



# A Review of Social Skills Manuals for Adolescents with Autism Spectrum Disorder

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## Abstract

**Purpose of This Review** Although there is a proliferation of published manuals with content addressing the social skills of adolescents with autism spectrum disorder available, there are few all-encompassing resources outlining the content of these sources including the curriculum focus and strategies suggested for teaching the content. The purpose of this review is to describe available social skills manuals so that practitioners can select curricula that address the needs of the individuals with ASD.

**Recent Findings** Twenty-five published manuals were identified, reviewed, and described by content, suggested structure for training, recommended strategies for delivery, and published efficacy research.

**Summary** All manuals had a focus on developing conversation skills but varied in other content. Ten manuals have a prescribed scope and sequence for content and an identified format for instruction. Efficacy research with adolescents was found for only five manualized programs and only three studies addressed generalization of social skills.

**Keywords** Social skills training · Autism spectrum disorder · Adolescents · Social skills groups · Social competence · Social deficits

## Introduction

Individuals identified with autism spectrum disorder (ASD), by definition, have challenges in the areas of social communication and social interaction, including (1) nonverbal communicative behaviors, (2) social-emotional reciprocity, and (3) developing and maintaining relationships as defined in the Diagnostic and Statistical Manual of Mental Disorders 5th edition (DSM-5) [1]. Although atypical social interaction patterns first appear in early childhood, social competence may remain a challenge for individuals with ASD throughout the school years and beyond. In fact, one of the factors influencing the poor post-school outcomes for individuals on the spectrum [2] is a lack of the required social competence to find and

maintain employment or to navigate the social complexities of college or university systems. Social skills are one of the 16 predictors of post-school outcomes for individuals with ASD [3], and instruction in social skills is considered best practice in preparation for post-school transition [4].

Instruction of social skills comprises both the content of the lessons and the strategies used by the instructor to facilitate learning, understanding, and skill acquisition. The social competence content ideally would address the areas that are known to be challenging for learners with ASD. For example, interpreting the nonverbal social cues expressed in facial expressions, body language, and voice prosody are known difficulties for individuals on the spectrum [1, 5–7]. Temple Grandin, a renowned adult with ASD, describes how she had to explicitly learn to understand body language, such as when others were crossing their arms and frowning it meant that they were not feeling comfortable with the interaction [8]. Social reciprocity such as sharing a conversation with all speakers contributing to the dialog and by sharing topics of the conversation are often skills to be explicitly taught to individuals with ASD. It is not uncommon for individuals with ASD to give a monolog about a preferred interest regardless of whether or not the topic of interest is shared by others. In sum, perspective taking, empathy, and emotional reciprocity are challenging for individuals with ASD [9]. Neither the concept

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of a friend nor an understanding of reciprocal friendship may be well developed for individuals with ASD [10]. This lack of understanding about friendship becomes particularly important during adolescence when peers and social networks typically become increasingly salient [10]. Adolescence is also the period of development when romantic interests begin. The subtle social cues that are involved in flirting and the social rules about dating make the development of such relationships especially challenging for individuals with ASD [11, 12].

It is important to address the social challenges for adolescents with ASD, and providing intervention in a small group format is used in clinics and schools. Social skills training is one of the 27 evidence-based practices identified by the National Professional Development Center on ASD in their extensive review of published articles [13••]. The published research with evidence supporting social skills training included individuals with ASD across all age groups including adolescents and young adults to age 22. Social skills training has been conducted in small groups of between 6 and 10 individuals in order to provide an intervention focused on the needs of those with ASD in a safe environment to practice skills [13••].

Social skills training for adolescents and adults with developmental disabilities, including ASD, is not a new approach. One manualized social skills training model, which has been used for over 40 years, was developed by Arnold Goldstein and colleagues to support adults during the de-institutionalization process. In their trainer manual for structured learning therapy, 15 small-group sessions are outlined with content that includes conversation skills, expressing oneself, planning skills, and labeling and identifying emotions [14]. The recommended strategies for trainers/instructors are as follows: modeling, role play (behavioral rehearsal), social reinforcement (praise and performance feedback), and transfer training (through homework activities) [14]. This model remains in use today as *Skillstreaming*, with a published manual and accompanying CD focused on teaching prosocial skills for adolescents [15].

The increase in the number of adolescents with ASD is likely to result in a greater demand for social skills training groups [2]. The leaders of these groups may search for published manuals that provide information about both the structure and strategies for addressing social skills for individuals with ASD. Clinics and community organizations can offer social skills groups as part of the services they provide. Some schools have created the opportunity for students with ASD to participate in social skills groups as part of their class schedules. Currently, there are many manuals in English with content addressing social skills for adolescents with ASD that are available for purchase in North America. However, without information comparing the content, structure, and research support of these sources, selecting the most appropriate

manual remains difficult. The following review of the available social skills manuals addresses this gap in the field.

## Method

In order to find published manuals that met the criteria of (1) a focus on the instruction of multiple social skills targeted for adolescents with ASD and (2) that could be purchased in new condition, the key words of “social skills, adolescence, and autism, and/or Asperger” were used in Google and Amazon searches. Manuals that focused on children younger than age 13, provided a review of the literature only, or did not address the social skills deficits that are characteristic of ASD were excluded. Twenty-five manuals were found that could be purchased through Amazon or directly from the university where the program was developed and are included in this review (see Table 1).

Each manual was reviewed by at least two of the authors using a matrix of the eight categories developed for the purpose of this review. Descriptive data were collected on the eight categories. First, the core social content for instruction that was included in the manual was identified, or more specifically it was noted if the manual content focused on the three areas of challenge as defined by the DSM5 (nonverbal behavior, social-emotional reciprocity, and relationships) [1] as well as a fourth category of conversation skills based on social instruction recommendations by experts in the field. The content areas were defined as conversations (responding to questions, staying on topic), nonverbal (body language, facial expressions, eye contact), reciprocity (turn-taking, perspective taking), and relationships (friendships, dating). Second, the format and structure of the instruction described (e.g., review of skills, introduction of new skills, task analysis, modeling, role play, homework assigned).

Third, any of the 27 evidence-based practices identified by the National Professional Development Center on ASD that were part of the lesson structure were listed [13••]. Fourth, additional targeted social skills other than the core social deficits for ASD that were a focus of the curriculum were identified. Fifth, recommended duration and frequency of a lesson or activity was noted.

Sixth, any recommended generalization strategies included in the manual in order to practice skills across settings were identified and included the use of homework assignments, parent involvement recommended, and community field trip suggestions. Seventh, whether or not there was a prescribed scope and sequence for the instruction and activities (e.g., requiring the user to start at lesson 1, implement a lesson with a particular format, and then move on to lessons or activities that build on the initial lesson content) was recorded with a yes or no. Finally, the eighth category coded whether the manual included an assessment tool (A), system to manage behavior

(SB), or an accompanying CD. When disagreements in the descriptions occurred, reviewers discussed the items and reached consensus, which appears in the final manual description in Table 1.

In addition to the review and description of the manuals, a search of the published research was conducted by two of the authors to find articles describing outcomes when the social skills manuals were used with adolescents with ASD. The same key terms used to find the manuals, along with the names of the authors of the manuals, and the names of the programs (e.g., Skillstreaming; PEERS) were used to search the databases of PsychInfo and ERIC EBSCO. One of the challenges to finding these studies is that the name of the manualized program and authors may have been embedded in the method section of the publications and not included in titles or keywords. If any published studies were found, it was noted in Table 1 by the letter (R) in the column indicating if the manual had a prescribed scope and sequence.

Following the review, the manuals were grouped into three categories: (1) manuals with a prescribed scope and sequence for content (e.g., understanding facial expressions; listener and speaker roles; turn-taking in conversations) and recommended evidence-based strategies for delivery (e.g., introductory discussion, video examples, role play, summary, and review) ( $n = 10$ ); manuals with recommended lessons or content and suggested evidence-based strategies for instruction but a focus on individualizing content ( $n = 9$ ); and (3) those manuals with content (activities, worksheets, or charts) only, or with an emphasis on the implementation of strategies only ( $n = 6$ ).

## Results

Twenty-five manuals were identified and purchased that addressed enhancing the social skills and social competence of adolescents with ASD or with social skills deficits. All the manuals addressed conversation skills. Nonverbal behavior was a focus of 23 (92%) manuals but was not included in the behaviorally based curriculum of Taubman, Leaf, and McEachin [16] or in the manual focused on building self-esteem, coping, and awareness of unwritten social rules by Gentry and Wiley [17]. Addressing social-emotional reciprocity was found in 22 (88%) of the manuals, most frequently with a focus on turn-taking during conversations. The core content area addressed in the least number of manuals was relationships ( $n = 19$ ); however, three quarters (76%) of the manuals addressed issues of friendship, dating, or peer relationships. All of the manuals contained content for at least two of the core content areas that are a challenge for individuals with ASD.

All of the manuals provide some format or structure for a lesson or activity; however, there is variability in the

suggestions. Many of the formats include an introduction of skills, modeling, and role play [15, 18–22]. Some of the authors recommend starting with a review of learning objectives or goals [16, 19, 23–25]. Structures also include the use of case studies [26, 27], quizzes [28], group games [25, 29], relaxation [17], warm up or improvisational activities [30, 31], and worksheets [32] (see Table 1).

All but one of the manuals containing worksheets only [32] included the recommendation to use evidence-based strategies for adolescents with ASD [13••] when teaching the proposed content. One fifth of the manuals describe eight or more evidence-based strategies [19, 22, 25, 30, 33]. The most commonly recommended strategies include modeling or video modeling (68%), positive reinforcement (60%), and prompting (36%) reflecting a curriculum incorporating a behavioral theoretical approach.

The content is divided into lesson plans for 18 (72%) of the manuals with the number ranging from 12 [29] to 70 lessons [18, 34]. Manuals that described a format for delivery of instruction in a lesson also suggested an amount of time for lesson duration with 40 to 45 min two to three times per week recommended for six (24%) programs [15, 18–20, 25, 27] and with 60-min sessions one to five times weekly recommended for five (20%) programs [17, 24, 31, 34, 35]. Three manuals also include worksheets or activity sheets for adolescents to complete [17, 26, 32], with this as the primary content in the manual by Mannix [32] which includes 195 worksheets. The primary strategies used to support the generalization of social skills are activities for parent involvement in 60% of the manuals and the use of homework activities for 32% of the manuals.

The use of an assessment to determine the focus of the social skills instruction was included in 20% of the manuals, for example, the Autism Social Skills Profile by Bellini [30], or recommended, for example the accompanying Social Skills Improvement Scale by Elliot and Gresham [19]. Almost two-thirds (64%) of the manuals included information about how to create a system to manage challenging or problem behavior (see Table 1). Eight manuals (32%) came with a CD or thumb drive, two with all of the content of the manual [15, 21], most with lesson plans or worksheets to be printed [22, 27], and two with video examples to use with instruction [19, 25]. These supplementary materials are helpful for group leaders who can use copies of worksheets to distribute to participants and use video examples in their instruction.

There is currently sufficient evidence that social skills training, in general, is effective for adolescents with ASD [13••]. Research using specific social skills training models also has been conducted to determine if the use of the program results in positive outcomes for participants. Sixteen published efficacy studies with participants with ASD ages 13 to 18 were found that evaluated only five (20%) of the available manualized social skills programs [15, 20, 21, 25, 31] and

**Table 1** Description of available social skills manuals for youth with ASD

Program	Core social content	Format and structure of lessons and/or activities	EBPs	Additional target social skills	Exposure (number, length or frequency)	Generalization strategy	Prescribed scope and sequence/research (R)	Assessment (A); system to manage behavior (SB); (CD)
<b>Manuals with a clear scope and sequence and described strategies for instruction</b>								
Cumpata and Fell (2015) <i>Quest II</i>	Conversations; Nonverbal; Reciprocity; Relationships	Case study; Practice activity; Share and report	M R+ VS	Asking for help; Personal safety; Hygiene; Self-control; Technology safety; Bullying, Dating, Peer pressure	2–3 sessions per week; 45 min	Parent involvement	Yes	SB; CD (all lesson plans and materials for lessons)
Elliott and Gresham (2008) <i>SSIS</i>	Conversations; Nonverbal; Reciprocity; Relationships	Lesson objectives; Introduce skill; Skill steps; Model skill; Role-play skill; Practice skill; Monitor progress with feedback; Generalize skill	TAPI PMII P M VM R+ CBI S-M	Cooperation; Asking for help; Advocacy; Manners; Self-control	20 lesson plans; 2 sessions per week; 45 min	Homework; Parent involvement	Yes	A (SSIS); SB; CD (video clips, direct observation forms, notes to parents)
Gajewski, Hirn, and Mayo (1998)	Conversations; Nonverbal;	Introduce skill; Guided instruction; Model skill, Role-play skill; Feedback; Cognitive planning; Generalize skill	M VS CBI S-M R+	Problem solving; manners; Giving information; Accepting feedback; Convincing; Expressing opinions; Disagreeing	30 lesson plans	Parental involvement	Yes	No
Guli, Wilkinson, and Semrud-Clikeman (2008) <i>SCIP</i>	Conversations; Nonverbal; Reciprocity;	Warm-up activity; Review of homework; Group discussion; Activity; Wrap-up; Home challenge	M R+	Teasing; Problem solving	16 lesson plans; 2 times per week; 90 min	Parent involvement	Yes/ R	SB; CD (home challenge forms)
Laugeson (2013) <i>PEERS</i>	Conversations; Nonverbal; Reciprocity; Relationships	Review; Didactic instruction; Role-play skill; Activity; Homework;	M R+ P	Sportsmanship; humor; Teasing / bullying; Changing a reputation; Handling arguments; Get together	64 scripted lesson plans; 4–5 sessions per week; 30–60 min	Homework; Parent Involvement	Yes/ R	SB
McAfee (2013) <i>Navigating the Social World</i>	Conversations; Nonverbal; Reciprocity	Lesson goals; Introduce skill; Role-Play skill; Activity	VM M P Sc R+ CBI	Self-control; Asking for help; Complimenting; Problem solving; Figurative language; Reducing behaviors	20 lesson plans Conversation skills tracking sheets	Parent involvement	Yes/ R	SB; CD (all of the manual)

**Table 1** (continued)

Program	Core social content	Format and structure of lessons and/or activities	EBPs	Additional target social skills	Exposure (number, length or frequency)	Generalization strategy	Prescribed scope and sequence/research (R)	Assessment (A); system to manage behavior (SB); (CD)
Painter (2006)	Conversations; Nonverbal; Reciprocity; Relationships	Lesson objectives; Skill rationale; Introduce skill; Role play skill; Activity; Snack/social time; Closing	VS M	Phone skills; Manners; Dinner outings	23 lesson plans; 1 session per week; 60 min	Parent Involvement	Yes	No
Stichter (2016) <i>SC</i>	Conversations; Nonverbal; Reciprocity; Relationships	Lesson objectives; Greeting; Daily schedule; Goal setting; Review previous skill and homework; Introduce skill; Model skill; Structured practice activity; Naturalistic practice activity; Homework	R+ M VM PP CBI S-M VS, TAI	Self-control; Problem solving; Goal setting; Expressing & reading emotions	32 scripted lessons; 2 sessions per week; 45 min	Homework	Yes/ R	SB; USB (video clips; power point; Prezi)
Toole (2016)	Conversations; Nonverbal; Reciprocity;	Opening; Group activity; Introduce skill; Practice skill; Snack; Board game; Game show; Group activity; Parent debrief	P VS R+	Get together	12 Lesson Plans: 1 session per week; 120 min; data sheets for each week	Parent involvement	Yes	SB
Walker (1988) <i>ACCESS</i>	Conversations; Nonverbal; Reciprocity; Relationships;	Review; Direct instruction; Skill examples and non-examples; Take-a-ways; Activity; Role play skill; Student contract	M	Borrowing; Asking for help; Humor; Peer pressure; Being left out	30 Lesson Plans; 5 sessions per week; 60 min	Homework	Yes	A (Identify SS to teach); SB
Individualized curriculum—no recommended scope and sequence								
Baker (2003)	Conversations; Nonverbal; Reciprocity; Relationships;	Didactic instruction; Model skill; Role play skill; Feedback; Homework	M SN DTT R+	Self-control; Self-regulation	70 lessons; 1–5 sessions per week; 30–40 min	Homework	No	SB
Frankel and Wood (2011)	Conversations; Nonverbal; Reciprocity; Relationships;	Lesson objectives; Standards, and benchmarks; Materials; Introduce skill; Activity; Homework	CBI PMII	Expanding interests; Figurative language (idioms, sarcasm); Anxiety; Bullying	15 Lesson Plans Samples	Homework, Parent Involvement	No	A (Anxiety Questionnaires for Teacher, student, parent); SB

Table 1 (continued)

Program	Core social content	Format and structure of lessons and/or activities	EBPs	Additional target social skills	Exposure (number, length or frequency)	Generalization strategy	Prescribed scope and sequence/research (R)	Assessment (A); system to manage behavior (SB); (CD)
Gentry and Wiley (2016)	Conversations; Relationships	Assessment; Skill rationale; Skill steps; Relaxation; Social chat; Snack; Activity; Discussion questions; Review	PMII VS	Honesty; Self-esteem; Coping with change; Social media; Unwritten rules; Bullying; Peer pressure; Hygiene; Personal appearance	30 Lesson Plans; 1 session per week for 30–120 min	Parent involvement	No	SB
McGinnis (2011) <i>Skillsstreaming</i>		<i>Skillsstreaming–Arnold Goldstein Approach</i>		Conversations; Nonverbal; Reciprocity; Relationships	Define skill; Model skill; Establish participant skill need; Role-play skill; Homework	R+ M P	Asking for help; Self-control; Sportsmanship; Persuasion; Responding to failure; Advocacy; Peer-pressure; Goal setting; Problem solving	50 lesson plans; 2 sessions per week; 45–50 min
Homework; Parent Involvement	No/R	A; (Staff and Parent checklists); SB; CD (entire book)						
Sargent, Perner, Fegsen, and Cook (2011) <i>CEC</i>	Conversations; Nonverbal; Reciprocity; Relationships	Lesson objective; Skill rationale; Skill steps; Model skill; Role play skill; Practice; Generalize Skill; Evaluation	VM MR+ TAII VS TA S-M SN P	Manners; accepting Feedback; Coping with change; Hygiene; Humor; Dating; Advocacy; Hallway etiquette; Bullying; Technology safety; Cafeteria rules; Giving directions; Being productive; Goal setting	50 lesson Plans; groups with typical peers	Homework	No	SB; CD (conversation scripts, lesson plans, facial expression photos, power point presentations)
Stefonek (2016) <i>ACT</i>	Conversations; Nonverbal; Reciprocity	Daily check-in and warm-up activity; Explain skill; Quiz; Role-play skill; Group discussion; Generalize skill; Review	S-M VM	Apologizing; Self-advocacy; Negotiation; Time and place; Flexibility; Recovery after social mistake; Teasing; Compliments; Interviewing;	16 Lesson Plans	Community field-trips	Yes	No



**Table 1** (continued)

Program	Core social content	Format and structure of lessons and/or activities	EBPs	Additional target social skills	Exposure (number, length or frequency)	Generalization strategy	Prescribed scope and sequence/research (R)	Assessment (A); system to manage behavior (SB); (CD)
Taubman, Leaf, and McEachin (2011)	Conversations; Reciprocity; Relationships;	Lesson objectives; Skill steps	R+ TA	Social imitation; Joint attention; Compliments; Asking for help; Apologizing; Sportsmanship; Teasing/ bullying	31 Lesson Plans	No	No	SB
Taylor and Laurel (2016)	Conversations; Nonverbal; Reciprocity; Relationships	Lesson objective; Materials; Activity;	VS TA R+ P VM PMII SN S-M	Play; Joint attention	Sample lesson plans	Parent involvement	No	No
Winner (2006) <i>Social Thinking</i>	Conversations; Nonverbal; Reciprocity; Relationships	Critical vocabulary; Lesson objectives; Materials; Introduce Skill; Activity;	M VM S-M CBI VS	Making educated guesses; Asking for help; Self-awareness; Complimenting; figurative speech; Social rules; Problem solving	69 lesson plans; 1–5 sessions per week; 45–60 min Goal suggestions	Parent Involvement	No	SB; CD (CA content standards; goal bank)
Lessons only without scope and sequence or focus on instructional strategies without lessons								
Bellini (2006)	Conversations; Nonverbal; Reciprocity	Group discussion; Conversation game; Improvisational activity; Introduce skill, Structured practice activity; Free play	PMII VS VM M TAII P SN S-M R+	Self-control; Problem solving; Processing speed; Self-awareness; Social rules	No lessons described; assess then identify target skills	Homework	No	A (Autism Social Skills Profile); SB
Buron, Brown, Curtis, and King (2012)	Conversations; Nonverbal; Reciprocity; Relationships	Introduce skill; Skill examples; Create a 5-point scale	VS S-M	Self-control; Dating; Dorm Workplace; Anxiety	No lessons described	No	No	No
Cooper and Widdows (2008)	Conversations; Nonverbal; Reciprocity; Relationships	Skill overview; Case study; Activity; Take note	S-M	Self-control; Flexibility; Self-talk; Self-awareness; Social rules; Hygiene	40 workbook activities	No	No	No

Table 1 (continued)

Program	Core social content	Format and structure of lessons and/or activities	EBPs	Additional target social skills	Exposure (number, length or frequency)	Generalization strategy	Prescribed scope and sequence/research (R)	Assessment (A); system to manage behavior (SB); (CD)
(Mannix 2009)	Conversations; Nonverbal; Reciprocity; Relationships	Skill rational; Worksheet		First impressions; Behavior; Reputation; Hygiene; Self-improvement; Humor; Advocacy; Problem solving; Self-control; Common sense; Work ethic; Expectations; Respect; Flexibility; Peer pressure	195 worksheets	Parent involvement	No	No
Patrick (2008)	Conversations; Nonverbal; Relationships	Introduce skill; Skill examples; Role play skill;	S-M Sc VM	Personal interest; Honesty; Dating; Safety; Healthy living; Independent living; Hygiene; Sensory; Postsecondary	No lessons described	No	No	No
White (2013)	Conversations; Nonverbal; Reciprocity; Relationships;	Greeting; Review previous skill and homework; Introduce skill; Practice skill; Homework; Free time; Wrap up	VS Sc R+ S-M PMII	Problem solving; Flexibility; Figurative language	No lessons described	Homework; Parent involvement	No	No

R+ reinforcement, M modeling, VM video modeling, S-M self-management strategies, CBI cognitive behavior interventions, VS visual supports, Sc Scripting, P prompting, PMII peer-mediated intervention and instruction, TAI technology-assisted intervention and instruction, SN social narrative, DTT discrete trial training, TA task analysis, R research, A assessment, SB system to manage behavior, CD CD or media to view or print



are described below (see Table 1). Four of the manualized social skills programs had a clear scope and sequence and a standard format of instruction which allows for an evaluation of implementation fidelity, an important consideration in efficacy research [20, 21, 25, 31].

The manualized social skills program with the most published research is the *Program for Evaluation and Enrichment of Relational Skills* (PEERS) [20] developed by Laugeson, which focuses on improving friendship quality and ecologically valid social skills among adolescents with higher-functioning ASD. Seven articles evaluating PEERS conducted in clinics and in schools were found using various designs including an active treatment comparison and a randomized controlled trial and with replications by researchers other than the model developer in both the USA and Korea.

PEERS has been evaluated compared with a delayed treatment control for teens with ASD ages 13 to 17 with findings indicating improved knowledge of the rules of social etiquette and a reported significant increase in hosted get-togethers and better quality of friendships [36]. Also, their parents reported significant improvements in their teens' overall level of social skills [36]. A published evaluation at a 14-week follow-up revealed that these outcomes had been maintained [37], and another study found maintenance of gains for adolescents participating in PEERS 1 to 5 years after program completion [38].

The school-based PEERS program was compared to the *Super Skills* program [39], for 73 students ages 12 to 14 with ASD that were randomly assigned to the different groups [40•]. Results revealed that teachers of the students in the PEERS group reported significantly greater reductions in ASD symptoms and that students made significantly different improvements in social awareness, social communication, and social motivation on the Social Responsiveness Scale [41] compared with outcomes from the teacher-reported measures from the comparison group. Compared with participants in the *Super Skills* group [39], teens in the PEERS group reported significantly greater improvements in knowledge of social skills, frequencies of hosted get-togethers, and reciprocal social interaction with peers [40•].

The PEERS program was implemented and evaluated using a randomized controlled trial design by Schohl and colleagues, researchers other than the model developer, for 58 participants aged 11–16 years old who were randomly assigned to either an immediate treatment or waitlist comparison group [42•]. The experimental group significantly improved their knowledge of social skills and friendship skills, decreased their levels of anxiety, problem behaviors, and core autistic symptoms compared with the waitlist group. They also increased their amount of get-togethers with peers. A second study evaluated the generalization of social skills for the participants in the Schohl et al. study using digitally recorded 10-min social interactions between adolescent

participants with ASD and a typically developing adolescent confederate [43•]. PEERS participants demonstrated significantly improved vocal expressiveness, and a trend toward improved overall quality of rapport, compared with participants in the waitlist group that exhibited worse performance [43•]. Another replication of the PEERS program from researchers other than the model developer was conducted in Korea [44•]. Forty-seven teens ages 12 and 18 years with ASD and a verbal intelligence quotient (IQ)  $\geq 65$  were randomly assigned to PEERS or a delayed treatment control group. Participants in PEERS showed significant improvement in social skills knowledge, interpersonal, and leisure skills, as well as a decrease in depressive symptoms and ASD symptoms compared with the delayed treatment control [44•].

Five studies were found that evaluated *Social Competence Intervention* (SCI) a cognitive behavioral approach developed by Stichter to address social skills including perspective taking, decoding facial expressions, conversation skills, and problem solving [25]. Studies conducted in clinics and schools with various designs including randomized control trials were included. Outcomes from the implementation of *Social Competence Intervention* (SCI) for a group ( $n = 27$ ) of 11- to 14-year-olds with ASD held after school revealed parent-reported changes in the Social Responsiveness Scale (SRS) measuring impairments in social awareness and communication [41], and parent-reported changes in executive functioning such as the ability to regulate behavior and to use meta-cognitive strategies. [45]

SCI was also implemented in three schools with 25 students ages 11 to 15 with autism, resulting in increased social awareness and communication reported by teachers, improved ability to recognize facial expressions of emotions and interpret emotional states from photographs, and improved teacher report of executive functioning post-intervention [46•]. Another school-based study evaluated the generalization of social skills from a SCI group to observed interactions during lunch for 6-, 12-, and 13-year-old students with autism and during math for three students [47•]. The results reveal that SCI holds promise for outcomes that generalize to additional settings, with post-intervention increases in initiating to peers observed for five students, responding to peers for four students and overall social interaction for five students during lunch, and overall social interaction with peers and adults for two of the three students during math compared with baseline levels [48].

SCI was delivered to 11 students ages 11 to 14 in rural schools using a 3D virtual learning platform and this resulted in significant changes on the parent-report social cognition, motivation, and communication measure used (SRS), but not the teacher-report version [48]. SCI ( $n = 146$ ) also was compared to a business as usual condition ( $n = 123$ ) using a clustered randomized control design with students ages 11 to

14 from 34 publicly funded schools [49]. Outcome analyses revealed moderate effect sizes for the SCI group for capacity to interact socially with teachers and peers and for awareness of social cues and information [49].

Two studies that evaluated social skills groups that used the current version of *Skillstreaming* for adolescents with ASD were identified. Tse and colleagues evaluated a clinic-based, social skills program adapted from the *Skillstreaming* manual [15] with 46 adolescents ages 13 to 18 with high functioning autism in six groups of 7 to 8 and found pre-to post-test significant differences for the total scores on the parent-reported standardized measures used [50], or the SRS [41] and N-CBRF [51], a measure of emotional and behavioral problems. Lerner and Mikami randomly assigned 13 youth with high functioning autism to two social skills training programs, *Skillstreaming* [15] and Sociodramatic Affective Relational Intervention (SDARI) that met once a week for 90 min after school for 4 weeks and compared outcomes on pre-post measures [52]. Participants in both groups had increased numbers of reciprocated friendship nominations on a sociometric measure following the social skills training. Over the course of the intervention, *Skillstreaming* participants were observed to increase their peer interaction compared to decreases in peer interaction for participants in the SDARI group.

One article was found that compared the *Social Competence Intervention Program* (SCIP) to a control group [53]. The sixteen 8–14-year-old participants demonstrated improvements in key social skills including increases in positive interactions and decreases in solitary play from observations in natural settings following this drama-based program. Parents and children in the SCIP condition reported multiple positive changes in social functioning during interviews. One study evaluating the use of *Navigating the Social World* [21] with three youth ages 15, 16, and 19 with ASD was found. Mitchel and colleagues [54] used a multiple baseline design to evaluate the targeted skills of introducing oneself, starting a conversation with a peer, and problem-solving. There were resulting increases for all three participants compared with baseline levels that were maintained at a 3-month follow-up. Generalization was observed for each of the targeted skills for two of the three participants in locations outside of the social skills group.

## Conclusions

A search for available manuals focused on addressing the social competence of adolescents with ASD resulted in the identification of 25 sources [15–35, 55–58]. The social skills programs found in these manuals were initially created as long ago as 30 [52] and 40 [15] years ago;

however, one fifth of the reviewed manuals were published in 2015 or 2016 reflecting the continued demand for social competence content for youth with ASD. All of the manuals had a focus on conversation skills; however, the content of the manuals varied and one quarter of the manuals did not address peer relationships and friendship skills. It would be important to determine the focus of any planned social skills training program in order to select a manual that was the best fit with the targeted goals of the program. Ten of the manuals had a prescribed scope and sequence for the content and a systematic format for delivery of the instruction so that the social skills training could be implemented with fidelity, or as designed. However, research evidence in support of effectiveness when implemented for adolescents with ASD was found for only five of the manualized programs.

PEERS is the manualized program with the strongest evidence with the largest number of efficacy studies, which are carefully controlled by use or rigorous designs, with research focused on the generalization of social skills, and with positive outcomes from replications by implementers other than the model developers. *Social Competence Intervention* also has a body of research that includes a randomized control trial design and research focused on the generalization of the social skills addressed in the curriculum. Clearly more research on the outcomes of social skills training groups is needed. It would be important to assess outcomes that are matched to the focus of the curriculum content (e.g., decoding facial expressions, peer interaction, participation in social events) and to compare manualized programs that focus on different social competence skills. If a manualized program where individualization is recommended is used, such as *Skillstreaming* [15], then identifying the content that was selected for the social skills group, and assessing related outcomes would be important. Some of the programs are implemented using a different format or context, such as incorporating drama activities [28, 31], and these programs could be compared to more traditional group formats. In addition, more research focused on the generalized outcomes of manualized social skills programs for youth with ASD is necessary to demonstrate that these programs result in increased social competence beyond the period of time when the groups are meeting.

## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interests.

**Human and Animal Rights and Informed Consent** This article does not contain any studies with human or animal subjects performed by any of the authors.

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