-functioning autism to recognize complex emotions using interactive multimedia. *Development and Psychopathology, 18*, 591–617.

Gralinski, J. H., & Kopp, C. (1993). Everyday rules for behavior: Mother's requests to young children. *Developmental Psychology, 29*, 573–584.

Gray, C., & Garand, J. D. (1993). Social stories: Improving responses of students with autism with accurate social information. *Focus on Autistic Behavior, 8*(1), 1–10.

Gresham, F. M., & Elliott, S. N. (1990). *The social skills rating system*. Circle Pines, MN: American Guidance Service.

Gresham, F. M., & Elliott, S. N. (2008). *Social skills improvement system: Rating scales*. Bloomington MN: Pearson Assessments.

Griffin, H. C., Griffin, L. W., Fitch, C. W., Albera, V., & Gingras, H. G. (2006). Educational interventions for individuals with Asperger syndrome. *Intervention in School and Clinic, 41*, 150–155.

Hillier, A., Fish, T., Coppert, P., & Beversdorf, D. Q. (2007). Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum. *Focus on Autism and Other Developmental Disabilities, 22*, 107–115.

Hodgdon, L. Q. (1995). Solving social-behavioral problems through the use of visually supported communication. In K. A. Quill (Ed.), *Teaching children with autism: Strategies to enhance communication and socialization* (pp. 265–286). New York: Delmar.

Howlin, P. (2000). Outcome in adult life for more able individuals with autism or Asperger syndrome. *Autism, 4*, 63–83.

Howlin, P., & Goode, S. (1998). Outcome in adult life for people with autism, Asperger syndrome. In F. R. Volkmar (Ed.), *Autism and pervasive developmental disorders* (pp. 209–241). New York: Cambridge University Press.

Hume, K., Loftin, R., & Lantz, J. (2009). Increasing independence in autism spectrum disorders: A review of three focused interventions. *Journal of Autism and Developmental Disorders, 39*, 1329–1338.

Humphrey, N., & Symes, W. (2010). Perceptions of social support and experience of bullying among pupils with autistic spectrum disorders in mainstream secondary schools. *European Journal of Special Needs Education, 25*, 77–91.

Jennes-Coussens, M., Magill-Evans, J., & Koning, C. (2006). The quality of life of young men with Asperger syndrome: A brief report. *Autism, 10*, 511–524.

Kamps, D. M., & Tankersley, M. (1996). Prevention of behavioral and conduct disorders: Trends and Research Issues. *Behavioral Disorders, 22*, 41–48.

Kerbel, D., & Grunwell, P. (1998). A study of idiom comprehension in children with semantic-pragmatic difficulties. Part I: Task effects on the assessment of idiom comprehension in children. *International Journal of Language & Communication Disorders, 33*, 1–22.

Klin, A., & Volkmar, F. R. (2003). Asperger syndrome: Diagnosis and external validity. *Child and Adolescent Psychiatric Clinics of North America, 12*, 1–13.

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

Krasny, L., Williams, B. J., Provencal, S., & Ozonoff, S. (2003). Social skills interventions for the autism spectrum: Essential ingredients and a model curriculum. *Child and Adolescent Psychiatry Clinics of North America, 12*, 107–122.

Laugeson, E. A. (2014). *The PEERS® curriculum for school based professionals: Social skills training for adolescents with autism spectrum disorder*. New York, NY: Routledge.

Laugeson, E. A., Ellingsen, R., Bates, S., & Sanderson, J. (2014). *The ABC's of meeting PEERS and making friends: Teaching social skills to adolescents with ASD in the classroom.* Manuscript under review.

Laugeson, E. A., & Frankel, F. (2010). *Social skills for teenagers with developmental and autism spectrum disorder: The PEERS treatment manual*. New York: Routledge.

Laugeson, E. A., Frankel, F., Gantman, A., Dillon, A., & Mogil, C. (2012). Evidence-based social skills training for adolescents with autism spectrum disorders: The UCLA PEERS program. *Journal for Autism and Developmental Disorders, 42*(6), 1025–1036.

Laugeson, E. A., Frankel, F., Mogil, C., & Dillon, A. R. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 39*, 596–606.

Laushey, K. M., & Heflin, J. (2000). Enhancing social skills of kindergarten children with autism through the training of multiple peers as tutors. *Journal of Autism and Developmental Disorders, 30*, 183–193.

Mandelberg, J., Laugeson, E. A., Cunningham, T. D., Ellingsen, R., Bates, S., & Frankel, F. (2014). Long-term treatment outcomes for parent-assisted social skills training for adolescents with autism spectrum disorders: The UCLA PEERS program. *Journal of Mental Health Research in Intellectual Disabilities, 7*(1), 45–73. doi: 10.1080/19315864.2012.730600.

Matson, J. L. (2007). Determining treatment outcome in early intervention programs for autism spectrum disorders: A critical analysis of measurement issues in learning based interventions. *Research in Developmental Disabilities, 28*, 207–218.

Matson, J. L., Matson, M. L., & Rivet, T. T. (2007). Social-skills treatments for children with autism spectrum disorders: An overview. *Behavior Modification, 31*, 682–707.

Mehzabin, P., & Stokes, M. A. (2011). Self-assessed sexuality in young adults with high-functioning autism. *Research in Autism Spectrum Disorders, 5*, 614–621.

Mesibov, G. B. (1984). Social skills training with verbal autistic adolescents and adults: A program model. *Journal of Autism and Developmental Disorders, 14*, 395–404.

Miller, P. M., & Ingham, J. G. (1976). Friends, confidants and symptoms. *Social Psychiatry, 11*, 51–58.

Morrison, L., Kamps, D., Garcia, J., & Parker, D. (2001). Peer mediation and monitoring strategies to improve initiations and social skills for students with autism. *Journal of Positive Behavior Interventions, 3*, 237–250.

Murray, D. S., Ruble, L. A., Willis, H., & Molloy, C. A. (2009). Parent and teacher report of social skills in children with autism spectrum disorders. *Language, Speech, and Hearing Services in Schools, 40*, 109–115.

Myles, B. S., Bock, S. J., & Simpson, R. L. (2001). *Asperger syndrome diagnostic scale*. Austin, TX: Pro-Ed.

Newman, B., Reinecke, D. R., & Meinberg, D. L. (2000). Self-management of varied responding in three students with autism. *Behavioral Interventions, 15*, 145–151.

Orsmond, G. L., Krauss, M. W., & Selzter, M. M. (2004). Peer relationships and social and recreational activities among adolescents and adults with autism. *Journal of Autism and Developmental Disorders, 34*, 245–256.

Provencal, S. L. (2003). *The efficacy of a social skills training program for adolescents with autism spectrum disorders*. Unpublished doctoral dissertation, University of Utah.

Quill, K. A. (1997). Instructional considerations for young children with autism: The rationale for visually cued instruction. *Journal of Autism and Developmental Disorders, 27*, 697–714.

Rao, P. A., Beidel, D. C., & Murray, M. J. (2008). Social skills interventions for children with Asperger's syndrome or high-functioning autism: A review and recommendations. *Journal of Autism and Developmental Disorders, 38*, 353–361.

Rapin, I. (1999). Appropriate investigations for clinical care versus research in children with autism. *Brain & Development, 21*, 152–156.

Reichow, B., & Volkmar, F. R. (2010). Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders, 40*, 149–166.

Rubin, Z., & Sloman, J. (1984). How parents influence their children's friendships. In M. Lewis (Ed.), *Beyond the dyad* (pp. 223–250). New York: Plenum.

Shattuck, P., Seltzer, M., Greenberg, M. M., Orsmond, G. I., Bolt, D., Kring, S., et al. (2007). Change in autism symptoms and maladaptive behaviors in adolescents and adults with an autism spectrum disorder. *Journal of Autism and Developmental Disorders, 37*, 1735–1747.

Shtayermann, O. (2007). Peer victimization in adolescents and young adults diagnosed with Asperger's syndrome: A link to depressive symptomatology, anxiety symptomatology and suicidal ideation. *Issues in Comprehensive Pediatric Nursing, 30*, 87–107.

Smith, T., Scahill, L., Dawson, G., Guthrie, D., Lord, C., Odom, S., et al. (2007). Designing research studies on psychosocial interventions in autism. *Journal of Autism and Developmental Disorders, 37*, 354–366.

Starr, E., Szatmari, P., Bryson, S., & Zwaigenbaum, L. (2003). Stability and change among high-functioning children with pervasive developmental disorders: A 2-year outcome study. *Journal of Autism and Developmental Disorders, 33*, 15–22.

Sterling, L., Dawson, G., Estes, A., & Greenson, J. (2008). Characteristics associated with presence of depressive symptoms in adults with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 38*, 1011–1018.

Stokes, M., Newton, N., & Kaur, A. (2007). Stalking, and social and romantic functioning among adolescents and adults with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 37*, 1969–1986.

Strain, P. S., Kohler, F. W., Storey, K., & Danko, C. D. (1994). Teaching preschoolers with autism to self-monitor their social interactions: An analysis of results in home and school settings. *Journal of Emotional and Behavioral Disorders, 2*, 78–88.

Swaggart, B. L., Gagnon, E., Bock, S. J., Earles, T. L., Quinn, C., Smith-Myles, B., et al. (1995). Using social stories to teach social and behavioral skills to children with autism. *Focus on Autism and Other Developmental Disabilities, 10*(1), 1–16.

Tantam, D. (2003). The challenge of adolescents and adults with Asperger syndrome. *Child and Adolescent Psychiatric Clinics of North America, 12*, 143–163.

Taylor, J. L., & Seltzner, M. M. (2010). Changes in autism behavioral phenotype during the transition to adulthood. *Journal of Autism and Developmental Disorders, 40*, 1431–1446.

Travis, L. L., & Sigman, M. (1998). Social deficits and interpersonal relationships in autism. *Mental Retardation and Developmental Disabilities Research Reviews, 4*, 65–72.

Tse, J., Strulovitch, J., Tagalakis, V., Meng, L., & Fombonne, E. (2007). Social skills training for adolescents with Asperger syndrome and high functioning autism. *Journal of Autism and Developmental Disorders, 37*, 1960–1968.

Turner-Brown, L. M., Perry, T. D., Dichter, G. S., Bodfish, J. W., & Penn, D. L. (2008). Brief report: Feasibility of social cognition and interaction training for adults with high functioning autism. *Journal of Autism and Developmental Disorders, 38*, 1777–1784.

Van Bourgondien, M. E., & Mesibov, G. B. (1987). Humor in high-functioning autistic adults. *Journal of Autism and Developmental Disorders, 17*, 417–424.

Volkmar, F. R., & Klin, A. (1998). Asperger syndrome and nonverbal learning disabilities. In E. Schopler, G. B. Mesibov, & L. J. Kunce (Eds.), *Asperger syndrome or high functioning autism?* (pp. 107–121). New York: Plenum Press.

Webb, B. J., Miller, S. P., Pierce, T. B., Strawser, S., & Jones, P. (2004). Effects of social skills instruction for high-functioning adolescents with autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 19*, 53–62.

White, S. W. (2011). *Social skills training for children with Asperger syndrome and high-functioning autism*. New York: Guilford Press.

White, S. W., Keonig, K., & Scahill, L. (2007). Social skills development in children with autism spectrum disorders: A review of the intervention research. *Journal of Autism and Developmental Disorders, 37*, 1858–1868.

White, S. W., Koenig, K., & Scahill, L. (2010). Group social skills instruction for adolescents with high-functioning autism spectrum disorders. *Focus on Autism and Other Developmental Disabilities, 25*, 209–219.

Wing, L. (1983). Social and interpersonal needs. In E. Schopler & G. Mesibov (Eds.), *Autism in adolescents and adults* (pp. 337–354). New York: Plenum Press.

Winter, M. (2003). *Asperger syndrome: What teachers need to know*. London, England: Jessica Kingsley.