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The Impact of an Individualized Social Skills Intervention for a High Functioning Child with Autism Spectrum Disorder

Rachel Schaub
Eastern Illinois University

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The Impact of an Individualized Social Skills Intervention for a High Functioning Child with Autism Spectrum Disorder

BY

Rachel Schaub

THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING THIS PART OF THE GRADUATE DEGREE CITED ABOVE
The Impact of an Individualized Social Skills Intervention for a High Functioning Child with Autism Spectrum Disorder

Rachel Schaub

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Abstract

The Social Skills Intervention (developed specifically for this study) is a social skills plus anxiety reduction program that uses direct instruction, anxiety reduction, and reinforcement principles. The purpose of the study was to examine the effectiveness of the social skills training on increasing the frequency of three target behaviors for one 8 year old, female student. A secondary purpose was to decrease student anxiety by teaching how and when to use a specific coping technique. A concurrent multiple-baseline across behaviors design was used to evaluate social skills instruction on target behaviors. During baseline, intervention, and maintenance sessions, the participant’s responses were videotaped and then subsequently viewed and coded after the session. The percentages of correct responses demonstrated by the participant were measured to evaluate the effectiveness of the social skills training on target behaviors. Results suggest that the social skills intervention plus anxiety reduction increased the student’s correct responses for each target behavior. However, no change in the participant’s level of anxiety was found.
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Impact of an Individualized Social Skills Intervention for a Child with High Functioning Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a disorder consisting of two core components: deficits in communication/social skills, and the presence of repetitive behaviors or interests, such as preoccupation with specific objects or activities (American Psychiatric Association, 2013). In addition to these three components, there are additional characteristics that are often seen in children with ASD, but are not required for a diagnosis. For instance, some individuals with ASD may struggle to maintain eye contact. In addition, they may be overly-sensitive to certain stimuli (such as loud music) at times and hyposensitive to pain (such as falling on the ground) at other times. Furthermore, they may not react to the pain they feel until hours later, making the response somewhat delayed (Bradley & Caldwell, 2013). Others may have difficulty recognizing emotions in others or difficulty understanding pragmatic language (Shriver, Allen, & Matthews, 1999). The present study aims to examine the effect of a social skills plus anxiety reduction intervention on three targeted behaviors of a child with high functioning ASD.

Autism was first defined by Leo Kanner in 1943. Kanner noticed that the children he defined as having Autism all shared characteristics of social isolation, a lack of empathy for others, difficulties with communication, and repetitive patterns of activities (Blacher & Christensen, 2011). Kanner also noticed that these children did not respond when their name was called and appeared to lack any interest in other individuals or children (Blancher & Christensen, 2011). Shortly thereafter, Hans Asperger noted similar characteristics in four children with normal intellectual functioning. However, the
children that Asperger observed mainly exhibited social difficulties and repetitive behaviors rather than speech deficits (Blacher & Christensen, 2011). Therefore, Asperger was the first individual to recognize Asperger’s (also referred to as High Functioning Autism), a less severe form of Autism. Although Autism was identified in the 1940’s, significant research into effective intervention practices for children with Autism did not begin until the late 1960’s. Since then, research on Autism has rapidly increased as has the awareness of Autism as a disorder. One significant change is that Autism is now considered a “spectrum of disorders” and therefore referred to as Autism Spectrum Disorder (ASD).

**Changes to Autism Spectrum Disorder Diagnostic Criteria**

The diagnostic criteria for ASD changed slightly in the past year causing frequent discussion among school psychologists and concerned parents of children with ASD. For instance, in the Diagnostic and Statistical Manual – Fourth Edition Text Revision (DSM-IV-TR), ASD was defined as a disorder consisting of three main areas: deficits in communication, deficits in social interaction skills, and the presence of repetitive behaviors or interests (American Psychiatric Association, 2000). However, in 2013, the DSM-5 redefined ASD as a disorder consisting of two main areas: deficits in social communication/social interaction skills, in addition to the presence of repetitive behaviors or interests (American Psychiatric Association, 2013). In the updated criteria the social skills and communication categories were combined (American Psychiatric Association, 2013). The DSM-IV criteria required an individual to display at least six of the behaviors listed from the three separate categories to receive a diagnosis of ASD. However, the DSM-5 criteria require an individual to only display five of the behaviors
listed in the two separate categories to receive a diagnosis of ASD. There is also less focus on symbolic or imaginative play in the DSM-5 criteria as compared to the previous criteria. Many feared that this change in diagnostic criteria would potentially decrease the individuals identified with ASD. However, studies have estimated that only a small percentage of individuals (9%) are likely to not meet criteria due to these changes (Huerta, Bishop, Duncan, Hus, & Lord, 2012). Huerta et al. (2012) projects that the new criteria will allow for more accurate diagnoses of ASD and reduce the possibility of over-identification of ASD.

Furthermore, the DSM-IV criteria identified high-functioning autism as a separate diagnostic category outside of ASD; however, the DSM-5 does not. Instead high-functioning Autism is still recognized as a less severe form of ASD, but is not recognized as a separate diagnostic category. Although the DSM-5 revised the diagnostic criteria for ASD and the criteria are different from the DSM-IV-TR, these changes did not affect the current study because inclusion criteria were based on educational criteria, not DSM criteria.

It is important to note that the educational criteria for ASD are different from DSM-5 criteria. The DSM-5 criteria are more stringent than educational criteria. They require that one possess all the features of ASD (deficit in social communication skills and social interaction skills, and the presence of repetitive behaviors or interests) to receive an ASD diagnosis (American Psychiatric Association, 2000). For an educational diagnosis, two ASD features (difficulty with social interactions and communication) must be met and these features must negatively affect the child’s educational performance to receive services (Department of Education, 2004). Lastly, the educational criteria
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outlined in the most recent version of the Individuals with Disabilities Education Act (IDEA) expanded the definition of ASD and the timeline for when a diagnosis can be given, therefore increasing the number of children who are likely to meet educational eligibility criteria (Department of Education, 2004).

Another area of concern for many parents and educators was the number of individuals that are impacted by ASD. According to the Centers for Disease Control and Prevention, ASD affects 1 in every 88 individuals (2012). While many have attempted to offer an estimate of the number of individuals affected by ASD, there is debate as to whether this number is representative of the national population in the United States (Blane & Borden, 2008; Centers for Disease Control and Prevention, 2012). Others also question the accuracy of current ASD diagnoses (Blane & Borden, 2008; Williams, 2006), due to the fact that many individuals diagnosing ASD (i.e., clinicians, doctors, and psychologists) may not completely understand the diagnostic criteria or give diagnoses hastily to ensure that a child receives educational services (Blane & Borden, 2008).

Regardless of the actual prevalence, social skills interventions for children with ASD are extremely important as social impairment is considered a core deficit for children with ASD (Shriver, Allen, & Matthews, 1999). Despite the need for social skills interventions, they are often overlooked because teachers and school officials are more focused on decreasing and or eliminating behavioral excesses, such as aggressive or defiant behaviors, rather than increasing appropriate and adaptive social interactions (Howell, 1985).
Diagnosing Autism Spectrum Disorder

Children are generally diagnosed with ASD prior to two or three years of age (Freeman, 1997). In addition, (as mentioned above) for a child to receive a DSM-5 diagnosis of ASD, the two key features must be present: deficits in social skills and communication skills and the presence of repetitive behaviors or interests (American Psychiatric Association, 2013). However, there are varying levels of severity for each diagnostic criterion, which is why ASD is classified as part of a spectrum of disorders.

In regard to language development, some individuals may fail to develop language as a whole, while others may only struggle to understand pragmatic language. In regard to social skills deficits, some individuals with ASD may have difficulties with simple aspects such as eye contact whereas others completely lack the ability to initiate and sustain conversation (Shriver, Allen, & Matthews, 1999).

In regard to preoccupation with specific objects or activities, some individuals may simply prefer a specific topic for discussion or play (such as trains), whereas others may be so fixated on the different types of train cars or the history of trains to the extent that it inhibits reciprocal conversation. If preoccupation inhibits reciprocal conversation this not only impacts communication but social interactions as well (Shriver, Allen, & Matthews, 1999).

Some individuals with ASD may also have an intellectual disability whereas individuals with high-functioning autism are functioning with fewer cognitive or intellectual concerns. Children with high functioning autism have an IQ score above 70, are generally included in the general education classroom for the vast majority of the day, typically perform well academically, yet tend to struggle with social interactions and
communication (Koegel & Frea, 1993). Due to the fact that there are varying degrees of this disorder, it is important to design interventions to meet the needs of the individual with ASD.

**Characteristics of Autism Spectrum Disorder**

**Insistence on sameness.** Just as there are varying degrees of ASD, there are many ways in which ASD can affect an individual (Shriver, Allen, & Mathews, 1999). For example, although one must possess deficits in social skills and communication skills, in addition to the presence of repetitive behaviors or interests (American Psychiatric Association, 2013) in order to receive a diagnosis of ASD, there are additional ways in which ASD can affect an individual’s behavior. It is important to note that these additional characteristics may or may not occur in individuals with ASD, and therefore are not required to be present for a diagnosis.

One of the many characteristics associated with ASD, insistence on sameness, is related to the diagnostic criterion of repetitive behaviors or interests (American Psychiatric Association, 2013). This characteristic generally consists of having very strict daily schedules or routines that one abides by, due to the fact that one prefers similar activities and routines and becomes upset when those routines vary. For example, a simple, unexpected change in the school schedule, such as a fire drill or a visit to the library, may be upsetting to an individual with ASD. Therefore, they are generally unwilling to alter their schedules or deal with transitions flexibly. This rigidity affects their ability to form friendships as they often have difficulty working with others or being flexible enough to engage in play with others. Furthermore, adhering to such a strict daily schedule can result in distress when the schedule is disrupted. This can result in
children with ASD exhibiting behavioral outbursts, such as refusal and disruptive behavior (Shriver, Allen, & Matthews, 1999).

**Difficulty participating in imaginative play.** Another characteristic that is often seen in children with ASD is difficulty participating in imaginative play. This characteristic is generally related to deficits in communication (one of the diagnostic criteria) that children with ASD have (American Psychiatric Association, 2013). This area of difficulty affects their social skill development in early childhood. In addition, children with ASD may struggle to interpret social cues (Cotugno, 2009). Often, these individuals lack the ability to interpret verbal and nonverbal communication, such as identifying when someone is angry or joking. They also have difficulty determining what emotions a person might be feeling or taking someone else’s perspective. For example, an individual with ASD may not notice nonverbal signs of anger (such as clenched fists, furrowed brows, or shallow breaths) that are obvious to individuals without ASD. The individual with ASD may continue to perform the behavior that is angering the other individual, without realizing that there is a problem. This inability to recognize signs of emotion can negatively impact relations with others as it is often misinterpreted as a lack of empathy (Bauminger, 2007).

**Emotional identification.** Yet another characteristic associated with ASD is difficulty with emotional identification. This characteristic is generally related to difficulties in social skills (American Psychiatric Association, 2013). In addition, children with ASD struggle to understand and identify their own emotions, which cause further problems with social interactions. For instance, the inability to identify one’s emotions can result in verbally or physically aggressive outbursts. Teaching children with ASD
how to identify when they are becoming upset (i.e., tensing muscles, increased heart rate) can be used as a first step in teaching calming techniques.

Another factor that complicates emotional identification in children with ASD is their difficulty communicating verbally. If a child is unable to verbalize their emotions and experiences appropriately to obtain desirable outcomes, they may learn that exhibiting maladaptive behaviors (e.g., grabbing, pinching) leads to equally desirable outcomes. For example, a child with limited verbal communication may learn to hit or growl at other children to access toys, rather than ask to share or join in. Hitting and growling may be just as effective in accessing toys as requesting to play. Since verbal communication is a deficit area for children with ASD, they must be taught how to appropriately verbalize (e.g., “may I have a turn”). Then they can learn that appropriate verbalization leads to desirable outcomes (e.g., preferred toys) and aggressive and maladaptive behaviors are likely to decrease (Licciardello, Harchik, & Luiselli, 2008).

Another difficulty with emotional identification for children with ASD is theory of mind, or the ability to take another person’s perspective. Children with ASD are often unaware of others’ thoughts or feelings and therefore, children with ASD often have difficulty taking someone else’s perspective. While it is difficult if not impossible to teach an individual how to have theory of mind, it can be helpful to teach children with ASD about emotions in order to improve the appropriateness of their social interactions. If children are taught how to recognize and understand the emotions of others, this can increase their ability to function socially in that they are less likely to misinterpret someone’s actions or fail to notice when someone is distressed (Samson, Huber, & Gross, 2012). Furthermore, emotional regulation difficulties for individuals with ASD often
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persist into adulthood if not addressed (Samson, Huber, & Gross, 2012) emphasizing the need for early intervention in this area.

Cognitive Theories of Autism Spectrum Disorder

While it is known that ASD is a neurobiological disorder (suggesting that ASD affects the functioning of the brain), the causes of ASD are yet to be determined. Many potential causes have been suggested that have not been empirically supported (i.e., certain foods, vaccinations, the age of the mother, a negative mother-child relationship, etc; Glicksman, 2012.). However, there is evidence to support a genetic component to the development of ASD. For instance, siblings of an individual with ASD have a much higher rate of developing ASD than individuals without a sibling with ASD (Blacher & Christensen, 2011). Furthermore, monozygotic twins have a much higher rate of developing ASD than fraternal twins (Blacher & Christensen, 2011). Although it is clear that genetics play a role in the development of ASD, it is not caused by a specific gene (Blacher & Christensen, 2011). Rather, it appears to be a complex combination of genes that varies among individuals.

While the exact cause of ASD is still undetermined, there are many theories that attempt to explain the social difficulties individuals with ASD have, specifically communication difficulties (Oberman & Ramachandran, 2007). Although the number of proposed theories is too vast to cover for the purposes of this study, there are three theories that appear to be predominant in the literature: the theory of mind deficit, the executive dysfunction theory, and the weak central coherence theory.

**Theory of mind deficit.** The theory of mind deficit proposes that children with ASD not only have difficulty recognizing, understanding, and attributing mental states to
others, but also, to themselves (Premack & Woodruff, 1978). It is a complex condition in which awareness of the thoughts, feelings, and intentions of oneself and others is underdeveloped. This is not to say that all individuals with ASD completely lack theory of mind. Rather, theory of mind is generally not fully developed.

To examine theory of mind in individuals with ASD, Baron-Cohen, Lesile and Frith (1985) conducted an experiment with 20 children with ASD and 27 typically-developing children where the children were asked to infer the mental state of a doll. The age of children in the group with ASD ranged from 6 to 16 years old, whereas the age of children in the control group ranged from 3.5 to 6 years old. The experiment involved the researcher showing two dolls to the child with ASD and showing that one of the dolls had an object in a basket. The researcher then removed one of the dolls from the room and pretended to have the remaining doll remove the object from the basket of the doll that has left. The researcher then brought the previously absent doll back into the situation and asked the child where the doll will go to in order to find the object (in other words, where the doll will think the object is located). Results of this experiment found that 80% of children with ASD failed to realize that the doll would be unaware of the fact that the object had been removed from its original location, whereas 100% of children in the control group answered the question correctly (1985). The authors interpreted these findings by suggesting that the majority of children with ASD assumed that the doll possessed their same knowledge, even though the doll had been absent when the removal of the object took place. The authors inferred that this inability to realize the mental state of others suggests that children with ASD have a deficit in theory of mind, or the awareness of others’ mental states.
While the results of this study are significant, some have argued that the "theory of mind deficit" is not a complete explanation or complete proof that all children with ASD lack theory of mind (as four of the 20 children successfully passed this theory of mind task; Happe, 1994). However, as with any disorder, there is variability in how it is expressed, which could account for the four children that did successfully pass the test. Therefore, the fact that the majority of the children with ASD failed to pass this theory of mind task suggests that many children with ASD may have a similar deficit, and is therefore considered to be a somewhat valid, yet incomplete theory in explaining the various characteristics associated with ASD (Oberman & Ramachandran, 2007).

Executive dysfunction theory. Executive functioning involves "mental control processes that enable self-control...[that] are necessary to maintain an appropriate problem-solving set for the attainment of a future goal" (Geurts, Verte, Oosterlaan, Roeyers, & Sergeant, p. 836, 2004). Executive functioning involves processes such as working memory, planning, response inhibition, and cognitive flexibility (Geurts et. al, 2004). Typically, individuals with high functioning ASD tend to have difficulties in the areas of planning and cognitive flexibility (Geurts et. al, 2004), which has led some individuals to suggest that some of the social difficulties individuals with high functioning autism experience are related to executive functioning. The executive functioning theory was suggested because researchers noted that individuals with ASD displayed symptoms similar to those who had a deficit in executive functioning due to frontal lobe damage (i.e., difficulty switching attention, insistence on sameness, etc.; Baddeley & Wilson, 1988). This observation led to the investigation as to whether or not deficits in executive functioning could explain some of the symptoms of ASD.
While some studies have found that children with ASD have deficits in executive functioning, others have found mixed results. More specifically, in a study by Ozonoff and Jensen (1999), children with ADHD, Tourette’s, and ASD all displayed deficits in executive functioning, suggesting that deficits in executive functioning are not exclusive to ASD. While the executive functioning theory attempts to explain some of the difficulties individuals with ASD experience, it is not a complete explanation of the symptoms of ASD.

**Weak central coherence theory.** The weak central coherence theory aims to explain some of the social difficulties that children with ASD often display. Central coherence is defined as “a tendency to integrate information into meaningful representations” (Lopez, Donnelly, Hadwin, & Leekam, p. 674, 2004). It has been argued by some researchers that individuals with ASD have weak central coherence and therefore tend to focus on intricate details of an object or situation, rather than focusing on the global whole or the big picture (Frith, 2003). This often causes difficulty in social situations as children with ASD become fixated on minute details rather than attending to the entire social context. Weak central coherence is also related to the fact that children with ASD often have difficulty generalizing new behaviors to new environments (Mirenda & Donelllan, 1987). It is thought that because individuals with ASD focus on the minute details of a situation rather than attending to the entire situation, they often miss social cues or fail to recognize when a newly learned behavior could be applied to a different context than the one in which the behavior was learned.

**Which theory holds the most merit?** Although all three of the afore-mentioned theories do have some significance, as of yet, there is no single theory that can explain
the various communication difficulties associated with ASD (Oberman & Ramachandran, 2007). Therefore, if one aims to study the characteristics of ASD, all of the afore-mentioned theories need to be taken into account. The theory that appears to be less convoluted by other constructs and therefore more reliable or valid is the Weak Central Coherence Theory (Boucher, 2012), although results based on this theory still need to be interpreted with caution. As a result, the present study will consider aspects of all three theories. The present study will aim to improve social skills in an individual with ASD by increasing their awareness of their surroundings, or the global whole (i.e., weak central coherence theory) and generalizing skills to new contexts. Increasing awareness of how others feel will also be emphasized (i.e., theory of mind deficit). Lastly, aspects of the executive dysfunction theory will be incorporated by attempting to increase the participant’s attention to others.

**Importance of Developing Interventions for Children with Autism Spectrum Disorder**

Quality research focusing on interventions for children with ASD is limited in that the majority of these studies are not scientifically sound, with problems being apparent most often in methodology (DeRosier, et. al, 2011). Those with high functioning ASD generally have adequate cognitive abilities but lack social skills (DeRosier, et al., 2011). For children with ASD, their social skills deficits are evident early in life (preschool) and their difficulties with social interactions become increasingly challenged and complicated. Often children with ASD desire to have social relationships, but lack the skill or ability to do so. Seeking social relationships without success may leave many children with ASD lonely and frustrated (DeRosier et al., 2011).
Further complicating matters, as children with ASD mature, they become increasingly aware of their social deficits which often results in internalizing disorders, such as anxiety or depression (DeRosier et al., 2011). Children with ASD are often bullied, which may also lead to internalizing problems. Considering that many children with high functioning autism are included in the general education classroom (more likely to experience bullying), emphasizing social skills is of utmost importance (Rao, Beidel, & Murray, 2008). If untreated, social difficulties continue into adulthood often impeding employment opportunities. Not surprisingly, anxiety disorders are the most commonly reported comorbid disorder for children with ASD (Reaven, Blakeley-Smith, Culhane-Shelburne, & Hepburn, 2012). Therefore, studying ASD and developing appropriate interventions for children with ASD is crucial.

**Social Skills Interventions for Children with Autism Spectrum Disorder**

Peer tutoring (Bauminger, 2002), social stories (Chan & O’Reilly, 2008), direct instruction, cognitive behavioral therapy, and applied behavior analysis (Rotheram-Fuller & MacMullen, 2011) are all empirically supported interventions used to improve the social skills of children with ASD.

**Peer tutoring.** Peer tutoring is an intervention that involves a typically-developing peer without ASD (or a peer with ASD but adequate social skills) to participate in the intervention sessions. This peer practices the socially appropriate behaviors with the child with ASD, which increases the likelihood that skills will generalize to other settings (Bauminger, 2002). This type of intervention serves to increase communication abilities for children with ASD.
The effectiveness of peer tutoring was demonstrated in a study conducted by Bauminger (2002). In this study, 15 children between the ages of 8 and 17 years with a diagnosis of high functioning autism (HFA) participated in a social skills intervention. The intervention lasted for 7 months, and target participants practiced social skills with typically-developing peers. The participants with HFA were taught how to identify emotions and how to interact socially (e.g., initiating conversation and maintaining eye contact; Bauminger, 2002). Two undergraduate students who were unfamiliar with the purpose of the study conducted the observations of social behaviors. These observations were conducted during recess, four times on four separate days, for each child. The intervention was conducted by the classroom teacher for 3 hours per week in which the participants met with their peer-tutor. All participants displayed a significant increase in their abilities to initiate interactions and respond to social initiations (Bauminger, 2002).

**Social stories.** Another type of intervention for children with high functioning autism is the use of Social Stories. Social Stories (Gray, 2000) involve short stories that are designed to teach a specific social skill, such as asking questions or joining in. The stories explain the appropriate times to display the behavior, why the behavior is important, and how it will affect others (Leaf, Oppenheim-Leaf, Call, et. al, 2012). The child either has the story read to them or reads it to him or herself. After the story is read, the child is asked comprehension questions and then participates in role play of the target behavior (Chan & O’Reilley, 2008). One can either use social stories already written by the original author, Gray (2000), or one can create their own social stories; however, they must follow Gray’s (2000) guidelines. For instance, social stories are generally displayed on white paper with font sizes ranging from 22 to 26 points. Also, according to Leaf et.
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Social Stories must be written at the specific child’s comprehension level. Furthermore, four sentence types should be included: descriptive, perspective, affirmative, and directive (2012). This type of intervention is related to perspective-taking and communication in that it aims to increase the communication abilities in children with ASD while simultaneously teaching them about others’ perspectives (i.e., their teacher’s perspective, their mother’s perspective, etc.)

In a study conducted by Chan and O’Reilly, Social Stories were used as an intervention for two children with ASD, ranging from 5 to 6 years of age (2008). The children had the choice of having the story read to them or reading the story to themselves (Chan & O’Reilly, 2008). The study was designed to increase social communication in the two male participants (such as appropriate hand-raising, vocalizations, and social initiations) by reading stories about these targeted skills for about 20 minutes per session (Chan & O’Reilly, 2008). Social Stories were read in the morning, one to four times per week for each child (Chan & O’Reilly, 2008). The children then answered comprehension questions and participated in role play. The results of this study found that the behaviors targeted for intervention significantly increased and were maintained at follow up. However, the authors noted that the change in behavior could have been due to the modeling and role play rather than the Social Stories themselves (Chan & O’Reilly, 2008).

**Direct instruction.** Direct instruction is yet another model used for social skills interventions for children with ASD. Direct instruction involves teaching a social skill at each session, explaining the importance of having that skill, the steps involved in the skill, role modeling the skill, practicing the skill, and rewarding correct responses (Leaf,
Oppenheim-Leaf, Call, et. al, 2012). Direct instruction has been shown to be effective for both group and individual interventions (Leaf et. al, 2009; Leaf, Dotson, Oppenheim, Sheldon, & Sherman, 2010). In addition, when compared to Social Stories, direct instruction was much more effective in changing children’s behavior (Leaf et al., 2012). This type of intervention targets communication deficits as well as language deficits.

Leaf et al. (2012) examined the comparative effects of a direct instruction intervention and a social stories intervention on social skills. A total of six children aged 5 to 13 years participated in this study. Three children received direct instruction in social skills training, while three children participated in Social Stories. All children were taught six social skills. For children in the direct instruction group, a teacher described each social skill, identified the importance of displaying that skill, and described situations in which it is appropriate to use the behavior (Leaf et al., 2012). The teacher broke the skill down into smaller components, modeled the skill for the children, and participated in role play of the target behavior (Leaf et al., 2012). When the child displayed the behavior correctly, positive reinforcement in the form of praise was given (Leaf et al., 2012). In contrast, participants in the Social Stories group were read a social story for 45 minutes, three to six days per week.

Results found successful acquisition and generalization of all eighteen behaviors taught via direct instruction, whereas only four of the eighteen behaviors taught via social stories were learned and generalized (Leaf et al., 2012). Therefore, the authors concluded that direct instruction was more effective than Social Stories in increasing socially appropriate behaviors in children with ASD (Leaf et al., 2012).
What is applied behavior analysis? Most effective interventions for children with ASD are based upon the principles of Applied Behavior Analysis (ABA; Wilczynski et al., 2003). ABA uses operant conditioning to alter behavior. ABA interventions generally involve providing prompts to the child to perform the target behavior, and providing consequences based on that behavior. For instance, if the child exhibits the target behavior, they receive a reward (such as a bite of a cookie, a pat on the shoulder, praise, or a combination). If the child does not answer or displays an incorrect behavior, they are prompted again, and then additional prompts with increasing assistance are provided. The child is rewarded for any response that is close to the correct response regardless of how much assistance is needed. This procedure is referred to as discrete trial learning (Whalen & Schreibman, 2006). Interventions based upon ABA generally aim to increase communication and language development in children with ASD.

Interventions that are based upon ABA are typically intense in that they involve individual instruction and the intervention is based on the needs of that specific child (Wilczynski et al., 2003). In a study conducted by Whalen and Schreibman (2006), four children with ASD who lacked the ability to respond to joint attention bids (behaviors intended to prompt the child to look at what the researcher is viewing, such as pointing to an object in the room or shifting one’s eye gaze) were taught to respond appropriately to joint attention bids and then were taught to initiate joint attention (2006). Individual intervention sessions took place three days a week for 1.5 hours each time. During each session, the experimenter provided the child with opportunities to respond to joint attention bids every five minutes, such as placing the child’s hand on a toy, showing a toy to a child, pointing to a picture on the wall, or shifting their eye gaze to a picture on the
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wall after establishing eye contact with the child (Whalen & Schreibman, 2006). Reinforcement was provided after each correct response in the form of access to a desired toy, regardless of the number of prompts required. A multiple baseline design was implemented, with all four children showing a substantial increase in their ability to respond to and initiate joint attention bids (Whalen & Schreibman, 2006).

**What is cognitive behavioral therapy?** In addition, cognitive behavioral therapy (CBT) has also been used to improve social skills and decrease anxiety in children with ASD (Rotheram-Fuller & MacMullen, 2011). This therapy addresses the underlying cognitions that affect an individual’s behavior (Rotheram-Fuller & MacMullen, 2011). For instance, CBT for anxiety would require the child to identify which situations trigger anxiety and what behaviors follow, precede, or exacerbate anxiety. CBT is used to change an individual’s negative thought processes in order to influence the individual’s behavior, which ultimately decreases anxiety. When using CBT with children with ASD, CBT is used to increase emotional identification or perspective-taking. It is important to teach children with ASD coping strategies before introducing them to anxiety-provoking situations (Rotheram-Fuller & MacMullen, 2011). For example, strategies such as deep breathing, rhythmic counting, visual imagery, or positive self-talk could be used to counteract anxiety symptoms. In addition, CBT has been successful when used in a group format (Rotheram-Fuller & MacMullen, 2011) and children with high functioning autism are likely to benefit because their adequate cognitive abilities increase the likelihood that they will understand how their thinking affects their behavior (Rotheram-Fuller & MacMullen, 2011).
Previous research has found CBT to be effective for decreasing anxiety in children with ASD. For instance, in a study conducted by Wood, et al. (2009), 40 children aged 7 to 11 years old were assigned to a CBT intervention group for 16 weekly sessions that lasted for 30 minutes. All participants had a verbal IQ of 70 or higher (2009). The intervention consisted of teaching the participants coping strategies (such as recognizing emotions and cognitive restructuring) and exposure therapy (Wood et al., 2009). Results indicated that anxiety symptoms decreased among the treatment group after the CBT intervention was introduced (Wood et al., 2009).

**Similarities and differences of CBT and ABA.** Due to the fact that aspects of CBT and ABA will be used throughout this study, it is important to compare and contrast the two theoretical approaches. Although the Applied Behavior Analysis and the Cognitive Behavioral intervention approach for children with ASD are different, they share many similarities. For instance, both cognitive behavioral therapy and applied behavior analysis observe events or situations that occur immediately prior to the occurrence of the target behavior. While Applied Behavior Analysts refer to these events as “antecedents,” Cognitive Behavioral Therapists refer to them as “triggers.” In addition, both Applied Behavior Analysts and Cognitive Behavioral Therapists provide “reinforcement” following the demonstration of appropriate behavior. While cognitive behavioral therapy tends to focus on the thoughts preceding the problem behavior, applied behavior analysis tends to focus on the situations or events preceding the behavior. Both thoughts and situations are influential on behavior, and it is therefore beneficial to consider both when designing an intervention.
Limitations of Social Skills Interventions

One issue with social skills interventions is that they have poor generalizability to other settings (Cotugno, 2009). Many clinicians design interventions that do not plan for generalization (Cotugno, 2009) and often an intervention that is taught in one setting does not generalize to other settings without explicit teaching. Children with ASD who master a skill in one context, will likely fail to apply the same skill in another environment. For example, if a child with ASD is taught to introduce himself to other children at school, this would also be a good skill for him to use at soccer camp. Generalization is an important aspect of interventions for children with ASD. If the skills taught within the intervention cannot be generalized to settings in which they are needed, then the intervention has little ecological validity (Whalen, 2009).

There are some strategies that can be utilized to increase generalization. For instance, one can use preferred items as reinforcers, conduct the intervention in a natural setting (such as the school setting), and reinforce generalized behaviors (Whalen, 2009). DeRosier et al. (2011) also suggest including parents in the intervention to improve generalization. For instance, parents can help their children practice specific skills they have learned both at home and outside of the home. In the therapy setting, sending children home to practice new skills with their parents might be termed “completing homework.”

Characteristics of Effective Social Skills Interventions

Teaching children with ASD social skills using a direct teaching format appears to be more effective than using a play-based format. Kroeger, Schultz and Newsom (2006) examined differences in social skills between children receiving social skills
intervention in a play-based format versus a direct teaching format (Kroeger, Schultz, & Newsom, 2006). Twenty-five children participated in the study. Twelve children were in the direct teaching group and 13 in the play-based group. Children in the direct teaching group used video-modeling to teach social skills, while the play-based group engaged in unstructured play (Kroeger, Schultz, & Newsom, 2006). Results displayed that although both groups did increase socially appropriate behaviors, the direct teaching group made significantly more socially appropriate gains (Kroeger, Schultz, & Newsom, 2006).

Along with teaching skills using a direct format, research suggests that teaching children in a structured format is most effective (Baron-Cohen & Bolten, 1993). Teaching in a structured format may be effective because children with ASD prefer predictability in the environment, rather than a constantly changing atmosphere. While typically-developing children learn best in a structured environment as well, structure or consistency is of particular importance to children with ASD.

The composition of the group may also have an impact on the effectiveness of the social skills intervention. For instance, interventions designed for children with ASD who have similar deficits or strengths (i.e., high functioning autism) tend to be more successful than interventions composed of children with varying degrees of ASD (i.e., children who are verbal and nonverbal; DeRosier, et al, 2011). If the intervention is designed to make improvements in areas in which most of the group needs assistance and is capable of improving (for instance, focusing on social skills for children with high functioning autism), the intervention is more likely to succeed. However, if there are children in the intervention group that are non-verbal, they are less likely to benefit from an intervention addressing social skills. Furthermore, it is important to ensure that the
students in the intervention group do not display aggressive outbursts, as this could impede the success and safety of the group (DeRosier, et al., 2011).

Because children with ASD present with a variety of social difficulties that are not specifically similar across all children with ASD, effective intervention is likely to target social skills that are specific to each individual child with ASD. In addition, since children with ASD may suffer from anxiety symptoms or an anxiety disorder itself, teaching coping skills to children is likely an important intervention component. In general, the literature suggests that more research is needed to determine what types of interventions are most effective for children with ASD and to further support prior research findings.

**Purpose of Study/Hypotheses**

While there is a vast amount of research covering different interventions for children with ASD in addition to differing theories as to what causes ASD, there are interventions that have been shown to successfully increase communication/language development and therefore social skills in children with ASD. More specifically, the direct instruction intervention technique has been shown to be highly effective for children with high-functioning ASD. While most successful interventions for children with ASD are based upon ABA principles, recently researchers are examining the effects of incorporating CBT techniques into the therapeutic process. Of the studies reviewed, many report success in decreasing anxiety when CBT principles are implemented; however, more research is needed. Furthermore, most studies either utilize CBT or ABA strategies, but few have attempted to combine the two.
The current study had four aims: 1) to examine the effect of a social skills intervention involving direct instruction, anxiety reduction, and reinforcement principles on three target behaviors of a child with high functioning autism 2) to decrease student anxiety by teaching how and when to use a specific coping technique 3) to probe for generalization of social skills in the classroom setting, 4) and to probe for social skill maintenance in the school setting. Four hypotheses were made. It was hypothesized, based on previous research, that the social skills intervention would increase target behaviors because the intervention included direct instruction of social skill problems specific to the child, reinforced correct social skill responses, and utilized repetition and structure. It is important to note that the multiple components of the direct instruction technique are not being tested separately. Rather, the effect of the combination of the multiple intervention components on the targeted behaviors is what is being examined. It was also hypothesized that after intervention there would be a decrease in anxiety symptoms. In addition, it was hypothesized that the gains made through intervention (i.e., percentage of correct responses) would generalize to the classroom setting when prompted by the classroom teacher (i.e., high percentage of correct responses in the classroom setting) after intervention was implemented. The fourth and final hypothesis was that the percentage of correct responses would remain high after intervention had ended and a period of time had passed (i.e., at least one month).

**Dependent Variables**

The dependent variables in this study included three target behaviors and anxiety. The three targeted behaviors were selected based on the Social Skills
Screener (Appendix D) completed by the child participant’s teacher. The Social Skills Screener is completed by indicating on a Likert scale (1 – Never, 5 – Always) how often the child demonstrates five social skill behaviors. The five behaviors include: Greeting Others, Giving Compliments, Listening to Others, Expressing Empathy, and Joining Others in Play. Each of these behaviors has been cited as areas of difficulty for children with ASD (Bauminger, 2002; DeQuinzio, et. al, 2007; Kamps et. al, 1992; Leaf et. al, 2012). Of the five, the top three most problematic behaviors (i.e., the behaviors the teacher indicated the child displayed the least often) were identified for intervention. Each of the three behaviors identified for intervention are briefly described below.

**Giving Compliments.** Giving compliments is the ability to say something such as “Wow!” or “Cool” which involves the awareness of what others in the immediate environment are doing. Giving compliments is not a skill that comes naturally to children with ASD. However, it is not a skill that is outside their capability. Teaching children with ASD how to give compliments can increase how well-liked they are by their peers and therefore improve their social interactions.

**Listening to others.** In addition, listening to others is the ability to turn and look at an individual when they are attempting to gain your attention. Similar to the fact that children with ASD often do not respond to their name being said, they also fail to respond when others are attempting to gain their attention (such as teachers; Boucher, 2012).

**Expressing empathy.** Furthermore, expressing empathy is the ability to ask another individual what is wrong after that individual expresses sadness or
disappointment. This is another skill that children with ASD have difficulty acquiring, and it is therefore an important area to focus on.

**Data Design/Analysis**

This study utilized a multiple baseline design, which is an advantageous method to use for evaluating interventions with children with ASD (Kazdin, 2011). This type of design introduces intervention across three or more behaviors, settings, or participants. For the current study, intervention was introduced across three target behaviors, concurrently. The intervention was introduced to the first target behavior that had at least three stable baseline data points or a decreasing trend for at least three data points. A minimum of three data points are necessary before implementing an intervention in order to examine whether there is an increasing, decreasing, variable, or stable trend in the data (Cooper, Heron, & Heward, 2007). If a baseline has less than three data points, it is more difficult to visually analyze the trend in the data and therefore more difficult to confidently state that the change in the behavior after intervention is introduced is due to the intervention and not an extraneous factor.

In the current study, after three stable baseline data points were obtained, the intervention was introduced to the first target behavior, then the second behavior, and finally, the third behavior. A multiple baseline design demonstrates control when the dependent variable (the target behavior) changes because the independent variable (the social skills intervention) is introduced to that specific target behavior and the remaining two target behaviors (that have not been introduced to the intervention) remain the same as baseline levels until intervention is introduced (Kazdin, 2011).
There were many reasons for using a multiple-baseline design for this study. First and foremost, multiple-baseline design does not require the treatment or intervention to be removed in order to demonstrate control, as it is already demonstrated through the additional phases that have not been introduced to the intervention yet (Kazdin, 2011). In contrast, an ABAB design does require removal of the treatment in order to demonstrate control. Also, a multiple baseline design does not require the use of a control group (Kazdin, 2011). Therefore, treatment is not withheld from any of the participants.

Furthermore, a multiple baseline design allows one to observe multiple behaviors simultaneously, while implementing the intervention in an individual, step-wise fashion (Kazdin, 2011). Lastly, this type of design allows one to design the intervention for very specific behaviors for a small number of participants, thereby individualizing the treatment (Kazdin, 2011), which is extremely important when working with individuals with ASD.

An example of what a multiple baseline looks like (specific to the current study) is in Figure 1 on the following page. This figure was created by the author to assist with better understanding multiple baseline design and visualizing ideal outcome data for the current study.
Figure 1. Percentage of prompts where the correct response was observed during each intervention session.
In the above example (Figure 1.), the target behaviors increased only when the intervention was introduced to that specific behavior, while the behaviors that had not been introduced to intervention remained at baseline levels.

**Anxiety.** While the social skills were the main focus of the present study, a peripheral aspect involved measuring anxiety levels in the participant before and after intervention. Anxiety was measured using the Multidimensional Anxiety Scale for Children (MASC, 1999) which is a 39 item self-report assessment for children ages 8 through 19 years. There are four different factors within the MASC: Separation Anxiety, Physical Symptoms, Harm Avoidance, and Social Anxiety. According to Mazzone et al., a \( T \) score is obtained for each of the four factors indicating whether the child falls in the normal range \( (T = 45-55) \), at-risk range \( (T = 55-65) \), or clinically significant range \( (T \geq 65) \) for that specific factor of anxiety (2007). There is also an overall \( T \)-score which indicates whether the child's general level of anxiety falls within the normal range, at-risk range, or clinically significant range.

The MASC has been shown to have adequate reliability and validity in measuring anxiety symptoms in children (Thaler, Kazemi, & Wood, 2010). In a study by Thaler, Kazemi, and Wood, the MASC was completed by 42 adolescents between the ages of 11 and 17. Parents of the participants also completed the MASC Parent Report. High agreement was found between the MASC self-report and the MASC parent-report. More specifically, the correlation coefficient between the child and parent reports for the MASC overall \( T \)-score was .51, which is higher than the suggested amount necessary (.40) to determine adequate reliability.
The MASC was compared to the Anxiety Disorders Interview Schedule (ADIS; a measure that is considered to be the "gold standard" for assessing anxiety according to Christner, Stewart, & Freeman, 2007), and high convergent validity was demonstrated (2010). Both the MASC child report and parent report obtained convergent validity statistics of .40 (a statistically significant amount) with the ADIS. These results indicate that the MASC is a valid and reliable measure of anxiety.

In the current study, the parent also completed the Spence Children's Anxiety Scale, because a MASC parent report could not be obtained. In previous studies, the Spence Children's Anxiety Scale was found to be highly correlated (correlation coefficient of 0.76) with the MASC (Baldwin & Dadds, 2006), which supported its use in this study. To examine changes in anxiety, pre and post child MASC T-scores were compared and pre and post parent SPENCE scores were compared.

Independent Variable

Social skills training plus anxiety reduction. The independent variable in this study was social skills training plus anxiety reduction (deep breathing). Based on prior research, a social skills intervention is likely to be effective if it includes direct instruction (DeQuinzio, Townsend, Sturmey, & Poulson, 2007; Kamps, et al., 1992; Leaf et al., 2012). Direct instruction was used by first teaching the child why the social skill was important and then teaching the child the steps involved in displaying the skill. Next, the individual implementing the intervention modeled the social skill for the child and allowed and encouraged the child to practice using the social skill. During the practice portion of the session, when the child correctly demonstrated and practiced the social skill taught or reviewed, she earned a token and verbal praise. The
child collected the tokens she earned in a jar and at the end of the session had an opportunity to spend the tokens on various small prizes.

Some researchers have emphasized the importance of incorporating anxiety reduction techniques into interventions for children with ASD (Reaven et al., 2012; Rotheram-Fuller & MacMullen, 2011) because anxiety-like symptoms are commonly reported among children with ASD. In the current study, deep breathing was the anxiety reduction technique taught. The child was taught how to 1) identify when her body was tense and relaxed, 2) breathe deeply (e.g., breathing in through your nose for five seconds, holding your breath for 3 seconds, and then exhaling through your mouth for five seconds), and 3) taught why and when to use deep breathing (e.g., when you feel tense, when you want to calm down, etc.). The individual implementing the intervention demonstrated deep breathing and then had the child practice deep breathing three times before each intervention session began.

Training session outline. The social skills training sessions (Appendix M) followed the following sequence. At the beginning of the session, the individual implementing the intervention started by welcoming the student to the session and built rapport by asking her about her day. The individual implementing the intervention then gave the student a brief outline of what would occur during the session (e.g., today we will review deep breathing and learn how to listen to others). Then the individual implementing the intervention reviewed (taught if it was the first session) the components of the coping strategy and had the participant practice using the strategy three times (see above for details on deep breathing). Next, the individual implementing the intervention explained the importance of the social skill for that
week. For instance, if listening to others was addressed that week, the individual implementing the intervention explained that it is important to listen to others because it shows respect, so you know what is going on, and so you can follow directions. Then, the individual implementing the intervention went over the necessary steps to display the social skill. For instance (using the same listening to others example), the individual implementing the intervention explained that listening to others has 3 steps: 1) First you need to face the other person by turning your shoulders toward the other person, 2) You need to look the other person in the eye, and 3) You need to nod your head to indicate that you are listening. Afterwards, the individual implementing the intervention modeled the social skill with one of the observers. The individual implementing the intervention had the child practice with the individual implementing the intervention and one of the observers. The child was reinforced with praise and a token when she correctly demonstrated and practiced the social skill taught or reviewed during the session. After practicing, the individual implementing the intervention reviewed the corresponding homework assignment with the child and gave the child the homework worksheet (Appendix H). The homework assignments served to increase generalization of skills by allowing the child to practice the skills in other settings with different individuals and by increasing the frequency with which the child practiced each skill outside of the intervention sessions. The child was encouraged to practice the social skill in class and at home. The child was told that if she completed and returned the homework assignment at the following session she would earn a token.
Lastly, it is important to note that the results of this study cannot be generalized to every child with ASD, as the characteristics and severity of ASD vary among children. In addition, the intervention is individualized for one participant, so it would not be accurate to claim that the results will generalize to everyone in the ASD population. However, the results of this study could potentially be generalized to children with ASD who are similar to the child in this study in terms of age, characteristics, and behaviors targeted.

Method

Participants

The participants in this study consisted of “Sara,” an elementary-aged, 8 year old female, with an educational diagnosis of ASD (who completed the MASC: Self-Report before and after intervention and received social skills intervention), Sara’s mother (who completed the SPENCE: Parent-Report anxiety rating scale before and after intervention), and Sara’s general education classroom teacher (who completed the social skills screener to determine which behaviors to target for intervention). Exclusionary criteria included any display of aggression during baseline data collection. The four inclusionary criteria included displaying a low percentage (0-40%) of target behaviors at baseline, having a good attendance record, meeting educational criteria for ASD, and having a documented IQ score of 70 or higher. Sara met all inclusionary criteria. Her percentage of correct responses for target behaviors at baseline was 0% for Giving Compliments, 28% for Expressing Empathy, and 16% for Listening to Others.

Permission to recruit and implement the proposed research was obtained from a local elementary school in Central Illinois. Once permission was obtained, Sara was
recruited from the elementary school by contacting special education teachers and informing them of the study. The individual implementing the intervention gave flyers (Appendix A) to special education teachers detailing the study and encouraged the teachers to send the flyers home with students who may be eligible for participation. Sara’s mother contacted the individual implementing the intervention and indicated she was interested in having her daughter participate. The intervention was arranged to take place at Sara’s elementary school and informed consent was obtained from Sara’s mother prior to implementing the intervention (Appendix B). Sara received small prizes during the intervention. Her mother was given the videotaped intervention and data collection sessions at the termination of the study. No other incentives (monetary or otherwise) were given to Sara, her mother, or Sara’s teacher.

**Observers and individual implementing the intervention.** This study consisted of the individual implementing the intervention (the primary researcher) and two observers (undergraduate students). During intervention sessions and data collection sessions, only one observer was present along with the individual implementing the intervention. Together the observer and individual implementing the intervention took turns delivering prompts to Sara to measure her percentage of correct responses to each of the three target behaviors. Sara’s responses were videotaped and then subsequently viewed and coded after the session. To calculate inter-observer agreement, 14 of the 16 videotaped sessions (88%) were coded by an observer and the individual implementing the intervention. Each viewed the tape individually and then indicated whether or not Sara provided the correct response after the prompt was delivered. Then their codes were compared and calculated for inter-observer agreement. Intervention sessions were also
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videotaped, so that the observer could complete the treatment integrity data sheet at a later time. Treatment integrity data were collected to determine if the intervention was implemented as intended.

**Training for the observers.** A training video was made specifically to train observers for this study. After having observers study and review the correct responses for the three target behaviors (see Appendix J), each observer coded the training video independently during three practice sessions. The video consisted of an adult delivering one of five prompts that corresponded with one of the five targeted behaviors from the Social Skills Screener (Appendix D). Observers were trained to code (identify whether or not the correct response occurred after the prompt was delivered) all five behaviors, because it was unclear which of the five behaviors would be selected for intervention. Once observers met 80% inter-observer agreement with the person implementing the intervention using the training video, they were considered trained. Interobserver agreement was 100% prior to beginning the study.

**Setting**

Social skills training and data collection took place at a local elementary school. A conference room was used three times a week, after school for 30-60 minutes. The furnishings of the environment included one table, four chairs, one poster board (for the individual implementing the intervention to write on), free play activities (i.e., Legos, 48 piece Disney princess puzzle, blank pieces of paper for drawing, crayons), and a token economy system.
Procedure

As stated previously, prior to the start of the study, informed consent was obtained from the teacher and the parent. Verbal assent was also obtained from the child participant prior to the start of the study. The teacher completed the Social Skills Screener, which determined that Giving Compliments, Expressing Empathy, and Listening to Others would be targeted for intervention. In addition, anxiety data were collected from the student (using the MASC: Self-Report) and the parent (using the SPENCE: Parent Report) before and after the intervention.

Design. A concurrent multiple baseline across behaviors design was used to evaluate the effectiveness of the social skills intervention plus coping strategy. Baseline and experimental conditions were introduced across target behaviors after varying numbers of baseline sessions. The behaviors targeted for social skills intervention represented the multiple baselines. Changes in target behaviors were determined through visual analysis and calculating effect sizes.

Baseline. During baseline the child participant was brought down to the conference room after school, took off her jacket, set her backpack down, and sat at the table in the room alongside the observer and the individual implementing the intervention. Various toys were on display at the table including Legos, a princess puzzle, blank pieces of paper for drawing, and crayons. Data collection sessions were videotaped and behaviors were scored at a later time by a trained observer using the Social Skills Observation Sheet (Appendix E). Recording the sessions allowed the individual implementing the intervention to calculate inter-observer agreement. In addition, videotaping allowed for the individual implementing the intervention and the observer to
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focus solely on giving the prompts in the correct order (determined by the Social Skills Data Sheet developed for that data collection session). To code the videotaped sessions, the observer viewed the tape and then recorded whether or not the participant displayed the correct behavior after each prompt was given.

To video the sessions, a flip camera was placed on a tripod on a ledge approximately five feet in front of Sara. The camera was positioned behind the individual implementing the intervention at a raised height (approximately four feet high) so that even though the camera was directly across from Sara, it was not in plain sight. The camera was turned on prior to Sara entering the room to prevent drawing unnecessary attention to the fact that sessions were videotaped, as that could have potentially impacted the manner in which Sara behaved (i.e., responded to prompts) during each session.

Baseline data collection began once Sara was seated and had been instructed to play with the toys available to her on the table. The individual implementing the intervention and the observer began taking turns administering the prompts for the three target behaviors (i.e., Giving Compliments, Expressing Empathy, and Listening to Others). The Social Skills Data Sheet (see Appendix E for an example) was used to guide the order in which the prompts were given. A new data sheet was generated for each data collection session to compensate for order effects. Before each session, the individual implementing the intervention flipped a coin to determine which trials would be administered by which individual so that the child would not know which individual would give the next prompt. Each trial that either the individual implementing the intervention or the observer administered contained three prompts (i.e., one for each target behavior). The trials that the individual implementing the intervention administered
were highlighted in pink, while the trials that the observer administered were highlighted in green to facilitate the delivery of the prompts. The prompts were delivered in a specific order and were counterbalanced to decrease order effect on the participant's responses (see Appendix E). No reinforcement was provided during baseline sessions.

The trained observer typically coded the videos at her apartment within 3-4 days after the data collection session using the Social Skills Data Sheet (Appendix E). The form included 10 prompted trials for each targeted behavior (a total of 30 prompts, 10 for each of the 3 target behaviors). When the observer viewed the tape, she coded whether or not the participant displayed the correct response to the target behavior after the delivered prompt. The percentage of correct responses was calculated for each target behavior.

Baseline data was collected every other day (i.e., Monday, Wednesday, Friday) until one of the target behaviors stabilized or there was a decreasing trend in the data, with a minimum of three data points, as suggested by Kazdin (2011). Once baseline data were stable for one target behavior, the individual implementing the intervention began social skills training starting with the social skill that corresponded with the baseline target behavior that stabilized first. The social skill that corresponded with the next target behavior to have stable baseline data was introduced next. Once baseline data were stable in the third target behavior, the last social skill was introduced. This ensured the baseline and intervention phases for each behavior were staggered, which is needed when using a multiple baseline design.

**Intervention + reinforcement 0% (IR0).** During the IR0 phase, social skills training plus anxiety reduction took place by having the individual implementing the intervention follow the social skills training outline (Appendix M). First, a flip camera
was placed on a tripod on a ledge approximately five feet in front of Sara. The camera was positioned behind the individual implementing the intervention at a raised height (approximately four feet high) so that even though the camera was directly across from Sara, it was not in plain sight. The camera was turned on prior to Sara entering the room to prevent drawing unnecessary attention to the fact that sessions were videotaped. Once the student had entered the room, the individual implementing the intervention welcomed the student to the session and told the student the outline for the session that day. The individual implementing the intervention reviewed the coping skill (deep breathing) with the participant. Then, the individual implementing the intervention taught the social skill for that week and reviewed previous social skills if it was not the first week of intervention. Next, the individual implementing the intervention and the observer demonstrated how to perform the social skill for that week through role play. Afterwards, Sara was told to select a free play activity (i.e., Legos, puzzles, blank paper for drawing, crayons, and coloring books) and that she would have the opportunity to practice the social skills either taught and/or reviewed that session. Practicing the social skill(s) lasted approximately five minutes (the individual implementing the intervention used a stopwatch). During this time, the individual implementing the intervention and the observer took turns prompting Sara to demonstrate the social skill taught or reviewed that day. The prompts used during practice were similar to the prompts on the Social Skills Data Sheet, however, they were delivered in an impromptu manner (the observer and individual implementing the intervention did not use a data sheet to guide them). When Sara correctly demonstrated the social skill after a prompt, she was praised and earned a token. The number of prompts reflected the number of social skills taught or reviewed.
For example, if only one skill had been taught, three prompts were given, whereas if two skills had been taught or reviewed, six prompts were given. Sara had the opportunity to practice each skill three times. When more than one social skill was practiced, prompts for each social skill were mixed so that three similar prompts were never given consecutively. After practicing, the social skills session ended and data collection began. There was no verbal or non-verbal cue given to Sara to let her know that the practice session was ending.

At the start of the data collection session, the individual implementing the intervention signaled the observer (i.e., cleared her throat to get the observer’s attention and pointed to the stopwatch) to indicate that the data collection session was starting. The signal was covert so that Sara was unaware that the data collection session was beginning. In the IR0 phase, the data collection was implemented using the Social Skills Data Sheet. No changes were made to the Social Skills data collection sheet. In other words, 30 prompts (10 for each of the 3 target behaviors) were given and Sara did not receive any verbal praise or tokens when she responded regardless of correct or incorrect responses. Once the data collection session ended (i.e., all prompts had been given), Sara was prompted to count her tokens and decide if she wanted to “purchase” a prize from the menu using the tokens she earned during the session. The tokens could only be used the day they were given to Sara, so she always chose to purchase a toy rather than save her tokens. After Sara made her purchases, the person who implemented the intervention gave her a homework assignment focusing on the social skill for that week. She was encouraged to complete the assignment at home and told that if she returned the completed assignment she would earn a token. Sara’s mother was also informed about the
homework assignment. After the session had ended, the observer and/or the individual implementing the intervention viewed the videotape at home and recorded the percentage of correct responses for each target behavior.

During the IR0 data collection phase, Sara verbally expressed confusion and distress as to why she was no longer receiving tokens for correct responses (e.g., Sara asked, “Where are my tokens?” and “Why aren’t you giving me any tokens now?”). This was likely due to receiving tokens during the practice session, but not during the data collection session. This also suggests that Sara was unaware of when practice sessions ended and when data collection began. In order to maintain rapport with Sara, changes were made to the data collection sessions. For example, the following data collection sequence took place: 25% of the prompts included reinforcement opportunities, 20% of the prompts included reinforcement opportunities, and 15% of the prompts included reinforcement opportunities. Intervention during these phases remained consistent throughout the study. The change was made only to the data collection process, where Sara had additional opportunities for reinforcement (which were not coded) that were slowly faded out across the intervention phase.

**Intervention + reinforcement 25% (IR25).** The social skills session took place exactly as described in the IR0 phase. The start of the data collection session was similar to the IR0 phase in that the individual implementing the intervention signaled the observer (clearing her throat to get the observer’s attention and pointing to the stopwatch) to indicate that the data collection session was starting. In the IR25 phase, in addition to the 30 prompts on the Social Skills Data Sheet, 10 additional reinforcement prompts were given in which no data were collected (indicated by yellow highlighting and two asterisks
placed next to the prompt on the Social Skills Data Sheet; See Appendix E for an example). When Sara correctly responded to “reinforcement” prompts, she received verbal praise and a token. This allowed her an opportunity to receive a token for 25% of the prompts (10 out of 40 prompts = 25%) delivered during the data collection session. The 10 reinforcement prompts were randomly intermixed among the 30 data prompts. Therefore, a total of 40 prompts were given, 30 data prompts and 10 reinforcement prompts. The Social Skills Data Sheet was manipulated before the session began to reflect the additional 10 reinforcement prompts that had been added (see Appendix F for an example). Furthermore, prompts were delivered by the individual implementing the intervention and the observer randomly. The individual implementing the intervention and the observer had the same copy of the Social Skills Data Sheet (a new sheet was developed for each data collection session), which helped facilitate data collection in an organized fashion. Once all prompts were given Sara was told she could purchase a prize from the store with the tokens she had earned. Then she was given a homework assignment focusing on the social skill for that week. Within 3 days the observer and/or the individual implementing the intervention viewed the videotape of the data collection session at home and coded the percentage of correct responses for each target behavior.

**Intervention + reinforcement 20%.** The social skills session took place exactly as described in the IR0 phase. The start of the data collection session was similar to the IR0 phase in that the individual implementing the intervention signaled the observer (clearing her throat to get the observer’s attention and pointing to the stopwatch) to indicate that the data collection session was starting. In the IR20 phase, in addition to the 30 prompts on the Social Skills Data Sheet, 7 additional reinforcement prompts were
given in which no data were collected (indicated by yellow highlighting and two asterisks placed next to the prompt on the Social Skills Data Sheet). When Sara correctly responded to reinforcement prompts, she received verbal praise and a token. This allowed her an opportunity to receive a token for roughly 20% of the prompts (7 out of 37 prompts = approximately 20%) delivered during the data collection session. The 7 reinforcement prompts were randomly intermixed among the 30 data prompts. Therefore, a total of 37 prompts were given, 30 data prompts and 7 reinforcement prompts. The Social Skills Data Sheet was manipulated before the session began to reflect the additional 7 reinforcement prompts that had been added (see Appendix G for an example). Once all prompts were given, the person implementing the intervention told Sara she could purchase a prize and then gave her a homework assignment focusing on the social skill for that week. The observer and/or the individual implementing the intervention viewed the videotape at home and recorded the percentage of correct responses for each target behavior.

**Intervention + reinforcement 15%**. The social skills session took place exactly as described in the IR0 phase. The start of the data collection session was similar to the IR0 phase in that the individual implementing the intervention signaled the observer (clearing her throat to get the observer’s attention and pointing to the stopwatch) to indicate that the data collection session was starting. In the IR15 phase, in addition to the 30 prompts on the Social Skills Data Sheet, 5 additional reinforcement prompts were given in which no data were collected (indicated by yellow highlighting and two asterisks placed next to the prompt on the Social Skills Data Sheet). When Sara correctly responded to reinforcement prompts, she received verbal praise and a token. This allowed
her an opportunity to receive a token for roughly 15% of the prompts (5 out of 35 prompts = approximately 15%) delivered during the data collection session. The 5 reinforcement prompts were randomly intermixed among the 30 data prompts. Therefore, a total of 35 prompts were given, 30 data prompts and 5 reinforcement prompts. The Social Skills Data Sheet was manipulated before the session began to reflect the additional 5 reinforcement prompts that had been added (see Appendix H for an example). Once the data collection session was over, Sara was told she could purchase a prize and then the individual implementing the intervention gave her a homework assignment focusing on the social skill for that week. Later the observer and/or the individual implementing the intervention viewed the videotape at home and recorded the percentage of correct responses for each target behavior.

**Generalization.** In addition, Sara’s classroom teacher was asked by the individual implementing the intervention during the IR15 phase to begin classroom data collection for generalization (i.e., session 12; approximately one week before generalization data collection needed to begin). The Social Skills Data Sheet (see Appendix E) was given to the classroom teacher by the individual implementing the intervention approximately one week prior to generalization data beginning (see page 52 for a description of how the Social Skills Data Sheet is used). The individual implementing the intervention explained how to give the prompts, which responses were considered correct, and how to use the data sheet (i.e., identical to the manner in which it was used by the individual implementing the intervention and the observers during baseline and IR0 sessions) to calculate a percentage of correct responses for each target behavior. A second reminder to collect generalization data was provided to the classroom teacher one week after
intervention sessions had ended (i.e., one week after session 13) because she had not collected any data at that point.

Sara’s mother was also asked by the individual implementing the intervention during the IR15 phase to begin generalization data collection within the home setting. The Social Skills Data Sheet (Appendix E) was given to Sara’s mother after session 12 had ended, and the afore-mentioned procedure (i.e., the same procedure that was used with the classroom teacher) was used to explain how to use the data collection sheet to Sara’s mother. Neither the teacher nor Sara’s mother returned any of the data collection sheets. Therefore, it was assumed that no generalization data were collected.

**Maintenance.** The maintenance phase was implemented the following school year, approximately 17 weeks after the IR15 phase ended. The procedures for the maintenance phase were similar to baseline. For example, no social skills intervention was implemented. First, a flip camera was placed on a tripod on a ledge approximately five feet in front of Sara. The camera was positioned behind the individual implementing the intervention at a raised height (approximately four feet high) so that even though the camera was directly across from Sara, it was not in plain sight. The camera was turned on prior to Sara entering the room to prevent drawing unnecessary attention to the fact that sessions were videotaped. Once the student had entered the room, she began playing with toys available to her (i.e., Legos, coloring books, puzzles). The individual implementing the intervention reminded her about potential prizes she could earn with tokens. Then, the individual implementing the intervention cleared her throat to signal to the observer that the data collection session was starting. In the maintenance phase, in addition to the 30 prompts on the Social Skills Data Sheet, 5 additional reinforcement prompts were given
in which no data were collected (indicated by yellow highlighting and two asterisks placed next to the prompt on the Social Skills Data Sheet). When Sara correctly responded to reinforcement prompts, she received verbal praise and a token. This allowed her an opportunity to receive a token for 15% of the prompts (5 out of 35 prompts = 15%) delivered during the data collection session. The 5 reinforcement prompts were randomly intermixed among the 30 data prompts. Therefore, a total of 35 prompts were given, 30 data prompts and 5 reinforcement prompts. The Social Skills Data Sheet was manipulated before the session began to reflect the additional 5 reinforcement prompts that had been added (see Appendix H for an example). After all prompts had been given, Sara was told to select a prize with any tokens she had earned. Later, the observer and/or the individual implementing the intervention viewed the videotape at home and recorded the percentage of correct responses for each target behavior.

Materials for the Individual Implementing the Intervention

Social skills materials. Social skills materials included poster board with markers, a token economy system, homework assignments (Appendix K), free play activities (i.e., Legos, coloring books, crayons, 48 piece Disney princess puzzles, blank paper for drawing), and facial expression pictures. A poster board was used during each session to detail the steps used in the coping strategy (i.e., deep breathing) as well as each of the social skills taught. Each poster board was saved so the individual implementing the intervention could refer back to the original board to review deep breathing and each social skill previously taught.

The token economy included tokens that Sara could earn during the session and a prize bank (where Sara could store tokens she earned during the session). A menu of
prizes Sara could “buy” with the tokens she earned was created (Appendix O). The menu listed how many tokens each prize “cost.” The prizes were set at the end of the table opposite from where the child was working during each session so that the student could easily reference which prizes were available and how many tokens she needed to earn them. Prior to the start of the intervention, prizes were purchased based on recommendations from Sara’s mother regarding types of small items Sara might like. See Appendix O for a list of prizes available to Sara.

Homework assignments were developed specifically for this study and included questions for Sara’s mother to review with Sara at home regarding the social skill learned and practiced that day. Facial expression pictures were also used during intervention. Facial expression pictures were used to teach the social skill “expressing empathy.” Images were obtained from “google images” by searching the following key words: “facial expressions” and “social skills.” Five images were selected of female children with the following facial expressions: happy, sad, mad, excited, and afraid. Images were printed on plain paper. Each image was approximately 2 inches x 2 inches.

**Materials for the Participant’s Teacher**

**Social skills screener.** The social skills screener (Appendix D) was developed by the individual implementing the intervention. This screener measures how often an individual displays certain social skills and was administered to Sara’s teacher prior to implementing the social skills intervention. Refer to page 31 of this manuscript (Dependent Variable section) for a description of how the screener is administered and the five social skills assessed.
Social skills data sheet. The Social Skills Data Sheet (Appendix E) was developed by the individual implementing the intervention. The Social Skills Data Sheet was intended to be used by Sara’s classroom teacher to collect generalization data. The sheet is completed by indicating whether or not Sara displayed the correct response after a prompt is delivered (in this case a prompt delivered by the teacher in the general education classroom). To complete the Social Skills Data Sheet the classroom teacher needed to determine if the correct target behavior was demonstrated after the corresponding prompt was given. If the correct behavior was displayed, a checkmark was made in the corresponding box on the Social Skills Data Sheet. At the end of the form, the number of times the participant displayed the correct behavior for each of the target behaviors (total possible = 10) was recorded and a percentage of correct responses for each target behavior was calculated. This same sheet was given to Sara’s mother as well to collect generalization data within the home setting.

Materials for the Observers

Social skills data sheet. The Social Skills Data Sheet measured whether Sara correctly displayed the target behavior after a prompt was delivered by one of the observers or the individual implementing the intervention. The Social Skills Data Sheet was also used during baseline, all intervention phases, and the maintenance phase. Although there were slight variations in the Social Skills Data Sheet across phases (i.e., IR0, IR25, IR20, IR15; see procedure section for more detail) to allow reinforcement during data collection to be faded out, the total number of prompts where data was collected remained consistent across all phases (i.e., total of 30 prompts, 10 prompts for
each of the three target behaviors). The prompts were counter balanced to decrease the likelihood of order effects. Reinforcement prompts were never coded for data collection.

Leaf et al. used a similar method to measure the frequency of targeted behaviors in their study examining the effects of direct instruction on social skills for children with ASD (2012). In this study, one of the observers engaged in a behavior that would provide an opportunity for the participant to display the appropriate social skill, (e.g., to measure "giving compliments," the observer showed a picture he/she had drawn to the child to see if they provided a compliment). The following are examples of prompts that were given by either the observer or the individual implementing the intervention to prompt target behaviors using the Social Skill Data Sheet (Appendix E):

### Giving Compliments
The observer touched the child’s shoulder to get their attention, gestured toward the activity, and said “Look what I made!” or “I’m drawing a big picture” or used a similar phase to bring attention to what she was doing. If the target child acknowledged the assistant by complimenting what she was doing (e.g., “Cool!” or “Wow!” or “That is a great picture”) a mark was made to indicate that the child displayed the correct response.

### Expressing Empathy
The observer said, “Ouch,” “Aww man,” or sighed loudly to see if the child’s verbal response expressed concern by matching or questioning the observer’s verbal statement. If the child demonstrated any of these behaviors a mark was made to indicate that the child displayed the correct response.

### Listening to Others
The observer said, “Sara.” If the child turned and looked at the assistant then a mark was made indicating that the child demonstrated the correct response.
Reliability

Inter-observer agreement (IOA) was collected using The Social Skills Data Sheet. IOA is the percentage of agreement between two or more raters during an observation session (Kazdin, 2011). In the current study, IOA was collected to ensure that the observers and the individual implementing the intervention were recording the child’s behavior (i.e., whether or not the correct response was displayed for each target behavior) consistently with one another. IOA provides a measure of reliability for the data collected in that it tells to what degree the data collected is similar across data collectors and whether or not the data is being collected in the same manner (Kazdin, 2011).

Interobserver agreement was collected for 88% (i.e., 14/16 sessions) of the data collection sessions. The observer and the individual implementing the intervention used the Social Skills Data Form to code the videotape and then compared their responses to calculate IOA. IOA was calculated by counting the number of agreements (between the observer and the individual implementing the intervention) divided by the total number of agreements and disagreements and then multiplying the number by 100. The average IOA was 95% with IOA ranging from 80%-100%. More specifically, Cohen’s Kappa correlation coefficient was also calculated to further examine the rate of agreement between observers. Cohen’s Kappa is an additional measure for reliability that is often used in studies involving observations conducted by two or more raters (Viera & Garrett, 2005). Correlation coefficients close to 1.0 are considered to have high reliability, whereas coefficients closer to 0.0 are considered to have poor agreement (Viera & Garrett, 2005). For this study there was a high rate of agreement between
observers, $k = 0.693, \ p < .000$, which further supports the reliability of the observations conducted.

**Treatment Integrity**

Two observers measured whether the individual implementing the intervention did so consistently and appropriately by completing a treatment integrity checklist after each session. The observers independently completed a checklist that asked whether the following 6 steps were addressed during intervention: 1) calming reviewed by the individual implementing the intervention 2) an explanation of the importance of the new social skill was given 3) an explanation of the steps necessary to use the new skill was given 4) the new skill was modeled by the individual implementing the intervention 5) the participant practiced using the skill and 6) the participant was reinforced for using the skill.

To complete the treatment integrity checklist (see Appendix I), the observers reviewed the videotapes of the intervention sessions and evaluated whether each of the 6 steps listed above took place. If the step was observed a checkmark was placed next to the step. The total number of checkmarks were added together and a percentage was calculated (e.g., if all 6 items were observed, 100% treatment integrity was reported). This was done for all of the intervention sessions. Across 10 sessions, treatment integrity was 100% for both observers More specifically, the correlation coefficient for treatment integrity as measured by the observers was 1.00, which is the highest amount of agreement between two observers, as their ratings for each session were identical (i.e., each individual rated 100% treatment integrity for all 10 intervention sessions). After each social skills session, Sara was sent home with homework that reviewed the social
skills taught during that session. Homework was intended to increase the likelihood that the skills taught during intervention (i.e., in the social skills training environment) would generalize to the home environment. Sara was given 10 different homework assignments and 0 assignments were returned. This suggests that homework assignments were likely not completed and this aspect of the intervention (which intended to increase generalization of social skills to the home environment) likely had poor treatment integrity.

Results

The changes in the three target behaviors (i.e., giving compliments, expressing empathy, and listening to others) were examined during baseline, intervention, and maintenance phases. It was hypothesized that once the social skills intervention was introduced, the frequency of correct responses for each of the three target behaviors would increase. It was also hypothesized that after the social skills intervention was terminated, the percentage of correct responses for each of the three target behaviors would be observed in the classroom setting. Specifically, the percentage of correct responses for each of the three target behaviors were expected to be higher in the classroom setting compared to baseline rates (in the intervention/training setting). In addition, it was hypothesized that the percentage of correct responses for each of the three target behaviors would remain high after intervention had ended and a period of time had passed (i.e., at least one month). The fourth and final hypothesis was that the participant would have fewer anxiety symptoms after the social skills intervention was implemented.
Target Behaviors

The percentage of correct responses for each target behavior was calculated by dividing the number of correct responses observed, by the total number of opportunities (10). The percentage of correct responses for each target behavior is displayed in Figure 2. Overall, the number of correct responses increased and remained stable once the intervention was introduced to each target behavior. Correct responses during maintenance remained similar to correct responses during intervention. Changes to each target behavior are discussed in detail below.
Figure 2. Rate of reinforcement is represented by the number following "R." For instance, four phases were present (0%, 25%, 20%, and 15%). No changes to the intervention took place—only changes to the data collection portion of each session.
**Giving compliments.** At baseline the mean percentage of correct responses for giving compliments was 0%. The mean percentage of correct responses for giving compliments increased to 76% when intervention was introduced. During the maintenance phase, the mean percentage of correct responses increased to 97%.

Table 1. (Appendix N) displays effect sizes for changes in giving compliments (SMD\textsubscript{all} and PND) and effect size classifications. SMD\textsubscript{all} represents the Standard Mean Difference for all the data points collected during baseline compared to the data points collected during intervention. Table 2. (Appendix N) displays effect sizes for changes in giving compliments (SMD\textsubscript{all}) and effect size classifications. Data points collected during intervention were compared to the data points collected during maintenance. SMD\textsubscript{all} is the measure used for single subject designs in order to estimate the effect size of the independent variable (Olive & Smith, 2005). Percentage of Non-Overlapping Data points (PND) is the measure used to calculate the intervention effect based on whether or not the data points from baseline overlap with any of the data points during intervention (Olive & Smith, 2005). SMD\textsubscript{all} of .02 are considered small, .05 medium, and .08 large (Olive & Smith, 2005). PND below 50% indicates an ineffective intervention effect, 50-70% indicates a questionable intervention effect, 70-90% indicates an effective intervention effect, and 90% and greater indicates a very effective intervention effect (Olive & Smith, 2005). Effect sizes for giving compliments from baseline to intervention (see Appendix N) SMD\textsubscript{all} = 3.1 suggesting a large effect, and PND = 100% suggesting a very effective intervention effect. Further, effect size from intervention to maintenance was large as well (SMD\textsubscript{all} = 1.7 suggesting a large effect). These results suggest that once the intervention was introduced, the percentage of correct responses for giving compliments
increased and continued to increase after a period of time passed (17 weeks) and intervention was no longer in place. Therefore, these results give support for the effectiveness of the social skills intervention increasing Sara’s ability to give compliments.

**Expressing empathy.** At baseline the mean percentage of correct responses for expressing empathy was 28%. When intervention was introduced, the mean percentage of correct responses for expressing empathy increased to 71%. During the maintenance phase, the mean percentage of the target behavior decreased slightly to 63%, but remained significantly higher than the mean percentage during baseline (28%).

Effect sizes for expressing empathy from baseline to intervention were large (see Appendix N; $\text{SMD}_{\text{all}} = 3.3$ suggesting a large effect, and $\text{PND} = 100\%$ suggesting a very effective intervention effect) while effect size from intervention to maintenance was medium ($\text{SMD}_{\text{all}} = -0.6$ suggesting a medium effect). These results suggest that the percentage of correct responses remained stable after a significant period of time had passed and the intervention was removed. Although Sara’s mean percentage of correct responses for expressing empathy decreased during the maintenance phase, her mean percentage during maintenance remained much higher than baseline. These results suggest that once intervention was introduced, the percentage of correct responses for expressing empathy increased and remained at a fairly high level, giving support to the effectiveness of the social skills intervention increasing Sara’s ability to express empathy.

**Listening to others.** At baseline the mean percentage of correct responses for listening to others was 15.71%. When intervention was introduced the mean percentage of correct responses for listening to others increased to 91.67%. During the maintenance
phase, the mean percentage of the target behavior increased to 97%. Effect sizes from baseline to intervention for listening to others were large (see Appendix N; \( \text{SMD}_{\text{all}} = 6.0 \) suggesting a large effect, and \( \text{PND} = 100\% \) suggesting a very effective intervention effect) while effect size from intervention to maintenance was medium (\( \text{SMD}_{\text{all}} = 0.5 \) suggesting a medium effect). These results suggest that once intervention was introduced, the percentage of correct responses for listening to others increased and remained high after no longer receiving intervention (i.e., summer break). Therefore, these results give support for the effectiveness of the social skills intervention increasing Sara’s ability to listen to others.

**Generalization of Target Behaviors**

There was intent to collect generalization data (once intervention was complete) to determine if the average percentage of correct responses for each of the three target behaviors displayed in the classroom (and the home setting) were higher than the average percentage of correct responses displayed during baseline (in the intervention setting). Sara’s general education classroom teacher and Sara’s mother agreed to collect generalization data; however, this data was never collected. The teacher and parent indicated that due to time constraints and the school year ending they were unable to collect generalization data.

**Anxiety**

Sara’s anxiety symptoms were assessed before and after the intervention took place. It was hypothesized that anxiety levels would decrease after the intervention was complete. Anxiety symptoms were measured pre and post intervention using the MASC: Self-Report (March, 1997) for children and the Spence Children’s Anxiety Scale: Parent
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Report (Spence, 2000). Sara completed the self-report while her mother completed the parent report. Pre-intervention anxiety levels were not elevated (fell within the average range and were considered typical compared to other children Sara’s age) according to the overall $T$ score on the self-report and the overall $T$ score on the parent report (self-report $T$-score = 43, parent-report $T$-score = 30). At post-intervention anxiety levels remained in the average range according to the overall $T$ score on the self-report and the parent report (self-report $T$ score = 49, parent-report $T$-score = 33). Therefore no change in anxiety as measured by the MASC and Spence Children’s Anxiety Scale was found between pre and post measures.

Discussion

The current study examined the effectiveness of social skills training plus anxiety reduction on increasing three target behaviors (i.e., complimenting others, expressing empathy, and listening to others). A coping skill was taught and reviewed at each session (i.e., deep breathing). In addition to teaching deep breathing, the social skills intervention included direct instruction, reinforcement of correct responses, repetition, and structure. Once intervention was introduced, increases in correct responses were observed across all three target behaviors. In addition, these changes remained high during maintenance. This study provides preliminary support for the use of the social skills training plus anxiety reduction program (used specifically in this study) as an effective method to increase socially-appropriate behaviors and maintaining these behaviors over time.

It is interesting that in the current study the increase in correct responses across target behaviors were maintained at such high percentages considering the amount of time that passed between the last intervention session and the first maintenance data
collection session (i.e., approximately 4 months). After the last intervention session, students were out of school for roughly three months for summer break and the first maintenance data collection session did not occur until approximately one month into the fall school year. Despite this significant break, correct responses for each target behavior continued to be high and stable prior to Summer Break and following Summer Break. This may be a testament to the robust nature and efficacy of the individualized social skills intervention used in this study. However, to verify these findings, replication studies are needed.

This study also sought to examine the impact of social skills training plus anxiety reduction on reducing anxiety. Unfortunately, this question could not be answered because the participant did not present with elevated symptoms of anxiety at the beginning of the study. Therefore, it is unclear whether social skills training plus anxiety reduction would have successfully decreased anxiety symptoms. To overcome this limitation, researchers should include elevated symptoms of anxiety as an inclusion criteria for participation in future studies. It is also possible that anxiety symptoms identified in children with ASD differ from anxiety symptoms identified in children with anxiety disorders. If this is the case, it is possible that the measures used to assess anxiety symptoms in children identified with anxiety disorders may not accurately measure anxiety symptoms in children with ASD.

Regardless of whether anxiety can be accurately measured in children with ASD using traditional anxiety instruments, it is likely that teaching children with ASD coping skills (such as deep breathing) would be beneficial. Coping techniques are useful tools for all children when faced with uncomfortable or stressful situations. Therefore, teaching
coping strategies to children with ASD, who are more likely to experience discomfort when there are changes in their environment (i.e., an unexpected change in routine), seems more than logical.

This study also sought to examine whether increases in correct responding generalized to the classroom and home settings. However, as previously stated, generalization data was not collected by the classroom teacher or Sara’s mother. The classroom teacher was prompted multiple times to collect generalization data, but reported that she was unable to collect data due to time constraints. Although Sara’s mother indicated that she would collect generalization data at home, she reported that time constraints prevented her from collecting data in the home setting. Furthermore, social skills homework assignments, which were intended to assist generalization of the skills learned in the intervention setting to the home setting, were never returned.

The results from the current study were also consistent with previous research (Leaf et al., 2010 & Leaf et al., 2012), which suggested that direct instruction is an effective method for teaching social skills to children with ASD. However, one of the differences between the findings in the current study and the Leaf et al. (2010) study is that in the current study the participant’s correct responses to target behaviors remained high for all three target behaviors, even during maintenance. In the Leaf et al. study, maintenance data for several target behaviors decreased and were variable (i.e., unstable during the maintenance phase). The current study found that the social skills intervention plus anxiety reduction effectively increased the target behaviors and these increases were maintained even after intervention was removed for a period of time. One reason the current study may have had successful maintenance results may be explained in that Sara
and her mother were provided videotaped copies of the intervention sessions after intervention was over. Scattone (2007) indicated that children with ASD enjoy watching themselves on videotape practicing the social skills they are taught. It is possible that Sara may have watched these tapes over summer break, which may have helped maintain the progress she made during intervention. As mentioned previously, additional research examining methods which may increase the generalization or maintenance of social skills (such as providing participants with videotaped copies of themselves) should be investigated through future research.

Although the current study found positive results during the maintenance phase, there were subtle differences between the three target behaviors. The percentage of correct responses for two of the three target behaviors (giving compliments and listening to others) increased from intervention and remained fairly stable. The percentage of correct responses for the third target behavior (expressing empathy) decreased slightly from intervention, but remained significantly higher than baseline. A slight decrease in expressing empathy during maintenance may have occurred because expressing empathy tends to be a more difficult skill for children with ASD to master (Baron-Cohen, 2009), as it requires higher level thinking skills and multiple steps. For instance, to express empathy, the child must listen to the words the other person says, look at their facial expression to determine what emotion they are feeling, and figure out an appropriate response. In addition, expressing empathy requires the child with ASD to be aware of the perceptions and emotions of others, which is not a skill that comes naturally for children with ASD (Gould, Tarbox, O’Hara, Noone, & Bergstrom, 2011). These reasons may give
insight into why expressing empathy did not remain as high during maintenance as listening to others and giving compliments.

Limitations

Limitations of the current study include potential observer-expectancy effects, and the absence of a typical peer during the social skills intervention. Both the observers and the individual implementing the intervention knew what phase of the study was being conducted, as social skills lessons were introduced at the beginning of each intervention session, but not during baseline or maintenance sessions. In addition, reinforcement was present during the majority of intervention sessions, but was not present during baseline. Due to the fact that the observers most likely knew which phase of the study was being conducted, even though this was never explicitly communicated to them, there is a concern for experimenter bias or observer-expectancy effect (Rosenthal, 1976 & Zusne, 1987). Observer-expectancy effect occurs when the observer knows what the expected outcome is and may influence the data unknowingly. As a result, the data could have been impacted by observer bias. In the future, determining how to implement a multiple baseline study without revealing which phase of the study is being conducted would prove beneficial. One way to achieve this goal would be to have one observer code the videos of each session without being involved or assisting with the intervention itself. In other words, two observers would be needed; one to assist with the intervention and one to code the videotapes.

To help prevent possible observer-expectancy effects, a second observer was involved in the data collection. Unlike the individual implementing the intervention, the observer was not heavily invested in the success of the study (i.e., did not have
expectations of how the data would turn out) and was therefore less likely to be affected by experimenter bias. In addition, a high level of IOA was achieved (i.e., 95%) and the majority of data points were coded identically between the individual implementing the intervention and the observer. Another procedure that was used to counter possible observer-expectancy effects was having a process for dealing with disagreements. For example, when there was a disagreement, the individual implementing the intervention would inform the observer that there was a disagreement. Then, both individuals independently reviewed the tape and compared coding decisions again. If agreement still was not obtained, the data collected by the observer was used in Figure 2., as it was less likely to be affected by observer bias. There were approximately two instances in which IOA fell below 100%, which required the observer and the individual implementing the intervention to view and code the tape a second time. However, both instances in which IOA fell below 100% were still at satisfactory levels (i.e., IOA of 80%--89%). Typically, a satisfactory level of 80% IOA or higher is the standard. However, for the present study, a satisfactory level of 90% IOA or higher was set as the standard, which resulted in two instances that fell below 90% to be viewed and coded a second time.

A second limitation to the current study was the absence of a typical peer. The individual implementing the intervention was unable to recruit a typical peer to participate in the social skills intervention. Having a typical peer participate in the social skills group is beneficial for various reasons including increasing generalization of the skills taught to other settings (i.e., the classroom, playground). In addition, including a typical peer in the social skills intervention increases the number of opportunities for children with ASD to engage with other children in a positive and safe environment.
Lastly, including a typical peer promotes individual differences and diversity among typically developing peers, which would hopefully make them more likely to demonstrate compassion and understanding for children with disabilities.

**Future Research**

In the future, this study should be replicated in order to provide more support to the preliminary findings. In future replications it would be helpful to conduct the intervention sessions twice a week as opposed to three times a week because at times Sara seemed overwhelmed during the third (Friday session) session of the week. Initially, intervention sessions were scheduled to take place twice a week, but due to time constraints with the school year ending, intervention took place three times each week. It is possible that Sara appeared overwhelmed at the end of the week because practicing the new skills occurred too frequently. It is also possible that because the third session of the week fell on a Friday, Sara would have rather gone home than remain at school for an additional hour. Future studies might examine whether limiting sessions to twice a week improves student performance or attitude (i.e., participation).

In addition, future research could examine whether or not the percentage of correct responses would remain at a high level if reinforcement were to be completely faded out (i.e., 0% reinforcement rate). While the present study was able to decrease the rate of reinforcement as the sessions progressed, a reinforcement rate of 0% was never attempted. One way future studies could examine the effect of reinforcement more thoroughly would be to simply conduct more intervention sessions to allow for the rate of reinforcement to reach 0%. However, one would need to start earlier in the academic year in order to finish the intervention sessions before the school year ended. Another option
would be to reduce the rate of reinforcement during the maintenance phase of the study. For instance, if the rate of reinforcement was 15% during the last intervention session, reducing the rate of reinforcement to 10% for the first two maintenance sessions, 5% for the next two sessions, and further reducing to 0% during the last two sessions of maintenance, would allow one to examine whether completely removing reinforcement has a significant impact on the percentage of correct responses. However, more maintenance sessions would need to be conducted in order to reduce the reinforcement similar to the manner in which it was reduced during intervention (i.e., every 2-3 sessions).

In addition, it would be advantageous for future studies to further examine appropriate measures of anxiety for children with ASD. As previously stated, it has been speculated by many researchers (Reaven, et. al, 2012; Samson, Huber, & Gross, 2012) that the anxiety symptoms that children with ASD experience may differ from those experienced by the general population. Therefore, using a standard anxiety measure that is not specifically designed for children with ASD may not be the most effective method in assessing anxiety in children with ASD.

Implications

The Social Skills Intervention implemented in this study was an individualized approach that included various components. It is unclear which components (if any) have an impact on the target behaviors because the current study examined all the components together and therefore they are interconnected. Consequently, if an individual uses the Social Skills Intervention with another student with ASD, it is important that each component is included and implemented with integrity. Future research might attempt to
examine each of the components (i.e., direct instruction, verbal praise, token reinforcement, rate of reinforcement) separately to determine their individual impact on increasing target behaviors.

It is also important to investigate additional methods for teaching specific target behaviors (i.e., expressing empathy). Some skills are likely to be more difficult for children to master. It is important to continually evaluate and examine the way in which social skills are taught in order to maximize learning. Expressing empathy is reportedly a more challenging skill to master for many children with ASD, so developing more effective strategies to teach children with ASD how to identify emotions in others and determine what others might be feeling would be beneficial to the field.

Furthermore, persons reading the results of this study should be informed that the intervention and therefore the results of the study are limited to the participant involved in the study or others with similar characteristics to the participant in this study. This information is incredibly useful when planning interventions for Sara or when considering interventions for individuals with similar characteristics to Sara. It would be inappropriate to implement a district-wide social skills intervention similar to the one developed for the current study, because the intervention was tailored specifically to Sara’s concerns and characteristics.

Overall this study adds valuable information to the literature surrounding social skills intervention plus anxiety reduction with children with ASD. It provides promising preliminary results in support of a cost-effective strategy that can be implemented in order to increase the occurrence of socially-appropriate behaviors.
References


DeRosier, M. E., Swick, D. C., Davis, N. O., McMillen, J. S., & Matthews, R. (2011). The efficacy of a social skills group intervention for improving social behaviors in
Social Skills Intervention for HFA 78


Social Skills Intervention for HFA 79


Appendix A

Increasing Social Skills in Children with ASD

Dear Parents/Guardians,

My name is Rachel Schaub and I am a graduate student in the School Psychology program at Eastern Illinois University. I am conducting research as fulfillment of a program requirement, and I am inviting you and your child to participate.

My study will consist of providing a social skills intervention for one child with high functioning ASD. Twice a week, one student will receive direct instruction on how to perform appropriate social behaviors (such as greeting others, giving compliments, joining others in play, expressing empathy for others, and/or listening to others). The child will be taught the appropriate behavior, will practice the behavior, and will receive rewards (such as candy or statements such as “Good job!”) for demonstrating the appropriate behavior. Data on how frequently the child displays the appropriate behavior will be collected at each session.

After initial data has been collected, if your child displays the appropriate social behavior before the intervention is implemented, they will have an option of participating as a group member (with your permission). As a group member, your child will learn the above mentioned skills, have an opportunity to practice the skills, and will receive rewards for using the skills. The selected skill taught during group, will however not be specifically tailored to your child. If you decide not to have your child participate as a group member, information regarding alternative services/methods for improving social skills for children with ASD will be offered.

If you have a child who does not have a diagnosis of ASD, he or she may also participate in the social skills group as a peer member with your permission. As a peer member, your child will learn the above mentioned skills, have an opportunity to practice the skills, and will receive rewards for using the skills.

If you have any questions about this intervention, you may contact me via e-mail or phone (rmschaub@eiu.edu or 618-420-8397) or any of the following individuals:

Chad Burgett (Principal of Carl Sandburg)
Phone #: 217-639-4000

Dr. Margaret Floress (Thesis Supervisor)
Phone #: 217-581-3523 E-mail: mfloress@eiu.edu

I greatly appreciate your consideration of this intervention study, and I hope to hear from you soon!

Rachel Schaub
School Psychology Graduate Student at EIU
Appendix B

CONSENT TO PARTICIPATE IN RESEARCH

The Effects of an Individualized Intervention for a Child with High Functioning Autism

You are invited to participate in a research study to fulfill the requirements of a master's thesis, conducted by Rachel Schaub, a School Psychology graduate student at Eastern Illinois University, and supervised by Dr. Floress, a professor in the School Psychology program at Eastern. Your participation in this study is entirely voluntary and you may withdraw you or your child's participation at any time. Feel free to ask questions about anything you do not understand, before deciding whether or not to participate.

PURPOSE OF THE STUDY
This study is designed to examine the effectiveness of an individualized intervention program on three behaviors of a child with high functioning autism in addition to incorporating coping skills techniques in order to reduce anxiety levels.

PROCEDURES
If you volunteer your child to participate in this study, your child will be asked to:

- Complete a rating form measuring behaviors associated with anxiety
- Allow the researcher to collect initial data regarding their current level of social behaviors in the conference room at a school in Charleston, IL
- Participate in 30 minute videotaped intervention sessions in the intervention setting (the conference room at an elementary school), twice a week for approximately 10 weeks
- Receive rewards (such as candy or verbal praise) for correct responses during intervention sessions

If you volunteer your child to participate in this study, you will be asked to:

- Complete a rating form measuring the level of your child's anxiety before and after the intervention.
- Complete brief homework assignments with your child regarding the specific social skills targeted each week.
- Collect data on whether your child displays the appropriate social skills within the home setting

POTENTIAL RISKS
There are no foreseeable risks associated with this research study. Your child may experience slight discomfort related to learning and practicing social skills. If your child experiences this type of discomfort and no longer wants to participate in the study, you may withdraw their participation and other local resources or information regarding social skills will be offered to you. Also, this study is completely anonymous and none of the data collected will be linked in any way to specific participants. Further, if you or your child decides to withdraw from the study, you will have the option of obtaining a copy of the videotaped sessions. If you do not want a copy of these tapes, they will be destroyed immediately.

POTENTIAL BENEFITS TO PARTICIPANTS
The potential benefits for your child participating in this study include: improved social skills, potentially improved interactions with peers, and reduced anxiety during social interactions.

INCENTIVES FOR PARTICIPATION
The incentive for participation is the potential improvement in social skills for your child, which will be beneficial not only in the school setting, but also in the community and the home setting. Your child will also earn small tangible prizes for demonstrating and practicing the social skills taught.

CONFIDENTIALITY
Social Skills Intervention for HFA 85

Any information that is obtained in connection with this study and that can be identified with you or your child will remain confidential. Confidentiality will be maintained by: securing the data in an office in the Physical Science Building, not allowing anyone besides myself, Dr. Floress, and trained observers to view the data, and by destroying the data after three years.

PARTICIPATION AND WITHDRAWAL
Participation in this research study is voluntary. If you volunteer your child to be in this study, you and your child may withdraw (via e-mail, over the phone, or in person) at any time without consequences of any kind or loss of benefits or services to which you are otherwise entitled. Your child is also free to verbally withdraw assent to participate in which case the intervention would be discontinued and you (the parent) would be contacted.

IDENTIFICATION OF INVESTIGATORS
If you have any questions or concerns about this research, please contact:

Rachel Schaub (primary researcher)
E-mail: rmschaub@eiu.edu
Telephone: (618) 420-8397

Or

Dr. Margaret Floress (Thesis Chair/Supervisor of this study)
E-mail: mfloress@eiu.edu
Telephone: (217) 581-3523

RIGHTS OF RESEARCH SUBJECTS
If you have any questions or concerns about the treatment of you or your child in this study, you may call or write:

Institutional Review Board
Eastern Illinois University
600 Lincoln Ave.
Charleston, IL 61920
Telephone: (217) 581-8576; E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

I voluntarily agree for myself and my child to participate in this study. I understand that I am free to withdraw my consent and discontinue my participation at any time. I have been given a copy of this form.

__________________________________________  ____________________________________________
Printed Name of Child                        Signature of Parent/Guardian

__________________________________________  ____________________________
Printed Name of Parent/Guardian                Date
Appendix C

CONSENT TO PARTICIPATE IN RESEARCH

The Effects of an Individualized Intervention for a Child with High Functioning Autism

You are invited to participate in a research study to fulfill the requirements of a master's thesis, conducted by Rachel Schaub, a School Psychology graduate student at Eastern Illinois University, and supervised by Dr. Floress, a professor in the School Psychology program at Eastern. Your participation in this study is entirely voluntary and you may withdraw from the study at any time. Feel free to ask questions about anything you do not understand, before deciding whether or not to participate.

PURPOSE OF THE STUDY

This study is designed to examine the effectiveness of an individualized intervention program on three behaviors of a child with high functioning autism.

PROCEDURES

If you volunteer to participate in this study, you will be asked to:

• Complete a social skills screener in order to determine the frequency of this child's appropriate social behaviors before the intervention begins.

• Collect data regarding whether the student displays the appropriate social skills in the school setting

POTENTIAL RISKS

There are no foreseeable risks associated with this research study, but if any risks were to occur, you are not obligated to continue with this study. Also, this study is completely anonymous and none of the data collected will be linked in any way to specific participants.

POTENTIAL BENEFITS TO PARTICIPANTS

The potential benefits for your participation in this study include: improved social skills for this student, potentially improved interactions with peers, and reduced anxiety during social interactions.

INCENTIVES FOR PARTICIPATION

The incentive for participation is the potential improvement in social skills for this child, which will be beneficial not only in the school setting, but also in the community and the home setting.

CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain confidential. Confidentiality will be maintained by: securing the data in an office in the Physical Science Building, not allowing anyone besides me and my thesis committee to view the data, and by destroying the data in three years.
PARTICIPATION AND WITHDRAWAL

Participation in this research study is voluntary. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind or loss of benefits or services to which you are otherwise entitled.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about this research, please contact:

Rachel Schaub (primary researcher)
E-mail: mschaub@eiu.edu
Telephone: (618) 420-8397

Or

Dr. Margaret Floress (Thesis Chair/Supervisor of this study)
E-mail: mfloress@eiu.edu
Telephone: (217) 581-3523

RIGHTS OF RESEARCH SUBJECTS

If you have any questions or concerns about this study, you may call or write:

Institutional Review Board
Eastern Illinois University
600 Lincoln Ave.
Charleston, IL 61920
Telephone: (217) 581-8576
E-mail: eiuirb@www.eiu.edu

You will be given the opportunity to discuss any questions about your rights as a research subject with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with EIU. The IRB has reviewed and approved this study.

I voluntarily agree to participate in this study. I understand that I am free to withdraw my consent and discontinue my participation at any time. I have been given a copy of this form.

Printed Name of Child

Printed Name of Teacher

Signature of Teacher Date
Appendix D

Student Behavior Rating Scale

Student’s Name: ____________________________

Student’s Age: _____ Gender: _____

Your Relationship to Child: __________________

Phone Number: ____________________________

Directions: The following questions ask about specific skills or behaviors that this student may or may not exhibit during social interactions. Please rate how often this student shows the following five behaviors. Circle the number corresponding with the frequency that you feel is the most accurate representation of each behavior for the past 3 months. Additional comments for specific areas that you feel need to be targeted for intervention can be noted at the end of the sheet. Please indicate which 3 behaviors are the most problematic, in your opinion, by circling those three items. Thank you for participating!

Please use the following guidelines to rate this student’s behavior:

Never = occurs 0% of the time
Sometimes = occurs 25% of the time
Often = occurs 50% of the time
Very often = occurs 75% of the time
Always = occurs 100% of the time

---

1) How often does this student greet others? (i.e., say, “Hello” or “Hi” after someone greets them?)

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
</tbody>
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2) How often does this student give compliments (such as, “Wow!” or “Cool!”) or say thank you after receiving a compliment?

<table>
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<tr>
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<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
</tbody>
</table>
3) How often does this student show signs of listening to others? (i.e., turns their body towards the other person, looks at the other person?)

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<th>2</th>
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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
</tbody>
</table>

4) How often does this student express empathy for others? (i.e., ask others what is wrong after they express disappointment or sadness?)

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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
</tbody>
</table>

5) How often does this student join others in play? (i.e., walks up to children playing and joins them after being invited?)

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
<td>Sometimes</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
</tbody>
</table>

Additional Comments (Optional):

THANK YOU FOR YOUR TIME!
### Trial One:
- "Melody" (L)
- "Look at what I'm drawing!" (C)
- "Aww man!" (E)

### Trial Two:
- "Look at what I'm drawing!" (C)
- "Aww man!" (E)
- "Melody" (L)

### Trial Three:
- "Aww man!" (E)
- "Melody" (L)
- "Look at what I'm drawing!" (C)

### Trial Four:
- "Melody" (L)
- "Aww man!" (E)
- "Look at what I'm drawing!" (C)

### Trial Five:
- "Look at what I'm drawing!" (C)
- "Melody" (L)
- "Aww man!" (E)

### Trial Six:
- "Aww man!" (E)
- "Look at what I'm drawing!" (C)
- "Melody" (L)

### Trial Seven:
- "Melody" (L)
- "Look at what I'm drawing!" (C)
- "Aww man!" (E)

### Trial Eight:
- "Look at what I'm drawing!" (C)
- "Aww man!" (E)
- "Melody" (L)

### Trial Nine:
- "Aww man!" (E)
- "Melody" (L)
- "Look at what I'm drawing!" (C)

### Trial Ten:
- "Melody" (L)
- "Aww man!" (E)
- "Look at what I'm drawing!" (C)

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<table>
<thead>
<tr>
<th>Listening Probe:</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complimenting Probe:</td>
<td>10</td>
</tr>
<tr>
<td>Expressing Sympathy Probe:</td>
<td>10</td>
</tr>
</tbody>
</table>

---

**Total**

**Percentage Correct**

---
### Trial One:
- **“Melody” (L)**
- **“Look at what I’m drawing!” (C)**
- **“Aww man!” (E)**

### Trial Two:
- **“Look at what I’m drawing!” (C)**
- **“Melody” (L)**
- **“Look at what I’m drawing!” (C)**
- **“Aww man!” (E)**

### Trial Three:
- **“Aww man!” (E)**

### Trial Four:
- **“Look at what I’m drawing!” (C)**
- **“Aww man!” (E)**

### Trial Five:
- **“Melody” (L)**
- **“Look at what I’m drawing!” (C)**
- **“Aww man!” (E)**

### Trial Six:
- **“Melody” (L)**
- **“Aww man!” (E)**
- **“Look at what I’m drawing!” (C)**
- **“Melody” (L)**

### Trial Seven:
- **“Aww man!” (E)**
- **“Look at what I’m drawing!” (C)**
- **“Melody” (L)**

### Trial Eight:
- **“Aww man!” (E)**

### Trial Nine:
- **“Melody” (L)**
- **“Look at what I’m drawing!” (C)**

### Trial Ten:
- **“Aww man!” (E)**
- **“Look at what I’m drawing!” (C)**
- **“Melody” (L)**

<table>
<thead>
<tr>
<th>Listening Probe</th>
<th>/10</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complimenting Probe</td>
<td>/10</td>
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</tr>
<tr>
<td>Expressing Sympathy Probe</td>
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</table>
Appendix G
IR20 Social Skills Data Sheet

<table>
<thead>
<tr>
<th>Trial One</th>
<th>Trial Six</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Melody” (L)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
<tr>
<td>“Look at what I’m drawing!” (C)</td>
<td>“Aww man!” (E)</td>
</tr>
<tr>
<td>“Aww man!” (E)</td>
<td>“Look at what I’m drawing!” (C)</td>
</tr>
<tr>
<td><strong>“Aww man!” (E)</strong></td>
<td>“Melody” (L)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial Two</th>
<th>Trial Seven</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Look at what I’m drawing!” (C)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
<tr>
<td>“Melody” (L)</td>
<td>“Look at what I’m drawing!” (C)</td>
</tr>
<tr>
<td>“Look at what I’m drawing!” (C)</td>
<td>“Melody” (L)</td>
</tr>
<tr>
<td>“Aww man!” (E)</td>
<td>“Aww man!” (E)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial Three</th>
<th>Trial Eight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Aww man!” (E)</strong></td>
<td><strong>“Look at what I’m drawing!” (C)</strong></td>
</tr>
<tr>
<td>“Melody” (L)</td>
<td>“Aww man!” (E)</td>
</tr>
<tr>
<td>“Look at what I’m drawing!” (C)</td>
<td><strong>“Melody” (L)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Trial Four</th>
<th>Trial Nine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Look at what I’m drawing!” (C)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
<tr>
<td>“Aww man!” (E)</td>
<td>“Look at what I’m drawing!” (C)</td>
</tr>
<tr>
<td><strong>“Melody” (L)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
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<table>
<thead>
<tr>
<th>Trial Five</th>
<th>Trial Ten</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>“Melody” (L)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
<tr>
<td>“Look at what I’m drawing!” (C)</td>
<td>“Aww man!” (E)</td>
</tr>
<tr>
<td>“Aww man!” (E)</td>
<td>“Look at what I’m drawing!” (C)</td>
</tr>
<tr>
<td><strong>“Melody” (L)</strong></td>
<td><strong>“Aww man!” (E)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Listening Probe:</th>
<th>Total: 10</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complimenting Probe:</td>
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<td></td>
</tr>
<tr>
<td>Expressing Sympathy Probe:</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>


Appendix H
IR15 and Maintenance Social Skills Data Sheet

Trial One:
___ “Melody” (L)
___ “Look at what I’m drawing!” (C)
___ “Aww man!” (E)

** “Melody” (L)**

Trial Two:
___ “Melody” (L)
___ “Look at what I’m drawing!” (C)
___ “Aww man!” (E)

Trial Three:
___ “Melody” (E)

** “Look at what I’m drawing!” (C)**
___ “Melody” (L)
___ “Look at what I’m drawing!” (C)

Trial Four:
___ “Look at what I’m drawing!” (C)
___ “Aww man!” (E)

** “Melody” (L)**
___ “Melody” (L)

Trial Five:
___ “Melody” (L)
___ “Look at what I’m drawing!” (C)
___ “Aww man!” (E)

Trial Six:
___ “Aww man!” (E)**
___ “Look at what I’m drawing!” (C)
___ “Melody” (L)

Trial Seven:
___ “Aww man!” (E)
___ “Look at what I’m drawing!” (C)
___ “Melody” (L)

Trial Eight:
___ “Look at what I’m drawing!” (C)
___ “Melody” (L)

** “Aww man!” (E)**
___ “Aww man!” (E)

Trial Nine:
___ “Melody” (L)
___ “Look at what I’m drawing!” (C)

Trial Ten:
___ “Aww man!” (E)
___ “Look at what I’m drawing!” (C)
___ “Melody” (L)

Listening Probe: /10
Complimenting Probe: /10
Expressing Sympathy Probe: /10

Total __________

Percentage Correct __________

Appendix I
Appendix I

Social Skills Integrity Checklist

Place a checkmark in the corresponding space next to each step if it was properly demonstrated by the researcher:

1) Was calming reviewed? Yes ____ No ____
2) Did the researcher explain the importance of the new skill? Yes ____ No ____
3) Did the researcher explain the steps to perform the skill? Yes ____ No ____
4) Did the researcher model the skill? Yes ____ No ____
5) Did the participant practice the skill? Yes ____ No ____
6) Was the participant reinforced for the appropriate skill? Yes ____ No ____

<table>
<thead>
<tr>
<th>Total</th>
<th>Percentage Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steps Performed: ____/6</td>
<td>______________</td>
</tr>
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</table>
Appendix J

Definitions of Target Behaviors

Complimenting Others: involves the participant...

1) Giving a compliment to another person (i.e., “I like that,” “I like your shirt,” or “Good.”)

Listening to others: involves the participant...

1) turning their body to face the person who is speaking
2) looking at the other person’s face.

Expressing Empathy for Others: involves the participant...

1) Listening to the person that is talking to them
2) Looking at their facial expression
3) Asking a question that acknowledges the statement made or facial expression made (i.e.,
   “What color did you use?” or “What happened?”)
Appendix K

School-Home Communication Sheet

Please complete the following sheet with your child. It shouldn’t take more than a few minutes. This worksheet is designed to help your child practice the appropriate social skills in the home environment as well. Thank you!!

Student: ___________________________ Date: ______________

Parent Information:

Number of times your child responded when you said his/her name yesterday: _______

Questions for you to ask your child at home (Record response):

What did you learn about today? ________________________________________________

Why is it important to listen to others? __________________________________________

Can you show me how you listen to others? ______________________________________

Can you show me how to do deep breathing? _____________________________________

Any Additional Comments: ______________________________________________________

__________________________________________________________________________
Appendix L
Handout for School

Title of Research

- The Effects of an Individualized Intervention for a Child with High Functioning Autism

Purpose

- To examine the effectiveness of a direct instruction intervention on the social behaviors of a child with high functioning autism.

Study Components

- Direct observations of percentage of appropriate behaviors displayed during intervention sessions
- Total of 30 minutes per session, twice a week within the school setting
  - Direct instruction of the appropriate behavior
  - Modeling of the appropriate behavior
  - Practicing the appropriate behavior
  - Rewarding the appropriate behavior

Participants

- One child with high functioning autism (male or female)
  - Inclusionary Criteria:
    - 7 to 10 years of age
    - Parental written consent
    - Good attendance record
  - Exclusionary Criteria:
    - Children who display aggressive behaviors
    - Children with an IQ below 70 (an IQ of 70 or above is necessary in order to fully understand the components of the intervention)
    - Children who display appropriate social behaviors 50% or more of the observation time prior to intervention implementation

Need from School/Organization

- Permission to conduct the intervention in one of the rooms at the school twice a week
- Letter on school/organization letter head stationary:
  1) Stating agreement for the study to be conducted
  2) Contact person at the school/organization who can provide information about the appropriateness of the research at the school/organization
Appendix M

General Outline for Social Skills Training

1) Ice Breaker
   a. Introduce myself, and the individual helping me
   b. Have the child introduce him/herself
   c. Ask child how their day is going

2) Explain what will happen at every session
   a. Coping Skill
   b. Introduction of Social Skill for that week
   c. Show the flip chart with instructions on how to display each skill
   d. Role-model social skill
   e. Practice social skill
   f. Engage in play for 30 minutes
   g. Let child select prize for that session with tokens earned
   h. Give homework assignment

3) Teach/Review Coping Skill
   a. Use pre-made flip chart to teach skill

4) Teach/Review Social Skill
   a. Use pre-made flip chart to teach skill
   b. Role model skill
   c. Ask if there are any questions
   d. Practice skill
   e. Start play time
   f. Allow child to select prize based on tokens earned
   g. Give homework assignment
Deep Breathing

1) Why it’s important:
   a. It can help you calm down
   b. It can take away your nervous feelings
   c. It can make it easier to talk to people

2) When to use it:
   a. When you feel nervous (e.g. tight muscles)
      i. Before you give a speech in class
      ii. When you answer a question in class
      iii. When you are meeting new people

3) Steps:
   a. Recognize when your body is tense (e.g. clenched fists, tight muscles)
   b. Take one deep breath in through your nose for 5 seconds
   c. Hold this breath for 3 seconds
   d. Breath out through your mouth for 5 seconds
      i. Do this 3 times in a row
Outline for Teaching Each Social Skill

Giving Compliments/Responding to Compliments

1. Why it's important:
   a. To show others that you appreciate them
   b. It's a good way to make friends
   c. It makes other people happy
   d. Often others will compliment you in return

2. Steps:
   a. Decide what you want to compliment
   b. Decide what words to use
   c. Choose the right time and place to say it (don't want to interrupt the teacher or someone else who is speaking)
   d. Give the compliment ("Cool!", or "Wow!")
Outline for Teaching Each Social Skill

Listening to Others

1. Why it's important:
   a. So you know how they're feeling
   b. So you can talk to them
   c. So you know what's going on

2. Steps:
   a. Turn your body to face the other person
   b. Look at the person who is talking (Eye contact)
Outline for Teaching Each Social Skill

Expressing Empathy

1) Why it's important:
   e. To show others that you care

2) Steps:
   a. Decide what emotion the other person is feeling by looking at their face
   b. Listen to the words the other person says ("Aww man!" or "Ouch!")
   c. Choose the right time and place to say something (don’t want to interrupt the
      teacher or someone else who is speaking)
   d. Ask them if they are ok
Table 1.

*Effect size, $\text{SMD}_{\text{all}}$ and Percentage of Nonoverlapping Data Points (PND) classification categories for Target Behaviors from Baseline Phase to Intervention Phase*

<table>
<thead>
<tr>
<th>Target Behavior 1</th>
<th>Effect Size</th>
<th>Effect Size Classification</th>
<th>PND</th>
<th>PND Classification</th>
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<tbody>
<tr>
<td>Complimenting Others</td>
<td>3.1</td>
<td>Large</td>
<td>100%</td>
<td>Very Effective</td>
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<tr>
<td><strong>Target Behavior 1</strong></td>
<td></td>
<td></td>
<td></td>
<td>Intervention Effect</td>
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<tr>
<td><strong>Target Behavior 2</strong></td>
<td></td>
<td></td>
<td></td>
<td>Intervention Effect</td>
</tr>
<tr>
<td>Expressing Empathy</td>
<td>3.3</td>
<td>Large</td>
<td>100%</td>
<td>Very Effective</td>
</tr>
<tr>
<td><strong>Target Behavior 3</strong></td>
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<td>Intervention Effect</td>
</tr>
<tr>
<td>Listening to Others</td>
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<td>Large</td>
<td>100%</td>
<td>Very Effective</td>
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</tbody>
</table>

Table 2.

*Effect size, $\text{SMD}_{\text{all}}$ and classification categories for Target Behaviors from Intervention Phase to Maintenance Phase*

<table>
<thead>
<tr>
<th>Target Behavior 1</th>
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<th>Effect Size Classification</th>
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<tbody>
<tr>
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<td>Large</td>
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<tr>
<td><strong>Target Behavior 2</strong></td>
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<td>Expressing Empathy</td>
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<tr>
<td><strong>Target Behavior 3</strong></td>
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</tr>
<tr>
<td>Listening to Others</td>
<td>0.5</td>
<td>Medium</td>
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Appendix O

List of Potential Prizes Based on Tokens Earned

1) One bag of Skittles (regular size/serving amount)
   a. 1-3 tokens

2) Art Supplies (i.e., crayons, markers, paint)
   a. 4-6 tokens

3) Disney Princess Doll (i.e., miniature princess doll purchased from the Dollar Tree)
   a. 7-10 tokens