Social Cognition with Autism Spectrum Disorders and Peer Relationships

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Proposal Submitted in Partial Fulfillment of the Requirements for the Degree

Master of Science in Education: Emphasis Special Education

School of Education and Counseling Psychology

Dominican University of California

San Rafael, CA

May 2010
Acknowledgements

Throughout this journey, there have been many people to whom I am forever grateful. Each and every one of my students, past and present, continue to touch my life each day and teach me much more than I teach each one of them. My dear friend Nora has been so supportive, patient, and encouraging every step of the way. I would be lost without you. My family, especially my two sisters, have always been there for me. I am proud and grateful that I have you both as sisters. You both mean the world to me. I would truly not be where I am today without the unconditional love and constant support that I have received from my parents. I am forever grateful for all that you both have done for me. I am truly blessed to have you as parents.

I’ve had many wonderful professors throughout my years at Dominican. Two of them, Dr. Billye Brown and Dr. Rande Webster, will always hold a special place in my heart. Dr. Billye Brown has been a wonderful teacher, supervisor, mentor, and friend. Thank you for the countless hours you have spent listening to me, helping me, and most importantly, encouraging and supporting me. I would not have made it through this journey without the help and guidance of Dr. Rande Webster. Thank you for taking the time to challenge, calm, encourage, and guide me through this process. Most importantly, thank you for believing in me and seeing my true potential as an individual, student, and educator. I feel privileged and honored to have had the opportunity to work and learn from you.
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Abstract

Individuals with Autism Spectrum Disorders have deficits in social cognition, and as a result, face many social communication barriers especially with their peers. The purpose of this study was to determine whether social knowledge could be improved for students with high functioning Autism Spectrum Disorders. Previous studies have shown that these individuals can make significant gains in social interactions with interventions focused on social interactions and understanding. The participants of this ten day study included six fifth grade high functioning students with Autism Spectrum Disorders between the ages of 10 and 11. The results of the study showed that with an intensive social thinking program social knowledge could be improved for students with high functioning Autism Spectrum Disorders.
Introduction

Statement of Problem

The rise in children diagnosed with autism in the U.S.A. has reached alarming proportions in the past five years. According to Autism Speaks (2010), a national resource for children with autism and their families, approximately 1.5 million children in the United States are affected by autism, or 1 child out of 110. This diagnosis is more common than childhood cancer, juvenile diabetes, and pediatric AIDS combined, and the prevalence rate of autism is increasing 10-17% annually. The diagnosis and treatment of autism costs the nation over $35 billion dollars per year.

California data reflects these national trends. Currently there are 53,183 students diagnosed with autism in the state of California, an increase of over 18,500 students since 2005 (California Department of Education, 2009). In terms of raw data, it is instructive to note this increase in local school districts. In 2005, 335 students in San Francisco County schools had a diagnosis of autism. Currently, San Francisco County schools serve 454 students with autism. It is evident that at the national, state, and county levels autism is on the rise.

Although there are many definitions of autism, the two most widely accepted are authored by The Individuals with Disabilities Education Act and the Diagnostic and Statistical Manual of Mental Disorder’s fourth edition (DSM-IV). The Individuals with Disabilities Education Act 2004 defines autism as, “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, usually evident before age 3 that adversely affects a child’s educational performance” (p.10). The current version of the DSM-IV includes five major diagnoses that fall under the Autism Spectrum Disorders (ASD) umbrella which include: Autistic Disorder,
Asperger’s Disorder, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), Rett’s Disorder, and Childhood Disintegrative Disorder. A diagnosis of an Autism Spectrum Disorder occurs when a child has a severe qualitative impairment in reciprocal social interaction and communication skills and a restricted range of activities and interests. The child with autism appears to not have the intuitive ability to socialize, has difficulty with verbal and nonverbal communication, and exhibits a tendency to engage in unusual interests and ways of playing.

Families, schools, and communities are all impacted by the demands of caring for children diagnosed with autism. When a child is diagnosed with autism, families may be faced with the following dilemmas: family dynamics, finances, education, and transitioning into independent living (Fisher, Mudgal, Rue, Hunter, & Wilczynski, 2009).

It may be stressful for parents to decide how to allocate their attention across family members. Parents may feel the strength of their marriage challenged and guilty about the limited time they spend with their other children due to the majority of their attention focused on the child with autism (Fisher et al., 2009). Parents of children with autism experience challenges in activities such as enjoying family outings, going to other people’s homes, leaving their child with a babysitter, and shopping with the child (Cassidy, McConkey, Truesdale-Kennedy, & Slevin, 2007). Children with autism usually are involved with several different therapy activities, which take up a huge amount of the family’s time.

Maintaining this level of support for the child not only requires a great deal of time from parents, but often has financial implications for a family as well (Kohler, 1999). A family’s socioeconomic status impacts parental involvement in education as
well as accessibility to resources. Many low-income families report that they have little access to information and professional supports for their child with autism. The quality of total care may be compromised due to a family’s socioeconomic status (Baxter & Kahn, 1999).

The education needs of children with autism often cause family stress. There is a need for a greater number of qualified teachers to work with students with autism and their families. A deficit in the teaching staff qualified to work with individuals with autism and their families remains one of the biggest problems facing the field today (Simpson & Myles, 2008). School districts need to train and hire teachers who are specialized in educating this population of students as well as provide the necessary resources to support these students in their school environments. Schools need to provide adequate, in-depth opportunities to learn about instructional and management procedures. Teachers need to have knowledge and experience with a varied background of interventions and philosophies. This should include both behavioral and developmental models as well as specific methods in communication, social relationships, assessment, and collaboration.

The complex task of transitioning students with autism into independent living requires the collaboration efforts of parents, family, school, and community resources. Transition involves building bridges to the future through collaborative goal setting and long-term planning. It must involve individual students to the fullest extent possible, making sure to allow them to assume as much responsibility as they are capable of handling (Simpson & Myles, 2008). It is evident that supporting a child with autism places heavy demands on the physical, financial, and emotional resources of families.
Appropriate schooling can often provide critical social skills that bridge the gaps in social cognition for students with ASD. As elementary students progress through school, they are expected to meet various social milestones as well as foster and maintain healthy social relationships. Typically developing students have little difficulty with fostering social relationships, obtaining social knowledge, and understanding and applying social skills across various situations and environments. All of these areas of social development are part of social cognition- the necessary skills needed to acquire, understand, and appropriately use social knowledge. These skills come naturally and easily for typically developing students.

Elementary students with Autism Spectrum Disorders, however, have deficits in social cognition, and as a result, struggle to effectively develop social relationships with their peers, acquire social knowledge, and adequately use and generalize social skills in their daily lives (Crooke, Hendrix, & Rachman, 2008). Students with Autism Spectrum Disorders often find it difficult to effectively navigate in the social world.

**Purpose**

The purpose of this study is to determine whether social knowledge can be improved for students with high functioning Autism Spectrum Disorders.

**Research Questions**

Using a specific teaching strategy of modeling, practicing, and reflection with individuals with high functioning Autism Spectrum Disorders, the following questions will be addressed in this study:

1. will students with high functioning Autism Spectrum Disorders improve their ability to ask questions of others on a given topic during a one-on-one conversation?
2. will students with high functioning Autism Spectrum Disorders improve their ability to maintain a conversation by adding an appropriate thought on a given topic during a one-on-one conversation?

Theoretical Rationale

There are three current theories that explain the critical importance of social cognition in typically developing children. The first theory is Central Coherence Theory. Central Coherence Theory is described as the condition in which an individual is unable to utilize context in understanding one’s environment (Frith, 1989). In typically developing individuals, central coherence is the spontaneous tendency to integrate local details into a global entity of “gestalt.” Individuals with Autism Spectrum Disorders are weak in their ability to conceptualize whole chunks of information. They tend to demonstrate a preference for attending to details and relying on their rote memories to make sense of the constantly changing world around them (Frith, 1989). A lack of cognitive central coherence or gestalt processing can easily cause these individuals to miss important subtle cues that create meaning in a social context, such as intuitively understanding the main idea of a conversation or a literature passage. A useful metaphor is to imagine rolling a piece of paper into a tube, closing one eye, and placing the tube against the open eye. The tube acts as a telescope allowing the details of the world to be visible, but the context is not perceived (Buron & Wolfberg, 2008). In the classroom, the problem may not be attention, but focus. Activities and assignments are difficult to complete because the student with autism is preoccupied with the details, focusing on parts rather than wholes (Schlooz et al., 2006).
The second theory is called Executive Dysfunction Theory. The psychological term executive function includes: organizational and planning abilities, working memory, inhibition and impulse control, time management and prioritizing, and using new strategies (Buron & Wolfberg, 2008). Executive dysfunction occurs when individuals have difficulty in the areas of cognitive flexibility, planning skills, and problem solving skills (McEvoy, Rogers, & Pennington, 1993). Students with ASD have difficulty in their ability to navigate tasks towards a desired outcome. Individuals who lack executive functioning skills have difficulty staying on a single topic in conversations because it is hard for them to maintain a sense of order with spoken messages. Students with ASD are usually impulsive in schoolwork and in social situations, appearing to respond without thinking of the context, consequences, and previous experience. These individuals also have trouble with the organization of written expression and independently planning to complete assignments (Happe, Booth, Charlton, & Hughes, 2006).

Finally, Theory of Mind is the ability to recognize and understand thoughts, desires, beliefs, and intentions of other people in order to make sense of their behavior and predict what they are going to do next (Baron-Cohen, Leslie, & Frith, 1985). Theory of mind is the ability to take another person’s perspective and make assumptions about listeners’ needs and situational requirements. Theory of mind has been described as “mind reading” and weak theory of mind is referred to as “mind blindness” (Baron-Cohen, 1995). Theory of mind is the instinctive ability to know what is in another person’s mind. According to Tomasello and Bates (2001),

Linguistic communication is about discerning what other people intend for you to
pay attention to or think about when they use a linguistic convention (symbol) and then, in complementary fashion, using those same conventions yourself to manipulate the intentional and mental states of other persons (p. 4).

Students with ASD have difficulty “putting oneself in another’s shoes” and, therefore, lack empathy. These individuals do not recognize or understand cues that indicate the thoughts and feelings of the other person. By failing to account for other’s perspectives, individuals with ASD often misinterpret messages. Often these individuals will talk extensively about their own topic of interest because of their difficulty monitoring and responding to the social cues and social needs of their conversation partner (Baron-Cohen et al., 1985). According to Tager-Flusberg (1997), “Even when children with autism have acquired both lexical and syntactic forms, they remain at very primitive levels of communicative competence, hampered by their inability to add new information and extend a conversational topic over several communicative turns” (p. 140).

**Background and Need**

There has been substantial progress made in the field of autism over the last 50 years. Kanner (1943) described a unique group of children whose behavioral anomalies made them qualitatively different from children with identified disabilities. Kanner used the term “autistic” to describe these children (Simpson & Myles, 2008). These children manifested similar abnormalities from infancy or early childhood. Kanner recognized that these children had an inability to relate normally to other people and had delayed speech and language development. He observed that these children engaged in ritualized and repetitive behaviors, had difficulties with transitions, and did not like changes in their routines or schedules (Fisher et al., 2009). The characteristics of autism described by
Kanner over half a century ago have been revised, refined, and broadened in recent years; however, current definitions and thoughts of autism continue to reflect many of Kanner’s original observations (Simpson & Myles, 2008).

Around the same time Kanner was identifying symptoms of autism, Asperger (1943) was studying another group of children who demonstrated several similar characteristics. These children had impairments in the pragmatic aspects of language, especially conversation skills with some children having unusual prosody that affected tone, pitch, and rhythm. These children also had difficulty socially interacting with their peers and had an egocentric preoccupation with a specific topic or interest that would dominate their thinking or play. Asperger noted that these children needed guidance with self-help and organizational skills. The children demonstrated clumsiness in terms of gait, coordination, and handwriting; and some were sensitive to sounds and/or aromas (Simpson & Myles, 2008). Asperger’s work was not translated to English until 1981.

In 1980, autism was added to the DSM’s third edition. By 1987, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) was added to the DSM-III’s revised edition and the concept of autism spectrum disorders as more than one condition was in its promising rise. PDD-NOS was added to the continuum as a way of diagnosing individuals who possessed milder traits of autism. By 1994, Asperger Syndrome, Childhood Disintegrative Disorder, and Rett Syndrome had all been added to the DSM-IV and autism was seen as a spectrum of similar neurological disorders (Simpson and Myles, 2008).

Individuals with Autism Spectrum Disorders face many social communication barriers. Difficulties with social interaction and understanding are at the core of the
communication barriers. According to Mackay, Knott, & Dunlop (2007), these individuals struggle with understanding other people’s perspective, engaging in social interactions that are reciprocal, and understanding the concept of friendship. Both verbal and nonverbal skills are affected and these students fail to modify the selection of conversational topic to the needs of the listener or social situation.

Social skills deficits greatly impact the ability for these students to develop, foster, and maintain friendships. Students with ASD need to be taught the social thinking and social skills that typically developing students automatically acquire without any problems. Because of the rise of children being diagnosed with autism, there still continues to be a need to develop effective ways to help students with ASD appropriately function in our social world.

**Definition of Terms**

For the purpose of this study the following definitions will be used:

Social cognition: process where individuals acquire, understand, and use social knowledge to quickly and accurately respond to verbal and nonverbal social information

ASD: a generic term referring to any of the five pervasive developmental disorders (autistic disorder, Asperger’s disorder, Rett’s disorder, childhood disintegrative disorder, or PDD-NOS. The term autism spectrum has become popular due to its emphasis on the wide range of characteristics exhibited by individuals with autism.

Social Thinking: happens whenever you are sharing space with another person, when you are quietly in another’s presence, or when you are actively interacting with them. Considering what others are thinking and how they are feeling; willingness to modify
your own behavior to keep people thinking about you the way you want them to think about you.

Add-A-Thought: teaching students to recognize what someone’s comments make us think about and then to connect one of our thoughts to the thoughts stated by others.
Review of the Literature

The purpose of this literature review is to summarize research studies on the critical importance of social cognition on communication skills for high functioning children with autism spectrum disorders.

A study conducted by Crooke, Hendrix, and Rachman (2008) examined the effectiveness and generalizability of a social cognitive approach, social thinking, in children diagnosed with Asperger’s or high functioning autism. Six male children between the ages of 9 and 11 with a diagnosis of either high functioning autism or Asperger’s were recruited through the University of Arizona Grunewald-Blitz Clinic for Children with Communication Disorders and the Tucson Alliance for Autism. The University of Arizona Grunewald-Blitz Clinic served as the baseline and generalization site. The Tucson Alliance for Autism served as the treatment site. Two baseline measures were collected which included a non-structured group gathering time followed by a semi-structured activity and then dinner, dessert, and games. After the baseline measures were completed, eight consecutive weeks of group treatment began by addressing social cognitive deficits through a series of lessons designed to promote social thinking. Generalization measures occurred four times over the course of treatment and were conducted in the same format as the baseline measures.

The results showed significant changes from pre and post treatment measures on both verbal/nonverbal “expected” and “unexpected” behaviors and increased “listening/thinking with eyes” and “initiations”. The data from this study suggests that teaching social thinking to children with high functioning autism and Asperger’s may be
an effective approach for increasing positive social behaviors and decreasing less desirable social behaviors.

Mackay, Knott, and Dunlop (2007) sought to improve social communication for individuals with high functioning Autism Spectrum Disorders through a groupwork intervention focusing on social and emotional perspective-taking, conversation skills, and friendship skills. The participants were 46 children, 38 boys and 8 girls, with high functioning autism spectrum disorder between the ages of 6 and 11. The participants were put into one of 6 groups consisting of 7-8 children. Each group met weekly for 1 ½ hours over a period of 12-16 weeks. The purpose of each group was to teach key areas of social interaction and understanding through a variety of activities including games, group discussion, role play, and independent choice. The groups began with a high degree of structure and became more flexible as they progressed. Each session started with the children reviewing the schedule for the session, followed by small and large group activities, and then a snack break. Each session ended with about 10 to 15 minutes of free activity time, giving the students an opportunity to practice skills learned during the session in a less structured setting.

Results of the study demonstrated that significant gains in social interactions were achieved in comparison with a normative population. Parents and participants both reported improved and sustained changes in the key areas targeted in the group sessions. The study supports the theory that social cognition in children with high functioning Autism Spectrum Disorders can be enhanced through the use of groupwork intervention focusing on social interaction and understanding.
Bauminger (2002) studied the effectiveness of an intervention program designed for high functioning children with autism. The program aimed to promote social cognition and social interaction with peers. Fifteen high functioning children with autism between the ages of 8 and 17 were studied. There were 4 girls and 11 boys included in the study. The intervention was conducted by the child’s main teacher in the school in conjunction with a typically developing peer, and the child’s parents. Each participant worked on the intervention curriculum for three hours per week in class with the teacher over a seven month period.

The curriculum consisted of three sections: friendship skills (what a friend is, how to listen to a friend), teaching simple emotions (happy, sad, afraid, and angry) and how to identify them in social situations, and social-interpersonal problem solving (initiating a conversation, comforting a friend). Each student met twice weekly with his/her assigned typical peer to practice learned social skills. They met one day after school and one day during recess. Two main principles were emphasized during the peers’ work: reciprocity and continuity. In order to enhance reciprocity, the pairs of children were guided by the teacher to select social activities that were pleasant for both children. Continuity was emphasized by implementing the learned task. The parents received an explanation about the intervention curriculum. Their role was to motivate and support their child with practicing and implementing each social skill at home with the assigned peer.

The results of the study showed a positive change in the children’s social and emotional understanding as well as in the children’s observed social interactions and overall social skills. This study was an intervention program that emphasized the child’s
social cognitive capabilities as well as the ability to learn and practice specific social behaviors.

A study done by Kroeger, Schultz, and Newsom (2007) evaluated the effectiveness of two social skill group intervention programs for children with autism. Twenty-five children with autism between the ages of 4 and 6 participated in the study. Thirteen children were enrolled in the direct teaching group format and twelve children were enrolled in the play activities group format. There were three groups in each group format and all groups met for five weeks. All groups were similar in their structure.

Each session began with “hello” circle time activities, allowed for play time in the middle portion of the session, and ended with “goodbye” circle time activities. Circle time activities began with reviewing a visual activity schedule followed by the children saying “hello” to each other. Eye contact and smiling were reinforced. “Goodbye” circle time activities were performed to promote socialization as well as to provide a cue to the children that group time was over. While the play activities group engaged in supervised free play during the middle portion of the sessions, the direct teaching group participated in two other activities. First, they watched video models demonstrating play tasks. Then they engaged in free play during which the facilitators prompted the children’s practice of the modeled play skills. The video modeling and direct teaching intervention targeted the following skills: simple and complex motor imitation, parallel play, ball play, taking turns, seeking play partners, partner pretend play, and appropriate use of play stations.

The results of this study indicated that the direct teaching group consistently made more gains in social skills than the play activities group. Other findings from this study showed that group interventions are effective in improving social skills for children with
autism when delivered in a direct instruction format. These results are consistent with research that indicates repetition and intensity within a structured setting are critical components to teaching social skills.

A pair of studies done by Peterson, Slaughter, and Paynter (2007) developed a psychometrically sound, age-referenced measure of social maturity to explore links between social behavior and theory of mind for children on the autism spectrum. In study one, 37 typically developing preschoolers between the ages of 4 and 5 took were given a battery of standard false belief tests of theory of mind and were rated by their teachers on a newly developed age-referenced social maturity scale with seven items. There were 18 boys and 19 girls in the first study.

The second study consisted of 43 children between the ages of 4 and 12. Twenty-seven of the children had high functioning Autism Spectrum Disorders and 16 children were typically developing. All of these children took part in the same procedure as the first study.

The results of the first study found that theory of mind predicted typical preschoolers’ social maturity independently of age and verbal maturity. In the second study, children with ASD scored below age-matched and younger typically developing peers in both theory of mind and social maturity. The second study replicated the first study’s finding that theory of mind was linked with social maturity independently of age and verbal ability. The findings of both studies are valuable both in extending available methods for examining children’s social maturity with peers as well as in assisting to clarify mixed results from previous studies of how theory of mind relates to social maturity in typically and atypically developing children.
A study conducted by Gevers, Clifford, Mager, and Boer (2006) studied the effectiveness of a theory of mind based social cognition program to children with PDD-NOS. The study consisted of 18 children, 13 boy and 5 girls, between the ages of 8 and 11. All of the participants met the DSM-IV criteria for PDD-NOS. Social cognition training was provided for groups of five or six children in 21 weekly hour long sessions. The program targeted the development of theory of mind after giving attention to social skills such as making friends and perception. The program also included five monthly sessions of psychoeducation of the parents regarding PDD-NOS, the development of theory of mind, and the content of the training.

The results showed progress in the areas of perception, understanding humor, and interpersonal relationships. This study suggests that it is possible to improve theory of mind abilities through intensive training.

Bauminger (2007) conducted a study measuring the efficacy of an individual cognitive-behavioral-ecological intervention in facilitating children’s social interactions and their social cognition capabilities. This study replicated the intervention model that Bauminger implemented in 2002. Participants included 19 children, 18 males and one female, between the ages of 7 and 11. All participants had high functioning Autism Spectrum Disorders.

The intervention was conducted in the schools by the child’s main teacher, and also involved one typically developing older peer as well as the child’s parents. Each participant worked on the intervention curriculum for three hours per week over a seven month period in class with the teacher. The participant also meet twice weekly with the assigned peer to practice the learned social skills. They met one day after school and one
day during recess. Parents also completed social tasks with their children to reinforce and apply the learned skill in another setting. The intervention curriculum included three settings: instruction in prerequisite social concepts such as the understanding of friendship, affective education related to four basic emotions (sad, happy, afraid, and angry), and social interpersonal problem solving focusing on thirteen core social objectives such as initiating a conversation with a friend.

The results demonstrated improvement in children’s social cognition and social interactions as well as progress in children’s cooperation, self-control, and assertiveness was reported by their teachers. These results highly corresponded with those of the previous study in both social cognition and social interaction measures. This study discussed the efficacy in promoting integral social functioning when using a cognitive-behavioral-ecological intervention model with high functioning children with Autism Spectrum Disorders.

Bauminger (2007) conducted the second part of a cognitive-behavioral-ecological intervention for high functioning children with Autism Spectrum Disorders. This study examined the utility of a group centered intervention on children’s ability to interact cooperatively with peers during structured and non-structured social situations. Participants included 26 preadolescent high functioning children with ASD that were divided into two groups.

The first group consisted of 11 children, ten boys and one girl. The second group consisted of 15 children, 14 boys and one girl. The intervention was implemented at school, within teacher led small groups of peers that included both typical developing peers as well as high functioning children with ASD. The intervention curriculum was
implemented at twice weekly at school and lasted seven months. Each participant also met individually once weekly with the teacher to rehearse, practice, and clarify issues that were taught in the small group sessions. Each peer group included two typical peers and between one and three high functioning children with ASD.

The intervention included fifty lessons that focused on understanding social group behavior and practicing such behavior within this setting. The lessons covered the following five topics: (a) concepts for group involvement such as what a group is, group rules of behavior such as how to listen and take turns, (b) emotional understanding such as comprehending verbal and non-verbal cues and understanding rules for displaying emotions and mixed emotions, (c) group conversation skills, (d) cooperative skills such as shared interactive activity, mutual planning, and shared implementation of different social tasks, and (e) double messages such as recognizing cynicism and irony.

Results regarding children’s social cognition portrayed a consistent pattern of overall improvement along most of the variables measured. Children in both groups showed a more advanced ability to define and recognize emotions, social situations, and improved problem solving skills. They also revealed a better understanding and awareness of others. This treatment program appeared to be efficient in promoting social perception and problem solving capabilities, which compromise necessary components of social cognition.

The results from each study indicate that social cognition skills for students with ASD can be taught effectively through modeling, direct, explicit teaching, and repetition of skills. The results demonstrated that significant gains in social interactions were achieved through interventions that focused on social interactions and understanding.
These studies used intervention models that addressed social cognitive deficits among students with ASD and yielded results that increased positive social behaviors.
Methodology

Site and Participants
The study was conducted at a K-8 private school for students with mild/moderate learning differences in an urban setting in northern California. The school was selected for two reasons: it was a sample of convenience, and it had the appropriate population for the study. The total school enrollment is sixty-seven students. The ethnicity of the students is as follows: 67% Caucasian, 11% Asian, 10% Hispanic, 7% African-American, and 5% Filipino. The school has fourteen full-time staff members, two of whom are male. Two of the full-time teachers have their master’s degree in special education and the rest of the teachers have their mild/moderate special education teaching credential.

The participants included six fifth grade students between the ages of 10 and 11. There were four males and two females. All participants were high functioning learners with Autism Spectrum Disorders.

Access and Permission
The rights of all participants involved in this research were protected. This research adhered to the ethical standards of the American Psychological Association (2001). Each subject was individually invited to participate in the study. Letters were distributed to each participant’s parent informing the parents of the potential subjects of the planned research activities and the voluntary nature of participation. The parents of the participants were provided the opportunity to decline participation of their child at any time during the study. The participants’ parents had full and complete access to their child’s interview and to the results of the study. All interview responses remained confidential and anonymous except to the researcher. All raw data were redacted.
following coding procedures to remove all identifying information. All data were stored in a locked, secure location not available to anyone except the researcher. No risks to study participants were identified.

**Instruments and Their Validity and Reliability**

The instruments used were a combination of researcher created materials and Michelle Garcia Winner’s Social Thinking curriculum. Michelle Garcia Winner runs a clinic for students that struggle with social cognition and has developed a curriculum to help improve these students’ ability to think socially in their environments. Baseline data both on teaching asking questions of others and teaching adding thoughts on a given topic was obtained by using The Double Interview and Add-a-Thought Protocol. The protocol was used again at the end of the study. During the study, the students participated in the Add-a-Thought and Conversation Tree activities. The Social Thinking curriculum was used in the participants’ school; therefore, the students were familiar with both activities.

**Procedures of Data Collection**

At the beginning of the study, each participant was given The Double Interview and Add-a-Thought Protocol in order to collect baseline data. Each activity in the protocol began with the researcher modeling for the student. The Double Interview portion began with the researcher asking questions of the student. Then, the student had an opportunity to ask questions of the researcher. The researcher placed three pictures of her and her family in front of the student. The student was told to ask questions of the researcher. The researcher added a tally notation each time the student asked a question about one of the pictures.
The Add-a-Thought portion began with the researcher modeling the activity as well. The researcher and the student each received five cards with the words “Add-a-Thought” printed on each card. Then, the student chose a topic randomly from a basket in which there were thirteen different topic cards such as games, weekend activities, sports, and movies. The student made a statement about the selected topic. The researcher modeled for the student how to Add-a-Thought to the selected topic. As the researcher added a thought, she placed one of the Add-a-Thought cards under the topic card. The student added a thought and placed his/her card under the researcher’s Add-a-Thought card. This continued until all five Add-a-Thought cards were used.

After the modeling of this activity, the student and researcher were each given several new Add-a-Thought cards. The researcher chose a topic card from the basket, placed it on the table, and made a statement about the selected topic. The student took one of the Add-a-Thought cards and placed it under the topic card after adding a thought. This process continued until the student could no longer add a thought or strayed off topic. The researcher added a tally mark each time the participant could Add-a-Thought.

This same protocol was given and the same process was used at the end of the study to determine whether there was an increase in the number of times the participants could ask questions of others or add a thought on a given topic.

The study was conducted for a total of ten days for one hour each day. There were three groups of two students for each activity. The students participated in both activities each day. The two activities were: The Add-a-Thought Game and The Conversation Tree. Each session began with the researcher modeling both activities for the students. Then, each group of students modeled both of the activities for each other.
Each group was invited to come to a table where the researcher led the activities. The researcher worked with one group at a time while the other two groups practiced the activities. Each group chose a topic from a basket and began the first activity. Once all three groups had completed the first activity, the researcher worked with each group on the second activity. The researcher kept track of the amount of times the participants adding a thought and asked questions of other by using tally marks. Each session concluded with reflection and thoughts regarding the session. The same session format was followed each day for ten days.
Results

Descriptive Data Analysis

The purpose of this descriptive study was to determine whether social knowledge could be improved for students with high functioning Autism Spectrum Disorders and specifically to address the following research questions:

3. will students with high functioning Autism Spectrum Disorders improve their ability to ask questions of others on a given topic during a one-on-one conversation?

4. will students with high functioning Autism Spectrum Disorders improve their ability to maintain a conversation by adding an appropriate thought on a given topic during a one-on-one conversation?

Six students with high functioning ASD participated in the study. There were four males and two female students. The study took place over a period of ten consecutive days for one hour each day. A pre- and post-test protocol was given to each student at the beginning and end of the study that addressed each student’s ability to ask questions of others and add a thought on a given topic in a one-on-one conversation. Each day of the study, the students participated in one of the following activities: The Conversation Tree Game or the Add-A-Thought Game. Both activities were done each day.
The pre- and post-test protocol was given individually to each student. The protocol contained two parts. The first part addressed each student’s ability to ask questions of others while the second part focused on each student’s ability to add a thought to a conversation on a given topic.

The first section of the protocol focused on asking questions of others. Each student was asked a series of questions about him/her self. Then, the researcher placed three pictures of the researcher and family members and friends in front of the student. The student was told to ask the researcher any questions about any of the three pictures. The number of times the student was able to ask a question that was related to one of the pictures was recorded on the protocol. The same process was done at the end of the ten day study.

The results show that five out of the six students improved on their ability to ask questions of others in a one-on-one conversation. One of the six students didn’t show
any improvement between the pre- and post-test. Student One (1) was able to ask six more questions during the post-test. Student Three (3) was able to ask five more questions and Student Four (4) was able to ask four more questions during the post-test. Student One (1) was only able to ask one more question during the post-test. Finally, Student Six (6) was able ask four more questions during the post-test. Overall, the results show that the majority of the students were able to increase their ability to ask questions of others with an intensive, daily social thinking program.

**Adding A Thought**

![Adding A Thought Chart]

The second part of the protocol consisted of finding out how many times each student was able to add a thought on a given topic in a one-on-one conversation. There were a total of thirteen different topics in a basket and each student chose a topic from the basket. The topic was placed on the table and each time the student was able to add a
thought about the topic, the researcher placed a tally mark on the protocol. The task was finished when the participant either was unable to add more thoughts or added a thought that was off topic.

The results show that all six students improved on their ability to add thoughts on a given topic during a one-on-one conversation. Students One (1) and Four (4) both increased their ability by three to add thoughts on a given topic. Student Two (2) increased his/her ability by one and Student Three (3) increased his/her ability by five to add thoughts on a given topic. Student Five (5) increased his/her ability by two and Student Six (6) increased his/her ability by four to add thoughts on a given topic.

**Add-A-Thought Game**

![Graph showing the average number of times a thought was added over days for three groups.](image)

For the Add-A-Thought Game the students were randomly assigned a partner. There were a total of three groups. Each group was called up individually while the other groups quietly practiced the activity. The group chose a topic out of the basket and one
of the group members started a conversation about the topic. Each time a participant added a thought, the researcher placed a tally mark by his/her name. The same process was done each day.

A mean score was taken for each group for the number of times a thought was added to a conversation. The results for Group One (1) indicate that the average number of times a thought was added increased slightly over the ten days. Group One (1) started out with the lowest average number of times a thought was added to a conversation. For the majority of the days, their mean score either stayed the same or increased by one or two. Their mean score at day one (1) was 2.5 and at day ten (10) it was 5. Group Two (2) started out and ended with the highest average number of times a thought was added to a conversation. They started out on day one (1) with a mean score of 4.5 and ended on day ten (10) with a mean score of 9.5. The first six days their mean score increased or stayed the same, but during the last week of the study their numbers steadily increased. Group Three (3) started out on day one (1) with a mean score of 3 and ended on day ten (10) with a mean score of 7.5. During the first week of the study, their mean scores slightly increased and actually decreased by .5 between days four (4) and five (5). During the second week of the study, the mean scores for Group Three (3) rapidly increased, however. Overall, all three groups at least doubled their mean scores by the end of the study. Clearly all three groups made gains in their ability to add a thought to a conversation on a given topic.
For the Conversation Tree Game the students were randomly assigned a partner. There were a total of three groups. Each group was called up individually while the other groups quietly practiced the activity. The group chose a topic out of the basket and one of the group members started a conversation about the topic. Each time a participant asked a question related to the topic, the researcher placed a tally mark by his/her name. The same process was done each day.

A mean score was recorded for each group for the number of times appropriate questions were asked on the given topic. The average number of questions asked fluctuated for Group One (1) over the ten days. The mean score on day one (1) was 2 and on day ten (10) their mean score was 4.5. Group Two (2) started on day one (1) with the highest mean score of the three groups. On day one (1) their mean score 4.5 and on day ten (10) their average number of questions asked was 9.5. Group Two’s (2) average
number of questions asked on a given topic steadily increased over the ten day study. Group Three (3) made good progress as well over the ten days. They started out with a mean score of 2.5 on day one (1) and ended up with a mean score of 6.5 on day ten (10). All three groups at least doubled their mean score by the end of the study. Overall, all three groups improved their ability to ask questions of others on a given topic.
Discussion

Summary of Major Results

The results of this study show that students with high functioning ASD can improve their ability to add thoughts to a conversation and ask questions of others using an intervention model that focuses on social thinking. Through modeling, explicit teaching, and repetition, students made progress in their ability to socially interact with their peers. The results indicate that with an intensive, daily social thinking program these students increase their ability to foster and maintain positive peer relationships.

Relationships of Results to Existing Studies

The results of this study correlate with results of existing studies. A study conducted by Crooke, Hendrix, and Rachman (2008) examined the social cognitive approach, social thinking, in six male children with ASD. After baseline measures were completed, the students participated in eight consecutive weeks of group treatment which addressed social cognitive deficits through lessons designed to promote social thinking. The results of this study indicated that teaching social thinking to students with ASD could be an effective approach for increasing positive social behaviors.

Bauminger (2002) studied the effectiveness of an intervention program for high functioning students with ASD aimed to promote social cognition and social interaction with peers. Fifteen students between the ages of 8 and 17 were studied over a seven month period. The intervention was conducted by the student’s main teacher in the school as well as with a typically developing peer. The curriculum focused on friendship skills, simple emotions, and social-interpersonal problem solving. Results of the study showed growth in social and emotional understanding as well as improvement in social interactions.
A follow-up study was conducted by Bauminger in 2007. The participants included nineteen children between the ages of 7 and 11 with high functioning ASD. The intervention was conducted in the same format as the previous study over a seven month period. The curriculum included the three main topics discussed in the previous study: peer relationships, emotions such as happy, sad, angry, and social-interpersonal problem solving such as initiating a conversation with a friend. The results highly correlated with those of the previous study, showing an increase in both social cognition and social interaction measures for students with high functioning ASD.

Limitations of the Study

The study had a few limitations. All of the students were familiar with the social thinking program because the program is used at the school. The sample size was one of convenience; therefore, there were a limited number of participants. The generalizability of results was limited due to the small number of participants. The time frame of two weeks also limited the study. A longitudinal study may have found variations in the data. Finally, the researcher was familiar with the participants having taught many of them for two years. The participants were comfortable and at ease with the researcher; therefore, social interactions were easier to illicit from students.

Implications for Future Research

For future studies, it would be important to see if conducting the study over a longer period of time impacts data results. Future studies could also investigate whether more students has an effect on the data results. It would also be interesting to examine if the same results could be obtained using lower functioning ASD students. This would determine whether or not the idea of social thinking is transferable across the autism
spectrum. It would also be important to study whether or not the skills obtained were
generalized in various settings and with different individuals.

**Overall Significance of the Study**

Students with ASD continue to struggle to appropriately foster and maintain
social relationships with their peers. With the diagnosis of autism on the rise, there
continues to be a need for interventions to help these students effectively navigate in our
social world. This study shows that with a social thinking program that includes
modeling, explicit teaching, repetition, and reflection students with ASD are able to
improve their ability to ask questions of other and add a thought on a given topic during a
one-on-one conversation.
References


effectiveness of teaching social thinking to children with asperger syndrome

practice and autism in the schools: A guide to providing appropriate


based social cognition training program for school-aged children with pervasive
developmental disorders: An open study of its effectiveness. *Journal of Autism
and Developmental Disorders, 36(4),* 567-571.

Happe, F., Booth, R., Charlton, R., & Hughes, C. (2006). Executive function deficits in
ASD and attention deficit/hyperactivity disorder: Examining profiles across

Http://www.autismspeaks.org

Http://www.cde.ca.gov/index.asp

Kohler, F. (1999). Examining the services received by young children with autism and
their families: A survey of parent responses. *Focus on Autism and Other
Developmental Disabilities, 14,* 150-158.

delivered social skills programs for young children with autism. *Journal of Autism
and Other Developmental Disabilities, 37,* 808-817.


