***The effectiveness of group-based SST for children ages 7-12 with ASD in a clinical setting on increasing social participation with peers compared to a waitlist or facilitated play group is moderate.***

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**CLINICAL SCENARIO:**

**Condition/Problem**

- Autism Spectrum Disorder (ASD) refers to a broad group of neurodevelopmental disorders generally characterized by social/communication difficulties, repetitive or disruptive behaviors, among other impairments. The severity and type of symptoms varies greatly from child to child. Some children with ASD experience other medical concerns such as gastrointestinal problems, ear infections, food/skin allergies, headaches, or asthma on a more frequent basis than typically-developing children do (Schieve, et al., 2012). The issues addressed by this CAT are social, behavioral, and communication problems.

**Incidence/ Prevalence**

- As of 2014, Autism Spectrum Disorder occurs in about 1 out of every 68 children. It is almost 5 times more common in boys (1 in 42) than in girls (1 in 189) (Autism Speaks, Inc. 2015) Since social impairment is one of the criteria for diagnosis, all of these children will have difficulty in social situations.

**Impact of the Problem on Occupational Performance:**

- People with autism have trouble with maintaining social relationships because they lack conversational inhibition and may say socially unacceptable things (Brown & Stoffel, 2011). Their social participation may also be affected by sensory processing disorders which are common among individuals with ASD. Grooming may not be a priority for a person with ASD because they don't pick up on social cues that clue them in on appropriate hygiene habits (Interactive Autism Network at Kennedy Krieger Institute, 2007).

**Intervention** (Koenig et. al, 2010), (Soorya et. al, 2015), (Thomeer et. al, 2012)

- The articles reviewed for this CAT used social skills groups for 4-6 children with 1-3 therapists (2 children: 1 therapist ratio). Groups met between one and five times/week for 5-16 weeks for 70-90 minutes. Topics addressed varied by study, but generally included emotional regulation, social competence, social problem solving, and social communication. Groups generally included a structured lesson on a specific skill, role playing with rehearsal/practice of the skill, modeling, discussion, and individualized performance feedback. Sessions were structured and included a break time and a conclusion. One study included two peer tutors without ASD (Koenig et. al, 2010) and the other two studies (Soorya et. al, 2015 and Thomeer et. al, 2012) had a concurrent parent session where parents received support and learned about strategies about how to communicate with their child.

**OT Theoretical Basis**

- Dynamic systems theory supports group-based social skills training. Behavioral, social learning, and cognitive theories are hypothesized to contribute to mechanisms of change in social participation (Kramer & Hinojosa, 2010). One of the postulates from Skinner's behavioral theory states that, given the proper timing and type of reinforcement of behavior, a child will be more likely to learn a desired behavior. In the three identified studies, reinforcement of desired social behaviors during a group-based social skills training session results in learning of that specific behavior. Bandura's social learning theory highlights the importance of a child

observing behaviors of peers and then modeling those behaviors based upon what is perceived as successful or unsuccessful (Kramer & Hinojosa, 2010). The importance of positive social role models is emphasized in this model as well. The group-based social skills training groups in the three identified studies use this theory in its very definition - teaching skills in a group setting rather than individually. Group leaders and peer models without ASD provided optimal demonstration of skills that are hypothesized to be learned by participants partially through observation. Finally, Vygotsky's theory of cognitive development plays a role in teaching children with ASD social skills in a group setting. According to this theory, children learn through supported problem-solving experiences with peers (Kramer & Hinojosa, 2010). This interaction is supported by a caregiver or a highly skilled peer. This may explain why one of the three studies (Koenig et. al, 2010) included typically-developing peers in the social skills training group. In addition, this theory emphasizes teaching parents or caregivers "optimal ways of helping children understand, organize, and use social information in their environments in the process of developing effective habits and routines for social participation" (Kramer & Hinojosa, 2010). This may explain why two of the three identified studies (Soorya et. al, 2015 and Thomeer et. al, 2012) included concurrent support and education for parents of the children participating.

**Science Behind the Intervention**

- Social learning is the basis of social skills training although the specific mechanism of change is unknown (Reichow, Steiner, & Volkmar, 2012). People with ASD commonly lack social knowledge or awareness; specifically knowledge of appropriate responses in social situations (Lerner, White, & McPartland, 2012). Social skills training is based on the idea that a combination of immediate practice and the teaching of organized, specific social skills will result in improved social knowledge and thus social functioning and generalizability of skills to multiple settings (Lerner, White, & McPartland, 2012). A common deficit for people with ASD is their ability to quickly and accurately process information. Social skills training may increase processing speed and accuracy allowing for better social performance and social recognition (Lerner, White, & McPartland, 2012). People with ASD may also lack the motivation to socially interact. Some social skills training programs may try to address the lack of motivation using behavioral strategies by pairing something rewarding with a social interaction (Lerner, White, & McPartland, 2012).

**Why is this intervention appropriate for OT?**

- According to the Occupational Therapy Practice Framework: Domain and Process (2014), group-based social skills training would fall under the "group intervention" type of intervention. These groups allow clients to explore, develop, and practice social skills which will transfer to allow for optimal performance in occupations. The social skills learned and practiced in the group are considered "activities" in the framework definition because they address social participation and performance skills, specifically social interaction skills such as approaches/ starts, concludes/ disengages, expresses emotion, takes turns, regulating, replying, and empathizing. Social skills training addresses participation and personal factors under the International Classification of Functioning (ICF).

**FOCUSED CLINICAL QUESTION: What is the effect of group-based social skills training (SST) in a clinical setting as compared to no intervention or a facilitated play group on social participation with peers for elementary/middle school-aged children with ASD?**

**SUMMARY**
This CAT investigates the effect of social skills training groups on the social skills of young children with ASD. Three databases were searched including Cochrane, EBSCOhost, and OT Search. A total of twelve relevant articles were located. The articles critiqued in this CAT were all level lb with medium rigor. Articles were selected based on similarity of population, diagnosis, and type of social skills training used as an intervention. We chose randomized control trials to ensure that the reliability and validity of results were rigorous. Studies critiqued showed a decrease in severity of ASD symptoms; however, results were varied between studies for social behavior and social cognition.

**CLINICAL BOTTOM LINE: There is moderate support for the effectiveness of group-based SST for children ages 7-12 with ASD in a clinical setting on increasing social participation with peers compared to a waitlist or facilitated play group.**

**Limitation of this CAT:** This critically appraised paper (or topic) has been reviewed by occupational therapy graduate students and the course instructor.

**Table 1: Search Strategy**

| Databases Searched | Search Terms | Limits | Inclusion and Exclusion Criteria |
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| EbscoHost<br>Cochrane<br>OT Search | Social skills training<br>Autism<br>Autism spectrum disorders<br>Children<br>Systematic review<br>Meta-analysis<br>Peers<br>Group<br>Autistic disorder | Scholarly (Peer Reviewed) Journals | Ages 5-12 |

**Table 2: Summary of Study Designs of Articles Retrieved**

| **Level** | **Study Design/ Methodology** | **Total Number Located** | **Database Source** | **Citation (Name, Year)** |
|---|---|---|---|---|
| Level 1a | Systematic Reviews or Meta-Analysis of RCTs | 1 | Cochrane | (Reichow, Steiner & Volkmar, 2013) |
| Level 1b | Individualized RCTs | 6 | EBSCOhost | (Baghdadi, Brisot, Henry, Michelon, Soussana, Rattaz, Picot, 2013) |
| | | | EBSCOhost | (DeRosier, Swick, Davis, McMillen, Matthews, 2011) |
| | | | EBSCOhost | (Koenig, White, Pachler, Lau, Lewis, Klin, Scahill, 2010) |

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| | | | EBSCOhost<br><br>EBSCOhost<br><br>EBSCOhost | (Lopata, Thomeer, Volker, Toomey, Nida, Lee, Smerbeck, Rodgers, 2010)<br><br>(Frankel, Myatt, Sugar, Whitham, Gorospe & Laugeson, 2010)<br><br>(Soorya, Siper, Beck, Soffes, Halpem, Gorenstein, Kolevzon, Buxbau, 2015) |
| Level 2a | Systematic Reviews of Cohort Studies | 0 | | |
| Level 2b | Individualized Cohort Studies and low quality RCTs (Pedro less than or equal to 4) | 2 | EBSCOhost<br><br>EBSCOhost | (Thomeer, Lopata, Volker, Lee, Smerbeck, Rodgers, McDonald, Smith, 2012)<br><br>(Solomon, Goodlin-Jones & Anders, 2004) |
| Level 3a | Systematic Review of Case-Control Studies | 1 | EBSCOhost | (Williams White, S., Keonig, K., & Scahill, L., 2007) |
| Level 3b | Case-Control Studies and Nonrandomized Controlled Trials (quasi experimental or clinical trials) | 2 | EBSCOhost<br><br>EBSCOhost | (Cotugno, 2009)<br><br>(Barry, Klinger, Lee, Palardy, Gilmore, Bodin, 2003) |
| Level 4 | Case-series and poor quality cohort and case-control studies | 0 | | |
| Level 5 | Expert Opinion | 0 | | |

**Table 3: Summary of Included Studies**

| **Study 1:** (Koenig et al., 2010) | **Study 2: (**Soorya et al., 2015) | **Study 3:** (Thomeer et al., 2012) |
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| Randomized Control Trial | Randomized Control Trial | Replication of a Randomized Clinical Trial |
| 1b | 1b | 1b |
| Pedro: 8 out of 10 | Pedro: 6 out of 10 | Pedro: 6 out of 10 |
| n=44<br>• Children ages 8-11 with a full scale IQ score of ≥ 70, a clinical diagnosis of pervasive developmental disorder (PDD) and who met the diagnosis of PDD on the Autism Diagnostic Observation Schedule algorithm score, the Social communication Questionnaire score, and the Pervasive Developmental Disorders Behavior Inventory<br>• Children were excluded if they scored >18 on the Aberrant Behavior Checklist or if their scores were clinically significant on any scale of the Children's Symptom Inventory<br>• 77.3% male (n=34)<br>• 98.0% Caucasian (n=43) | n= 69<br>• Children ages 8-11 with ASD and verbal IQs of greater than 70.<br>• Exclusion criteria included initiation of a new psychiatric medication regimen within 30 days prior to the screening, significant structural deformities in the brain, current seizure disorder, and aggressive behaviors. | n=35<br>• Children ages 7-12 (mean age of 9.31)<br>• Prior clinical diagnosis of HFASD (Asperger's, PDDNOS, or HFA)<br>• Wechsler Intelligence Scale for Children-4th Edition short-form IQ>70, (and Verbal Comprehension Index or Perceptual Reasoning Index score greater than or equal to 80), expressive or receptive language score greater than or equal to 80 on a short-form of the Comprehensive Assessment of Spoken Language<br>• Score meeting ASD criteria on the ADI-R.<br>• 85.7% male (n=30)<br>• 80.0% Caucasian (n=28)<br>• Average parent education level of 15.00 years |

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| Group-based SST:<br>• n=23<br>• The groups met once per week for 75 minutes for 16 weeks.<br>• Each group had 4-5 participants, two peer tutors, and two licensed clinicians that remained constant throughout the 16 weeks.<br>• Sessions used a treatment manual and consisted of a predictable schedule posted in words and pictures: greeting, review of rules, an activity, snack, second activity, and a closing ritual.<br>• Activities required participants to socialize with peers, play cooperatively, take turns, listen to one another, problem solve together, and tolerate frustration and change.<br>• After session 3, group leaders composed individualized treatment plans based on baseline data and observations. Targets for change in behavior were, therefore, individualized.<br>• Leaders and peer tutors used behavioral strategies to promote desired behaviors and discourage undesired behaviors based on each treatment plan. | Group-based (SST):<br>• n=35<br>• Seaver-NETT (Nonverbal communication, Emotion recognition, and Theory of mind Training) SST for 12, 90 minute sessions that included a concurrent parent group.<br>• Sessions were led by a licensed clinical psychologist with previous experience working with children with ASD<br>• Child therapy groups (for both the control and intervention group) consisted of "a 15 minute free-play/snack time, 60 minute instruction, and 15 minute wrap-up/circle time" p. 210.<br>• There were 4-6 participants in each group and 2 to 3 therapists.<br>• "Session 1 was an introductory group (ice-breaker games, orientation to the group rules/structure), and session 12 was a wrap-up/party." p. 210.<br>• Intervention in the treatment group focused on nonverbal communication, emotion recognition, and theory of mind. | Group-based SST:<br>• n=17<br>• 5x/week for 5 weeks with five 70-minute treatment cycles per day<br>• Treatment groups were broken up based on age (7-8, 9-10, and 11-12). Each group contained 6 children and 3 staff<br>• Treatment sessions were standardized through the use of a manual and targets included development of social skills, interest expansion, face-emotion recognition, and interception of nonliteral language skills.<br>• The first 20 minutes of each cycle consisted of instruction of a specific skill. Instructional elements included direct instruction, modeling, role-playing, performance feedback, and transfer of learning. Skills were taught from more basic to complex.<br>• "Six 20-minute sessions (once per 20 treatment cycles) involved instruction in the interpretation of nonliteral |

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| | • A manual provided treatment guidelines and keeping the three main components in mind and allowed for individualization.<br>• "Instructional strategies included visual supports, didactic instruction, activities to reinforce target skills, weekly skills practice and token economy system to reinforce target skills and group participation" p.210<br>• "The 30- minute parent education group provided the rationale for target skills, homework review, and discussion of challenges and barriers" p. 210. | language, and six involved instruction in face-emotion recognition."<br>• The last 50 minutes of each cycle involved a therapeutic cooperative activity designed to practice and reinforce social interaction, face-emotion recognition, and non-literal language skills.<br>• All therapeutic activities ended with a debriefing on the group's performance and how to use the skills in the future.<br>• A response-behavioral system was implemented to increase and maintain prosocial behaviors and decrease ASD features and problem behaviors. Points were used to earn weekly outings and were monitored every 20 minutes.<br>• On-site 90-minute weekly parent training groups were also provided. These focused on increasing understanding of the condition, intervention techniques, and the program |

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| | | itself. Parents learned strategies for teaching, reinforcing, and promoting generalization of skills. |
| Waitlist, n=19 | Facilitated play group, n=34<br>• A treatment manual was provided that included ways to encourage child directed play based on individual characteristics.<br>• Therapists created stations that addressed specific types of play (object, motor, and dramatic).<br>• Each session began with a review of the schedule, circle time, activity time and a conclusion.<br>• A 30 minute concurrent parent group was facilitated by a therapist | Waitlist, n=18 |
| Social Behavior<br>• Initiating behavior<br>• Prosocial behavior<br>Symptom Severity | Social Behavior<br>Social Cognition | Social Behavior<br>• A child's tendency to escape from or avoid social contact<br>• A child's interpersonal aspects of social adaptation and skills needed for successful interaction<br>Social Cognition<br>• A child's ability to accurately identify a simple emotion |

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| | | • Receptive and expressive language abilities,<br>Symptom Severity |
| Social Behavior:<br>• Social Competence Inventory - Pro-Social Index (SCI-PSI)<br>• Social Competence Inventory - Social Initiation Index (SCI-SII)<br>Symptom Severity:<br>• Clinical Global Impressions Scale-Improvement Item (CGI-I) | Social Behavior:<br>• Social Responsiveness Scale (SRS)<br>• Griffith Empathy Measure<br>• Children's Communication Checklist-2 (CCC-2)<br>Social Cognition:<br>• Diagnostic Analysis of Nonverbal Accuracy-2 (DANVA2)<br>• Strange Stories Task<br>• Reading the Mind in the Eyes Test (RMET) | Social Behavior:<br>• BASC-2-PRS (withdrawal and social skills subtests)<br>Social Cognition:<br>• Diagnostic Analysis of Nonverbal Accuracy-2 (DANVA2)<br>• Comprehensive Assessment of Spoken Language (CASL) (idiomatic language subtest)<br>Symptom Severity:<br>• Social Responsiveness Scale (SRS) |
| Social Behavior:<br>• Both the treatment and waitlist groups made gains over time on both the SCI-PSI and the SCI-SII. However, there were no significant differences between baseline and endpoint scores on either index within group or between groups.<br>Symptom Severity:<br>• On the CGI-I, 16/23 participants in the SST group were rated as "responders", meaning they were rated as "much improved" or "very much improved" as compared to 0/18 in the wait list group.<br>• Rate of response for the treatment group was significantly | Social Behavior:<br>• Directly after treatment, SST showed significant improvements compared to the control (p=.04) in the composite score.<br>• At three month follow up, no significant interactions (p=.38) were found in the composite score.<br>Social Cognition:<br>• No significant differences were found between the SST and the control group directly after treatment or at the three month follow up (p=.79).<br>Moderators<br>• In the SST group, higher verbal IQ | Social Behavior:<br>• Participants in SST group had significant improvements on the BASC-2 Social Skills Subtest directly after treatment (p=.011) and at the three month follow-up (p=.004).<br>• There were no significant differences between groups on the BASC-2 Withdrawal Subtest directly after treatment (p=.020) or at the three month follow-up (p=.087).<br>Social Cognition<br>• Participants in the SST group had significant |

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| greater than the response in the waitlist group (p=0.001).<br>• No differences were noted between participants with autism vs. AD or PDD-NOS, but children with AD were more likely to be responders compared with children with PDD-NOS. | scores were associated with greater change in social behavior; this association was not seen for the control group.<br>• Age was almost a significant moderator of social behavior (p=.053) with older age associated with improved social behavior for the SST group.<br>• SRS total scores as well as the anxiety and ADHD subscales from the BASC-2 were not significantly associated with change for either social cognition or social behavior. | improvements on the CASL Idiomatic Language Subtest (p<.001).<br>• There were no significant differences between groups on the DANVA-2 (p<.078).<br>Symptom Severity<br>• Directly after treatment, the SST group had significant improvements on the SRS (p=.007)<br>• At the three month follow up, the SST group still had significant improvements on the SRS (p=.027). |
| Social Behavior<br>Pro-Social index<br>• A medium effect size (d=0.52) of the SST group compared to a small effect size (d=0.18) of the waitlist group.<br>Social initiation index<br>• A medium effect size (d=0.56) of the SST group and a medium effect size (d=0.74) of the waitlist group. | Social Behavior<br>• Large effect of SST (d=0.88) compared to control (d=0.12) after the final session. | Social Behavior:<br>• A medium effect size (d=.70) for the SST group was found for the BASC-2 Social Skills Subtest directly after treatment.<br>• Three months after treatment, a medium effect size (d=.68) for the SST group was found for the BASC-2 Social Skills Subtest.<br>• Although the BASC-2 Withdrawal Subtest was not significant, the small effect size (d=.39) directly after treatment |

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| | | was in the hypothesized direction.<br>• Three months after treatment, although the BASC-2 Withdrawal Subtest was not significant, the small effect size (d=.32) was in the hypothesized direction.<br>Social Cognition<br>• A small effect size (d=.34) for the SST group was found for the CASL Idiomatic Language.<br>• Results for the DANVA-2 Child Faces was not significant, but a small effect size (d=.26) for the SST group was in the hypothesized direction.<br>Symptom Severity<br>• A medium effect size (d=.67) for the SST group was found for the SRS directly after treatment.<br>• Three months after treatment a small effect size (d=.40) for the SST group was found for the SRS. |
| This study supports the use of a 16 week SST group to improve general symptom severity in children with ASD but not initiation or prosocial behavior. Future studies need to focus on addressing generalizability, obtaining all pertinent information from | The study supports the use of a 12 session SST group to improve social behavior in children with ASD but not social cognition.The results suggest that gains made during the intervention were not maintained 3 months after | This study supports the use of a 5 week comprehensive psychosocial intervention to improve some social behaviors such as social skills, severity of ASD behaviors, and receptive/expressive |

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| participants (IQ), and inclusion of "more rigorous fidelity measurement[s]" (p. 1215). | the intervention. Larger sample sizes are needed in future studies. | language abilities for the identified population. Small gains were found 2-3 mo. post treatment. A larger, more diverse sample size is recommended for future studies. |

## IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

### Overall Conclusions

The effectiveness of group-based SST for children ages 7-12 with ASD in a clinical setting on increasing social participation with peers compared to a waitlist or facilitated play group is moderate. In the selected three studies, the intervention was shown to reduce overall severity of ASD symptoms as reported by parents, but evidence was variable when assessing the more specific constructs of social behavior and social cognition. There were no negative effects reported.

### Boundaries

There were a total of 148 children ages 7-12 participating in these 3 studies. Specific diagnoses differed among studies and included ASD, High Functioning Autism (HFA), Asperger's, Pervasive Developmental Disorder (PDD), and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). All children needed prior clinical diagnoses of the above conditions and needed to have IQs above 70. Exclusion criteria also varied somewhat across studies. Combined, children were excluded if they had a score of less than 18 on the Aberrant Behavior Checklist (1 study), if their scores were clinically significant on any scale of the Children's Symptom Inventory (1 study), if they initiated a new psychiatric medication regimen within 30 days prior to the screening (1 study), if they had significant structural deformities in the brain (1 study), had a current seizure disorder or aggressive behaviors (1 study), or if they had an expressive or receptive language score less than or equal to 80 on a short-form of the Comprehensive Assessment of Spoken Language (CASL) (1 study).

### Implications for Practice

There is moderate evidence supporting the use of group based social skills training in children ages 7-12 with ASD in a clinical setting to improve social participation as compared to no intervention or a play group. Parents overall perception of symptom severity improved. Group sessions were long, lasting between 70 and 90 minutes for 5 to 16 weeks. Groups contained 4 to 6 participants with a therapist to child ratio of 1:2. Sessions were structured including a break time and a conclusion. Only children with ASD that had an IQ of 70 or above were able to participate and had to be able to tolerate a group setting.

There were variable results across the studies regarding the effectiveness of group based SST on improving social behavior and social cognition. The intervention was effective for improving receptive and expressive language abilities in one study but not the understanding of nonliteral phrases in different study. Two of the three studies did not include peer tutors. One study did not include a parent support group. Specific interventions and intensity varied across the studies. Definitions of social participation concepts varied across the studies. There were no negative effects of treatment reported.

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