Social Skills Training in Autism Spectrum Disorder Across the Lifespan

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KEYWORDS

• Autism spectrum disorder • Social skills • Social skills training • Lifespan
• Intervention

KEY POINTS

- Findings from the current literature review indicate that social skills training programs for individuals with autism spectrum disorder are effective in improving social competence, although effects are frequently not robust across all outcomes measured.
- When aggregating across the social skills training programs with the strongest evidence, common elements can be identified in both the treatment delivery method and the social skills content targeted.
- However, social skills training programs continue to remain limited in their generalizability and scope. Existing research has primarily tested programs designed for school-aged children with autism spectrum disorder, who have average or above average intellectual functioning.

The construct of social skills is both multidimensional and related to many other important constructs of interest, including cognition, language, and mental health. Despite this complexity, consensus in both colloquial and scholarly definitions of social skills involves common threads. Specifically, various definitions agree that social skills are socially acceptable, learned behaviors that enable individuals to function competently in various social tasks.[1] These specific behaviors, or skills, increase the likelihood of others receiving an individual positively and can be culturally bound.[2,3]

Using this definition, it is clear that social skills permeate successful adaptation in the development of positive personal relationships with family, friends, peers, and romantic partners.[4,5] However, social skills are also more broadly relevant to educational, professional, and daily living contexts whereby such skills are essential to effectively navigate complex interactions and group dynamics (eg, negotiating salaries, collaborating on school projects, living with roommates). Accordingly, teachers rate social skills as essential to children's success in the classroom,[6] and economists

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document the value of social skills in predicting both employment and wages in young adulthood.[7]

Following from this, social skills consistently predict multiple important outcomes in the general population, including quality of life, self-esteem, and overall happiness. Research has further identified that the relationship between social skills and these outcomes is mediated by positive personal relationships.[8,9] Reciprocal friendships represent one such form of a positive personal relationship and provide protective effects against internalizing symptoms and maladjustment.[10,11] For youth, in particular, having even just one close friend can buffer against the negative sequelae of internalizing disorders[12,13] and peer victimization.[14]

SOCIAL SKILLS DEFICITS IN AUTISM SPECTRUM DISORDER

Despite their importance, there is significant individual variability in the mastery of social skills in children and adults. Autism spectrum disorder (ASD) is diagnostically characterized by deficits in social communication.[15] Social skill deficits in ASD are apparent in early childhood. Children with ASD show impairments in early communication, social attention, and pretend play skills.[16,17] Following this impaired social learning in early childhood, differences in the maturation of social behavior continue through developmental cascades.[18] Although the social communication deficits present in ASD are wide ranging and individuals vary broadly in their clinical presentation, pragmatic language deficits are considered to be universally present.[19] Pragmatic language, or the social use of language, encompasses skills, such as topic initiation and maintenance, turn-taking in conversation, providing the appropriate level of information, understanding nonliteral language, and appropriate modulation of communication based on context.[20]

Similar to the general population, research evidence suggests that these social skill deficits significantly interfere with the adjustment of individuals with ASD. Children with ASD, regardless of cognitive ability, are reported to have fewer friends and are less actively engaged in their social settings.[21,22] In adolescents and adults with ASD, greater social skills impairments predicted lower rates of social participation, with more than half of young adults with ASD reporting no close friendships.[23–25] Romantic relationships are impacted as well, with adults with ASD demonstrating inferior social knowledge and skills related to sexuality, privacy, and courting as compared with typically developing young adults.[26] Outside of relational outcomes, social skill deficits have been associated with poor academic performance[27] and poor employment outcomes in individuals with ASD.[28,29] Furthermore, these difficulties in navigating the social world have also been found to correspond to increased mental health problems in individuals with ASD.[30,31]

SOCIAL SKILLS TRAINING

Clearly, targeting social skills deficits in individuals with ASD is a critical path through which to improve outcomes in this population. Although typically developing individuals may intuitively learn social norms and skills, the impaired social learning common in ASD likely interferes with this normative process. Social skills training programs seek to remedy this gap by providing specific guidance into and knowledge of the social world. Although social skills training is a common intervention for children with ASD, there has been a historical lack of research evidence on its efficacy. In published articles searched through 2011, a high-quality review identified only 5 randomized controlled trials (RCTs) that tested social skills training groups in ASD populations, across all ages.[32] Those 5 studies provided preliminary support that social skills

training groups can reduce loneliness and produce positive impacts on social competence and social functioning.

That being said, increasing scientific attention in the last decade has bolstered the evidence base of social skills training approaches. A more recent review and metaanalysis yielded 19 RCTs.[33] Synthesis analyses suggested an overall medium effect size of social skills training on social competence, with significant effects present in parent-report, self-report, observer-report, and task-based measures. However, positive effects of social skills training were not observed when using teacher-report as an outcome, and the effects in self-report appeared to be driven largely by changes in social skill knowledge, rather than changes in social behavior.[33] These results suggest that although the current state of the evidence supports the effectiveness of social skills training for mitigating the social deficits present in ASD, individuals with ASD may also need additional supports in enacting and generalizing social knowledge across environments. It is also possible that changes in social knowledge immediately following social skills training interventions generate downstream effects in social behavior, because skills are used and subsequently socially reinforced over time and across contexts. In support of the latter explanation, 2 studies do suggest that gains maintain, and for some outcomes improve further, over follow-up periods.[34,35]

Another metaanalysis examining only group social skills interventions for higher functioning individuals with ASD that used standardized measures of either autism-related social deficits (Social Responsiveness Scale; SRS-2)[36] or overall social skills (Social Skills Rating System; SSRS)[37] identified 8 RCTs.[38] Group social skills training interventions reliably produced changes in SRS total score, SRS subscale scores, and SSRS social skills subscale, with moderate to large effect sizes.[38] Moderator analyses suggested that social skills groups that included a concurrent parent group resulted in larger improvements on the SRS. Furthermore, more intense interventions in terms of time and dosage produced greater gains.

Ultimately, social skills training has been classified as an evidence-based practice for individuals with ASD.[39] However, the state of the evidence and the nature of the interventions vary across developmental stages. For example, for children in preschool and elementary school, play is the primary social context, and thus, play-based social skills are frequent targets of social skills training programs at this age. In contrast, at later developmental stages, conversations become the primary social context. Furthermore, most research studies examining social skills training have focused on elementary school-aged children with ASD, creating less thorough and rigorous evidence for social skills training for other age groups. The following sections seek to review the research evidence for social skills training across 4 developmental stages: early childhood, elementary school, adolescence, and adulthood. For conciseness, the review primarily focuses on RCTs, which are considered the gold standard for assessing treatment outcome.

REVIEW OF RESEARCH EVIDENCE

Early Childhood (0–6 years)

Although autism symptoms and associated social deficits can be detected as early as 12 months of age, few social skills training programs for very young children with ASD have been systematically tested. A review of social skills interventions for this age range found that most eligible studies (31 of 35) were single-subject designs.[40] Definably, social skills training in this age range is also less clear than at later developmental stages. Specifically, interventions at this age may aim to produce gains in a child's receptive and expressive language, a domain that is intertwined but distinct from

social skills. Furthermore, some treatment approaches emphasize prelinguistic social skills, such as joint attention, and naturalistic play interactions in order to promote normalized social attention and engagement as a way to alter the social trajectories of young children with ASD.[41] In contrast, traditional social skills training interventions represent an alternative path to learning social skills through direct teaching of social behavior and explicit rehearsal. As such, although these naturalistic developmental behavioral interventions may be effective for enhancing certain social skills in preschoolers with ASD,[41] they fall out of the scope of this review on social skills training.

In general, preliminary evidence suggests that social skills training groups can be effective in early childhood development. In 1 study of 4 to 6 year olds with ASD, a social skills group used video modeling of typical peers enacting specific skills paired with play activities to practice and reinforce modeled skills.[42] A variety of play-related skills (eg, imitation, turn taking, seeking play partners) and social engagement skills (eg, eye contact, social smile) were taught. This intervention group was compared with an active control group of children with ASD who participated in free play with minimal socialization guidance. Relative to this free play group, children in the direct teaching group showed significant increases in social initiation, responding, and interacting behaviors with peers.[42] In another RCT, a social skills training group called Peer Networks intervention for 5 to 6 year olds with ASD was implemented in the school setting.[43] This treatment targeted requesting and sharing play objects, commenting on one's own play, commenting on others' play, good manners (eg, saying please, thank you), and common play rules. Skills were first taught through didactic instruction, followed by multiple role-play practices with feedback and a generalization play activity with peers. As compared with a treatment as usual group, children in Peer Networks showed more initiation with peers during generalization probes and greater social communication growth as reported by teachers, but no differences in social responses or total communication with peers.[43] In addition, Treatment and Education of Autistic and Communication related handicapped Children (TEACCH), which is an evidence-based program for individuals with ASD across the spectrum, tested a social skills training group for 5 to 6 year olds with ASD and average intellectual functioning. This program showed improved child social-emotional functioning and reduced parenting stress against a waitlist control group[44]; however, like many social skills treatment studies, this study was limited by its small sample size (n = 11).

Elementary School (7–12 years)

School-aged children have historically been the target population for social skills training programs. As such, there are numerous RCTs in this developmental stage, not all of which can be reviewed in depth in this article. Instead, the current review draws information from the most recent evidence syntheses. In the most recent comprehensive metaanalyses,[33,38] more than half of the included RCTs were tested in school-aged children with ASD. Both metaanalyses suggest that social skills training in this age range produces significant positive results in terms of social outcomes. All studies for school-aged children with ASD included in these metaanalyses used a small group format, although there was variability in the frequency and intensity of sessions. Several programs used a traditional 60- to 90-minute weekly session format,[45–48] whereas others implemented high-intensity programs using a summer camp format.[49–51] Despite these differences, the programs generally incorporated similar content, including emotion and facial expression recognition, body boundaries, responding to teasing, nonliteral language, perspective taking, and basic conversation skills (eg, listening, taking turns). Less common but still present were skills related to play and playdates, such as entering a group game, suggesting a change in play

activity, and ways to maximize playdate success.[46] Concurrent parent training components were also frequently included for social skills training programs targeting school-aged children.

Adolescence (12–17 years)

Among the adolescent population, one of the most extensively tested social skills training programs for youth with ASD is the Program for the Education and Enrichment of Relational Skills (PEERS).[52] This program is characterized by 2 concurrent groups: a group for adolescents, in which the concrete rules of social skills are taught and practiced, and a parent group, in which parents are taught how to socially coach their adolescents in using the skills. Content includes conversational skills, appropriate use of humor, electronic communication, responding to bullying, good sportsmanship, and handling disagreements. In separate RCTs conducted by the treatment developers, PEERS for Adolescents produced social skills gains across a variety of measures, including standardized questionnaire assessment of overall social skills on SRSS, overall ASD symptoms related to social responsiveness on SRS, social knowledge, and number of hosted get-togethers with peers.[53,54] Furthermore, PEERS for Adolescents has been successfully adapted and replicated in multiple countries outside of North America, including South Korea,[55] Hong Kong,[56] and Israel.[57] Outside of social skill gains, multiple independent studies have found complementary benefits of the program to adolescents' mental health symptoms[58,59] and family stress.[60] Investigations into moderators of PEERS treatment outcome have suggested that the program is equally effective for male and female adolescents, as well as across early, middle, and late adolescence.[61,62]

Another social skills training program known as Multimodal Anxiety and Social Skills Intervention (MASSI) also found positive treatment results for adolescents with ASD as compared with waitlist controls in an RCT.[63] With its dual targets of anxiety and social deficits, MASSI combines multiple modalities, including individual therapy, a skills group, parent psychoeducation, and feedback from typically developing peers. Modules in individual therapy and in the skills group covered social skills content, including conversation skills, peer entry, and handling rejection, while weekly homework assignments were given to assist in mastery and generalization. Relative to the waitlist controls, social deficits as a function of autism symptoms decreased on the SRS in the active treatment group; however, anxiety symptoms did not differ between the treatment and control groups.

Although treatment outcomes appear encouraging for higher functioning adolescents with ASD, both PEERS and MASSI listed intellectual disability (ID) as an exclusionary criterion in their RCTs. Generally, very few social skills training programs are designed for the needs of individuals with ASD and comorbid ID. A review of literature in this area identified only 17 studies that targeted social behavior in primarily adolescents with ASD and ID; however, most were single-case research designs, frequently with idiosyncratic behavioral outcomes, thus, limiting conclusions about the efficacy of social skills training methods in this population.[64] Among adolescents with ASD and comorbid ID, behavioral teaching methods appeared to be the most effective in producing behavioral change in social behaviors.[64] More recently, video modeling has also been successfully applied and replicated as a method to teach specific social skills to adolescents with ASD and ID.[65,66]

Adulthood (18 years and Older)

Despite significant contextual changes in adulthood that might indicate a need for social skills training, particularly in relation to romantic relationships, workplace

interactions, and independent living, few social skills programs exist for adults with ASD. With the strongest evidence, 3 RCTs of the PEERS for Young Adults program[67] have been conducted for young adults (18–24 years old) with ASD and without comorbid ID.[34,68,69] Structurally similar to the PEERS for Adolescents program, this program teaches skills through didactic instruction and uses a concurrent group of social coaches (eg, parents, life coaches, peer mentors) to provide support and performance feedback in naturalistic social settings. The content of the young adult program is similar to that of adolescents, with the significant addition of 4 sessions on dating skills. Findings from these RCTs support that, as compared with waitlist control groups, the PEERS for Young Adults program produces improvements in overall social skills and social responsiveness on standardized measures as well as increases in social skills knowledge, empathy, and social engagement.

Two other group designs tested interventions focused on vocational social skills. The Acquiring Career, Coping, Executive function, and Social Skills (ACCESS) program taught coping techniques, workplace social dynamics, building social support networks outside of the family, and self-determination skills, such as self-advocacy.[70] As compared with a waitlist control group, the young adults with ASD who received ACCESS showed significant gains in global adaptive functioning, although direct changes in social functioning were less pronounced.[70] In another study, a curriculum specific to social skills relevant to job interviewing demonstrated specific improvements on individuals' mock job interview performance, but participants did not show improvements on other standardized outcomes.[71] Both of these intervention protocols included direct teaching, role plays, and practicing of skills. ACCESS additionally incorporated weekly homework assignments and a concurrent social coach group for parents and other caregivers.

Recently, researchers have also begun to examine virtual reality platforms as a way to provide social skills training to higher-functioning adults with ASD. In 1 such study, a virtual reality platform was used specifically to target social skills needed during job interviews, such as sharing things in a positive way, conveying oneself professionally, negotiation, and building rapport with the interviewer.[72] The 10-hour virtual reality job interview training program offered specific guidance on the relevant social skills, in vivo coaching feedback through the platform, and multiple opportunities to rehearse interview skills. Young adults with ASD in the virtual reality job interview training program showed greater improvements in their live role-playing performance of an interview than young adults in the treatment as usual group.[72] Six months later, the group that received the virtual reality interview training was also significantly more likely to be competitively employed.[73]

SUMMARY

Social skills training programs are available for those with ASD from early childhood to young adulthood, with supporting evidence from multiple RCTs. Metaanalyses and systematic reviews continually support social skills training as efficacious in ameliorating social skills deficits in ASD.[32,33,38] Despite this, the density and quality of the evidence within the highlighted developmental groups vary. Overall, most of the research included in the current review was published within the last decade, signifying a significant increase in the evidence for social skills training programs for use with individuals with ASD.

Importantly, commonalities can be drawn from the current evidence base as to what works to produce meaningful change in the social outcomes of individuals with ASD. **Figs. 1** and **2** detail the emergent themes of effective intervention elements and

Program Structure

- Small group modality
- Multiple staff
- Routine session format
- Concurrent parent training or peer involvement

In-Session Elements

- Didactic instruction of concrete skills
- Modeling of skills
- Skills practice with in vivo coaching feedback
- Positive reinforcement (eg, praise, rewards)

Generalization Supports

- Homework assignments to practice skills in naturalistic settings
- Parent or peer coaching outside of sessions to enhance generalization

Fig. 1. Common programmatic elements in evidence-based social skills training interventions for ASD.

content, respectively, in social skills training for ASD populations. Importantly, these figures are not representative of every *possible* effective intervention technique or helpful content area, but instead, document the methods and content that have generally been used in programs that produce clinically significant social gains. Many of the extracted commonalities are similar to previous summaries of components in evidence-based social skills training,[74,75] providing additional support for their validity. However, because the field is continuing to expand rapidly, updated reviews and syntheses will be needed in the coming years.

The common treatment elements used within evidence-based social skills training interventions generally draw from cognitive behavioral therapy (CBT) principles.[76] For example, psychoeducation, role-playing demonstrations, behavioral rehearsal, and

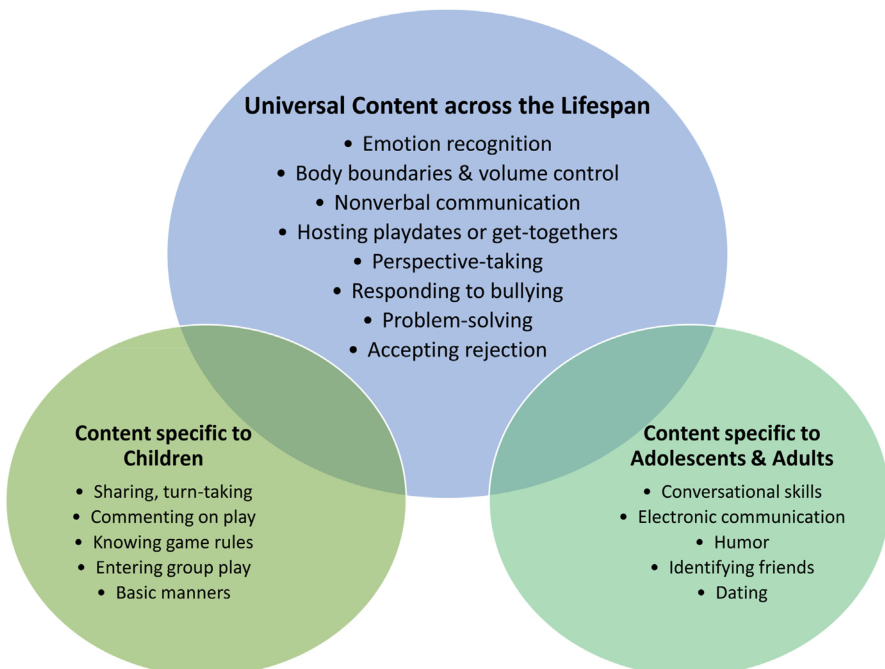

Fig. 2. Common content areas provided in evidence-based social skills training interventions for ASD.

homework assignments are common in CBT approaches. Many elements are also aligned with applied behavioral analysis (ABA), a core component of early intervention services for children with ASD.[77] In vivo coaching and performance feedback, positive reinforcement, and opportunities for generalization are all consistent with ABA.

FUTURE DIRECTIONS

Although the current literature provides evidence for the effectiveness of social skills training in individuals with ASD, more research is needed to confidently determine the efficacy, generalizability, and maintenance of treatment response to these approaches. In particular, future research would benefit from increased methodological rigor, through the following:

- Recruitment of larger sample sizes
- Utilization of active treatment controls
- Blind standardized assessment of outcome (eg, reduced reliance on parent- and self-report)
- Implementation of follow-up assessments to assess maintenance over time

All of these avenues of study are essential; however, the utilization of active treatment controls might be particularly pertinent. As most of the RCTs included in this review used a waitlist control group, it is possible that other mechanisms are accounting for treatment gains, such as group member interactions or therapeutic alliance. Ashman and colleagues[78] recently tested a didactic social skills training protocol against an active control group that facilitated positive social interactions among young adult participants through guided activities (eg, playing charades, discussing emotions in music). Both groups showed improvements over time, with no significant differences between them.[78] Similarly, a support group focused on social skills topics, which allowed groups of young adults with ASD to share their experiences and discuss solutions with little guidance, also resulted in increased empathy and fewer internalizing symptoms.[79] These findings lend some credence to the possibility that some of the positive effects observed in social skills training programs are due to nonspecific treatment factors.

In addition, studies in this field have neglected large swaths of individuals on the autism spectrum. As such, the research evidence is currently limited in its generalizability. In particular, there are gaps in the development and testing of social skills intervention for the following:

- Very young children (ie, 2–5 years old) with ASD
- Adults with ASD, especially middle-aged (ie, 35–55 years old) and older adults (ie, 55+ years old)
- Individuals with ASD struggling within specific social landscapes of adulthood (eg, vocational skills, romantic relationships, living outside of the home)
- Individuals with ASD and comorbid ID, across the lifespan
- Culturally and ethnically diverse individuals with ASD

Although some of these gaps have isolated exemplars of research teams investing implementation of social skills training in these groups, the scale of the need for services in these populations vastly outweighs the current evidence-based offerings.

Beyond increasing confidence in the current approaches, investigations into the moderators and mechanisms of treatment effects would be clinically useful. Furthermore, dismantling studies could elucidate the most essential pieces of the interventions, while augmentations to current evidence-based treatments could be tested

as potential ways to strengthen gains. For example, extended length of programs with additional opportunities for skills practice could be tested against currently established treatments to determine if changes in dose result in greater gains. Ways to maximize cost-effectiveness and service reach while maintaining treatment efficacy could be explored as well, through group telehealth approaches or varying the size of the groups (eg, comparing a 6-person group to a 12-person group). In conclusion, although the evidence base for social skills training in ASD across the lifespan has grown significantly in the past decade, there is much yet to be developed and tested in order to improve the lives and enhance the social world of those with ASD.

DISCLOSURE

Dr. E.A. Laugeson receives royalties for book sales of PEERS manuals through Routledge; these manuals are referenced in the current article.

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