5-11-2023

Increasing social engagement in children with autism spectrum disorder through perspective taking skills training

Robyn Devendorf
James Madison University

5-11-2023

Increasing Social Engagement in Children with Autism Spectrum Disorder Through Perspective Taking Skills Training

Robyn Devendorf

Increasing Social Engagement in Children with Autism Spectrum Disorder through Perspective Taking Skills Training

Robyn Devendorf, M.A.

A thesis submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillment of the Requirements

for the degree of

Educational Specialist

The Department of Graduate Psychology

May 2023

FACULTY COMMITTEE:

Committee Chair: Tiffany Hornsby, Ph.D.

Committee Members:

Debi Kipps-Vaughn, Psy.D.

Tonya Lambert Delp, Ph.D.

Table of Contents

Abstract

The current study sought to teach the perspective-taking skill, a behavior that may require training in children with autism spectrum disorder (ASD), and contribute to an increased ability in children with ASD to engage socially. One-on-one perspective-taking intervention sessions between the examiner and a child identified with ASD took place over ten sessions. Sessions were structured with the guidance of the Social Thinking curriculum entitled, "You Are a Social Detective!". A single-case design was employed, and results were reviewed through quantitative measures using teacher ratings on the Social Responsiveness Scale (SRS) at pre- and post-intervention. Additionally, use of the Goal Attainment Scale (GAS) served as a means to assess the student's general understanding of each lesson. Implications for the child included potentially improving emotional understanding of the self and others. The study intended to also help the child improve their understanding of others' actions and desires, and impact how they relate to other individuals in their environment.

Introduction

Autism spectrum disorder (ASD) is largely characterized by marked difficulties with social communication. It has been hypothesized that poor social skills contribute to reduced psychological wellbeing for individuals with ASD (Hotton & Coles, 2015). Additionally, social communication deficits have been shown to negatively affect academic performance (Welsh, Parke, Widaman, & O'Neil, 2001). The proposed study seeks to identify ways in which children with autism spectrum disorder (ASD), can learn and develop social skills through the use of a cognitive behavioral intervention. A primary component of successful socialization is perspective taking, or the ability to understand and interpret another's feelings, needs, and intentions. It has been found that in children with ASD, this skill is often under-developed. The relationship between perspective-taking ability and the social behavior of children with ASD was studied by Dawson and Fernald (1987), who found that perspective taking was significantly correlated with both social maturity and social behavior.

Relational frame theory (RFT) researchers (e.g. Gould et al., 2011) view perspective taking as a generalized operant behavior that can be learned via multiple exemplar training. Efficacy of the behavioral approach to increasing perspective taking skills has also been demonstrated by Rehfeldt et al. (2007) in a study looking at relational learning deficits in perspective taking and employing reinforced relational responding. Rehfeldt et al.'s findings aided in establishing the notion that perspective taking is a behavior and like most behaviors, it can be taught. Further, Leblanc et al. (2003) demonstrated how this theory can be used in applying and developing similar perspective-taking interventions with children with ASD; their study relied on video

modeling and reinforcement as a means to enhance the participants' understanding of others' perspectives.

Gould et al. (2010) sought to look at the effects of another perspective-taking training. The task replicated a basic component of perspective taking, essentially the ability to identify what other people are looking at. While it was found that with training, the participants were able to correctly identify where the individual on a stimulus card was orienting, generalizability of this training was found to be low. Using the Social Thinking Methodology Crooke and Winner (2022) have emphasized the presence of the cognitive component to teaching social behaviors. It has been argued that cognitive behavioral therapy approaches to teaching social communication skills is more effective than behavioral approaches alone for children with higher functioning ASD (Crooke, Winner, & Olswang, 2016; as cited in Nowell et al., 2019). Miyadera, (2021) attempted to increase perspective-taking ability by applying this approach of combining cognitive and behavioral methods of training. The study focused on emotions and perspective taking in conversation (Miyadera, 2021). Through use of components of the Social Thinking Methodology along with structured teaching methods, Nowell et al. (2019) looked at the efficacy of an intervention targeting social communication and self-regulation with children with ASD. The study employed a cognitive behavioral approach, and results indicated an improvement in overall social communication. The current study seeks to build on previous research by incorporating modeling, repetition, use of language, and consistent training in order to increase the student's level of social responsiveness, strengthen perspective-taking skills, and ultimately transfer to broader social skills in and outside of the classroom.

Review of Literature

In order for perspective-taking training to be considered as valuable to the process of developing and strengthening social skills, the relationship between these two facets must be substantiated. Dawson and Fernald (1987) looked at perspective taking and its relationship to the social behavior in 16 children with ASD. The children's ages ranged from six years and one month to 14 years and seven months. Five subtests were administered to measure perceptual role taking, while two were administered to measure conceptual role taking, and one to measure affective role taking. Perceptual role taking tasks included asking the child to present different drawings and faces of cubes so that they were oriented in a particular manner towards the experimenter. The child had to consider how they saw the drawing or cube versus how the experimenter was seeing it. The conceptual role taking tasks required the child to consider what might be appropriate for or desired by another person when presented with specific scenarios. This prompted the children to think about how to predict another's needs by tapping into how another individual's perspective differed. The affective role taking tasks simply asked the children to listen to situations and identify emotions that would likely arise for another person. The scores on these tasks added together gave a measure of general perspective-taking ability. To measure social behavior, the Vineland Social Maturity Scale and the Social Behavior Rating Scale were given to each child's teacher, and informal ratings were given by the examiners as well. In the analysis phase, it was found that perspective-taking ability most consistently predicted level of social behavior and perspective-taking ability was significantly correlated with both measures of social behavior, as well as with the severity of autistic symptoms (Dawson & Fernald, 1987). Given the correlation

between perspective-taking and social behavior, it is likely that conducting perspective-taking training as a behavioral intervention could lead to an increase in positive social behaviors.

The establishment of the relationship between social behavior and perspective-taking ability has opened the door for further research in the areas of perspective-taking training. In determining the most effective methods for perspective-taking training, researchers have considered what precisely perspective taking is. Relational frame theorists (RFT) like Rehfeldt et al. (2007) have proposed looking at perspective-taking as less of a cognitive conceptual act and more so as something people simply do; in other words, it can be viewed as a behavior (Gould et al, 2011). While research from behavioral analysts on perspective taking is limited, the RFT approach builds on decades of research on behavioral principles of learning and motivation.

Gould et al (2011) structured their study on perspective-taking ability and its relationship to the social behavior of children with ASD by considering the existing body of literature that has established the relevancy of perspective-taking to social behavior and the apparent efficacy of training and reinforcement to increase perspective-taking ability. The study included three children with ASD. A variety of stimulus cards were created for the study, and on each card, the child was asked to identify an object the person on the card was seeing. During natural environment probes, the participant was required to name an object in a real person's field of vision. Generalization sessions were included as well, where children were presented with both old and new cards. During baseline testing, all participants showed low percentages of correct responding. After training and maintenance sessions, the children showed a significant increase in response

accuracy. On natural environment probes the children responded with 49%, 66%, and 44%, accuracy. Two of these children had begun the study responding with 0% accuracy on the natural environment probes. It was noted that improvement levels on generalization probes were greater for each child compared to natural setting probes. One potential reason for this is the differing amounts of "distracter" stimuli present in the rooms compared to "distracter" stimuli placed on the cards. It has been suggested that it may have been more effective to train in the natural environment to begin with (Gould et al, 2011). Given the impact of the "distracter" variable on perspective-taking performance, training may be improved if this variable is allowed in the environment. The variable, while posing an extra challenge, exposes a child's true ability to identify and attend to another person's specific orientation despite what may be in the surrounding area. The current study sought to incorporate this phenomenon.

Imitation has been considered as a potentially important component to be included in perspective-taking skills training. LeBlanc et al. (2003) used imitation as a core factor in the perspective-skills training. The study used video-modeling, which involved showing a videotape of a person providing an exact version of a behavior for a child to imitate. The experiment included three boys with ASD, aged seven to 13. Three different measures of perspective taking were administered: the Sally-Anne task, the M&Ms task, and the Hide and Seek task. In each of these tasks, the child was given novel information about the whereabouts of an item, or the identity of an item that had been disguised. The child was then asked to guess what another child (without the same information) might guess if they were asked to find or identify the objects. Before each of these tasks was administered, the child was shown a video of an adult correctly

completing the task, then explaining the line of thinking that leads to the correct response. After watching, the child was then asked the perspective-taking questions. Incorrect responses led to the video being played again, and the child was asked to pay attention until they were able to correctly imitate responses. All children were able to pass the tasks with this repetition. All participants failed the Sally-Anne task; however, they were able to pass it after completing training for previous tasks. The controlled setting in which the study took place could be considered a limitation. LeBlanc et al. (2003) suggest that future studies on increasing perspective taking occur in natural social situations. Again the necessity for a perspective-taking skills intervention in a natural setting was brought to light, however the efficacy of the training itself remained present. Additionally, the study results suggest repetition and the use of a model are key components to this training.

In building on this literature, precise deficits shown by children with autism in understanding the structure of roles and relations were analyzed. A study by Rehfeldt et al. (2007) has served as preliminary support for the notion that perspective-taking involves derived relational responding. The study also evaluated the notion that perspective-taking may emerge via history of reinforced relational responding, and supported the idea that perspective-taking skills can be trained. The study included two groups of nine children ages six to 13. Each child in the experimental group had previously been diagnosed with either high-functioning autism or what had previously been known as Asperger syndrome. The control group consisted of children who were considered to be typically developing. In Experiment 1, the children were presented with a modified version of the Barnes Holmes protocol and consisted of 57 total trials, with

each trial including two questions. In general, the questions looked at simple relations, reversed relations, and double reversed relations. The participant had to answer both questions correctly in order for the trial to be scored as correct, and only in Experiment 2 (which utilized the same procedure) were corrections and reinforcements implemented. A 2 x 3, between- by within-subjects analysis of variance was conducted. The main effect for relation was found to be statistically significant. Results showed that the experimental group made more errors on all reversed relation test trial types than the control group did. The difference between the number of errors made on the reversed versus simple relations in the experimental group was notable. Following training trials with the control group, in comparison to pre-test performance the participants' accuracy increased significantly. This study highlights the presence of a perspective-taking deficit in children with ASD, specifically as it relates to relational responding. Additionally, it further supports the notion that perspective-taking in the form of relational responding is a skill that can be trained, as evidenced by improved performance by the control group post-training.

A case study by Miyadera (2021) intended to look at the role of perspective taking in a conversational intervention. The participant was encouraged to recognize emotions and understand the mental states of others. The study included one participant, who was a nine-year-old Japanese boy with ASD. The participant attended 10 sessions consisting of emotional and conversational training. During these sessions, the child was taught to recognize his and others' emotions, and how they may differ using the Cognitive Affective Training Program. Additionally, he was taught the basics of what a conversation entails, and what's important. Components of behavioral skills training were

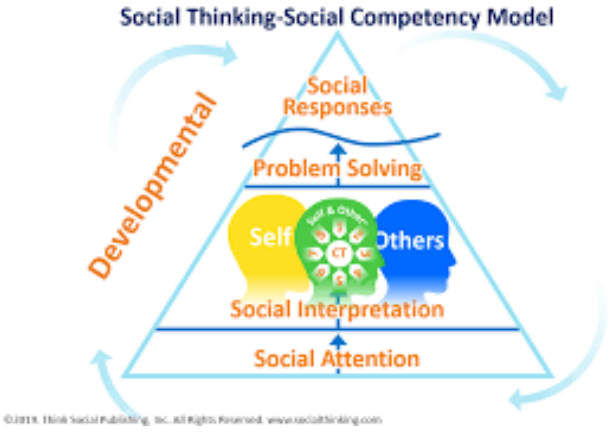
also included through this program, such as instruction, modeling, and monitoring. Following the sessions, the Sally-Anne task and the Smarties task were administered. In addition, the Japanese version of the Multidimensional Empathy Scale for Children (MESC-J) was utilized to look at the child's empathy and perspective-taking skills. Lastly, a conversational analysis took place where the child's discourse ability with a new person was assessed. It was found that at post-intervention, the participant was able to pass both Theory of Mind (ToM) tasks. Review of the results from the MESC-J revealed that the child's empathy score had increased by eight points while the child's perspective-taking score increased by three points. The conversational analysis found that at post-intervention, the percentage of self-expansion (relating to the child's self-concept and motivation levels) was significantly lower than at baseline, and the child's ability to develop a story while simultaneously incorporating other stories (i.e., expatiation) was significantly higher. Overall, the study found that this intervention, which was designed to focus on emotion, had some effects on perspective-taking ability. As it was a case study, it is not clear whether the findings could be generalized. Results from this study align with previous research that have supported the efficacy of social skills training focused, at least in part, on the component of perspective taking. Miyadera et al. (2021) introduced the component of one-on-one conversation training and the benefits of practicing conversations with new individuals.

Crooke and Winner (2022) further dissect social metacognition and its relation to social competencies. According to Crooke and Winner (2022), social metacognition includes introspective thinking, or reflecting on one's own thoughts, and extrospective thinking, or thinking and considering thoughts about others. Crooke and Winner (2022)

also noted that language plays an essential role when learning to notice one's own internal thoughts. By providing vocabulary to describe one's own perspectives, intentions, and feelings, one can more readily make sense of their own thoughts and experiences. The relationship between social metacognition and social competencies becomes apparent when a child is problem solving with others, inferring others' actions, thoughts feelings, beliefs, and intentions, engaging with others, as well as deciphering hidden rules. With metacognitive teaching, the focus is on socially attending to contexts, people, and events and interpreting what is observed to then problem solve and make decisions on how to respond. The four-tiered model *Social Thinking-Social Competency Model* (ST-SCM) illustrates this complex relationship between social metacognition and social competencies.

Figure 1

The Social Thinking-Social Competency Model



Nowell et al. (2019) utilized components of the Social Thinking Methodology in combination with the Structured TEACCHing framework while assessing the efficacy of a social communication and self-regulation intervention for school-age children with autism. Within small groups, the social communication training took place in an

environment that was structured to make activities understandable, employed strengths in visual skills to supplement weaker skills, included special interests to promote engagement in learning, and supported self-initiated meaningful communication (Mesibov & Shea, 2010, as cited in Nowell et al., 2019). Tasks flowed from one to the next in a meaningful, and predictable manner. The Social Thinking component of using language-based strategies that can be used across social environments was blended into the structured TEACCHing framework in order to create the program. This combination allowed for abstract social concepts to be made more concrete for children with ASD, who commonly do not infer meaning in language easily. When looking at social communication, the intervention provided terminology to describe expected versus unexpected behaviors and look at group plans. The intervention also stressed how social information can be conveyed through nonverbals, such as eye gaze, nodding, or facial expressions. Additionally, the intervention utilized social narratives, which allowed for the child to write personal narratives using their perspective about behavioral expectations in particular settings. Overall, it was found that the intervention group improved in their social communication knowledge and skills during the intervention period significantly more than a delayed treatment group.

Purpose

The overarching purpose of this quantitative, single case study was to evaluate how social skills training, with particular emphasis on perspective taking, could increase overall sociability for a child with autism. Previous research has demonstrated that poor social skills may contribute to reduced psychological well-being, and poor academics. The training intended to strengthen a skill that is central to socialization. The training

then intended to transfer to broader socialization, noticeable by the student's teacher (i.e., someone who regularly observed the child in varying social situations within the school environment). By the end of the ten weeks, the ability of the student to successfully socialize and be present in social environments was expected to be noticeably different. Little research exists on the impact of social skills training on perspective-taking ability and overall socialization levels outside of a clinical setting. As the school setting is more widely accessible, and needs can be more readily identified (especially social needs), an intervention conducted in this environment, utilizing a research-based curriculum designed for school use, could be potentially beneficial.

Previous relational frame theorists have substantiated the claim that perspective-taking can be viewed as less of a cognitive conceptual act and more so as a behavior (Rehfeldt et al., 2007). Additional research has expanded on this notion by suggesting that while perspective-taking and generalized social activities are behaviors, there are underlying cognitive components (Crooke & Winner, 2022). With the understanding and support from previous research that behaviors can be taught using a cognitive behavioral approach, the first research question for the current study was: Can behaviors and skills relating to perspective taking be taught using a cognitive behavioral approach? Previous research has also substantiated that there is a significant direct correlation between perspective taking and social maturity and behaviors (Dawson & Fernald 1987). Therefore, the second research question was: Can engaging in a perspective-taking training result in an overall increase in social responsiveness for a child with autism?

Methodology

Participants and Setting

As a single case study, one participant was required in order for the study to move forward. The participant was an eleven-year-old, fifth grade boy receiving Exceptional Student Education (ESE) services as a student with ASD.

This research was conducted within a large school district located in southeastern Florida. The individual intervention sessions took place within the participant's elementary school. The student was met in his classroom before each session and walked to the office of the school's assigned school psychologist, which the participant had been in prior to the start of the intervention for testing purposes. The office was located within the guidance suite, which allowed for some noise from students and staff to be heard. The researcher and participant sat next to one another at a small table during each session.

Instrumentation

Social Responsiveness Scales

The Social Responsiveness Scales (SRS) is a 65-item rating scale that measures the severity of autistic symptomatology as a quantitative trait, and it is particularly useful for characterizing milder autistic syndromes. This rating scale can be completed in 15 minutes and rates children in their natural social contexts as well as reflects what has been consistently observed over weeks or months of time. This instrument generates scores for specific domains relevant to autistic social impairment; higher total scores indicate greater severity of social impairment. Norms have been published by gender and rater type. All T-scores have a mean of 50 points and a standard deviation of 10 points. The specific domains addressed on the SRS include Social Awareness, Social Cognition, Social Communication, Social Cognition, and Restricted and Repetitive Interests. The subdomain of Social Awareness looks at a student's ability to pick up on social cues,

while the area of Social Cognition measures how well the student interprets these social cues. The area of Social Communication largely focuses on how well a student communicates expressively when actively socializing. The subdomain of Social Motivation measures the student's extent of motivation to engage in social-interpersonal behavior, and the area of Restricted and Repetitive Interests focuses on the presence of certain behaviors that are stereotypical of those with autism as well as restricted or very specific interests.

The SRS has high inter-rater reliability, as evidenced by strong correlations between parent and teacher reports (r = .72). Additionally, this instrument has high validity as evidenced by strong re-test correlations at a 3–6-month interval (r = .95). The SRS has also shown to correlate with the Social Communication Questionnaire (r = .68, r = .58, r = .65, r = .61) as well as moderately correlate with the Social and Communication Disorders Checklist (r = .49). The instrument has shown to be non-significantly correlated with IQ among children representing the normal range of IQ in the general population (Constantino et al, 2007).

The SRS aligns with research question 2, as it measures levels of social responsiveness. Furthermore, it was appropriate for the intended population as it is not significantly correlated with IQ among children representing the normal range of IQ in the general population, therefore by recruiting a child who represents the normal range of IQ, one could expect the rater's scores to have high validity. In other words, the SRS truly measures sociability and is not impacted by a lowered IQ. Additionally, SRS scores have been found to be correlated with other reliable and valid tests measuring the same construct. Lastly, re-test scores across a 3–6-month interval have shown stability. With

this knowledge, one could more confidently conclude that any changes on SRS scores after the 10-week intervention would be due to the intervention itself and not to low test-retest reliability.

The Goal Attainment Scale

The Goal Attainment Scale (GAS) is a structured observational tool that allowed the researcher to quantify the student's weekly progress. The GAS is a criterion-referenced measure that uses a scale with five levels of attainment represented by scores ranging from -2 to +2. The structure of the GAS allowed for a more objective observation of the student's progress towards attaining the lesson goals. The primary goal was for the student to display an adequate understanding of the lessons presented, and therefore suggest to the examiner that on that day, an impact had been made. The table below served as a guide for completing the GAS during observations:

+2	Much higher/much more than anticipated	Significant impact
+1	Higher/somewhat more than anticipated outcome	Moderate impact
0	Projected level of performance	No impact
-1	Somewhat less than anticipated outcome	Moderate regression
-2	Much less than anticipated outcome	Significant regression

"You Are a Social Detective!"

The "You Are a Social Detective!" (Winner & Crooke, 2020) is guided by the Social Thinking research-based curriculum. It is intended to be used in schools for group use; however, it was adapted for one-on-one use for the purposes of the current study. Social thinking in this curriculum has been defined as "the ability to share space effectively with others, whether interacting or not… It is being able to observe what is happening, interpret the meaning, problem solve, and respond." (Winner & Crooke,

2020, p. 9). The curriculum teaches social competencies through a core four-step teaching and social learning process: (1) attend, (2) interpret, (3) problem solve, and (4) respond. The curriculum includes 10 lessons, and each lesson plan includes the following components:

- Big picture context: Review of the lesson's target skills, their importance, and how they lead to more successful social outcomes at school.
- Lesson objectives: The expectations for the student which include but are not limited to defining newly learned vocabulary, using new skills to attend to and interpret comic depictions of different scenarios, reflecting on newly learned material, and memorizing new social skills strategies. (See Appendix C for a list of objectives for each session.)
- Key vocabulary to emphasize: Each lesson is largely defined and guided by a new set of vocabulary that is used and emphasized throughout the sessions. The student is encouraged to use and think about the vocabulary learned outside of the sessions as well.
- Suggestions for how to introduce the lesson: Loosely structured options for how to begin each lesson. Typical lessons begin with a brief review of the previous week's material.
- Discussion prompts: Additional questions that re-emphasize key concepts and offer the opportunity for conversation, clarification, and feedback around newly learned concepts. This provides the opportunity for the student to provide their own social narratives, explain how they are understanding the material, and even provide examples.

- Extension activity ideas with photo examples: Optional activities that allow for further reflection of material to be combined with engaging and creative tasks (e.g., making "brains" out of playdough and discussing how they look different from one another and why to encourage introspective and extrospective thinking).
- Writing prompts to extend the learning: Optional writing activities that can assist the students as they learn and retain the newly learned material.

The lessons are engaging and age appropriate; they are animated and include hands on activities such as crafting and drawing. During each lesson, the child was prompted to think about their own and others' areas of strength, use "clues" to consider a given situation (i.e., place, people, and what is happening), assess different comic displays depicting social situations, and decipher what is happening, how people are feeling, and what will happen next. The lessons also covered expected behaviors, as well as "hidden" rules, or unspoken expectations, and how to assess unexpected behaviors. Throughout the lessons, the concepts of the participant's and others' feelings are emphasized and is consistently a part of the conversation.

Procedure

The study utilized a quantitative, single-case design with pre-, during, and post-intervention data collection. One fifth-grade student, receiving ESE services as a child with autism spectrum disorder, participated in weekly trainings with the researcher. The researcher followed the Social Thinking curriculum entitled, "You Are a Social Detective" for 10 weeks, implementing one lesson each week. After receiving Institutional Review Board (IRB) approval from the researcher's institution as well as the school district in which the study took place, the study began.

The recruitment procedure began by contacting the principal of the chosen school to request permission to recruit one student for participation in the study. Details of the researcher's role, both inside and outside of the research, were described. Details of the study itself along with the purpose and potential benefits were provided as well. Following approval, the school's local school psychologist reached out to the ESE teachers to inquire if there were any potential students who met the following criteria: the child was between the ages of 9 and 12, received services by the school as a student with ASD, demonstrated sufficient verbal skills to participate in the curriculum, and exhibited functional cognitive levels at or above below average. The researcher was not made aware of the identities of the potential students. Once it was determined that one of the anonymous students' met criteria, the school psychologist and ESE specialist contacted the parent via email. The parent was informed that there was an opportunity for their child to participate in a social skills intervention as part of a study that would contribute to the researcher's thesis work. A description and the purpose of the study was provided along with the contact information of the primary researcher. The parent was encouraged to reach out to the researcher if they were interested. The parent contacted the researcher via email, who then answered further questions, and provided the consent form for the parent to sign to allow their child to participate. The participant was also asked to review and sign, if they wish, an assent form.

Prior to beginning work with the child, the child's teacher was asked to complete the Social Responsiveness Scale (SRS) in order to obtain baseline data. Once baseline data was obtained, training sessions were able to begin. The child attended ten consecutive training sessions lasting approximately 35 minutes each during non-core

instruction. During each session, the examiner and child worked through one of the ten lessons of the "You Are a Social Detective!" curriculum.

In each session, the goal for the child was to demonstrate improved understanding of the material. Following each session, the researcher assigned the student a Goal Attainment Scale (GAS) score based on observations of the student's progress and the presence of meaningful engagement with the curriculum that demonstrated understanding. Each session, the student had the opportunity to receive a score ranging from -2 to +2.

Following the tenth session, the child's teacher was asked to complete the SRS to collect post-intervention data. Pre- and post-intervention scores were obtained for the overall T-Scores, as well as each of the subdomains on the SRS (i.e., Social Awareness, Social Motivation, Social Cognition, Social Communication, and Restricted and Repetitive Interests).

Analysis

T-scores from each domain of the SRS were obtained at pre-and post-intervention. Pre- and post-scores were compared to one another at the close of the intervention. Changes in T-scores in each domain from pre- to post-intervention were noted and analyzed. For the purposes of the current study, a difference of 1 standard deviation (i.e.,10 points) or more was considered notable. Considering the general stability of SRS scores across 3-6 months, a difference of 10 points between a pre- and post-intervention (which lasted approximately 2.5 months) is noteworthy. The domains examined included: Social Awareness, Social Motivation, Social Cognition, Social Communication, and Restricted and Repetitive Behaviors and Interests. As each domain

T-score had specific items that contributed to different domain level scores, these individual items were also addressed and analyzed. This was intended to provide additional insight into which specific social behaviors of interest changed over time.

The Goal Attainment Scale served as a way to quantify qualitative observations during sessions. This required the examiner assigning the participant a score from -2 to +2 after each session. As previously noted, scores largely relied on whether or not an impact was made, or how much or how little of an impact was made. In considering GAS score assignment each week, the examiner looked at criteria such as how well the participant answered questions, if he engaged meaningfully (e.g. made relevant comments and asked relevant questions) and made connections from previous material learned during sessions. A visual presentation of all 10 acquired GAS scores illustrates for the reader how well the participant was receiving and applying the different concepts taught. This holistic view of the participant's general performance over time provides insight into how well he effectively learned. The choice of and manner of analysis here seeks to answer the first hypothesis.

The GAS system of analysis was also considered in order to contribute to the meaningfulness of the quantitative data collected using the Social Responsiveness Scale (SRS). While SRS scores alone could merely show if a change in social responsiveness was present, the additional consideration of GAS scores allows the reader to make inferences and understand why or why not changes occurred and contributed to the face validity of the scores.

Rigor and Trustworthiness

Stringent requirements for participation were considered in order to combat confounding variables and increase the trustworthiness of the intervention. Inclusionary criteria stipulated that the child's cognitive abilities fell within the below average to average range to ensure the student could meet the demands of each lesson and meaningfully interact with the material. It was also stipulated that the participant had sufficient verbal skills to ensure their use and understanding of language did not hinder any progress or prevent them from engaging in the lessons.

Additionally, the study utilized a curriculum guided by research-based methodologies backed by peer-reviewed publications (Crooke & Winner, 2022; Tarshis, et al., 2020; Clavenna-Deane et al. 2020; Nowell at al., 2019). Each of these studies related to various components of the Social Thinking Methodology. The "You Are a Social Detective!" curriculum itself has been used in classroom and clinical settings and has been lauded for its enjoyable nature, easy implementation, as well as for how it guides the social learning process.

Results

The research questions that this study sought to answer were first, can behaviors and skills relating to perspective taking be taught using a cognitive behavioral approach? And second, can engaging in a perspective-taking training result in an overall increase in social responsiveness for a child with autism? This section will describe the results for the dependent measures, as well as discuss the answers to the research questions.

Baseline

Baseline data were obtained through a pre-intervention assessment of the participant's social responsiveness using the SRS. The categorical placement of T-scores

on the SRS was considered. According to the SRS manual, T-Scores of 59 and below fall within normal limits. Scores between 60 and 65 fall within the Mild range, while scores between 66 and 75 fall within the Moderate range. Lastly, scores of 76 or higher fall within the Severe range. The participant's total T-score at baseline was 61. This score fell within the Mild range, indicating the presence of deficiencies in social behavior that were clinically significant.

In the subdomain of Social Awareness, the participant attained a T-Score of 61 at pre-intervention. This score fell within the Mild range, which again indicated deficiencies in social behavior that are clinically significant. At that time, the participant's teacher indicated that the student was not aware of what others were thinking or feeling. Additionally, she indicated that the participant *sometimes* knew when he was talking too loudly or making too much noise.

In the subdomain of Social Cognition, the participant attained a baseline T-Score of 55, which fell within normal limits. Teacher ratings indicated that the participant did not become upset when there are lots of things going on. The teacher also endorsed that the student does not always recognize when others are taking advantage of him.

Regarding the subdomain of Social Communication, the participant attained a T-Score of 61 at pre-intervention, which fell within the Mild range. The participant's teacher indicated that the student could *sometimes* communicate his feelings to others, and is *sometimes* inflexible and has a hard time changing his mind.

In the area of Social Motivation, the participant attained a T-Score of 66 at pre-intervention. This score fell within the Moderate range, which further indicated deficiencies in social reciprocal behaviors and fell in the clinically significant range.

Scores such as these are typical for children with autism spectrum disorders of moderate severity. The teacher endorsed that the student did not always seem self-confident when interacting with others, and he did not join group activities unless told to do so.

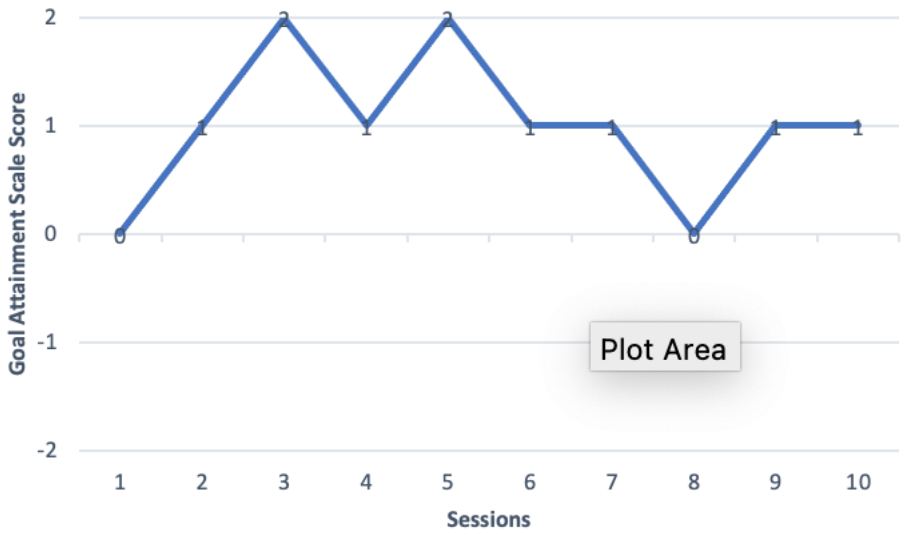
In the area of Restricted Interests and Repetitive Behavior, at baseline data collection the participant attained a T-Score of 68, which falls within the Moderate range. According to the teacher's ratings, it was often true that the participant would touch others in an unusual way (e.g., he may have touched someone just to make contact and then walk away without saying anything). Her ratings also indicated that the student behaved in a way that seemed strange or bizarre and thought or talked about the same things over and over.

Intervention Implementation

Throughout the intervention sessions following baseline data collection, the researcher assigned GAS scores to the participant after each session based on details of the participant's performance and success levels, which were obtained through observation. The GAS scores intended to provide more depth and insight to SRS data at pre as well post-intervention. These observations were attached to GAS scores. A visual presentation of these scores across the ten weeks can be found below.

Figure 2

Goal Attainment Scale Scores Across 10 Intervention Sessions



After session 1, the study participant was given a base score of 0. As this was the first session, neither improvement nor regression in performance could be observed yet. The participant was observed as friendly, and willing to engage with the researcher and share about himself. He demonstrated enthusiasm for the intervention.

Following session 2, after consideration of the observed performance, the participant was given a GAS score of +1. The participant answered questions such as "where do we use our social smarts?" readily. He identified the different areas of school in which he and other peers socialize. He demonstrated an ability to self-reflect on his own personal "smarts" when prompted, though some hesitations were observed when reflecting on how others may have different "smarts" or strengths, from him.

In session 3, the participant was reflective as he considered how he, as the social detective, uses his different senses (e.g., listening, watching) to attend to a situation and the peers who are a part of it. He expanded on his responses by providing relevant examples. His performance on this day earned him a GAS score of +2.

The study participant's performance in session 4 earned a GAS score of +1. The participant continued to demonstrate an understanding of what tools he had at his disposal to gather clues about a situation. He identified the actions of characters in pictures to determine what they were doing. When asked to use this information to make further connections, the participant was not consistently successful. For example, a picture was shown of a young boy scowling at a piece of broccoli with the words, "I don't like broccoli but I'll try it". The participant was asked what he would think was happening the next time this same boy was seen not eating broccoli. His response did not indicate that the boy does not like broccoli.

Following session 5, the participant received a score of +2. The participant was asked to use his toolbox to make smart guesses about different character's feelings. He identified details in the images such as the characters' faces, background details, and actions of surrounding characters. He used his observations of these details to successfully identify what was happening with the individual or a group (e.g., "they are sad", "the group is not listening to the teacher"). He demonstrated an understanding of new material while employing previously learned material.

Lesson 6 required the participant to define hidden rules or expectations. He demonstrated a basic understanding of this. When presented with "real" situations found in a storybook in which there were "hidden rules" (such as children in a library), he required additional time and help (in the form of verbal hints and pointing) from the researcher in order to identify these rules. However, he showed an understanding of the basic concept of the lesson. He earned a score of +1.

Following lesson 7, the participant was given a GAS score of +1. He demonstrated an understanding of what is meant by expected behaviors and gave relevant examples from his own life in which he follows the expected behaviors for him (e.g. being safe on the internet). He identified some basic expected behaviors presented in images, such as keeping one's body inside the circle during a small group game. The participant struggled more so when presented with the additional component of considering how it impacts others when he (or a character in an image) does or does not follow expected behaviors.

Lesson 8 required the participant to consider unexpected behaviors and the impact these may have on others. He was shown illustrations of characters showing emotions in response to an unexpected behavior. He demonstrated an understanding of the basic concept that presenting with unexpected behaviors can negatively impact others. He struggled with the specific emotions relating to this behavior. He provided example stories of his own in which expected behaviors were present, as opposed to unexpected behaviors. He shared that the lesson reminded him of when something good happened for his brother, so his brother became very happy. For this lesson he earned a score of 0.

In lesson 9, the participant was asked to reflect on how he had grown in his social smarts during these sessions. He discussed previously learned skills relevant to the lessons. He looked at new illustrations he had not seen and made smart guesses about the situations. However, in some situations where more in-depth consideration of unwritten expectations was required, he continued to struggle. He was given a score of +1 for this session.

Following lesson 10, the participant earned a score of +1. Using his previously learned skills, he discussed what was meant by observing others and gave an in-depth explanation as to how he can do this. He recognized what is meant by "others notice us" but was less willing to speak more to how one does this. He demonstrated a more thorough understanding of "unexpected" behaviors, as he more consistently identified what the unexpected behavior was, and described why it was different and what the impact was.

Post-Intervention

At post-intervention, SRS data were obtained in order to determine if an increase in the study participant's overall social responsiveness was made following the intervention.

The participant's total T-Score decreased from a score of 61T to 59T. This score initially fell within the Mild range, and at post-intervention, it fell within normal limits. However, the difference was less than a single standard deviation and is not considered notable.

In the subdomain of Social Awareness, the participant attained a T-Score of 48 at post-intervention. Compared to baseline data, this represents a difference of 13 points, which is more than 1 standard deviation and is notable. While the participant's score at pre-intervention indicated deficiencies in reciprocal social behavior, his score at post-intervention fell within normal limits. At post intervention, teacher ratings indicated that it was *sometimes* true that the student is aware of what others are thinking or feeling, while at pre-intervention she indicated that this was not true. Additionally, the participant's teacher indicated that it is *almost always* true that the participant knows

when he is talking too loudly or making too much noise. As previously noted, this was not indicated at pre-intervention.

In the domain of Social Cognition, the participant attained a T-Score of 64 at post-intervention. The increase in this score in comparison to baseline data suggests the participant's score went from falling within normal limits, to falling within the Mild range. However, the difference is less than one standard deviation. The participant's teacher endorsed that the participant does not always recognize when others are taking advantage of him at both pre- and post-intervention. However, his teacher indicated that it was not true that the participant becomes upset when there are lots of things going on before the intervention began, at post-intervention, she indicated that this is *sometimes* true.

In the subdomain of Social Communication, the participant attained a T-Score of 56 at post-intervention. The participant's score at pre-intervention fell within the Mild range, while at post-intervention his score fell within normal limits. While a change was present, the degree of change was not notable. At both pre- and post-intervention, the participant's teacher indicated that it is *sometimes* true that he can communicate his feelings to others. Teacher ratings indicated at pre-intervention that it was *sometimes* true that the participant is inflexible and has trouble changing his mind while at post-intervention, the teacher did not indicate this behavior was present.

In the area of Social Motivation, the participant attained a T-Score of 68 at post intervention. At both pre- and post-intervention, the participant's T-scores fell within the Moderate range, which indicates continued deficiencies in social reciprocal behavior. As previously noted, scores such as these are typical for children with autism spectrum

disorders of moderate severity. His teacher endorsed at both times of measurement that he does not always seem self-confident when interacting with others, and he does not join group activities unless told to do so.

In the area of Restricted Interests and Repetitive Behavior, at post-intervention the participant attained a T-Score of 51. The difference between the participant's obtained scores in this subdomain was more than one standard deviation and represents a notable difference. At pre-intervention, his score fell within the Moderate range while at post-intervention his score fell within normal limits. At this time, the participant's teacher's ratings indicated that it was not true that the participant would touch others in an unusual way (e.g., he may touch someone just to make contact and then walk away without saying anything), while at baseline this was *often* true. Her post-intervention ratings also indicated that it was not true that the student behaves in a way that seems strange or bizarre and thinks or talks about the same things over and over.

Table 1

Social Responsiveness T-Scores Pre- and Post-Intervention

Domain	Pre-Intervention	Post-Intervention	Difference Score
Total	61	59	-2
Social Awareness	61	48	-13*
Social Cognition	55	64	+9
Social Communication	61	55	-6
Social Motivation	66	68	+2
Restricted and Repetitive Interests and Behaviors	68	51	-17*

Note. Average T-score = 50, standard deviation = 10. * *indicates a difference score of at least 1 SD (i.e., notable change)*

Discussion

The aim of this study was to investigate the effectiveness of a social skills intervention targeting perspective taking on the overall sociability of a child with autism. As poor sociability has been correlated with reduced psychological well-being and poor academics, interventions that target social skills should be further studied. It is important that these interventions occur in settings where the need is readily identified and the services can be further reaching, namely schools. The majority of studies targeting the effectiveness of social skills interventions (specifically those targeting perspective taking) occur in clinical settings. In these settings generalizability is low as it does not allow for the added benefit of including observations in real-world settings, such as the classroom or playground. In addition, many families may not be able to bring their children to clinics or other intervention sites due to costs, time, and transportation. The current study combines the benefits of using a controlled, structured setting for training purposes with the opportunity to obtain information about the child generalization of these skills in their natural setting.

When considering the effectiveness of the current intervention, the participant's weekly performance and response to lessons should first be considered. Throughout the lessons, the participant grasped the more basic, tangible concepts with ease. This included simple reflection of one's own feelings and thoughts, (i.e., introspection) and an ability to see some of these same or different feelings in others (i.e., extrospection). He understood rules that were written and explicitly stated, especially those that he was commonly exposed to (i.e., expected classroom behavior, home rules, etc.). Bringing to mind Crooke and Winner's Social Thinking-Social Competency Model, these behaviors

make up the first tier: Social Attention (Crooke & Winner, 2022). With the added component of reading others' feelings and behaviors in order to then interpret the appropriate social rules, the student struggled. However, with each lesson, certain tasks or questions were either similar or repeated, and the participant demonstrated an ability to show an improvement in his understanding. These behaviors most closely align with tier 2 of the Social Thinking-Social Competency Model: Social Interpretation. LeBlanc et al. (2003) had previously suggested that repetition and the use of a model were key components to the training. With the current study, it was found that with repetition and corrective feedback, the participant could form connections that he struggled with more so in previous weeks. For example, the strategy of observing and identifying the situation before making "smart guesses" was used repeatedly throughout the sessions. By continuing to employ this strategy, and observe how characters in the book did this, the participant was able to successfully find "hidden rules" in different situations. He more readily identified simple rules such as the expectation for students to look at the teacher during a lesson, or the expectation for children to remain in their seat during a sit-down game. However, as situations continued to become less familiar and required further observation of details and understanding of more individuals in a group, this strategy was less useful. Components of the third and fourth tier (i.e., Problem Solving and Social Responses, respectively) of the Social Thinking-Social Competency Model were presented in these later lessons. Though some of these lessons were more complicated and he demonstrated solid foundational skills, the training involved appeared to impact the child minimally. Some of the basic skills acquired during earlier lessons (such as those relating to social attention) may not have transferred to the more complex topics.

The participant's level of social responsiveness from pre- to post-intervention was notable in a few areas, while less notable in others. While differences in overall SRS T-Scores between pre- and post-intervention was not notable, there were particularly notable changes between scores in the areas of Social Awareness and Restricted Interests and Repetitive Behaviors (RRB). Social Awareness measured the participant's ability to pick up on social cues. At the start of the intervention, the participant's teacher endorsed enough items for this score to fall within the Mild range, while at the close of the intervention, this area had the least number of concerns reported, and the resulting score fell within normal limits. Throughout the study, the intervention emphasized observing the situation, as well as other's actions, in order to understand social expectations. While the study results alone may not explicitly indicate conclusively that this training contributed to the improved score, there appears to be a relationship here. Gould et al. (2011) had previously explored this relationship with some success. The study was structured around drawing the child participant's attention to what other people were seeing, thus making social awareness a key component of the perspective-taking training. The skill of observing was also noted by the researcher to be the most consistently present during lessons. It appeared that the participant learned to use this strategy as he took on other more complex tasks and concepts presented in the curriculum. Nowell et al., (2019) employed the strengths of the child's visual skills to supplement weaker skills. In the current study, abstract social concepts that were difficult for the child to define or discuss meaningfully could be more readily teased apart with the addition of visual support (i.e., a comic display depicting a social situation). He demonstrated a strength with his ability to visually break down what a situation in front of him looked like, and

from there he could attempt to make his interpretations. Similar to Gould et al. (2011), the study allowed for "distracter" variables to be present (e.g., more characters in a picture that were not relevant to the situation, un-important rules) and like in the aforementioned study, this subsequently led to difficulties. However, his continued use of and improvement around the skill of observing resulted in increased GAS scores in several sessions.

The participant's scores on Restrictive Interests and Repetitive Behaviors was also notable between pre- and post- intervention. This domain looked at stereotypical behaviors or highly restricted interests. As the intervention targeted skills more central to the act of socializing and understanding socialization, the improvement in this area was not expected. It may be speculated that the increased levels of social awareness allowed the student to be more mindful and aware of his own outward behaviors. For example, before speaking about something that he may have already talked about repeatedly that day, he may have considered listening to the conversation already being had or considering whether that individual appeared willing to have a conversation with him. The participant's increased level of social awareness possibly allowed him to mimic the behaviors of other children more readily. LeBlanc et al. (2003) used modeling as a key component in a perspective-taking skills training; students observed and then were asked perspective-taking questions. A similar approach was taken in the current study, though in a more controlled manner. Again, while this single-case study alone cannot conclusively indicate causality, there was a notable difference in indirect ratings of the participant's behaviors, and previous literature supports the strategy used.

Looking at Social Communication, the decrease in scores from pre-intervention to post-intervention was relatively minor. However, this alone is telling for the reader. This domain measured the student's expressive communication. Certain positive behaviors according to teacher ratings were found to have increased, including being more flexible, and more easily changing his mind. Considering the manner in which the curriculum was taught, this limited change may be expected. The sessions focused on reading other's feelings and the situation, as well as brainstorming how and why one responds a certain way. The Social Response was the fourth tier on the Social Thinking-Social Competency Model and key component of the methodology. However, You Are a Social Detective! was initially intended to be used with small groups, which would offer more time for the students to practice expressively communicating or giving those social responses. In the current study, teaching this skill relied only on discussion between the participant and researcher. In contrast, Nowell et. al. (2019) successfully employed several similar components of the current intervention, and as a result there was an increase in levels of social communication. However, their study occurred within small groups, further suggesting the impact that this facet may have on intervention efficacy.

In the area of Social Motivation, increased scores between pre- and post-intervention were observed, although the degree of change was not notable. These scores measured the participant's extent of motivation to engage in social-interpersonal behavior. There were certain behaviors noted by the participant's teacher that continued to be observed as lacking at post-intervention, such as demonstrating confidence when interacting with others and joining in on group activities. Any minor change in endorsements was not large enough to have a notable impact on scores. It may be

beneficial to consider the student's presentation at baseline. The student was friendly towards the researcher and did not appear averse to making attempts to socialize with them. For the participant, social motivation may not be related to his social ability, and therefore training specific aspects of his social ability may not transfer to these behaviors directly.

In the area of Social Cognition, increased scores, indicating increased levels of concern between pre- and post-intervention, were endorsed by the student's teacher. While it is notable that the participant's score fell within normal limits at pre-intervention and fell within the Mild range at post-intervention, the precise difference score did not surpass a single standard deviation and was not considered notable. The area of Social Cognition, as it pertained to the SRS, looked at the participant's ability to interpret social cues. From observation of the student during lessons, this skill was also noted to be inconsistent, particularly in situations that were more complex (e.g., involved more "hidden" rules, included more people). The participant's teacher was more likely to observe situations resembling this in a classroom with several other students. Additionally, it may be important to consider the timing of each SRS measurement. Post-intervention scores were collected at the close of the school year while pre-intervention scores were collected at mid-year. The weeks leading up to the end of the school year can often be less structured and lead to more social demands. The students may have had more recess-time allotted, and there may have been end-of-the-year parties and events during which the teacher observed the student. Benefits of the structured nature of the training itself was supported by Nowell et al. (2019); however, it may not allow for generalizability to real life situations that are less structured.

Limitations

The current study has several limitations. While a single-case study can provide detailed insight, these studies lack generalizability. Considering the vast spectrum of autism, it is difficult to conclusively state that the current intervention would equally benefit other children on the spectrum. Additionally, social skills are understood as developing over longer periods of time than the 10 weeks allotted in this intervention, particularly for children with autism who are often delayed and require more practice and exposure to develop their social skills. Considering the setting, Gould et al. (2011) along with LeBlanc et al. (2003) both strongly suggested that social skills training in a natural environment may be more effective than in a controlled setting. Furthermore, while qualitative data were collected using a method that is comparatively more objective than narrative observation alone, there was still an element of subjectivity which could have allowed for less accurate conclusions regarding performance.

Future Research

The findings from the current study suggests there are several directions for future research in the area of social skills interventions for youth with autism. To begin, future research may consider extending the length and frequency of such interventions. While progress was observed, researcher observation suggests more time spent on foundational social skills may be necessary in order to obtain the more advanced skills necessary to navigate the complex social world. Furthermore, while the curriculum chosen for this particular was able to be adapted as a one-on-one intervention, it is possible that the participant (or other potential future social detectives) could have benefitted more so by participating with a group. Future researchers or educators may wish to include typically

developing peers as part of the group to function as peer models who demonstrate positive social behaviors. Groups may start small, possibly two to three students, and be further adapted to use within a classroom of students. As teachers become more familiarized and informed about the curriculum, it could potentially be used in a general education classroom where mixed abilities are found. Considering the curriculum was designed for general education, all students may find something of worth from the curriculum, not only those who have particular social deficits.

Future research may also consider utilizing curriculums that focus more solely on one aspect of socializing. While perspective-taking was highlighted in the current curriculum, identification of the curriculum's true impact on this skill is made less clear by training additional aspects of socialization. Perspective taking while immersed in a broader social skills intervention may limit the impact on this skill alone.

Conclusion

In conclusion, a social skills intervention emphasizing perspective taking for a child with autism has potential to aid in the development of certain social behaviors. Levels of social awareness of the study participant noticeably increased according to teacher ratings. While the participant's ability to interpret social cues did not noticeably increase, his increased level of social awareness suggests that the foundational skill behind perspective taking (i.e., being aware of others socially) did increase. With the development of this skill, the student can continue to work on the interpretation component with more exposure to social situations, and potentially further social skills training. Additionally, restricted interests and repetitive behaviors decreased as well,

suggesting social skills training could have an impact on helping children control some impulses behind these behaviors.

References

Clavenna-Deane, B., Pearson, M., & Hansen, B. (2020). The impact of social communication on employment success for adolescents with autism spectrum disorders. *Journal of the American Academy of Special Education Professionals*

Constantino, J. N. (2013). Social Responsiveness Scale. In F. R. Volkmar (Ed.), *Encyclopedia of Autism Spectrum Disorders* (pp. 2919–2929). Springer. https://doi.org/10.1007/978-1-4419-1698-3_296

Crooke, P. J., & Winner, M. G. (2022). Social thinking metacognitive strategies to support self-determined social goals in autistic youth. *Seminars in Speech and Language*, *43*(4), 277–298. https://doi.org/10.1055/s-0042-1750815

Dawson, G., & Fernald, M. (1987). Perspective-taking ability and its relationship to the social behavior of autistic children. *Journal of Autism and Developmental Disorders*, *17*(4), 487–498. https://doi.org/10.1007/BF01486965

Gould, E., Tarbox, J., O'Hora, D., Noone, S., & Bergstrom, R. (2011). Teaching children with autism a basic component skill of perspective-taking. *Behavioral Interventions*, *26*, 50–66. https://doi.org/10.1002/bin.320

Hotton, M., & Coles, S. (2016). The effectiveness of social skills training groups for individuals with autism spectrum disorder. *Review Journal of Autism and Developmental Disorders*, *3*(1), 68–81. https://doi.org/10.1007/s40489-015-0066-5

LeBlanc, L. A., Coates, A. M., Daneshvar, S., Charlop-Christy, M. H., Morris, C., & Lancaster, B. M. (2003). Using video modeling and reinforcement to teach perspective-taking skills to children with autism. *Journal of Applied Behavior Analysis*, *36*(2), 253–257. https://doi.org/10.1901/jaba.2003.36-253

Mesibov, G.B. & Shea, V. (2010) The TEACCH program in the era of evidence-based practice. Journal of Autism Developmental Disorders, 40, 570-579. http://dx.doi.org/10.1007/s10803-009-0901-6

Miyadera, C. (2021). A conversational intervention focused on perspective-taking ability for a child with autism spectrum disorder. *Journal of Special Education Research*, *9*(2), 49–59. https://doi.org/10.6033/specialeducation.9.49

Nowell, S. W., Watson, L. R., Boyd, B., & Klinger, L. G. (2019). Efficacy study of a social communication and self-regulation intervention for school-age children with autism spectrum disorder: A randomized controlled trial. *Language, Speech, and Hearing Services in Schools*, *50*(3), 416–433. https://doi.org/10.1044/2019_LSHSS-18-0093

Rehfeldt, R. A., Dillen, J. E., Ziomek, M. M., & Kowalchuk, R. K. (2007). Assessing relational learning deficits in perspective-taking in children with high-functioning autism spectrum disorder. *The Psychological Record*, *57*(1), 23–47. https://doi.org/10.1007/BF03395563

Tarshis, N., Winner, M. G., & Crooke, P. (2020). What does it mean to be social? Defining the social landscape for children with childhood apraxia of speech. *Perspectives of the ASHA Special Interest Groups*, *5*(4), 843–852. https://doi.org/10.1044/2020_PERSP-19-00116

Welsh, M., Parke, R. D., Widaman, K., & O'Neil, R. (2001). Linkages between children's social and academic competence: A longitudinal analysis. *Journal of School Psychology*, *39*(6), 463–482. https://doi.org/10.1016/S0022-4405(01)00084-X

Winner, M. & Crooke, P. (2022), social thinking-social competency model [graphic], Social Thinking, https://www.socialthinking.com

Appendix A

Consent to Participate in Research

Identification of Investigators & Purpose of Study

You are being asked to offer consent for your child to participate in a research study conducted by Robyn Devendorf, M.A. from James Madison University. The purpose of this study is to explore the effectiveness of an evidenced-based social skills training targeting the perspective-taking skill and overall social responsiveness in children with autism. This study will contribute to Robyn Devendorf's completion of her master's thesis.

Research Procedures

Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of intervention sessions that will be administered to an individual participant in the school. Your child's teacher will be asked to provide responses on a social responsiveness rating scale.

Time Required

Your child's participation in this study will require:

- 35 minutes once per week of your child's time.
- Total time for child's expected participation is 5.8 hours and spans over the course of 10 weeks.

Risks

The investigator does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

Potential benefits from participation in this study include for the child:

- Increased success in social interactions from the intervention.
- Increased ability to express emotion/points of view from the intervention.

Potential benefits in this study for parent:

- Opportunity to see your child find more success in social interactions.

Information from this study may benefit other people now or in the future by providing further evidence of the effectiveness of the "You are a Social Detective" curriculum and its impact on social behaviors in children with ASD.

Incentives

Your child will not receive any compensation for participation in this study.

Confidentiality

The results of this research will be presented during a symposium attended by faculty and students of the graduate psychology department. The results of this project will be coded in such a way that the respondent's identity will not be attached to the final form of this study. The researcher retains the right to use and publish non-identifiable data. While individual responses are confidential, aggregate data will be presented representing averages or generalizations about the responses as a whole. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers will be destroyed. Final aggregate results will be made available to participants upon request.

Participation & Withdrawal

Your child's participation is entirely voluntary. Your child is free to choose not to participate. Should you choose to allow your child to participate, you can withdraw them at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Robyn Devendorf
Graduate Psychology
James Madison University
devendrj@dukes.jmu.edu

Dr. Tiffany Hornsby
Graduate Psychology
James Madison University
Telephone: (540) 568-3358
hornsbtc@jmu.edu

Questions about Your Rights as a Research Subject

Dr. Lindsey Harvell-Bowman
Chair, Institutional Review Board
James Madison University
(540) 568-2611
harve2la@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of me as a participant in this study. I freely consent to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Participant (Printed)

_____ _____
Name of Participant (Signed) Date

This study has been approved by the IRB, protocol #23-3557

Appendix B

CHILD ASSENT FORM (Ages 7-12)

IRB # 23-3557

ASSESSMENT OF OUR SURROUNDINGS

We would like to invite you to take part in this study. We are asking you because you are a child who likes to play and talk with other children.

In this study we will be thinking about our strengths and others' strengths. We will also think about how we feel in different situations, and how others might feel in different situations too. We will learn to be "detectives" who look for clues that will help us know how to respond best to other people. This could be on the playground, at lunch, or just in class. To do this study we will meet once a week and work through different activities together. We will be making charts, drawing, and doing crafts as well.

Participating in this study will not hurt you in any way.

Your parents have been asked to give their permission for you to take part in this study. Please talk this over with your parents before you decide whether or not to participate.

You do not have to be in this study if you do not want to. If you decide to participate in the study, you can stop participating at any time.

If you have any questions at any time, please ask the researcher.

IF YOU PRINT YOUR NAME ON THIS FORM IT MEANS THAT YOU HAVE DECIDED TO PARTICIPATE AND HAVE READ EVERYTHING THAT IS ON THIS FORM. YOU AND YOUR PARENTS WILL BE GIVEN A COPY OF THIS FORM TO KEEP.

_____ _____

Name of Child (printed) Date

_____ _____

Signature of Investigator Date

Contact: Robyn Devendorf, (757) 705-7346, devendrj@dukes.jmu.edu

Appendix C

"You Are a Social Detective!" Contents:

Lesson	Objective
Lession 1: Calling All Social Detectives	1. Student will define three or more types and traits of classroom detectives 2. Student will learn what to "observe" and "predict" means
Lesson 2: My Smarts Your Smarts	1. Student will identify three or more types of smarts that define them 2. Student will discuss with researcher their different smarts and try to connect them
Lesson 3: Clue Collector Club	1. Student will state parts of a situation 2. Student will explain how social detectives use the situation (place + people + what's happening) to collect clues
Lesson 4: Smart Guess Toolbox	1. Student will list three ways to gather clues 2. Student will explain how clues help us to read others 3. Student will guess the component of a smart guess toolbox (heart, brain, eyes, ears)
Lesson 5: Making a Smart Guess	1. Student will use the components of the smart guess toolbox to make smart guesses 2. Using the book illustrations, the student will identify the situation and make a smart guess about the characters' thoughts and feelings
Lesson 6: Hidden Rules or Expectations	1. Student will define the concept of hidden rules or expectations 2. Using the book illustrations, the student will identify the situation and at least three corresponding unspoken expectations 3. Using a story from the library, student will identify the context of the story and at least three corresponding hidden expectations or rules
Lesson 7: Knowing What to Do with Clues	1. Student will define what is meant by expected behaviors 2. Using storybook illustrations student will identify at least three expected behaviors for the situation and

	describe the impact on thoughts and feelings
Lesson 8: Suspected!	1. Student will define what is meant by unexpected behaviors for the situation 2. Student will identify at least three unexpected behaviors and the impact on others' thoughts and feelings
Lesson 9: You Are a Social Detective	1. Student will identify at least two social smarts they have grown 2. Using book illustrations, student will practice using their Social Detective tools to make smart guesses.
Lesson 10: Detective Powers Are Superpowers	1. Student will describe three or more social detective tools they will take with them 2. Student will explain what is meant by "observing or noticing others" versus "others notice us"

Appendix D

"You Are a Social Detective!" Lesson Sample: Lesson 5 – Making a Smart Guess

1. Review
    a. Participant was asked, "What did we do last week?" before reviewing the main ideas of the previous lesson
        i. Lesson 4 focused on the tools the participant uses to gather "clues" about a social situation (eyes, ears, heart, mind)

2. Introduction
    a. The "Big Picture" of the lesson was reviewed
        i. The researcher explained that making a smart guess requires taking what has been observed in a situation and combining this with what is already known.

3. Explaining importance and relevance
    a. Considering why the concept of making smart guesses was important
        i. Necessary to social interactions (what is someone thinking/feeling? What did they mean by what they said? What was the intention or plan behind their words or actions?)
        ii. Helps us share space with others (talk about what others want to discuss, be able to respect their feelings and wishes, etc.)
        iii. Understand teacher directions
        iv. Helps with academics by allowing more meaning to be gathered from things like story books

4. Practicing
    a. The curriculum prompted the researcher to bring the student's attention to pages 18-24 in the YASD story book, in which comic depictions of varying social scenarios were laid out.
    b. One of these images depicted a boy with a sad face leaning his elbows on a table with his hands on his chin while a cracked television set sat behind him. The student was asked to use the clues to figure out:
        i. "Where is he?"
        ii. "What is happening?"
        iii. "What might he be thinking?"
        iv. "What might he be feeling?"
        v. "What do you think he should do now/next?"
    c. The student was given praise when he used his social tools to answer the questions correctly and offered corrective feedback when necessary.
    d. Across the rest of the story book pages, similar stories were depicted with similar questions attached that required the student to use what he has observed in the situation and combine it with what he knows in order to respond.

5. Discussion
    a. After giving the student the opportunity to practice, a brief discussion took place and the student was prompted by the following questions:
        i. “What did you learn today?”
        ii. “How might you be able to use some of these skills in school this week?”
        iii. “Was anything hard about the day’s lesson?”

6. Activity
    a. Many lessons included brief post-lesson arts and crafts activities with relevance to the lesson. For lesson 5, the student took a previously drawn image of a toolbox with his “smart guess tools” filling the box. He was asked to color these in however he would like to.