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# Investigating the Effectiveness of Parent-Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

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Investigating the Effectiveness of Parent-Implemented Interventions in Improving the Social  
Skills of Children with Autism Spectrum Disorder

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## ABSTRACT

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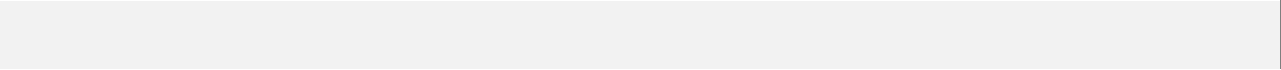
Abstract Title: Investigating the Effectiveness of Parent-Implemented Interventions in Improving the Social Skills of Children with ASD.

Chairperson: Anisa N. Goforth, Ph.D

There has been an increase in the diagnosis of Autism Spectrum Disorder (ASD) in recent years. As a result, many families who have a child diagnosed with ASD seek out effective treatment in improving the social skills of their child. Literature suggests varied results when considering the treatment outcomes of different social skills interventions. However, the use of evidence-based practices (EBP), parent involvement in the treatment, and individualized treatment goals is considered best practice when treating ASD. This study combined the use of three EBPs: video-modeling, social narratives and parent implemented intervention (PII), in attempts to effectively improve the social skills of children with ASD. A multimethod approach was used to study the effectiveness of this treatment. Specifically, an ABAB single subjects design with a 1-month follow-up was used to improve the social skills (social communication and social-emotional skills) of two children with ASD. Moreover, parent interviews, logs, rating scales and checklists were used to study the maintenance of treatment effects, the social validity and the treatment fidelity of the treatments. Results indicated that the treatment approach was not effective in improving social communication of one participant, but was moderately effective in decreasing the frequency of disruptive behaviors for one of the participants. Treatment fidelity was determined to be an important factor when considering the use of parent driven treatments within the home setting. Moreover, strong social validity was determined despite the parent having difficulty implementing the treatment consistently. Further discussion of the results, recommendations for future research and limitations of the study are also presented.

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## **Chapter 1: Introduction**

Autism Spectrum Disorder (ASD) is an umbrella term that describes a complex disorder of brain development that includes range of impairments affecting social interaction, communication and normally developing behaviors (American Psychiatric Association, 2013). In ASD, children instead display stereotyped behaviors, interests and activities (American Psychiatric Association, 2013). In recent years, there has been an increase in the diagnosis of ASD, with an estimated 1 in every 59 children being diagnosed with ASD (Center for Disease Control and Prevention [CDC], 2018). Approximately 1 in every 42 boys and 1 in every 189 girls are diagnosed with ASD (CDC, 2014). These statistics suggest a significant number of individuals are affected by this disorder. Moreover, children with ASD are often observed to have difficulty navigating social situations due to the characteristics of the ASD diagnosis.

To address the increasing numbers of individuals with ASD, researchers are looking to increase efficacy in interventions and help individuals who experience social skills deficits. Social skills can be categorized into three primary domains—social communication, social-emotional skills, and social competence (Cook et al., 2008; Cavanaugh, 2010; Ratcliffe et al., 2014). However, the complexity of the range of social skills needed to function in interpersonal interactions makes it challenging for researchers to develop effective treatments (Cook et al., 2008). Social skills are considered to be a complex construct because several components of different skills are inter-related and influence one another. For this reason, it is difficult to design efficacious social skills interventions. Indeed, because the construct of social skills is so complex, research has shown varied results in terms of the effectiveness of interventions (Bellini et al., 2007). Nonetheless, there are a number of evidenced-based



practices (EBP) available to effectively treat children with social skill deficits, including children with ASD.

An intervention strategy is determined to be an EBP after rigorous research has been conducted. Various designs and methodologies are considered when determining if an intervention strategy is effective in treating a specific treatment issue (APA, 2006). Specifically, there are three intervention strategies that are considered EBPs that address the social deficits of children with ASD. These interventions are: (1) social narratives, (2) video modeling, and (3) parent implemented interventions (PII). Social narratives are descriptive sentences that objectively define anticipated events, perspective sentences that describe the internal status of the person or person involved, and directive sentences that provide individualized statements of desired responses (Delano & Snell, 2006; Winner & Crooke, 2009). Video-modeling involves teaching a specific skill or targeted behavior using video recording and display equipment (Franzone & Collet-Klingenberg, 2008). Finally, parent implemented interventions (PII; Hendricks, 2009) require the parent to become the interventionist in order to implement the learned skills with their child within the home environment.

An important component of evidence-based practice for children with ASD involves developing interventions that are individualized to the child's needs (Bellini et al., 2007). Some researchers in autism treatment use a modular approach to address the specific needs of the children (Winner & Crooke, 2009). Modular treatment approaches do not include the use of a manualized intervention to provide treatment, but rather, utilize several evidence-based strategies and techniques from multiple theoretical perspectives to provide individualized treatment based on the client's specific needs.

As individualized treatment appears to be important in working with children with ASD, this study took a modular approach to treatment and investigated the effectiveness of using PIIs with the

combined use of social narratives and video-modeling within the home setting. Moreover, this study utilized a multi-method approach using single-subject design and qualitative methodology to collect and analyze data to explore multiple perspectives and gain a well-developed understanding of how to appropriately/effectively implement EBPs in the home setting. It is through this approach that three primary goals were investigated. This study: 1) examined the effectiveness of combining EBPs to treat children with ASD, 2) examined the maintenance of social skills using PII, social narratives, and video-modeling simultaneously, and 3) examined parents' perceptions regarding the acceptability and feasibility of the treatment within the home setting.

## **Chapter 2: Literature Review**

As children grow and develop, they learn how to navigate social situations through the different experiences they encounter. However, children with ASD perceive social stimuli differently when compared to typically developing peers. Therefore, this literature review will cover the characteristics of the ASD diagnosis, the complexity of social skills, and the different approaches clinicians use to improve the social skills of children with ASD. Moreover, this review will highlight the importance of maintenance of treatment effects, social validity, and treatment fidelity when treating the social skills deficits of children with ASD.

### **Autism Spectrum Disorders**

Currently, there is a rise in children who are being diagnosed with ASD and who are in need of services across multiple settings (i.e. home, school, and clinic) in order to improve their social deficits (CDC, 2014; Gresham et al., 2001). According to the *Diagnostic and Statistical Manual of Disorders, Fifth Edition* (DSM-5; APA, 2013), essential criteria for an ASD diagnosis include: a) persistent impairment in reciprocal social communication and social interaction skills; b) restrictive and repetitive patterns of behavior; and c) challenges that must be present beginning in early childhood and which impair daily functioning. If an individual is diagnosed with ASD, impairments in communication and patterns of behavior often manifest in various ways and are heavily dependent on the person's age, intellectual level, language ability, and past or current treatment (APA, 2013). Moreover, the social deficits of a child are compared to the social functioning of typically developing children when determining if a diagnosis of ASD is appropriate.

Additionally, to account for the wide range of communication and behavioral manifestations seen in children with ASD, ASD is considered as a possible diagnosis using a spectrum or range of

patterns and symptomology (APA, 2013). In other words, although two different individuals may be diagnosed with ASD, the types of social deficits and severity of deficits may (and often do) vary from person to person. For example, one child diagnosed with ASD may participate in hand-flapping and self-injurious behavior; have low-intellectual ability, and severe language impairment. On the other hand, another child with high-functioning ASD may have difficulty maintaining eye contact and taking turns in conversations, and also have restricted interests and average intellectual abilities. Thus, the diagnosis of ASD can refer to a large range of strengths and deficits, even within similar categories of impairment (i.e., Level 1, Level 2, etc.).

### **Social Skill Deficits in Children with ASD**

Typically developing individuals use social skills in their daily lives to navigate the social world in which we live. Individuals diagnosed with ASD, however, are commonly described as having marked difficulty with social skills (APA, 2013). *Social skills* can be broadly defined as the essential communication and behavioral elements that contribute to social interaction (Cook et al., 2008). When the construct of social skills is studied in the fields of psychology and related fields, their complexity is often explored using three primary domains—social communication, social-emotional skills, and social competence.

#### **Social Communication**

Social communication encompasses concepts such as the pragmatics of language and language expression, social interaction, and social cognition (Thiemann & Goldstein, 2001). For example, social communication involves the use of appropriate eye contact and gaze, perspective taking, and general social awareness. First, social pragmatics includes the use of verbal and non-verbal communication (Tager-Flusberg, 2003). Verbal communication refers to speech acts such as requests and comments,

while non-verbal communication refers to elements like body language and eye contact (Tager-Flusberg, 2003). Second, language expression refers to the more technical elements of language, such as semantics, syntax, and morphology (Hurford, 2001).

Social pragmatics and language expression are closely related and are often addressed in the literature. A study by White (2015) investigated the link between syntax and the understanding of pragmatic and figurative (nonliteral) aspects of language. Results indicated that idiom comprehension may not be significantly impaired in individuals with ASD beyond their structural language abilities. Specifically, syntax and vocabulary were both significant contributors to the understanding of idioms, other figurative/nonliteral expressions, and pragmatic expressions (White, 2015). Therefore, a child's language expression abilities (i.e. syntax) should be investigated when a child with ASD struggles to interpret social communication and idioms such as, "It's raining cats and dogs." Nonetheless, research continues to find that children with ASD have difficulties in understanding idioms and often interpret language literally, which can make communication with typically developing peers awkward and more difficult (Vogindroukas & Zikopoulou, 2011).

Social interaction is also considered a component of social communication. Specifically, social interaction focuses on how an individual acts and behaves during a social situation (White et al., 2007). Several variables may contribute to social interaction, such as a person's speech style and context, cultural influences, conflict resolution strategies, and social reasoning. For example, a child with ASD named "Bobby" may have a restricted interest in space exploration. Bobby holds great excitement for this topic, as he can recite detailed statistics regarding space exploration, and wants to work for NASA one day. However, when Bobby interacts with his peers, he only discusses space exploration. This restricted interest and focused conversation on this one topic may be appropriate during a space camp,

but other peers may not share his same interest in other settings, which may make social interaction more difficult for Bobby. Therefore, social communication, or more specifically, skills related to understanding the social context of communication, is especially important for children like Bobby so he can improve social interactions with peers in multiple settings, as well as develop friendships.

Moreover, social interactions are influenced by culture. A study by Chen et al. (2017) showcases how culture is a contributing variable to the social interactions of individuals diagnosed with ASD. This study examined the similarities and differences of everyday participation among males and females with ASD in Australia and Taiwan. The everyday social interactions of these participants were self-recorded using a device that prompted the participants seven times a day for one week. Once the participants were prompted, they recorded where they were, what they were doing, and who they were with (Chen et al., 2017). Results found that Taiwanese participants were more likely to stay home than Australian participants. Interestingly, female participants were more likely to engage in social interactions than males, and the participants with higher levels of social anxiety were less likely to participate in social activities (Chen et al., 2017). This study highlights how one's cultural influences (nationality and gender), as well as comorbid diagnoses, can contribute to specific types of social interactions in individuals with ASD.

Additionally, Corbett et al. (2015) argue that cognitive processes also affect the social interactions of children with ASD. Specifically, the authors argue that difficulties with facial memory contribute to the impairment of reciprocal social interactions observed in children with ASD. That is, children with ASD often have difficulty identifying and understanding facial expressions, making it difficult to remember people's faces. Difficulty identifying and understanding facial expressions and remembering faces lead people with ASD to interact less socially, and then once they do, their poor

recognition makes the social interaction more difficult to navigate. This study investigated 66 children (34 with ASD and 32 who were typically developing) using neuropsychological measures to predict natural social interactions. Moreover, a peer interaction paradigm was also used to observe the real-life interactions of children with ASD. Results found that facial memory strongly predicts relevant social engagement, and that impairments in facial memory are associated with reduced ‘real-world’ interactions (Corbett et al., 2015). Additionally, these results highlight the strong connection between facial memory and reciprocal social interaction, suggesting that improvement in one area may benefit the other (Corbett et al., 2015). Thus, social interaction may be strongly influenced by social cognitive processes.

Therefore, social cognition is another component of social communication. It includes executive functioning, Theory of Mind (ToM), and joint attention. Executive functioning refers to a child’s ability to multi-task, solve problems, make plans and follow directions (Fisher & Happe, 2005). These broad mental capabilities are essential tools that aid in the navigation of social situations. Social relationships often include situations during which problem-solving, making plans and following directions are necessary. For example, a child with ASD may have difficulty solving conflict in a relationship or making plans to engage in social activities with other individuals. Therefore, social situations may be more difficult to navigate due to difficulty with executive functioning.

The research on executive functioning in adults, adolescents, and older children with ASD has demonstrated clear executive function impairments in affected individuals (Drayer, 2009). Executive skills are important, for they are needed to complete a wide range of adaptive and social activities. Additionally, many children with ASD are often diagnosed with ADHD as a comorbid disorder because of concerns regarding executive functioning abilities (DiQuattro, 2014).

There is limited research dedicated to investigating the comorbid diagnoses of ASD and ADHD. DiQuattro (2014) investigated whether ADHD is truly a separate, diagnosable disorder in children with ASD, or if ADHD symptoms should be credited under the diagnosis of ASD. This study examined the executive functioning profiles of children with a single diagnosis of ASD, a single diagnosis of ADHD, and the comorbid diagnoses of ASD and ADHD. Specifically, three areas of executive functioning were assessed: inhibition, working memory, and planning and organizing. Results indicated that children with a single diagnosis of ADHD demonstrated significantly better performances on inhibition and working memory. Furthermore, there were no significant difference between the three groups in their investigation of planning and organizing skills (DiQuattro, 2014). More importantly, children with ASD or a comorbid diagnosis of ASD and ADHD appear to have even more difficulty with inhibition and working memory than children with ADHD (DiQuattro, 2014). Thus, such specific difficulties of executive functioning may further complicate social communication.

Theory of Mind (ToM) refers to a child's ability to not only understand his or her own mental states, but the mental states of others (Baron-Cohen, 2000). ToM is involved in making social predictions based on a person's own knowledge regarding the beliefs, desires, and thinking processes of others (Baron-Cohen, 2000). Thus, these predictions or theories are based on the child's ability to synthesize social information by using knowledge acquired from his/her own social experiences, and to use such knowledge to better understand the perspectives of his/her peers. Children with ASD who have difficulty with ToM may thus find it confusing as to why others may not share their specific interest(s). Therefore, children with ASD often make inaccurate social predictions about others' behaviors and thinking.



ToM is well researched and is considered a common deficit observed in children with ASD. Hoogenhout and Malcom-Smith (2017) acknowledged the strong influence ToM has on ASD, and investigated whether or not ToM skills could predict the severity of ASD. Sixty-two children with ASD were administered a developmentally sensitive ToM battery to determine ToM ability. Moreover, the intelligence quotients of participants and ASD criteria from the DSM-V were used to determine the severity level of ASD. A hierarchical cluster analysis was conducted, and three distinct clusters representing levels of ToM corresponded with severity levels of ASD emerged (Hoogenhout & Malcom-Smith, 2017). In Cluster 1, children had early-developing ToM and a severe level of ASD. These participants attended autism-specific schools. Cluster 2 included participants who had false-belief ToM (understands that mental states can misrepresent reality) and a moderate level of ASD. These participants attended either an autism-specific school or a special needs school. Lastly, Cluster 3 consisted of individuals who had sophisticated ToM understanding and a mild level of ASD. These participants attended general special needs or mainstream schools (Hoogenhout & Malcom-Smith, 2017). The children in this study were students of the schools involved with this study at the time of this study, and little is known if students were at a previous school placement before this study took place. These findings suggest that ToM can accurately predict the severity of an ASD diagnosis. In doing so, these findings highlight the significant influence ToM has on the symptomology of ASD. Therefore, impairments in ToM may significantly contribute to how a child with ASD communicates in social situations (Hoogenhout & Malcom-Smith, 2017).

Finally, social cognition also involves joint attention, which refers to a child's ability to interpret verbal and non-verbal social cues (pointing, eye gaze, etc.), and to use such cues to share attention on a given stimulus (Murray, et al., 2008). For example, a peer may point to an object and say "Look!" to a

friend. Joint attention is achieved when the child receiving the social cue interprets the finger pointing and looks in the direction where the child is pointing. Then, both children look at the object and return to their resting states after they have shared attention. Difficulties with joint attention can make social situations challenging for children with ASD (Murray, et al., 2008). Joint attention not only helps individuals communicate because they can share a focus, but it also helps with bonding and seeing another's point of view. Therefore, joint attention can be important in creating and maintaining friendships and other relationships (Lord & Magill-Evans, 1995).

Chang, Shih & Kasari (2016) explored how joint attention contributes to friendships of preschool-aged children with ASD in mainstreamed classrooms. Thirty-one participants (ages 2-5 years) with ASD were observed in their individual classrooms in order to capture interactions with peers and adults during free-play. Results indicated that only 20% of these participants had friends at school. Additionally, participants that did have friends were more likely than children without friends to display joint engagement with their peers during free play, and to use a higher level of joint attention skills (Chang, Shih & Kasari, 2016). Therefore, the findings of this study highlight how pivotal joint attention is to social communication and friendships.

In sum, the broad domain of social communication encompasses language and language expression, social interaction, and social cognition. Deficits in social communication can make social situations more difficult for children with ASD to navigate. Therefore, children with ASD may have difficulty initiating and maintaining friendships (Lord & Magill-Evans, 1995). Therefore, it is important for interventions to effectively treat social communication deficits.

**Interventions for social communication.** Considering the broad domain of social communication, there are several interventions that focus treatment on improving elements of social

communication. As one example, the *Social Communication Intervention Project* (SCIP; Adams et. al., 2011) is a social skills intervention that works on improving the pragmatics and semantics of language, social interactions, and social cue interpretation of school-aged children (Adams & Gaile, 2012). In SCIP, individualized goals are made for each child in the intervention. Randomized controlled trials have shown that this intervention is effective in improving conversational competence, parent-reported pragmatic functioning and social communication, and teacher-ratings of classroom learning skills (Adams et al., 2012).

Furthermore, a study by Srinivasan and colleagues (2016) used a randomized controlled trial to investigate the effects of an “embodied rhythm and robotics intervention” on the spontaneous and responsive verbal communication of thirty-six children with ASD. The embodied rhythm therapy used imitation-based music and movement activities based on the musical elements of rhythm, melody and phrasing, while the robot therapy involved whole-body imitation games with multiple robots. The comparison group completed tabletop activities focused on academic and communication skills in attempts to mimic common school-based interventions. Over a 10-week treatment, results indicated that children in the rhythm and robot groups increased their levels of social verbalization (Srinivasan et. al., 2016). Thus, novel methods that involve music, body movements, and robotics appear to improve social communication deficits of children with ASD.

Additionally, Krstovska-Guerrero and Jones (2016) used a multiple-baseline single-subject design to examine the effectiveness of a social communication intervention involving prompting and reinforcement to teach gaze shifting to four toddlers with ASD. The intervention focused on the use of most-to-least prompting/requests to teach gaze shifting as a component of social communication (e.g., shifting gaze from an object to the interventionist’s eyes). The intervention lasted 9 weeks. All

participants demonstrated mastery of gaze shift once treatment concluded (Krstovska-Guerrero & Jones, 2016). Thus, early intervention with young children with ASD has been shown to improve elements of social communication.

Despite the complexity of social skills, these studies highlight that several different elements of social communication may be effectively addressed as part of related interventions. Moreover, several different approaches to intervention may also be utilized to improve social communication in children with ASD, including improving conversational competence, parent-reported pragmatic functioning and social communication, teacher-ratings of classroom learning skills, social verbalizations, and gaze shifting (Adams et al., 2012; Krstovska-Guerrero & Jones, 2016; Srinivasan et. al., 2016).

### **Social-Emotional Skills**

Another important domain of social skills is social-emotional skills, which refers to a child's ability to understand emotional situations, to express emotions and to regulate his or her emotions (Ratcliffe et al., 2014). Research suggests that many typically developing children struggle with social-emotional skills. Specifically, a national survey of nearly 150,000 students in grades 6 through 12 found that only 29% to 45% of students reported having social competencies such as empathy, decision-making, and conflict resolution skills (Benson, 2006). Interestingly, over 50% of these students seemed to have difficulties with social-emotional skills, suggesting that a substantial number of students (even typically developing students) struggle with social-emotional skills. Thus, if typically developing children have difficulty with social-emotional skills, then children with ASD who are characterized as having social deficits are even more likely to find social-emotional learning challenging.

Indeed, social-emotional skills are important for childrens' well-being and academic success. Research suggests that children with poor social-emotional skills also display problems with academic

performance (Parkinson, 2011). For example, when children have difficulty managing and navigating emotions, inappropriate behaviors often emerge and interfere with their academic progress (Docksai, 2010). In fact, research studies have found that better overall adjustment and academic performance is associated with learning and practicing social-emotional skills (Durlak et al., 2011; Greenberg et al., 2003). Therefore, to improve academic and behavioral concerns, the use of social-emotional intervention programs should be considered. For example, in 2008, a social-emotional learning (SEL) program was implemented in forty Los Angeles public elementary schools in an attempt to improve academic performance (Docksai, 2010). This SEL program focused on developing the interpersonal skills, emotional management skills, problem-solving skills, positive relationships, and communication skills of children. The daily application of this program resulted in a 30% increase in the students' academic performance and a 45% decrease in the students' aggressive behaviors (Docksai, 2010).

Difficulty with social-emotional skills appears to be a common challenge for many children. Therefore, children with ASD may be exposed to social-emotional learning programs that are provided to all children. Though emotion dysregulation is not a defining feature of ASD, there is a growing consensus that emotional problems play a prominent role in this disorder (Samson et al., 2015). Thus, children with ASD may need more intensive or specific interventions to improve their social-emotional skills. Children with ASD have shown a marked difficulty with skills such as self-awareness, self-management, social-awareness, relationship skills, motivation, empathy, and responsible decision-making (APA, 2013; Shah, 2012). Therefore, it is essential for children with ASD to receive targeted interventions that are focused on improving their social-emotional skills.

A study by Samson et al. (2015) examined a wide range of emotion regulation skills by comparing a group of 32 individuals diagnosed with ASD to a group of 31 typically developing

individuals. Participants completed daily diaries about their experiences and emotion regulation regarding three emotional domains: anger, anxiety, and amusement. Moreover, parent interviews were conducted to explore their child's emotional experiences and regulation skills. Results indicated that children with ASD are less likely to use adaptive emotion regulation skills and tend to use maladaptive skills more often when compared to their typically developing peers (Samson et al., 2015). In contrast, another study by Williams and Happe (2010) investigated how individuals with ASD recognize expressions of social emotions (embarrassment; pride; guilt) and non-social emotions (happiness; sadness; fear; surprise; disgust; and disappointment). Individuals with ASD (n=21) were compared to individuals diagnosed with a learning disability (n=21). Participants viewed nine silent, five-second video clips of people showing different emotions. Results indicated that both groups had difficulty recognizing social emotions, and could both better identify non-social emotions (Williams & Happe, 2010). When compared to other literature, these authors suggest that either the emotion processing skills of individuals with ASD are not as impaired as is traditionally believed, or that individuals with ASD compensate with different skills so they can succeed on experimental tasks when their emotion-processing is impaired.

Nonetheless, these studies highlight the difficulty children have with social-emotional skills. When it involves emotion regulation, children with ASD appear more often to display maladaptive skills to navigate their emotional responses. Moreover, it is difficult for individuals with ASD to recognize the emotions of others. Therefore, interventions that are designed to address social-emotional learning and labeling emotions should be considered when treating children with ASD.

**Interventions for social-emotional skills.** There are several social skills interventions that focus on improving elements of social-emotional skills and which use short-term goals to help children learn

to identify, regulate, and understand their own emotions, in attempt to improve a child's attitudes toward themselves, others, and school (Shah, 2012). Manualized social-emotional interventions like *Emotional-Based Social Skills Training* (EBSST) have taken a cognitive-behavioral approach to improve the social-emotional skills of children with ASD (Ratcliffe et. al., 2014). Cognitive-behavioral Therapy (CBT) is an approach to therapy that is very goal-oriented and which examines how one's thoughts, feelings, and behaviors influence one another (Beck, 1998; Rothbaum et. al., 2000).

EBSST uses components of CBT through the different training modules of the intervention. First, participants must learn to label and identify their emotions. Participants then link these emotions with situational and body cues. Then, participants work on emotional problem-solving by recognizing emotional problems while also generating, selecting, and implementing helpful solutions (Ratcliffe et. al., 2014). The cognitive aspect of EBSST involves using a 'feeling control kit,' as part of which participants can use cognitive strategies to change unhelpful thoughts into helpful thoughts. Moreover, behavioral strategies can also be used in EBSST, including deep breathing, relaxation, and distraction skills. Moreover, based on emotional development and emotional intelligence theories (Mayer, Salovey, & Caruso, 2000), EBSST also emphasizes teaching children to understand emotions, emotional problem-solving, and emotion regulation skills (Ratcliffe et. al., 2014). That is, the intervention trains children learn about their emotions, how their emotions can affect their thinking, and also to learn about how their emotions influence their behaviors. Results found that EBSST is effective in improving the emotional competence, social skills, and mental health of children with ASD (Ratcliffe et al., 2014). Additionally, teachers in this study reported that these treatment effects were maintained over a 6-month period (Ratcliffe et. al., 2014). Therefore, manualized treatments such as EBSST that use components of CBT may improve the social-emotional skills of children with ASD.

A case study by Corbett (2003) used video-models to improve the emotion perception of a child diagnosed with both ASD and a mild cognitive impairment. The child was shown a series of brief video-models (3-15 seconds) of typically developing children engaged in a variety of play and social situations (Corbett, 2003). Within these video-models, children exhibited one of four basic emotions. The basic emotions included being happy, sad, angry, and afraid. The intervention was delivered to the child in the home setting for 10 to 15 minutes a day for one week. Each intervention session (each day) involved the child viewing five brief video-models for each basic emotion. Therefore, the child viewed twenty different social or play scenes that expressed basic emotions during different situations. Results indicated that the social-emotional skills of this child improved with the use of video-modeling (Corbett, 2003). This improvement was achieved by focusing on the child's ability to perceive emotions.

In another study of social-emotional interventions, Duff and Flattery (2013) implemented an intervention to improve self-awareness of six adolescents with ASD (ages 15-21) in a school setting. The study used mirrors to measure different levels of self-awareness by requiring teachers to implement guided mirror activities. Results indicated that the self-awareness abilities of all participants improved or were maintained by the end of treatment (Duff & Flattery, 2013). Therefore, elements of social-emotional skills such as self-awareness can be an effective focus of a social-emotional intervention.

Moreover, a study by Schrandt, Townsend and Poulson (2009) focused on improving the empathic abilities of children with ASD. Four children with ASD who had difficulty empathizing with others were selected for this study. Puppets and vignettes, along with various types of affect, modeling, prompts, behavioral rehearsals, and reinforcements, were used to teach participants empathic responses. Participants participated in an education program that offered center-based and in-home behavioral intervention for children with ASD for 5.5 hours per day, 5 days a week. The intervention used vignettes



and puppets to explore different emotions (sadness or pain, happiness or excitement, and frustration) in an attempt to improve empathic ability (Schrandt, Townsent & Poulson, 2009). Each training session consisted of 30 randomly chosen trials (seven training and three non-training trials per emotion), during which the researcher used manual and auditory prompts to teach appropriate empathic responses. Results indicated an increase in empathetic responding across all participants. In addition, those empathy skills further generalized to the participants' actual relationships (Schrandt, Townsent & Poulson, 2009).

In sum, children with ASD are more likely to have social-emotional deficits when compared to their typically developing peers. There is a need for effective interventions for these children to address these skills. Social-emotional skill programs have been shown to be effective in improving the academic performance of children and also to decrease inappropriate behaviors within the school setting. Additionally, interventions designed to improve specific components of social-emotional skills (i.e., self-awareness, emotion perception, and empathy) have been shown to be effective in improving the social-emotional skills of children and adolescents diagnosed with ASD. Moreover, intervention strategies like video modeling have been shown to be an effective tool in improving social-emotional skills.

### **Social Competence**

Lastly, the social competence domain of social skills has a different focus than the social communication and social-emotional skills. Social competence does not refer to the teaching and learning of specific skills; rather, social competence involves a child's knowledge and ability to adequately use different social skills in various settings (Cook, et al., 2008; Gresham et al., 2001). For a child to be considered socially competent, the child must be able to appropriately use social skills to

foster and initiate social interactions that lead to sustained social relationships (Elliott et al., 2008; Vickerstaff et al., 2007). In an attempt to obtain a more concrete understanding of the social competence construct, Yager (2015) sought to create a standardized measure to assess the nature and severity of social competence of children with ASD. Specifically, this study aimed to develop and evaluate a parent rating scale capable of assessing differences in social competence (i.e., social strengths and weaknesses) among adolescents with ASD and neurotypical adolescents. Results from a confirmatory factor analysis supported a multidimensional factor representing the construct of social competence. This multidimensional factor included seven distinct domains: social motivation, social inferencing, and demonstration of empathetic concern, social knowledge, verbal conversation skills, nonverbal skills, and emotion regulation skills (Yager, 2015).

Social competence may contribute to a child's overall well-being and future success. Jones, Greenberg and Crowley (2015) suggest that there is a strong association between kindergarten social competence and future wellness. A cohort of 753 diverse students was tracked for two decades in attempts to better understand the connection between social competence and future success. A teacher-reported social competence measure was used to assess a student's ability to resolve peer problems, listen to others, share materials, be cooperative, and be helpful. The results showed that teacher-reported social competence in kindergarten was a consistent and significant predictor of future outcomes across all major domains: education, employment, criminal justice, substance use and mental health. Specifically, Jones and colleagues found that for every one-point increase in a child's social competence score in kindergarten, they were twice as likely to attain a college degree in adulthood, and 46% more likely to have a full-time job at age 25. In contrast, with every one-point decrease in a child's social competence score at kindergarten, they were 54% more likely to have negative interactions with the

police, and 82% more likely to be in or on a waiting list for public housing (Jones, Greenberg & Crowley, 2015). One limitation to this study was that only one measure of social competence was used; also, other behavioral and non-cognitive factors may have contributed to findings regarding long-term outcomes. Nonetheless, this study suggests that there may be a strong association between children's social competence and later outcomes.

Therefore, associations between social competence and later outcomes are likely to exist as well. The rate of college attendance and adult employment is already lower for individuals on the spectrum when compared to their typically developing peers. Moreover, early deficits in social competence can affect the social well-being of individuals with ASD in the future. A study by Newman and colleagues (2011) found that individuals with ASD rarely receive calls from friends. Moreover, reports indicate that individuals with ASD rarely meet up with friends on their own (Newman et. al., 2011). In the typically developing population, a demonstrated lack of social connection may contribute to later psychopathology (Tantam, 2000). Therefore, the lack of social connection and other life stressors may contribute to future diagnoses like depression and anxiety in individuals diagnosed with ASD (Tantam, 2000).

Moreover, comorbid diagnoses in ASD are common. Research suggests that affective disorders and conduct disorders are common secondary diagnoses to ASD (Tantam, 2000). Specifically, Chang, Quan, and Wood (2012) studied the effects of anxiety disorders on the social functioning of children diagnosed with ASD, and found that individuals with more severe Social Anxiety Disorder also had more social skill deficits. Thus, comorbid disorders such as anxiety disorders may present a barrier to developing social competency among children with ASD (Chang, Quan & Wood, 2012). Additionally, such diagnoses may pose other challenges for individuals with ASD.

Furthermore, Richa et al. (2014) conducted a meta-analysis to examine the correlation between ASD, suicidal ideation, and suicide completion. Results indicated that individuals diagnosed with ASD are at a higher risk for suicidal ideation and completion of suicide. Ironically, individuals with ASD who exhibit suicidal ideation and suicide completion are often considered to be “higher functioning” on the spectrum (e.g., Level 1). However, causation cannot be determined from this study, as individuals diagnosed with ASD often have comorbid affective diagnoses that may also contribute to thoughts of suicide (Richa et al., 2014).

Finally, individuals with ASD may be disproportionately at risk of experiencing sexual abuse and victimization (Sevlever, Roth, & Gillis, 2013). Research suggests that individuals with ASD may be targeted more by abusers because of their deficits in social competence (Sevlever, Roth, & Gillis, 2013). Considering the potential long-term outcomes related to deficits in social competency, it is important for social skills interventions to be effective so children can increase their likelihood of functioning appropriately in future social situations and become successful adults (Howlin, 2005; Shea & Mesibov, 2005).

**Interventions for social competence.** It is clear that children with ASD struggle with social competence. They must understand how and when to use social skills in social situations, while also knowing when and how to effectively adapt them across multiple environments (Cavanaugh, 2010). Thus, a number of studies have focused on how to help children with ASD improve their social competence skills. A meta-analysis conducted by Whalon and colleagues (2015) reviewed 37 articles that used social competence interventions within the school setting, and found that overall, the reviewed interventions produced moderate-to-high effect sizes regardless of intervention type. Additionally, a significant majority of those interventions reviewed were considered to be child-specific (an intervention

designed for child's specific needs) and used social narrative, video-modeling, or the combination of these two intervention techniques to improve social competence (Whalon et. al., 2015).

Although several interventions aim to address social competency in children with ASD, there are only a few interventions that solely focus on social competency. The *Social Competence Intervention* (SCI; Stichter et. al., 2012), for example, teaches children with high functioning ASD when to use the appropriate social skills to help maintain friendships. Similar to other social skills interventions, SCI combines various theoretical approaches such as applied behavior analysis, underlying theories of ToM, emotion regulation, and the teaching of appropriate behaviors to achieve appropriate social expectations (Stichter et. al., 2012). ToM, emotion regulation, and executive functioning appear to influence one another. Therefore, social competence interventions typically focus on ToM enhancing emotion regulation and executive functioning skills to improve the social competency of children with ASD (Solomon et al., 2005).

Furthermore, the authors of this study conceptualized social competency as consisting of a combination of ToM, emotion regulation, and executive functioning. Moreover, with this definition of social competency, they were able to directly measure the effectiveness of social competency, which is rarely seen in the literature. Results indicated that a series of measures that examined theory of mind (ToM), emotion regulation, and executive functioning were used to assess the efficacy of SCI (Stichter et. al., 2012). Results indicated that SCI significantly improved the direct measurement of ToM and problem solving. Parent reports indicated improvement in the overall social abilities and executive functioning of their children with ASD (Stichter et. al., 2012).

Moreover, a study by Gengoux (2015) examined whether brief priming sessions (previewing activities with an adult ahead of time) could improve the social initiations made by children with ASD

(ages 6-8) during play time in inclusive settings (summer camp and after school programs). Gengoux (2015) conducted priming activities in the home of the participant the day before the participant was observed in the inclusive setting. For example, the primary investigator would use priming probes like, “I really like Checkers, Jenga, and Chess. Would you like to play one with me?” during the priming activities. These priming probes would then provide more opportunities for the participants to initiate socially interactions with the primary investigator during the priming session. These priming sessions equipped participants with more knowledge and tools to initiate social interactions when they entered the inclusive environment. Results from a multiple-baseline design across four participants showed that priming increased the rate of social initiations made by children with ASD. Additionally, increases in broader initiations and statements of competence were also observed (Gengoux, 2015). Thus, this study supports the use of priming as an effective intervention to promote social interactions between children with ASD and typically developing peers in an inclusive environment.

In a study with adolescents who have ASD, Vernon and colleagues (2016) developed an experiential learning program called the Social Tools And Rules for Teens (START) program to improve social competence. They argue that experiential learning, or the process of learning through authentic experiences and reflection of those experiences through practice, is essential for improving social competency. Sessions were structured as follows: an individual therapy check-in, unstructured group socialization time, a structured group activity, a group discussion and practice of social skill topics, and an individual checkout session that included parent involvement (Vernon et. al., 2016). This program not only taught participants specific skills, but provided opportunities for participants to interact socially in a more natural setting in an attempt to improve their social competency. Parent- and adolescent-reported measures and conversational probes were used to examine the effectiveness of the

intervention on various social skills surveys (Vernon et. al., 2016). The conversational probe measures showed specific improvements in each participant, including increases in social inquiries (verbal questions that were clearly intended to elicit a verbal response from a conversation partner), decreases in negative statements, and a decrease or increase in verbal contributions (Vernon et. al., 2016).

Adolescents with ASD who participated in the START program thus improved in their use of skills in more natural settings.

Overall, social skills are complex and consist of a variety of components, including social communication, social-emotional skills, and social competence. Although researchers can deconstruct social skills down into these three components, the complexity of social skills can makes it difficult to parse apart specific social skill deficits. Due to this complexity, it can be difficulty for clinicians to operationalize definitions of specific skills during treatment planning. Therefore, most social skills interventions focus on varying but incomplete elements of social skills in an attempt to improve the general social skills of children with ASD.

### **Effectiveness of Social Skills Interventions**

Despite the number of social skills interventions that have been developed and implemented to improve the social skills of children with ASD, general critiques exist regarding the effectiveness of social skills interventions. Outcome research studies refer to either efficacy or effectiveness. That is, efficacy research is done in a primary research setting where environmental variables are controlled, and where the best possible implementation of an intervention can occur. This research is focused on measurable effects (Goldberg, 2013). Effectiveness research, on the other hand, explores how useful the intervention is to the participant when used in real-life situations (Goldberg, 2013). When examining social skills interventions, efficacy primarily refers to whether an intervention improves social skills in a

clinic setting, while effectiveness refers more to the generalization and maintenance of social skills interventions in more natural settings.

Nonetheless, treatment outcomes are varied when examining the efficacy and effectiveness of social skills interventions regardless of the setting. However, some researchers argue that treatments should be designed to work within more naturalistic environments so maintenance and generalization can occur (Gresham et al., 2001). Bellini and colleagues (2007) conducted a meta-analysis to analyze the efficacy, maintenance, and generalization of social skills interventions for children with ASD. This meta-analysis included analyzing 55 single-subject designs using a percentage of non-overlapping data for each study. The researchers determined that social skills interventions showed poor effectiveness and generalizability (Bellini et al., 2007). However, a major limitation of this study is that the interventions that were included had only been implemented within a school setting. Similarly, the results of this meta-analysis only reflect outcomes of social skill interventions within a school setting, and do not necessarily extend to all social skill interventions implemented within multiple or different settings (e.g., out-patient clinics).

In contrast, multiple studies suggest that higher rates of efficacy and effectiveness exist in regards to improving social skills of children with ASD (without subsequent generalizability). Hwang and Hughes (2000) reviewed 16 empirical studies that examined the effectiveness of “interactive interventions” designed to improve the early social communication skills of children with ASD. Hwang and Hughes (2000) defined interactive interventions as interventions that focused on social and communication skills such as imitative play, joint attention, and reciprocal interaction. The effectiveness of interventions was analyzed in relation to participant characteristics, treatment setting, target behaviors, training methods, and results. Across the 16 different studies, positive changes were observed



for social and affective behaviors, nonverbal and verbal communication, eye contact, joint attention, and motor imitation (Hwang & Hughes, 2000).

In another study, Rodgers (2000) reviewed peer-reviewed journals and identified interventions that provided empirical support for certain improvements in the social functioning of children with ASD. The strategies used in these interventions included video modeling, self-management, social stories, direct instruction, and social skills groups. These studies revealed positive outcomes in social functioning among both children and adolescents with ASD (Rodgers, 2000). Additionally, many participants showed improvements in other areas that were not the direct focus of the intervention, such as improvements in the frequency of language use, and decreases in inappropriate behaviors during periods of active social engagement (Rodger, 2000).

Although there are inconsistencies among studies examining the efficacy and effectiveness of social skills interventions, researchers suggest there needs to be a more specific focus on the effectiveness and generalization of social skills interventions. For example, several researchers (e.g. Bellini et al. 2007); Gresham et al., 2001) recommend increasing the frequency of social skills intervention a child receives, providing instruction within the child's natural environment, and adapting the intervention to the specific type of social skill deficit.

Specifically, Bellini et al. (2007) suggested that 30 hours of instruction over 10 to 12 weeks is insufficient for behavioral change, and that there should thus be an increase in the intensity and frequency of intervention. Moreover, Greshman et al. (2001) and Quinn et al. (1999) agree that social skills interventions are often ineffective when there is a mismatch between strategy and skill deficit. Therefore, the intervention strategy should be designed to address the specific need of the child instead of the child needing to fit within a selected strategy that does not appropriately address his/her needs

(Bellini et al., 2007). Furthermore, when a child receives intervention within a contrived setting, such as a pull-out or resource room, little maintenance or generalization is achieved (Greshman et al., 2001). Therefore, incorporating a social skills intervention in a more natural setting, such as in the general education classroom or at home, is assumed to improve maintenance and generalizability of skills.

### **Evidenced-Based Practices for Children with Autism Spectrum Disorders**

In response to the varied results that social skills interventions have produced, researchers have turned to the implementation and use of evidence-based practices (EBP; APA, 2006). The push toward using EBPs has been observed across several fields of research. This push toward using EBPs originated in health service research. More recently, the field of psychology is adapting to this form of practice (Ubbink, Guyatt & Vermeulen, 2013). In psychology, several types of research methodology are reviewed when determining whether an intervention strategy should be considered an EBP (Michie et al., 2005). Therefore, intervention strategies can be observed using multiple perspectives, so a comprehensive understanding of the intervention strategy can be established. Specifically, research involving a) clinical observations; b) qualitative research; c) systematic case studies; d) single-case experimental designs; e) public health and ethnographic research; f) process-outcome studies; g) effectiveness research concerning interventions; h) efficacy research; and i) meta-analysis (Greenberg & Newman, 1996; APA, 2006) is all considered when determining if an intervention strategy should be designated as an EBP.

There are several EBPs that have been used to effectively treat ASD. For the purposes of this study, three EBPs will be reviewed. Specifically, the use of social narratives, video-modeling, and parent-implemented interventions (PII) will be explored. These specific intervention strategies have been carefully chosen to be used in this study because the literature supports the combined use of these

specific intervention strategies. Social narratives are effective on their own, but research has found that social narratives are most effective when paired with another intervention strategy (Schneider & Goldstein, 2010). Moreover, video-modeling seems to be the most effective treatment in improving the social skills of children with ASD, although at least one study has promoted the combined use of video-modeling and social narratives (Franzone & Collet-Klingenberg, 2008). The flexibility of these two intervention strategies allows researchers and clinicians to design individualized interventions. Considering the effectiveness and the flexibility of these strategies in improving the social skills of children with ASD, these strategies will be taught to parents so the intervention can readily be implemented in the home setting. Additionally, the use of PII provides a framework that involves training and moderating parents as they successfully implement an intervention within the home (Hendricks, 2009). Therefore, these three intervention strategies appear to be the most appropriate to combine and provide effective treatment within the home setting.

### **Social Narratives**

Social narratives are an EBP that have been shown to be effective in improving the social skills of children with ASD (Delano & Snell, 2006). Social narratives are: 1) descriptive sentences that objectively define anticipated events, 2) perspective sentences that describe the internal status of the person or persons involved, and 3) directive sentences that provide individualized statements of desired responses. For example, ‘Paul’, a 9-year old with ASD, has difficulty walking instead of running at school. Therefore, a social narrative for Paul might include sentences like ‘Inside the school, people walk, not run’ (descriptive sentence); ‘People feel safe in school when everyone is walking’ (perspective sentence); and ‘I will try to walk when I am inside’ (directive sentence). Additionally, social narratives may also include visual images to help describe the purpose of developing the desired

skill (e.g., a picture of a child or cartoon walking in the hallway; Winner & Crooke, 2009). Overall, in one study, the quality of social narratives were shown to be effective when used as the sole intervention strategy; however, the observed improvements in social skills tend to slow down over time when clinicians solely use social narratives (Scattone, Tingstrom & Wilczynski, 2006). Thus, there appears to be a gap in the research regarding whether treatment effects are maintained over time, and if they generalize to the development of other social skills.

A number of research studies have shown that social narratives improve a variety of different social skills and problematic behaviors in children with ASD, including decreasing attention-seeking behavior, initiating comments, and initiating requests (Delano & Snell, 2006). Feinberg (2002) examined the effectiveness that social narratives had on improving four specific behaviors (greeting behaviors, requesting to play a game, asking peers to join play, and accepting another's choice of play) with children who had ASD (the children were between 8-13 years old). Thirty-four children with ASD were randomly assigned to two story groups (the control group or social narrative group). Participants in the social narrative group were exposed to carefully crafted social narratives five times throughout one day, while the control group was exposed to a regular story five times throughout one day. Results indicated significant differences between the two groups. In the treatment group, there was an improvement in all four target behaviors (Feinberg, 2002). Social narratives have been shown to improve the social skills of children with ASD when those narratives are helpful to the child. This study, however, only focused on the immediate effects of social narratives, and did not examine if these improvements in social skills were maintained over time.

Other reviews of the social narrative literature argue that studies reporting unfavorable results while using social narratives are ignored, likely because of the popular and frequent use of social

narratives within several social skill treatment “packages” (Wall, 2015). Therefore, Wall (2015) explored the efficacy of social narratives to further examine how to make social narratives a more effective intervention tool. Results indicated that social narratives increase prosocial skills, and may improve general social skills. Moreover, Wall noted that the majority of studies that showed inconsistent or unfavorable outcomes were the result of weak and inconsistent methodologies. For example, such studies inconsistently implemented the social narratives and/or the social narratives were considered to be of poor quality. Overall, it is essential that social narratives are crafted to meet the specific needs of clients, but that they also are implemented with strong methodology and fidelity.

In contrast, some studies have found that social narratives are more effective when used as part of a treatment package that involves prompting and/or other intervention strategies such as video modeling. A study by O'Handley et al. (2015) used a multiple-baseline design across participants with embedded changing conditions, counterbalanced across groups (i.e., A/B/B+C and A/C/C+B) to investigate the differential effects of social narratives, video modeling, and the combined use of social narratives and video modeling. Results found that social narratives on their own resulted in moderate improvements in eye contact, while video modeling aligned with previous research and showed stronger treatment effects in improving eye contact. Moreover, the combined use of social narratives and video modeling showed strong treatment effects; however, researchers of this study concluded that the video modeling accounted for most of the favorable outcomes, while the social narratives contributed minimal additive effects (O'Handley et al., 2015). Similarly, Malmberg, et al. (2015) sought to parcel out the effect of the combined use of social narratives and video modeling. Results also led researchers to conclude that social narratives are best used while accompanied by other intervention strategies.

Specifically, the combined use of social narratives and video modeling has shown to improve the social skills of children with ASD (Malmberg, et al., 2015).

Overall, social narratives provide a written prompt with directive and descriptive components to help children with ASD navigate various social situations (Winner & Crooke, 2009). Research studies have indicated that social narratives improve social skills such as eye contact and the general social interactions of children with ASD when delivered through various mediums. Social narratives have also shown to be most effective when designed for a client's specific needs and when they are used with other intervention strategies, such as video modeling (Delano & Snell, 2006; Schneider & Goldstein, 2010). Nonetheless, there continue to be debates about the effectiveness of social narratives in treating the social deficits of children with ASD.

### **Video Modeling**

Video modeling may be the most researched evidence-based practice in treating ASD, at least in regards to providing favorable results of improving social skills (Franzone & Collet-Klingenberg, 2008). Video modeling involves the teaching of a specific skill or targeted behavior using video recording and display equipment (Franzone & Collet-Klingenberg, 2008). There are several types of video modeling. Specifically, video self-modeling, video peer/other-modeling, and video point-of-view modeling, have all been used to improve the social skills of children with ASD (Alzyoudi, Sartawi & Almuhihi, 2015). The use of a specific type of video-modeling is often dependent on the treatment goal and may serve different functions in treatment.

**Video self-modeling.** Self-modeling involves the participant being recorded while participating in the appropriate behavior. This video is then used to teach the behavior later on, so the participant can view himself/herself participating in the appropriate behavior. This intervention strategy has shown to

improve a wide range of behaviors, including a decrease in disruptive behaviors, improvements in transitions between activities, and improvements in communication skills, such as turn-taking (Victor, Little & Akin-Little, 2011). Moreover, such improvements have shown to be maintained over time when using video self-modeling (Victor, Little & Akin-Little, 2011). A meta-analysis investigating the efficacy of video self-modeling found that they strongly improve social communication and disruptive behaviors in preschool- and elementary-aged participants with ASD (Mason et al., 2016). Another study by Schatz et al. (2016) found that video self-modeling was an effective method for improving on-task classroom behavior for three elementary school students diagnosed with ASD. The study used a multiple-baseline design across participants, as part of which participants were shown a video of themselves successfully participating in on-task classroom behavior. After being shown the videos, researchers observed the participants in their natural school setting, and all participants showed improvement from the baseline to intervention phases (Schatz et al., 2016).

Interestingly, one study examined the effectiveness of parent-created video self-models. Allen et al. (2015) conducted a case study on a 17-year-old girl diagnosed with Intellectual Development Disorder (IDD) and ASD. In a multiple baseline design that assessed necessary routines or independent living, this participant and her mother created three video self-models using an iPad tablet and the mobile app “VideoTote.” Results showed marked, immediate, and sustained improvement following the implementation of the video self-models. This positive performance was maintained over time and generalized to the community setting (Allen et al., 2015).

Additionally, Lantz (2015) examined how video self-modeling can increase the prosocial behavior of children with ASD and their siblings. Treatment goals were determined based on the client’s specific needs and abilities. Three social behaviors were identified for each participant. Results revealed

that video-self modeling improved 5 of the 6 targeted social behaviors in these kids, and also improved social interactions between children with ASD and their siblings. Moreover, these children generated more natural responses throughout the course of the intervention and did not appear to be reciting a script like several other children on the spectrum do when receiving social skills treatment (Lantz, 2015). Video self-modeling has thus shown to improve a number of social skills in children with ASD.

**Video peer/other-modeling.** Peer- or other-modeling involves a participant viewing a peer or other individual (e.g., teachers, parents, etc.) modeling targeted behaviors or skills, so as to later teach the specific behavior or strategy in therapy. Marcus and Wilder (2009) compared the effectiveness of self-modeling and peer/other-modeling. A combination multiple baseline and multi-element design was used to compare the two procedures. The treatment was intended to teach three children with ASD how to appropriately identify and label novel letters. Interestingly, Marcus and Wilder (2009) found that all three participants met the mastery criteria while receiving the self-modeling condition, and only one of the participants met mastery criterion in the peer/other-modeling condition. Thus, this study found that self-modeling was more effective than peer/other-modeling in gaining mastery of identifying novel letters. Though the treatment concern of this study (reading intervention) is different from improving social skills, Marcus and Wilder determined that video-self modeling may be more effective than video peer-modeling in teaching new skills and recommended the use of self-modeling when teaching novel information or tasks.

In contrast, Markey (2015) conducted a study to investigate the effectiveness of using the combined strategies of peer/other video-modeling and least-to-most prompting to improve participants' appropriate use and navigation of library resources (i.e. catalogues, online databases, etc.) for both academic and leisure purposes. This study used a single-subject, multiple case study design taking a



descriptive approach in measuring baseline, peer/other video-modeling, and withdrawal phases to track the acquisition of skills of five middle-school aged children with ASD (Markey, 2015). Results indicated that all five participants were able to gain appropriate skills to appropriately navigate and use library resources after receiving the treatment package of peer/other video-modeling and least-to-most prompting (Markey, 2015).

**Video point-of-view modeling.** Point-of-view modeling uses video equipment to provide a different perspective than previously described types of video modeling. Point-of-view video modeling allows the social situation to be experienced through the eyes of the actor within the video-model, rather than using a third-person perspective (Aldi et al., 2016)

Researchers have recently been successful in incorporating this first-person perspective into video models to effectively treat the social deficits of individuals with ASD. For example, Aldi et al. (2016) used point-of-view modeling to treat two young men diagnosed with ASD in an attempt to improve various daily living skills. Moreover, portable electronic devices, like an iPad and iPod, were used to deliver the video models. Results showed that both men showed improvement in their use of daily living skills. However, at the one month follow-up, both men did score above their original baselines, but did not maintain the short-term growth in their skill use (Aldi et al., 2016).

Similarly, Kouo (2017) used point-of-view modeling in a study examining an intervention for five kindergarteners diagnosed with ASD who had difficulties with initiating social interactions. Using a multiple baseline design across participants, the children were administered the video models and were observed interacting with a typically developing peer in a clinical setting immediately after exposure to the video model. Overall, results indicated that point-of-view modeling was effective in treating the

social deficits of young children diagnosed with ASD. However, in an attempt to generalize and maintain skills to the classroom setting, retraining was needed (Kouo, 2017).

A study by Cotter (2011), however, questioned if there is a difference in terms of effectiveness between point-of-view modeling and other video modeling (i.e., self-modeling). In fact, this researcher questions the consistent effectiveness of video modeling in general. Six boys diagnosed with ASD ages 4 to 8 years were treated with different types of video-modeling (i.e. self- vs point-of-view modeling) using an adapted alternating treatments design. Results found no significant difference between the types of video modeling used, and no positive treatment effects (Cotter, 2011). Thus, supplemental teaching strategies (in vivo modeling with error correction) were later implemented (Cotter, 2011).

In sum, video modeling appears to be a very effective intervention for individuals with ASD. Generally, video modeling seems to be most useful in improving social communication, behavior, and daily life skills. There are a number of advantages to using video modeling, such as that parent can implement video models with high treatment integrity, and that video modeling adapts well to advances in technology. Moreover, there does appear to be significantly more support for the use of video self-modeling over the use of other types of video modeling, such as peer/other- and point-of-view modeling. That being said, there is a larger literature base dedicated to self-modeling. This may be due to more challenges that can be attributed to using different types of video models. For example, peer/other-modeling requires another individual for the intervention to occur, while informed consent and assent is required for participation in terms of research purposes. Moreover, point-of-view modeling is meant to be designed from the perspective of the actor, which can be difficult to accomplish do to unfamiliarity with the participant's perspective. Nonetheless, video modeling as a whole has strong support and evidence in effectively treating the social deficits of young children and adults with ASD.

## **Parent-Implemented Interventions**

Parent-Implemented Interventions (PII) are considered to be an EBP that has shown to improve the social skills and behavioral difficulties observed in children with ASD (Hendricks, 2009). Specifically, PII has been shown to improve social communication, behavior, joint attention, play, cognitive, school-readiness, academic, and adaptive skills (Hendricks, 2009; Schultz, 2013). These improvements have been observed in both group designs and single subject studies (Schultz, 2013). Additionally, PII has been shown to be most effective for toddlers (0-2 years) to elementary-aged children (6-11 years) with ASD (Schultz, 2013).

PII has been used in various programs where the implementation of the intervention is partially or completely the responsibility of the parent(s) (Schultz, 2013). Therefore, parents require adequate knowledge to implement the desired intervention with fidelity in the home setting. Six steps are outlined in order for practitioners and parents to successfully implement PII: (1) determine the needs of the family; (2) outline goals; (3) develop the intervention plan; (4) train parents; (5) implement the intervention; and (6) monitor progress (Hendricks, 2009). These steps are further explained below.

**Determining the needs of the family.** For a PII to be successful, the working relationship between the clinician and family should be seen as a partnership (Hendricks, 2009). Given that each family is different and each child with ASD is unique, it is important for the clinician to gain an adequate understanding of the specific needs of a family and child. Hendricks (2009) suggests that practitioners determine the individual needs of families through parent/caregiver interviews and observations of the child, caregiver-child interactions, and daily routines. It is through this gathering of data that the strengths, concerns, behaviors, and support systems of the child and family can be identified.

**Outline goals.** After the specific needs of the family have been identified, the clinician can then help the family determine the goal(s) of the intervention. Hendricks (2009) recommends that the goals established in Individualized Education Programs (IEPs) or Individualized Family Service Plans (IFSPs) should be prioritized when developing goals for the PII. Practitioners, parents/caregivers, and other members of the treatment team should select goals that a) address the primary concerns for the child, parents, and/or other family members, b) will have a positive impact on family functioning, c) can be implemented by parents with consistency, and d) are appropriate for parents to implement independently in the home and/or community setting (Moes & Frea, 2000). Additionally, Hendricks (2009) recommends that clinicians should assure that goals are written in observable and measurable terms, were selected in partnership with parents/caregivers, and are shared with all team members in a written format.

**Develop the intervention plan.** Once clear, observable, and measurable goals have been established, the intervention plan can be created. All of the information gathered at that point in the therapeutic relationship should be considered when developing an intervention plan. Therefore, clinicians should consider the parents' priorities, family characteristics, daily routines, and home context to inform and guide the intervention plan (Moes & Frea, 2000). Moreover, the parents' ability to implement the intervention and the cost of the intervention should also be considered (Koegel et al., 1999). For example, parents may not have the availability to implement an intervention three times a week. Therefore, the intervention plan should accommodate for their availability.

Furthermore, Hendricks (2009) recommends that clinicians should develop an intervention plan with step-by-step instructions so parents/caregivers can easily adapt to implementing the intervention. Goals should be clearly identified and available to the parents/caregivers, and should include details

such as the specific targets of the intervention, who will be responsible for implementing the intervention, when the intervention will occur, and where in the home the intervention will take place. Once step-by-step directions for how to implement the intervention have been established, a clear plan for data collection should be considered.

**Parent training.** Research has found favorable results when parents are involved in social skills interventions (DeRosier et al., 2011). Moreover, parents should have the adequate knowledge and tools to implement an intervention at home in order for it to be considered to have treatment integrity (Shindorf, 2016). Thus, it is important to provide adequate parent training that focuses on implementing interventions and monitoring progress to the caregivers that will be participating in PIIs. Elements of the parent training, such as the specific format (e.g., individual, group, combination), the training location (e.g., home, school, clinic, community), training components (e.g., feedback and coaching, modeling, video analogies, or video analysis), as well as the duration of the intervention should be determined before the intervention begins (Hendricks, 2009).

Parent trainings have been shown to be effective in improving the target behaviors and skills of children with ASD. Specifically, Scahill et al. (2016) conducted a 24-week, 6-site, randomized trial of parent training and parent education in 180 children with ASD (ages 3-7 years; 158 boys and 22 girls). The parent training involved 11-13 sessions of teaching parents behavior management skills, two telephone booster sessions, and two home visits. In contrast, parent education involved 12 sessions of teaching parents useful information about ASD, and one session in the home . Results indicated that the parent training was far superior to parent education in improving adaptive and disruptive behaviors (Scahill et al., 2016).

Research has also found that less intensive parent trainings have also been effective in improving the target behaviors and skills of children with ASD. A study by Coolican et al. (2010) adapted the original 25-hour parent training in pivotal response treatment (PRT) to three 2-hour training sessions. A non-concurrent multiple across-participants baseline design was used to train the parents of eight preschool-aged children with ASD. Results indicated that the abbreviated parent training was effective in improving children's communication skills. Parent fidelity in implementing PRT techniques also improved after training, and the observed improvements were generally maintained at the 2- to 4- month follow-ups (Coolican et al., 2010).

Moreover, researchers have explored a parent's ability to effectively implement specific intervention strategies such as video models to their children with ASD. A study by Besler and Kurt (2016) examined whether mothers could implement video models to their children (4-6 years) with treatment integrity after attending training sessions. Through the use of a multiple baseline design, all three boys were able to learn the targets 'play' skill, maintain their learning, and generalize to a non-teaching condition (Besler & Kurt, 2016). Additionally, all three mothers were able to implement video models with high treatment integrity (Besler & Kurt, 2016). Therefore, positive treatment outcomes were observed when parents successfully implemented intervention strategies with fidelity.

Lastly, a study by Beharav and Reiser (2010) examined the effectiveness of using remote technology or tele-practice as a tool to provide parent coaching. Two models were compared in this study—the traditional clinical model, which provided two speech and language therapy sessions each week (clinic model) – and the clinic/tele practice model, which provided a clinical therapy session followed by a tele-practice session at home. Parents of children with ASD reported that they perceived

tele-practice sessions to be just as valuable as the clinical sessions, to the degree that they were willing to continue in-home intervention after the study ended (Beharav & Reiser, 2010).

**Implement the intervention.** Once a clear intervention plan has been developed and the parents have received adequate knowledge, training, and tools to implement the intervention, the parent/caregiver will be ready to implement the intervention at home. Hendricks (2009) recommends that parents implement interventions with their children daily (unless something else is designated in the intervention plan), implement the intervention in the most natural setting and incorporate it into the child's routine whenever possible, and implement the intervention at approximately the same time every day in a quiet room with minimal distractions. Furthermore, it may be difficult for parents to balance being a caregiver to their child with ASD due to their numerous parenting responsibilities and the responsibility of implementing the intervention with integrity.

**Monitor progress.** Hendricks (2009) suggests that monitoring child progress and parent performance refines the intervention and improves treatment integrity. Specifically, progress monitoring data is used to determine if the intervention is impacting the target skills, while intervention fidelity checklists and adapting trainings/support improve the parents' implementation of the intervention (Hendricks, 2009). Therefore, tools like fidelity checklists, parent intervention protocol forms, and data collection sheets are important to use with PIIIs. Furthermore, two primary forms of data collection are used to monitor child progress while using PIIIs: frequency data and parent log books (Hendricks, 2009).

Charlop-Christy and Carpenter (2000) recognized the difficulty children with ASD have with social communication. They also realized that interventions within the clinic setting designed to improve communication deficits often do not generalize well to the home setting. Such interventions within the clinic setting often use predetermined scenarios (approximately 10) and tangible reinforcers to modify

behavior and improve social communication outcomes. Charlop-Christy and Carpenter argue that these interventions are limited because natural interactions are not a component of the intervention. Therefore, they modified the traditional communication intervention strategy, known as incidental teaching, by incorporating PII and having parents implement the intervention at home.

Charlop-Christy and Carpenter (2000) developed a biweekly behavior management program intervention for three boys diagnosed with ASD (ages 6 years, 6 years 2 months, and 9 years 8 months) using a multiple baseline design across and within children, with an alternating treatments design. Three treatment phases were used in this study: incidental teaching, discrete trial training, and modified incidental teaching sessions (MITS). Parents were trained to implement each phase of treatment. However, the MITS phase was specifically designed to be used in the home setting, and the use of natural interactions was essential to this treatment phase. Results indicated that MITS led to improved social communication for all children. The discrete trial led to improved social communication for two children, while only one child showed improvement using the incidental teaching treatment. Most importantly, however, MITS led to the generalization of all target phrases, while no children generalized the skills using the other treatment phases (Charlop-Christy & Carpenter, 2000).

Additionally, Ingersoll and Gergans (2007) recognized the importance of parent involvement in order to better generalize the social skills of children with ASD. They used PII in conjunction with reciprocal imitation training (RIT) to generalize social imitation skills in naturalistic settings. Three children with ASD and significant social deficits (2 years 7 months, 3 years 1 month, and 3 years 6 months) and their mothers participated in this study. A multiple-baseline design across participants was used to measure the effectiveness of this intervention. After baseline data was collected, mothers were taught to implement RIT techniques twice a week for 10 weeks in a clinical setting. Generalization was



assessed in the families' homes at the end of treatment and a 1-month follow-up. Results indicated that parents learned RIT techniques and that the children were observed increasing their use of spontaneous social imitation (Ingersoll & Gergans, 2007).

A study by Lorimer and colleagues (2002) examined the effectiveness of PPIs and the use of social stories as a preventative behavioral intervention in the home setting with a child with ASD. The participant in this study was considered to have a mild to moderate diagnosis of autism, had above-average cognitive ability, and could communicate his wants and needs similar to same-aged peers. However, this participant exhibited several challenging behaviors at home, including tantrums that involved hitting, kicking, and throwing objects. The intervention was conducted over a 24-day period. Two autism specialists (speech language pathologist, occupational therapist, and/or behavioral therapists), along with a parent in the home setting, were present for each treatment session. The parent read the social stories to the participant once in the morning. Additionally, they were read by a therapist before each therapy session (dependent on what service he was receiving that day). Results determined a decrease in challenging behaviors during the treatment phases of the intervention (Lorimer et. al., 2002).

Furthermore, another study focused on generalizing appropriate pedestrian safety skills by using PII. Harriage (2013) used behavioral skills training (BST) with PII to improve the pedestrian safety skills of three individuals with ASD (14 years, 15 years, and 23 years). Parents participated in a 10- to 15-minute individual BST training sessions in their homes every day before the three trial sessions. Each 'trial' took place in a community setting and involved the navigation of different streets and intersections. Different directional prompts were provided by the parents, ranging from no prompts to full physical prompts. The needed level of directional prompt (i.e. verbal prompt vs. partial physical

prompt) was determined by the parent and clinician before the start of each trial. All participants showed significant improvement in their use of appropriate pedestrian safety skills (Harriage, 2013).

In sum, PII's used in conjunction with other intervention techniques have shown to be effective in generalizing the skills of children with ASD to more natural settings (Charlop-Christy & Carpenter, 2000; Harriage, 2013; Ingersoll & Gergans, 2007). However, the amount of parent-training provided by the clinician, the level and frequency of interventions that parents implement, and the settings in which the intervention is implemented, vary across studies. Therefore, the PII steps of determining the needs of the family, outlining goals, and developing the intervention plan are essential for effectively using PII. If the clinician appropriately identifies the individual need of the client and designs the intervention around that need, then the potential effectiveness of the intervention is likely to be improved (Bellini et al., 2007).

Interestingly, no published studies examine a combination of the EBPs of social narratives, video-modeling, and PII to effectively treat ASD. The lack of literature on combining EBPs while using PII may be due to the typical use of a manualized treatment in conjunction with PII. Such manualized treatments may incorporate these EBPs or elements of these intervention strategies. However, taking a manualized approach to treatment restricts the flexibility of the intervention strategies, especially individualized social narratives and video-modeling. In an attempt to increase the likelihood of an intervention's effectiveness, researchers recommend tailoring interventions to a client's specific needs (Bellini, et al., 2007). Thus, a modular approach to treatment allows the flexible use of EBPs, whereby the combined use of social narratives, video-modeling, and PII's may be better achieved.

## **Modular Approach to Intervention**

Until this point, social skills interventions have been discussed based on the different components (i.e., social communication, social-emotional skills, and social competence) that contribute to social skill development. It has also been noted that social skills interventions are varied in terms of effectiveness. Therefore, a push toward the use of EBPs in treatment in the field of psychology is taking root and several professionals are starting to use EBPs in practice. However, several manualized social skill interventions may only be designed to use limited or no EBPs. Therefore, researchers are starting to use a modular approach to treatment to effectively treat ASD.

Michelle Garcia Winner's well-known *Social Thinking* intervention was developed using several theoretical frameworks to provide treatment instead of utilizing one inflexible curriculum (Winner & Crooke, 2009). In this intervention, there is an emphasis on who the intervention is designed for and the specific, unique needs of that individual. The clinician does not use *Social Thinking* as a standalone tool, but rather gathers several concepts and strategies to better understand a person's social experience, using cognitive-behavioral techniques to appropriately address the individual needs of the client (Winner & Crooke, 2009).

Similarly, the intervention Youth Engagement Through Intervention (YETI) takes a modular approach to treatment while also using evidence-based practices (Goforth & Schoffer Closson, 2012). YETI combines the use of EBPs such as visual schedules, video modeling, social narratives, differential reinforcement, and positive behavior supports (Shindorf, 2016). Developed by Anisa Goforth and Jennifer Schoffer Closson, YETI utilizes elements of several evidence-based practices to provide treatment that addresses the individual needs of children with ASD and related disorders within a group

setting. Therefore, YETI provides treatment for children diagnosed with ASD and comorbid disorders, as well as diagnoses similar to ASD, such as Social Pragmatic Communication Disorder.

Furthermore, the modular approach can easily include parents in the intervention to aid in their child's success (DeRosier et al., 2011; White, Koenig, & Scahill, 2007). Moreover, because of the flexibility of a modular approach, elements such as music (LaGasse, 2014), drama (Andersen-Warren, 2013), video modeling (Kroeger, 2007), and peer mediation (Wang, Cui & Parrila, 2011) have been incorporated into such treatments in order to address the interests of clients and pair them with the intervention. Therefore, many interventions can be developed to teach social skills by using a variety of strategies and themes within the modular approach.

Using a modular approach to intervention as opposed to manualized treatments taps into a much larger debate regarding research philosophies. In fields like psychology, it is common to observe a gap between research and practice. That is, the evidence we find in a more controlled research setting sometimes has difficulty translating into the real world. Therefore, several researchers have contributed their efforts to conducting practice-based research to help bridge that gap between research and practice (Crooke & Olswang, 2015). More traditional research methods, using a controlled, laboratory setting, are considered the gold standard in health care research, based on strong internal validity. However, Crook and Olswang (2015) argue that research must be viewed from multiple perspectives, and that researchers must consider both internal and external validity, if the gap between research and practice is to ever be bridged in the field of psychology.

With such an extreme focus on internal validity, the external validity of an intervention may be threatened (Crooke & Olswang, 2015). That is, the focus that is dedicated to providing extremely structured research designs, evaluation, and reporting has hindered the intervention's capability of

effectively being used in more natural settings. It is important to note, however, that Crooke and Olswang (2015) do not suggest that internal validity should be disregarded; but rather, external validity should complement the dedication to internal validity. Thus, researchers should seek a balance between measuring the internal and external validity of treatment when taking a modular approach to treatment.

Winner (2002) contributes to this debate by questioning the quality of measures that assess the social skills of children with ASD. She argues that standardized tests which measure social skills of children with ASD are typically not sensitive enough to the significance of such deficits and have difficulty reflecting the progress made in treatment. Therefore, Winner (2002) examined the social functioning of children with ASD by using both formal techniques such as standardized measures, as well as informal techniques such as observations and interviews, to provide a better picture of the child's social deficits. Winner (2002) argues that this approach ensures that the child's social deficits are not only identified, but that the function of the social deficit is also better understood.

Similarly, parent perspectives are often considered to be biased when examining the effectiveness of an intervention, because parents are biased towards wanting to see improvements in their child, at any cost (Durbin & Wilson, 2012). This assumed bias can often be observed when multiple forms of standardized rating forms are compared to one another (Dollinger & DiLalla, 1997). For example, parents and teachers who assess a child's behavior at pre- and post- sessions of an intervention often vary in their responses post-intervention. Typically, there are larger discrepancies in ratings between the teacher and parent at post-test. Thus, researchers and clinicians often use standardized measures in attempts to account for such biases. For example, the *Behavior Assessment Systems for Children, Second Edition* (BASC-2; now BASC-3) gathers information from multiple perspectives (i.e., Parent, Teacher, and Self-reports), so the results of the different reports can be

compared to one another to accurately identify behavioral concerns (Tan, 2007). Therefore, standardized measures that gather information from multiple perspectives can better account for parent bias.

Several research studies on parents' acceptability of interventions for children with ASD use parent rating scales specifically designed for the intervention (Hutchins & Prelock, 2013; Wilson, 2013). In these studies, a standardized tool is not used to measure parent acceptability; rather, researchers use unstandardized tools that are more specific and sensitive to the intervention. For example, a study by Whittingham, Sofronoff, & Sheffield (2006) was designed to investigate parent acceptability of parenting strategies from *Stepping Stone*, which is a new branch of the *Triple P* program. Forty-two parents of children with autism were instructed to rate each strategy for acceptability, usability, and likelihood, and a focus group gathered more detailed responses to the program. Parent responses were generally positive, and researchers found that parents were more likely to use strategies if their child's behavior was attributed to "uncontrollable factors." This approach to collecting parent acceptability data surpassed general information that could be collected from a standardized treatment acceptability measure, and uncovered rich data that may have been overlooked if an intervention-specific measure was not used.

In summary, strong internal and external validity are both desirable in a research study. However, threats to different types of validity are likely to occur no matter the research design or research approach. Therefore, when taking a modular approach to treatment, it will be important to account for varying threats to validity by finding a balance between using formal standardized measures and informal methods of data collection.

### **Maintenance of Social Skills**

Children with ASD are often observed to have difficulty generalizing social skills to more natural settings, such as home and school (DiSalvo & Oswald, 2002; Krasny et al., 2003; Weiss & Harris, 2001). That is, children with ASD have difficulty using skills across multiple settings and conditions (Stokes & Baer, 1977). However, before the generalization of skills can be achieved, the maintenance of intervention effects need to be considered. *Maintenance* refers to the lasting change or improvement that is observed after the initial intervention has concluded (Lane & Beebe-Frankenberger, 2004). Thus, it is assumed that the maintenance of an intervention is needed when attempting to improve generalization.

For example, Shindorf (2016) explored the barriers to the generalization of social skills for children diagnosed with ASD. Results indicated that difficulties with the maintenance of social skills in the home setting was an evident barrier to the generalization of skills. Further, results indicated that several parents had little knowledge and/or confidence to implement the social skills intervention on their own (Shindorf, 2016). Therefore, in order to improve maintenance of skills in the home setting, it is imperative that parents have the adequate knowledge and confidence to implement or review information relevant to the intervention in the home setting. Once parents have the tools to use or review specific skills in natural settings, more opportunities to improve the maintenance of skills can occur.

Thus, the effectiveness of an intervention and its ability to be maintained over time in a natural setting should be studied before the generalization of skills is assessed. Therefore, factors that contribute to the possible difficulty of maintaining social skills should be explored. Unfortunately, there are very few studies that directly examine whether or not skills learned in social skills interventions are actually generalized and maintained in “real life” situations (Autism Ontario, 2011). Nonetheless, such factors,

including the design of an intervention and the addition of parent participation, will be explored in this review.

### **Designing an Intervention to Effectively Treat ASD**

The majority of interventions intended to improve the social skills of children with ASD are not designed for the long-term maintenance of skills. Unfortunately, many interventions often follow a “train and hope” philosophy of treatment (Crooke & Olswang, 2015). That is, clinicians implement an intervention within the clinic setting and hope that the favorable outcomes observed within the clinic setting will then be translated and used effectively in more natural settings and situations. The “train and hope” approach to treatment is often effective with typically developing children because they tend to generalize skills with more ease than children with ASD (Ghezzi & Rogers, 2011).

Thus, children with ASD may need interventions that focus more on the maintenance of skills than a neurotypical child would (Autism Ontario, 2011). Nonetheless, studies that focus on the maintenance and generalization of skills are often considered more difficult to conduct, due to concerns regarding logistics, potential biases, and possible measurement errors (Gao & Harris, 2014; Kukull & Ganguli, 2012).

Logistics such as scheduling intervention sessions and observation periods in more naturalistic settings can be relatively difficult when comparing the logistics of implementing an intervention within a clinic setting. Further, researchers often use parent and teacher reports to measure possible maintenance and generalization. However, as there may be an inherent bias in parents or in a parent or teacher due to the desire to observe improvements, this can contribute to possible measurement error (Durbin & Wilson, 2012).



Nonetheless, despite the relative difficulty that may be added when conducting studies that explore the maintenance of social skills, such research is needed to potentially improve the generalization of social skills for children with ASD. Moreover, potential bias and measurement error can be accounted for by using specific research design and methodology. Therefore, with additional consideration and organization, more studies that focus on the maintenance and generalization of social skills should occur.

### **Social Validity and Intervention Fidelity**

To strengthen research design and foster parent participation, the investigation of social validity and intervention fidelity should be considered. Research has shown that parent participation in treatment has improved the effectiveness and maintenance of treatment effects (DeRosier et al., 2011). Parents may acquire essential knowledge and confidence in order to effectively maintain treatment effects in natural settings (Kaiser, Hancock & Meadan et. al., 2009). Specifically, parents can provide more opportunities for social skills to be practiced in natural settings by scheduling play dates with peers, advocating for supports in the school setting, and providing direct supervision and instruction to their children when needed (Mandelberg et. al., 2014). However, if a parent/caregiver does not completely accept or “buy into” the treatment plan, such dissonance may affect the fidelity or use of the intervention in the home setting.

For this study, the concepts of parent acceptability and social validity are considered to be interchangeable. In intervention research, *social validity* refers to how people judge or accept the different components and procedures of the intervention (Luiselli & Reed, 2011). Furthermore, social validity is typically assessed by collecting opinions from the people that either received or implemented the intervention (Luiselli & Reed, 2011). Moreover, Lane & Beebe-Frankenberger (2004) further

emphasize the importance of parents/caregivers accepting the goals of the intervention and the intervention procedures in order to establish a social belief in the treatment's relevance. Therefore, interventions should consider fostering parent/caregiver participation in treatment and gauge their acceptability of the proposed treatment in attempts to improve the maintenance of social skills for children with ASD.

Treatment fidelity is yet another factor that is often associated with intervention effectiveness and maintenance. *Treatment fidelity* is a measure of reliability of the administration of an intervention in a treatment study (Hinkley & Douglas, 2013). Faulkner (2011) recognizes that there is limited information regarding treatment fidelity in published articles when working with youth and families; however, Faulkner emphasizes the importance of treatment fidelity when using EBPs or in developing new interventions. That is, if an intervention is implemented with low-reliability, then the intervention was not implemented as it was intended, and the results will most likely be affected. Furthermore, Grandstaff-Beckers, Saal, and Cheek (2013) further showcased the link between treatment fidelity and social validity. Meaning, the level of social validity and treatment fidelity often mimic each other. Therefore, if there is high social validity, then high treatment fidelity is often observed. Moreover, Bova et al. (2017) recommend monitoring treatment fidelity over time and using such data to correct potential drift or error in the administration of the study. Therefore, data collection, trainings, and correcting potential drift is needed to maintain high treatment fidelity. Lastly, Hinkley and Douglas (2013) suggest collecting treatment fidelity data in the form of fidelity checklists or videos that are later coded for reliability.

## **Current Study**

The current study examined three primary goals: 1) to examine the effectiveness of combining EBPs to treat children with ASD, 2) to examine the maintenance of social skills using PII, social narratives, and video-modeling simultaneously, and 3) to examine parents' perceptions of the treatment. These goals were explored using a multi-method approach. Research methodology involved the use of a single-subject design (i.e., ABAB), pre- and post- social validity scales, fidelity checks, parent interviews and journals/logs.

Due to the varied reports regarding the effectiveness of social skills interventions, it is important to design an intervention with a philosophy focused on effectiveness and maintenance. Therefore, individualized treatments were designed for two children with ASD through collaboration with caregivers and the primary investigator of this study. The intervention was implemented in the home setting by the primary caregiver(s) of the child with ASD. Additionally, caregivers were appropriately trained and coached in PII, video-modeling, and social narratives to gain adequate knowledge and confidence to implement the treatment with fidelity.

### **Clinical Significance**

Moreover, the conclusions made from this study contributed to the growing research regarding effectively treating the social skill deficits of children with ASD. Specifically, this study examined if the EBPs used in this study could be used in conjunction with one another to provide more effective treatment than standalone options (Winner & Crooke, 2009). This research provided further understanding in the use of a modular treatment when treating the social deficits of children with ASD (Crooke & Olswang, 2015).

Furthermore, this research has several other potential applications. This study focuses on parents implementing interventions in the home setting. Therefore, the results of this study highlight elements that parents need in order to successfully implement interventions at home (Hendricks, 2009). This information is also helpful for school personnel who desire to strengthen the school and parent partnership when working together to provide effective treatment to children (Sheridan et al., 1996). This research also explored the role home interventions play in the maintenance of social skills. Therefore, results of this study may help researchers develop future treatments as part of which treatment effects are maintained over time (Autism Ontario, 2011).

### **Research Questions**

This study examined three primary research questions regarding the effectiveness and maintenance of social skills of children with ASD.

*Research Question 1:* Does the combined use of parent implemented intervention, social narratives, and video modeling effectively treat the social skills deficits of children with ASD?

*Hypothesis 1:* Implementing a modular approach to treatment by combining EBPs in the home setting will facilitate skill acquisition in the home. Winner and Crooke (2009) argue that a modular approach to treatment allows for flexibility in treatment so interventions can be designed to meet the specific need of the client. The EBPs of video modeling, social narratives, and PII have all shown to be effective in improving the social skills of children with ASD as individual intervention strategies (Franzone & Collet-Klingenberg, 2008; Delano & Snell, 2006; Hendricks, 2009), yet there has been no research that has specifically examined the effectiveness of these three EBPs in simultaneously. Thus, I hypothesize that the modular approach to treatment using a combination of these three strategies will lead to an improvement in social skills for children with ASD in the current study.

*Research Question 2:* Will there be evidence of maintenance of treatment effects of the combined social skill EBPs (parent implemented intervention, social narratives, and video modeling) in the home setting at one-month follow-up?

*Hypothesis 2:* I hypothesize that a modular approach to treatment for improving social skills in the home setting will demonstrate maintenance of treatment effects at one-month follow-up, as demonstrated by comparing data collected during intervention phases to data collected during the maintenance phase. PII's are designed so parents completely or partially implement intervention on their own (Schultz, 2013). Moreover, PII's require the parents to be adequately trained and be provided with the tools to successfully implement an intervention (Hendricks, 2009). Additionally, the combined use of video models and social narratives has been shown to improve social skills (O'Handley et al., 2015). Therefore, I hypothesize that parents will be better equipped to continue using intervention strategies after treatment has concluded, and that maintenance of positive treatment effects will be observed at a 1-month follow-up.

*Research Question 3:* Do parents perceive combining PII, social narratives, and video-modeling as an acceptable and feasible intervention for targeting social skills development for their child with ASD?

*Hypothesis 3:* I hypothesize that parents will perceive the combining PII, social narratives, and video-modeling as an acceptable and feasible intervention for targeting social skills development as measured by social validity scales, treatment fidelity checklists, and a parent interview. Parent involvement in intervention has shown to be beneficial in treating the social deficits of children with ASD (DeRosier et al., 2011). Moreover, Lane & Beebe-Frankenberger (2004) emphasize the importance of parents/caregivers accepting the goals of the intervention and the intervention procedures in order to

establish a social belief in the treatment's relevance. Therefore, I hypothesize that the parent's involvement in the current study will increase their belief in the treatment to work and be effective for their child.

### Chapter III: Method

The current study explored three primary goals: 1) the effectiveness of combining EBPs to treat children with ASD, 2) the maintenance of social skills using PII, social narratives, and video-modeling simultaneously, and 3) parents' perceptions of the treatment. These goals were explored using a multi-method approach of single-subject and qualitative methodologies. Specifically, I used a single-subjects design (i.e. ABAB), pre- and post- social validity scales, fidelity checks, parent interviews and journals/logs.

#### Participants

This study included two participants from the Rocky Mountain area who both have a formal diagnosis of Autism Spectrum Disorder (ASD) from a licensed psychologist. Both participants were between the ages of 6 to 11 years of age (details described below). This age range was chosen because the research regarding PIIs has shown that this intervention is most effective for both toddlers (0 - 2years) to elementary aged (6 -11 years) children with ASD (Schultz, 2013). The participants were biological brothers who received treatment in the same home.

**Inclusion criteria.** For participation in this study, participants needed a minimum of low average cognitive abilities with a standard score of 85 or greater on an individualized, norm-referenced test of intelligence (e.g., *Wechsler Intelligence Scale for Children- Fifth Edition; WISC-V*). Furthermore, participants needed a minimum of low average receptive and expressive language abilities on an individualized, norm-referenced test of language (e.g., *Comprehensive Assessment of Spoken Language –Second Edition: CASL-2*). Two other children with formal diagnoses of ASD did not meet the criteria for participation in this study because they did not meet one or more of the requirements listed above. During the initial screening process, these two children were excluded from the study because they had

an intelligence score (e.g.,  $SS < 85$ ) and/or language ability (e.g. no verbal language skills) that did not meet the minimum inclusion criteria. Thus, a total of four participants were recruited for this study; however, only two participants met the inclusion criteria for this study.

Cognitive and/or language scores from previous evaluations were adopted to fulfill the screening criteria for this study if the testing was completed within the past 3- years and parents gave permission to use cognitive and/or language scores from the previous evaluation. If previous cognitive and/or language testing was not completed within the past three years, potential participants were given subtests of the WISC-V, and a General Ability Index (GAI) score was used to determine their cognitive abilities. The GAI is a strong predictor of a person's overall cognitive functioning and has been used in studies as part of a screening procedure to gain information regarding cognitive functioning without having to administer the full battery (Wechsler & Kaplan, 2015). Furthermore, to assess language ability, the CASL was administered to participants.

The legal guardians of the participants who qualified for this study provided documentation of the cognitive and language abilities of their children via psychological reports. These psychological reports were completed within a 3-year period prior to the beginning of this study, and the results of these reports were determined appropriate to adopt for determining the eligibility of this study. As primary investigator, I determined if a participant met the cognitive functioning requirement after reviewing the results, and I consulted with a licensed speech and language pathologist at the University of Montana to ensure participants had the appropriate language abilities to participate in this study.

**Participant A: Greg Smith.** Greg Smith (pseudonym) was an eleven-year-old Caucasian male who was in the sixth grade in a mainstream general education classroom. Greg was diagnosed with Autism Spectrum Disorder by a licensed psychologist at age 10. In addition to the current treatment,



Greg has received a group-based social skills intervention in the past. During this study, Greg also received services from an occupational therapist twice per week. Greg does not receive special education services; however, he did attend a social skills lunch group once per month while at school due to his difficulty navigating social situations.

After the initial screening process, Greg's overall functioning and ability was determined by the use of several measures. Greg's mother, Ms. Smith, completed the Social Skills Improvement System (SSIS), a standardized measure of social skills. On the parent report, Greg's Social Skills fell in the below-average range (Communication, Assertion, and Engagement), while his Problem Behaviors fell in the well-above average range (Internalizing & ASD). Greg's language skills were assessed using the Social Emotional Evaluation, on which he had an overall language score that fell within the average range. His Expressive Social Communication score was in the average range, while his Receptive Social Communication score was below average. Greg's cognitive functioning was assessed using the WISC-V. Greg's Full Scale IQ score of 120 fell within the high average range.

**Participant B: Alex Smith.** Alex Smith (pseudonym) was a seven-year-old Caucasian male who was in the second grade in a mainstream general education classroom. Alex was diagnosed with Autism Spectrum Disorder and Attention-Deficit/Hyperactivity Disorder by a licensed psychologist at age 6. In addition to the current study, Alex has received a group-based social skills intervention in the past. During the study, Alex also received services from an occupational therapist twice per week and behavioral intervention once a week. Alex does receive special education services at school under the 'Other Health Impairment' category.

Alex's overall functioning and ability was determined by the use of several measures. Alex's mother, Ms. Smith, completed the Social Skills Improvement System (SSIS), a standardized measure of

social skills. On the parent report, Alex's Social Skills fell in the well-below average range (Self-control, Cooperation, Communication), while his Problem Behaviors fell in the above average range (Externalizing, Impulsivity/Inattention, ASD). Alex's language skills were assessed using the Clinical Evaluation of Language Fundamentals scale on which his scores for core language, receptive, and expressive language were all within the average range. Alex's cognitive functioning was assessed using the WISC-V, and his Full Scale IQ score of 111 fell within the average/high average range.

Additionally, Alex was introduced to a medication intervention during the timeframe of this study. Alex was prescribed Guanfacine and started taking this medication on 8/1/2018. A new medication, Concerta, was introduced on 8/15/2018. On 8/22/2018, Alex's medical physician took him off of Guanfacine and he continued taking Concerta for the remainder of the study. Therefore, Alex was introduced a medication and the dosage of medication was adjusted throughout the baseline and treatment phases of this study. Mrs. Smith reported that she did not want to put Alex on medication to help manage his behaviors, however, his physician suggested trying a medication intervention before the school year started. The introduction of medication and changes in medication may have influenced the behaviors observed during the observational sessions and will be discussed in Chapter 5.

**Parent Participant: Ms. Smith.** Ms. Smith (pseudonym) is the birth mother of both Greg and Alex. Ms. Smith is also the mother of three additional children all of whom live in the home. Ms. Smith is married and her husband also lives in the home. For employment, Ms. Smith is self-employed and runs a daycare out of her home.

### **Setting**

Ms. Smith implemented the treatment with her children in their own family home. Progress monitoring data was collected in the home setting during the baseline, intervention, and maintenance

phases of the study. Trained research assistants collected observational data in the home, while parents recorded information via audio parent logs.

Demographic data and family information, treatment planning, and parent trainings were collected and conducted in a private room in the Clinical Psychology Center at the University of Montana. A research assistant trained in interviewing techniques conducted the exit-interview with Ms. Smith, while the primary investigator conducted a phone interview to collect information from the follow-up parent interview 1-month after the treatment concluded.

### **Materials**

As part of the parent trainings, Ms. Smith was provided a binder that held sheets of information regarding information about ASD, PIIs, social narratives, and video modeling. Pre-created examples were distributed to parents during the individual parent training sessions using a mobile tablet device (i.e., iPad). A PowerPoint presentation was also used for the psychoeducational components of the parent training sessions, which required adequate display equipment.

The social narratives used in the treatment were written in a private research lab at the University of Montana using Microsoft Word. Once the social narratives were finalized, they were printed onto different sheets of paper. These sheets of paper were laminated, three-hole punched, and put into a three-ringed binder.

Social narratives were individualized for each participant's treatment concern and can be referenced in Appendix N. A research team member trained in the development and distribution of social narratives and I created the social narratives. Social narratives included a combination of descriptive sentences that objectively defined anticipated events, perspective sentences that described

the internal status of the person or person involved, and directive sentences that provided individualized statements of desired responses (Winner & Crook, 2009).

Videos for the video modeling components of the study were recorded at the Mansfield Library at the University for Montana using their 'One Button Studio'. Once the raw video recordings were complete, the recordings were further edited using iMovie software on a computer in a private research lab at the University of Montana. The videos were created using peer models of a similar age cohort but different gender of the participants in the study. Video-models were no longer than three minutes long, and the participants viewed the video three times during each treatment session (Shukla-Mehta et al., 2010; Charlop-Christy & Daneshvar, 2003). A series of three individualized video models were created for each participant and stored on a password protected and encrypted flash drive. The social narratives used in this study lead the peer models (via voiceover) to partake in the appropriate behavior or skill. Written scripts of the video model used in this study can be reference in Appendix O. Parent permission for the peer models' participation was obtained before the recording of peer models.

During the treatment phase, Ms. Smith independently implemented the intervention using a tablet device (iPad). Treatment goals for each participant were determined by using a semi-structured parent interview and a standardized social skills measure. Therefore, Ms. Smith was considered a partner in the treatment planning phase of the treatment and all of the intervention tools (social narratives and video modeling) incorporated Ms. Smith's primary treatment concerns and suggestions.

Additionally, a treatment fidelity checklist and social validity rating scale were administered to Ms. Smith. In terms of data collection, treatment fidelity checklists were provided to Ms. Smith and blank observational data sheets were provided to the research assistants. Weekly consultation meetings ( $\leq 15$  minutes) with the primary investigator via phone were also conducted to help monitor treatment

fidelity and troubleshoot any difficulties during implementation. Moreover, informed consent, informed assent, permission forms, and a family information survey were all used before the treatment was implemented. Lastly, all physical data was transported using a briefcase with a combination lock to improve the security of the data while it was transported from the participants' homes to the research lab.

### **Research Team**

The research team consisted of six research assistants and me, as the primary investigator. Three of these research assistants were graduate students in school psychology and already have training in ASD, observational data collection techniques (e.g., momentary time sampling), and qualitative methodologies. One of the three graduate research assistants participated in the screening process and completed the cognitive testing required for the screening process of this study. The additional two research assistants were advanced undergraduate students in the CRESPP research lab at the University of Montana.

All research assistants completed a Human Subjects Protection Course, as required by the Institutional Review Board at the University of Montana. The primary researcher provided training to the research assistants from October 2017 to December 2017. The research team met once a week and covered a range of topics: an overview of ASD and the social difficulties children with ASD encounter; an overview of EBPs and specific details on how to implement social narratives, video-modeling, and PIIIs; behavioral observation and event-recording; as well as quantitative and qualitative data analysis techniques.

During the training for behavioral observations and event recording, the research assistants watched training videos of children exhibiting a variety of social skills. The research assistants practiced

taking event-recording data of each social skill. It is important to establish proficiency in event recording because of concerns with measurement error. Recorded observations are considered to have potential measurement error due to possible human error (Hallgren, 2012). Thus, to better account for such error, the consistency or reliability across observations provide more confidence in the accuracy of observations when attempting to determine the ‘true score’ (Hallgren, 2012). Consequently, each research assistant was considered proficient in event recording when an inter-reliability rate of 85% or more across three training videos was achieved (Alberto & Troutman, 2009; Hallgren, 2012). To measure inter-rater reliability, the percentage of agreement was calculated using the total number of agreements across observers divided by the total of agreements and disagreements, multiplied by 100.

Once the research team achieved proficiency in event recording, they conducted behavioral observations of children with ASD who participated in a group social skills intervention at the University of Montana. This social skills group is a part of a research program at the University of Montana. Therefore, the research assistants were a part of an additional research project and abided by all outlined IRB requirements and protocols. The research assistants collected behavioral observations for the ongoing study using event-recording techniques.

For this study, the research assistants aided in the creation and development of the social narratives and video models. Furthermore, one research assistant was assigned to one participant in order to take observational data using event-recording in the home environment. It is important to note that the research assistant assigned to a specific participant was not involved in the creation or development of the individualized social narratives and video models of their assigned participant. This precaution was taken in attempt to avoid any additional bias.

## **Measures**

This study used a multi-method approach to examine the hypotheses of this study. Single-subject design was used to measure intervention effectiveness, while rating scales and checklists measured social validity and treatment fidelity. Using quantitative methodology provided a formal, objective, and systematic process for obtaining quantifiable information. The qualitative component of this study used semi-structured parent interviews and parent logs to explore intervention maintenance, parent perceptions of the intervention's effectiveness, and the social validity of the intervention strategies. Using qualitative methodology in obtaining this rich and insightful data complements the quantitative results found in this study and better informs practice-based research.

**Family Information Survey.** The Family Information Survey (Appendix A) collected demographic data and other information that contributed to treatment planning. The demographic information collected through the family information survey helped account for variables that may have influenced treatment in some way. Specifically, items included age, gender, ethnicity, the age at which autism was diagnosed, the services that are/were being received for autism, medical conditions, any other diagnoses (ADHD, ODD, etc.), the age at which other diagnoses were made, and any services being received for other diagnoses. Moreover, the family information survey gathered information that inquired about medication intervention and/or additional mental health and behavioral supports. This information provided a more comprehensive profile of each participant and informed treatment goals, and contributed to inferences made after treatment concluded.

Furthermore, the family information survey gathered information about Ms. Smith's specific treatment concerns for her children to better partner with Ms. Smith in the development of treatment goals. Hendricks (2009) with the National Professional Development Center of ASD suggest gathering information regarding concerns in the areas of communication, social interaction, play, self-help,

rigid/restricted behavior, repetitive behavior, and aggressive or self-injurious behavior when utilizing PII's. Therefore, this survey collected demographic data and information regarding these areas of concern to better inform treatment planning and treatment goals.

**Social Skills Improvement System (SSIS).** To further inform the treatment planning and goal development for each participant, the *Social Skills Improvement System-Rating Scale* (SSIS; Gresham & Elliott, 2011) was administered to Ms. Smith for each participant. The parent form of the SSIS is composed of multiple rating scales that assess abilities and deficits in the areas of social and behavioral functioning. Specifically, the SSIS examines three domains: Social Skills, Problem Behaviors, and Academic Competence; however, the Teacher version of the SSIS is the only form that assesses academic competency. Only Social Skills and Problem Behavior domains were included for the purposes of this study.

Participants complete the items with the following response choices: 'Never', 'Seldom', 'Often', or 'Almost Always'. Raw scores are obtained and converted to standard scores, based on a mean score of 100. Moreover, confidence intervals and percentile ranks are also provided for each domain. Examples of items that are rated to assess the Social Skills domain include: *Express feelings when wronged*, *Ask for help from adults* and *Forgive others*. Examples of items that are rated to assess the Problem behaviors domain include: *Has temper tantrums*; *Talks back to adults*; and *Lies and does not tell the truth* (Gresham & Elliott, 2008).

Furthermore, the parent version of the SSIS is composed of 79 items (46 items assess social skills; 33 items assess problem behaviors) and was considered sufficient for treatment planning and goal development. The Social Skills domain includes the following subscales: Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-control. The Problem Behaviors domain



includes several subscales: Bullying, Hyperactivity/Inattention, Internalizing, Externalizing, and Autism Spectrum symptoms (Gresham & Elliott, 2011).

The SSIS is a standardized measure that has been normed using a representative sample of 4,700 children from the United States. The SSIS demonstrates strong reliability with Cronbach's alpha scores in the mid to upper .90s for each domain of the measure (Gresham & Elliott, 2011). Moreover, the SSIS has shown to have strong content, construct, concurrent, and predictive validity (Gresham & Elliott, 2011). It is important to note that there are not many research studies investigating the psychometric properties of new edition of the SSIS; however, the older version known as the Social Skills Rating System, from which the SSIS was created, has been heavily researched and is considered a reliable tool to assess social skills of children (Haggerty, Elgin & Woolley, 2011).

**Social Validity Scale.** To measure social validity, the parent pre- and post- test of the *Intervention Acceptability and Importance of Effects Survey* (Lane & Beebe-Frankenberger, 2004) was used in this study. This measure (Appendix B and C) assesses the social validity of an intervention by examining the ease of implementation, the impact the intervention has on the child, and the likelihood of lasting positive effects. Moreover, this measure was designed to be easily used within education consultation models; thus, teacher and student versions of the measure are available (Lane & Beebe-Frankenberger, 2004).

The pre- test consists of 12 items that assesses social validity, while the post-test consists of 13 questions. The creators of this measure included a 13<sup>th</sup> question on the post-test to explore if parents would recommend this intervention in the future. A 7-point Likert scale (*strongly disagree* to *strongly agree*) was used to investigate social validity. Though this study will only focused on examining the parent perspective, future studies can easily adapt this measure to gather other perspectives regarding the

social validity of an intervention. Lastly, it is important to note that currently, no information exists regarding the psychometric properties of this measure, as no studies have been conducted to determine its reliability and validity. Nonetheless, the content addressed in this measure aligns well with the purposes of this study and was considered appropriate to be used to examine the social validity of the intervention.

**Treatment Fidelity Checklist.** To measure the treatment fidelity of this intervention, the primary investigator designed the checklist that aligned with the procedures of the current study (see Appendix G). Fidelity checklists used in Ambrose (2017) and Hendricks (2009) were used as models when developing the treatment fidelity checklist for this study. Moreover, in attempts to make data collection easier for the parents, the treatment fidelity checklists consist of five ‘yes’ and ‘no’ questions. If the parent answered ‘no’ to any of the questions, a space at the bottom of the treatment fidelity checklist was designated for parents to further explain the context or why the component of the treatment was not implemented as intended. The treatment fidelity checklist was completed by the participant after each completed intervention session. Parents were required to implement the intervention twice a week, therefore, two fidelity checklists were intended to be completed each week for each participant after the corresponding treatment session concluded.

**Dependent Variable and Target Behavior.** In this single subject design, the dependent variable is considered to be the target behavior or social skill domain. This specific need, or social deficit, was highlighted as an observable and measurable goal in treatment. Furthermore, the social skills deficit was determined through the information gathered from the parent.

Information gathering involved Ms. Smith expressing her primary concerns during an intake interview. She also completed the SSIS and the family information survey. Once specific social

deficits/target behaviors were identified from the information provided by Ms. Smith, I partnered with the parent in the treatment planning process.

Belleni and colleagues (2007) argue that treatment should be designed according to the specific needs of the client. Therefore, this treatment took a modular approach (DeRosier et al., 2011; White, Koenig, & Scahill, 2007), and each goal was individualized and child-specific. Target behaviors (social domains) were identified and defined by specific social skills (i.e. emotion regulation is defined by emotion identification, taking a break while escalated, and using belly breathing).

***Greg's Target Behavior.*** Greg's goal, and thus target behavior, was to improve his overall social communication. In this study, social communication was defined by three social skill deficits that Greg needed to improve: 1) initiating conversations while nervous, 2) advocating for himself when he was being bullied, and 3) using a phone to build and maintain friendships. Change in the target behavior was measured by the independent use of these social skills. Furthermore, each social skill is defined below.

*Initiating conversation.* Participant independently initiates a conversation by asking a question and/or listening to peers.

*Advocating for self.* Participant walks away, tells peer to stop, and/or find an adult to help while being bullied or made fun of.

*Maintain friendships.* Ask a parent if a friend can play. After permission is given, invite the friend over using a phone to either call or text.

***Alex's Target behavior.*** Alex's goal was to improve his overall social-emotional skills. Specifically, emotion regulation was Alex's identified target behavior. In this study, emotion regulation was defined by three social skill deficits: 1) identifying emotions while escalated, 2) taking a break (Take-5) while escalated, and 3) using a healthy coping skill (belly breathing) to deescalate. Change in

the target behavior was measured by the independent use of these identified skills and the decrease in disruptive behaviors. Furthermore, each social skill is defined below.

*Identify emotions.* Ability to independently identify emotions using a 5-point emotions scale by showing or pointing fingers corresponding to appropriate emotion (i.e. 5 fingers = anger).

*Take-5.* Independently request to take a break for up to 5-minutes while escalated.

*Belly breathing.* Belly breathing requires the participant to fully saturate the lungs with oxygen and has the effect of pushing the belly outward. The participant’s hands or a stuffed animal may be on their stomach while lying on the ground when practicing belly breathing.

*Disruptive behaviors.* A disruptive behavior or tantrum was defined as an escalation lasting at least 15-seconds, which involved kicking, hitting, and/or yelling.

Table 1

*Dependent Variables*

<b>Participant</b>	<b>Target Behaviors</b>	<b>Skill</b>	<b>Measure</b>
<b>Greg</b>	Social Communication	<ul style="list-style-type: none"> <li>• Initiate Conversation</li> <li>• Advocate for Self</li> <li>• Maintain Friendships</li> </ul>	<ul style="list-style-type: none"> <li>• Independent use of Skill</li> </ul>
<b>Alex</b>	Social-Emotional Skills	<ul style="list-style-type: none"> <li>• Identify Emotions</li> <li>• Take a Break</li> <li>• Belly Breathing</li> </ul>	<ul style="list-style-type: none"> <li>• Independent use of skill</li> <li>• Frequency of Disruptive Behavior/Tantrum</li> </ul>

**Treatment Observations.** Baseline data and progress monitoring data were collected for each participant during a 10-week time frame, followed by a 1-month interview (after 10-weeks of baseline and treatment was completed). As recommended by Hendricks (2009), frequency data and parent log books were used to collect baseline data and monitor child progress. With observational data collection, researchers often use event-recording (frequency) when the researcher is interested in the number of times a behavior occurs (Alberto & Troutman, 2009). Event recording is a frequently used observation

recording procedure because it most directly and accurately reflects the number of times a behavior occurs (Alberto & Troutman, 2009). When using event recording, the observer makes a notation every time the participant engages in the targeted behavior.

Research assistants collected baseline data and progress monitoring data within the home setting for 30-minutes once per week. Specifically, research assistants collected frequency data by means of event-recording within three, 10-minute blocks using event recording data collection forms (Appendix H). One observer was assigned to each participant and collected data within the home setting at the same time each week.

Event recording is a frequently used observation recording procedure because it most directly and accurately reflects the number of times a behavior occurs (Alberto & Troutman, 2009). When using event recording, the observer makes a notation every time the participant engages in the targeted behavior. Due to both participants being a part of the same family unit and home environment, the research assistants conducted their observations together to avoid additional stress on the family unit.

To ensure inter-rater reliability, a third of the sessions were observed by both members of the research team (Alberto & Troutman, 2009). As previously reviewed, the percentage of agreement was used to measure inter-rater reliability: total number of agreements across observers divided by the total of agreements and disagreements, multiplied by 100 (Alberto & Troutman, 2009). These observations were then compared and any discrepancy between the observation were discussed and a joint decision was made to resolve the discrepancy. In this study, 36.36% of the 11-weeks of observation data collection periods were assessed for inter-observer agreement. Therefore, four observation data collections periods were assessed for each participant. The four observation periods that were assessed for inter-observer agreement occurred during the baseline phase, both intervention phases, and the

withdrawal phase. The inter-observer agreement of observation of Greg and Alex were both at 100% across the 11 weeks of data collection.

**Parent Interviews.** Interviews provide researchers the opportunity to gather information from the participant's in a more fluid and descriptive manner (Dearnley, 2005). When participants use words to describe their experiences and perspectives on subjects, they are not restricted to the confines of structured questions that only allow them to respond a particular way (i.e., multiple choice and or Likert scales). Moreover, an interview is a managed verbal exchange that depends on the communication skills of the interviewer (Gillham, 2000; Ritchie & Lewis, 2003). Therefore, the interviewer must create a safe environment where interviewees can speak openly (Clough & Nutbrown, 2007). In order for the participant to actively participate in the interview, the interviewer must establish good rapport and trust with the participant. Thus, the interviewer must have established attentive listening skills (Clough & Nutbrown, 2007), probe and prompt appropriately (Dearnley, 2005), and communicate clear questions (Cohen et al., 2007).

***Semi-structured intake interview.*** A semi-structured intake interview (Appendix D) was designed for this study to complement the family information survey and to gather information for further treatment planning and goal development. As PI, I designed the intake interview to include five questions that were adapted from the family information form created by Hendricks (2009) with the National Professional Development Center of ASD. These five questions identified the specific needs of the child, but also gauged the parent's investment in improving the child's social skills. Additionally, questions identified the child's strengths and the items or activities that motivate the child. Therefore, the purpose of this interview was to collect important information for treatment planning and goal development, but also provide an opportunity for rapport-building with parents of the participants.

Lastly, the semi-structured interview was reviewed by the research team and the research committee for this study, which included: two school psychologists, one clinical psychologist, one developmental psychologist, and one speech and language pathologist.

***Semi-structured exit interview.*** A semi-structured exit interview (Appendix E) was designed for this study to compliment the quantitative data by exploring the social validity and treatment fidelity of the intervention. I designed eight questions that were used to examine the parents' perspectives of the intervention's effectiveness and usefulness. Moreover, the semi-structured interview was reviewed and critiqued by the research team and research committee of this study.

***Semi-structured follow-up interview.*** A semi-structured follow-up interview (Appendix F) was designed for this study to be used to investigate the maintenance of treatment effects after the intervention has concluded. This interview gathered parent perceptions regarding the maintenance of the intervention. Moreover, the semi-structured interview was reviewed and critiqued by the research team and research committee of this study.

**Parent Logs.** Similar to interviews, parent logs provide a platform for parents to express themselves in their own words. Parent perceptions regarding the effectiveness of the treatment were obtained and complimented the progress monitoring recorded in the home environment (Hendricks, 2009). Including parent logs when examining the effectiveness of the treatment provided multiple perceptions of the intervention's effectiveness, the treatment's ability to be maintained over time, and parent perceptions regarding the treatment's usefulness. Thus, parent logs were used to collect qualitative data in this study. The parent logs were recorded using audio software on the iPads used in this study. The parent logs were transcribed verbatim into nVivo software for analysis. The transcribed data was then coded line by line by multiple coders to ensure consistency in theme development.

## Research Design

An ABAB single subjects design with a one-month follow-up observation was used to assess the effectiveness of parent-implemented interventions in improving the social skills of children with ASD. Moreover, this study investigated the social validity and treatment fidelity of the treatment. Social validity and treatment fidelity was assessed using checklists and rating scales. A parent exit- interview was conducted directly after treatment to gain a qualitative perspective regarding the social validity, treatment fidelity, and perceived effectiveness of the treatment. Lastly, a one-month parent follow-up interview was also conducted to explore continued maintenance of treatment effects and barriers to the continued use of strategies used in treatment.

With an ABAB single subjects design, observational data is collected to determine the baseline (A) before the treatment (B) is implemented (Cooper, Heron & Heward, 2007). The treatment is removed after the initial implementation of the treatment and a second baseline (A) is established. After the treatment has been removed, a second implementation of the treatment occurs (B) to strengthen experimental control and serve as confirmation that the treatment is/is not effective. Moreover, a one-month follow-up helps to determine if the maintenance of treatment effects is sustained over time. This study was conducted over 10-weeks, including both baseline and treatment phases. In attempts to obtain a stable baseline in the home environment and provide participants with ample treatment, an ABAB single subjects design with an abbreviated withdrawal of the treatment (second A in the ABAB design; Cooper, Heron & Heward, 2007) was determined to be an appropriate research design for this study.

An ABAB single subjects research design, however, is considered to be the most straightforward and generally most powerful within-subjects design for demonstrating a functional relation between an environmental manipulation and a behavior (Cooper, Heron & Heward, 2007) and can be used with one



or more participants. The benefit of using the ABAB single subjects design is not only appropriate for this study, but is considered a more superior design compared to other single subject designs. ABA single subject designs are reported in literature, however, the ABAB single subjects design is preferred because the reintroduction of the B condition enables the replication of treatment effects and strengthens the demonstration of experimental control (Christle & Schuster, 2003; Coper, Heron & Heward, 2007).

A multiple-baseline design across participants (concurrent or noncurrent) would have been the preferred research design to assess the effectiveness of parent-implemented interventions because participants would have had more exposure to the treatment phase. A multiple-baseline design across participants would have better controlled for possible threats to validity. It also controls for maturation, test-retest sensitivity, history effects, and instrumentation changes through the use of its staggering of baseline-to-intervention changes over time with uneven baseline phase lengths (Harvey, May & Kennedy, 2004). However, the challenges encountered while recruiting qualified participants for this study prevented the use of a multiple baseline design. Due to this study only having two participants, the ABAB design with an abbreviated withdrawal phase was considered an appropriate alternative to using the multiple baseline design. A multiple baseline design requires a minimum of three participants, although more than three participants are considered ideal (Harvey, May & Kennedy, 2004).

Multiple research designs have been used to study the effectiveness of parent-implemented interventions. A study by Meadan and colleagues reviewed 12 studies that examined the use of PIIs and discovered after close examination that there was considerable variability in intervention and data collection techniques. More specifically, 8 of the 12 studies used single subject design to explore the research questions while one study used statistical analysis of pre- and post- data, one study used a

randomized control study to compare two intervention models, and the remaining two studies used single subject design with group analysis methods (Meadan et. al., 2009).

The current study used elements of studies discussed in the literature review to create a research design appropriate for the purposes of this study. Like Lorimer et. al. (2002) an ABAB design was considered appropriate to measure the effectiveness of PII and social narratives. Additionally, Ingersoll and Gergaus (2000) used a similar intensity and duration of treatment (10-weeks with a 1-month follow-up) to examine the effectiveness of PIIs in improving social skills of children with ASD. Lastly, this study used a similar data collection procedure as described in Charlop-Christy and Carpenter (2000) to foster parent involvement through data collection and gain parent perspectives.

## **Procedure**

**Participant recruitment.** Upon approval from the Institutional Review Board (IRB) for the Protection of Human Subjects in Research, recruitment of participants began February 2018. I contacted local agencies and clinics in the Missoula area that serve children with ASD and I spoke with the appropriate directors or supervisors of the different agencies and clinics to explain the purposes and procedures of the study. Following the approval of the adequate directors or supervisors of the clinic or agency, I provided recruitment fliers (Appendix P) that were posted and available at these different clinics and programs. Potential participants contacted the primary investigator of the study to gain more information about the study. If potential participants were interested after speaking with the primary investigator, the screening process began for those potential participants. The contact information of potential participants were kept private and stored in a locked file cabinet.

Recruitment efforts began in February 2018 and ended in July 2018. Four potential participants were recruited for the study. After the initial screening process, only two participants met the inclusion

criteria for the study. For those who did not meet the inclusion criteria of the study after the initial screening process, a list of services and providers were provided to them. The two active participants were each awarded a \$25 Amazon Gift Card for their participation. Participation in this study was completely voluntary, and they were advised that they could withdraw from the study at any time. The awarded gift card was not dependent on the participants' completion of the study, and the child would have received the gift card at any time if they decided to withdraw early from the study. Moreover, the participants received free individualized services to help improve their social skill deficits, and parents were provided free parent training to implement EBPs in the home environment.

**Informed consent and assent.** After initially contacting potential participants, I scheduled an initial meeting with the parents/primary caregiver of the child with ASD. At this initial meeting, I explained the purpose of the study and provided relevant details. Such details included the predicted time commitment from the families, information about data collection, and information about parent training sessions. Following the description of the study, parents were asked if they would like to participate. Voluntary participants were provided informed consent and assent forms to complete in order to start the initial screening process. If participants met the inclusion criteria of the screening process, voluntary participants were then provided informed consent and assent forms. In addition to obtaining the informed consent from parents, each of the participants were provided with either a verbal or written assent form for the child to voluntarily agree to participate in the study. This assent form was read and discussed with the child participant before the child participants gave their assent. An additional verbal assent form was provided to individuals who did not have the appropriate reading fluency, reading level, or reading comprehension to knowingly give assent.

**Screening.** After the screening informed consent and assent forms were completed, the screening

process for the study began. Parents were provided with a family information survey to help determine their child's eligibility for the study. Participants that qualified for this study had received comprehensive evaluations completed within a 3-year timeframe before the screening process began. Therefore, the results of the testing within the comprehensive evaluations were adopted for the screening process of this study, and two participants met the inclusion criteria.

**Treatment Planning and Goal Development.** After the participants met the inclusion criteria of the screening process, their parents completed the SSIS. The parents of children in the study were also asked to provide a release of information form (Appendix I) in order for the primary investigator to access any previous records, including psychological or psychoeducational reports from various settings (schools, etc.). If the parent already had copies of previous reports that included the cognitive and language testing, parents voluntarily gave permission for the primary investigator to have access to such reports. Furthermore, the primary investigator conducted a semi-structured intake interview. The information gathered from the screening process, the SSIS, the participant's previous testing and reports, and the intake interview was used to develop an observable and measurable goal with an individualized treatment plan for each child.

Once a proposed treatment plan and specific goal was developed, I reviewed the treatment plan and specific goal with the parent. Parents were seen as equal partners in the treatment planning process and the parent's specific treatment concerns and suggestions were discussed before a final treatment plan and goals were established. Ms. Smith's input along with the data gathered using the intake interview, SSIS, and family information survey determined the goals of the study. The goals and intervention strategies were agreed upon by the primary investigator and parent before the treatment began.

**Parent Training.** Once the treatment plan and goals were finalized, Ms. Smith participated in three individual parent training sessions with the primary investigator. Each training session had a specific purpose and each session lasted no longer than 1 hour. These parent trainings were delivered across three separate sessions and could not be delivered in the same day. Ms. Smith completed all three training session over a two week timeframe. As it was previously reviewed, parent training sessions are necessary to effectively implement PIIs (Hendricks, 2009).

***Training Session 1.*** The first parent training session provided an introduction to intervention strategies, information about ASD, and examples of social narratives, video models, and the role of parents in PIIs. The primary focus of this session was on psychoeducation, whereby parents were taught a summarized review of the literature and gained examples to various positive and negative examples of social narratives and video-models. This information and exposure to various examples of intervention strategies provided a necessary foundational knowledge before specified intervention techniques for their child could be practiced. This training was administered through the use of a PowerPoint presentation.

***Training Session 2.*** The second training session was more specific to the child's needs, as at that time, the social narratives and video models designed for the participant's individualized goal were provided to Ms. Smith. The parent was provided the individual social narratives and video-models that were used in the treatment. The primary investigator modeled how to implement the intervention. The remainder of the session was spent on role-playing, whereby the parent practiced implementing the intervention during a minimum of three different situations.

***Training Session 3.*** The third and final training session focused on data collection techniques (i.e. audio logs) and how to properly operate the tools provided to complete the study. The appropriate

use of the iPad, audio recording equipment, and fidelity checklists were reviewed. Schedules of observational periods, baseline and treatment phases, as well as phone consultations, were finalized. At the conclusion of this training session, Ms. Smith was given all of the tools required for this study. All paper forms of the social narratives, finalized schedule, and fidelity checklists were provided to Ms. Smith in a 3-ring binder for each child participant (Greg and Alex).

**Baseline data collection, social validity pre-test and treatment withdrawal.** After the parent training sessions were completed and the treatment plan and goal was established, the baseline phase of the treatment started. Members of the research team collected event-recording data within the home environment. This data collection occurred before the treatment phase of the intervention began. During the first day of baseline data collection, Ms. Smith also complete a social validity pre-test. The initial baseline data collection occurred over the first three weeks of the study for both Greg and Alex. After the initial baseline phase was completed, three weeks of treatment occurred before the treatment was withdrawn for one week.

**Treatment.** Once the baseline phase of the intervention concluded, the treatment phase began. The initial treatment phase lasted for 3 weeks. After the initial 3 weeks of treatment, the treatment was withdrawn for 1 week, was reintroduced for 3 additional weeks. Furthermore, Ms. Smith was provided a clear plan on how to implement the individualized interventions for her children during the parent training sessions. Ms. Smith was provided with three video-models with the accompanying social narratives for Greg and Alex. Ms. Smith subsequently implemented the treatment two times a week. The days of the week when the intervention would take place were outlined in the intervention plan for Greg and Alex (e.g., Monday and Wednesday). Ms. Smith chose one video from the three video-models, and corresponding social narrative to implement during the week. Ms. Smith administered one video model

with its corresponding social narrative three times during one treatment session as recommended by Shukla-Mehta et al. (2010). Ms. Smith was not permitted to use the same video-model consecutively over the different treatment sessions. Therefore, Ms. Smith was given some flexibility to choose what video model and corresponding social narrative to implement to better meet the current need of her child during the treatment phase of the study. However, to maintain experimental control, Ms. Smith could not administer the same social narrative and video model for more than one treatment session a week. Moreover, using different videos throughout the week provided variability in the content and, ideally, maintained the interest of the participant. Additionally, though each video-model and corresponding social narrative focused on the same social skills domain/target behavior, different social situations were addressed through different video-models and social narratives. Therefore, each week of treatment included the implementation of two different video models and social narratives. For example, week one may entail the use of Video/Social Narrative 1 and Video/Social Narrative 2, while week two may entail the use of Video/Social Narrative 3 and Video/Social Narrative 1. The sequence of when the video models and social narratives were not recorded in this study.

The treatment followed the same structure: 1) preferred activity, 2) a video model/social narrative, and 3) practice using role plays and/or discuss application of the skill. Specifically, the first 5 minutes of the intervention consisted of each participant partaking in a preferred activity (e.g., screen time). A visual timer on the tablet indicated when the 5 minutes of the preferred activity concluded. The parent used a visual schedule to help the child transition between tasks. Once the preferred activity concluded, the parent implemented the video-model and read the corresponding social narrative. The parent also discussed and practiced the video-model and social narrative with their child. This sequence repeated two additional times during a single treatment session and at each treatment session. Each

treatment session lasted approximately 30-minutes to 45-minutes.

Table 2.

*Example Treatment Procedure for Greg*

<b>Week</b>	<i>Implementation 1</i>	<i>Implementation 2</i>
<b>1</b>	Desired Activity Initiate Conversation SN/VM Discuss/Role-play Complete 3X	Desired Activity Advocate for Self SN/VM Discuss/Role-play Complete 3X
<b>2</b>	Desired Activity Maintain Friendships SN/VM Discuss/Role-play Complete 3X	Desired Activity Advocate for Self SN/VM Discuss/Role-play Complete 3X
<b>3</b>	Desired Activity Initiate Conversation SN/VM Discuss/Role-play Complete 3X	Desired Activity Maintain Friendships SN/VM Discuss/Role-play Complete 3X

Table 3.

*Example Treatment Procedure for Alex*

<b>Week</b>	<i>Implementation 1</i>	<i>Implementation 2</i>
<b>1</b>	Desired Activity Identify Emotions SN/VM Discuss/Role-play Complete 3X	Desired Activity Take a Break SN/VM Discuss/Role-play Complete 3X
<b>2</b>	Desired Activity Belly Breathing SN/VM Discuss/Role-play Complete 3X	Desired Activity Take a Break SN/VM Discuss/Role-play Complete 3X
<b>3</b>	Desired Activity Identify Emotions SN/VM Discuss/Role-play Complete 3X	Desired Activity Belly Breathing SN/VM Discuss/Role-play Complete 3X



After each treatment session, Ms. Smith completed a treatment fidelity checklist and she completed parent logs every week. The fidelity checklists and parent logs were collected weekly by the members of the research team who conducted the observations in the home environment once a week, as outlined in the treatment plan. Observations did not occur during the actual implementation of the intervention. Lastly, Ms. Smith had a scheduled weekly consultation meeting with the primary investigator that lasted no more than 15-minutes, as outlined in the treatment plan.

**Exit Interview and social validity post-test.** A phone exit interview was conducted after the second treatment phase concluded. This in-person interview was conducted by a member of the research team who was a graduate student trained in interviewing techniques. After the exit interview concluded, the primary investigator scheduled a 1-month follow-up phone interview with Ms. Smith. Moreover, a member of the research team administered the social validity post-test after the last data collection observation. The parent was thanked for their participation and awarded a \$25 Amazon gift card for their participation.

**Follow-up Interview.** After the treatment concluded, the primary investigator conducted a phone interview with Ms. Smith to further investigate the maintenance of treatment outcomes. Ms. Smith was thanked again for her participation and assured that she could call at any time to ask questions or share concerns.

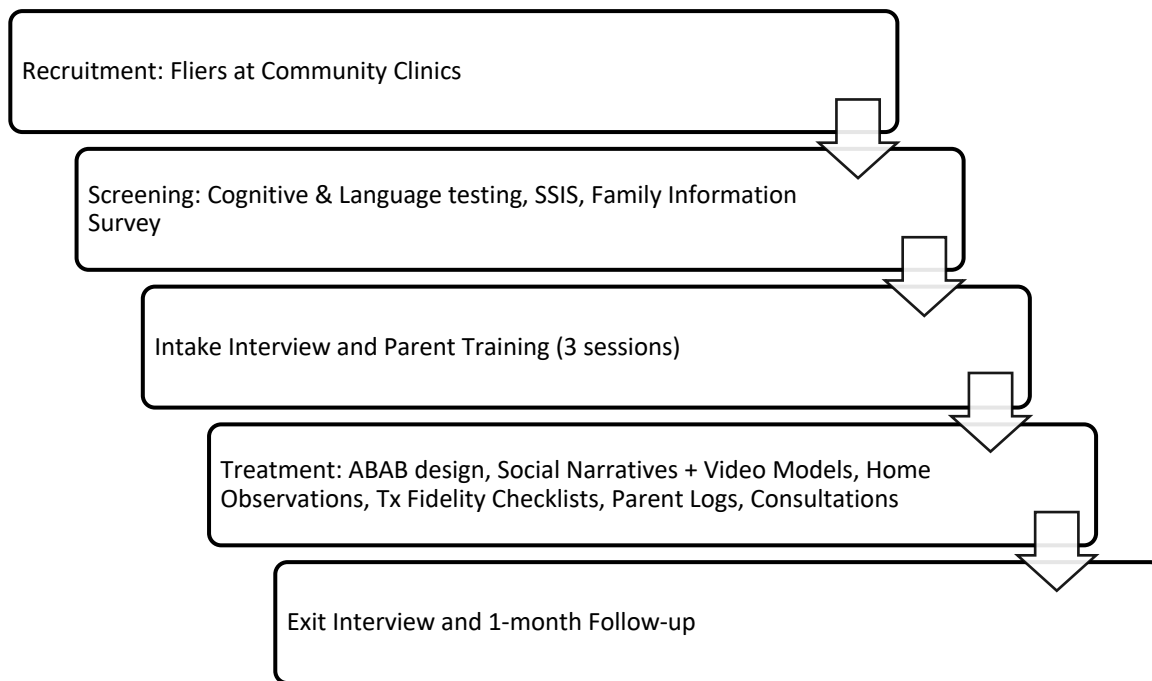


Figure 1. *General Procedure of Study*

### **Single Subjective Data Analysis**

Various quantitative analyses were used to interpret the different types of data in this study. Specifically, the percentage of non-overlapping data and visual analysis were used to measure the effectiveness of the intervention. A pre- and post- test comparison was used to measure the social validity of the study, and a percentage of correct treatment implementation will be calculated to measure the treatment fidelity of the intervention.

**Intervention Effectiveness.** The percentage of non-overlapping data (PND) rubric by Scruggs and Mastropieri (1998) was used to assess the practical significance of change between the baseline and intervention phases of the ABAB single subject design. This PND rubric provides an effect size for single-subjects designs. Specifically, the rubric indicates that a PND over 90 is very effective, 70-90 is effective, 50 - 70 is questionable, and a PND below 49 constitutes an ineffective treatment (Ambrose, 2017; Scruggs & Mastropieri, 1998). Moreover, the PND is computed by identifying the highest

baseline point. Once that is established, the number of intervention points that exceed the highest baseline point (non-overlapping) are counted. The proportion of non-overlapping to total number of intervention points are then calculated using PND to find the effect size for single subjects' designs (Scruggs & Mastropieri, 1998).

Furthermore, additional methods to evaluate the intervention are often used in single-subject designs. The visual analysis (i.e., graphs) is the most commonly used method in behavior analysis research, while the interrupted time-series analysis (ITSA) is a statistical method used in fields such as engineering, economics, and business (Harrington, 2013). Due to the nature of this study, visual analysis was conducted to measure the levels and variability of observational data (Wolery & Harris, 1982). The 'level' of the dependent variable was analyzed using the mean score of both the baseline and treatment phases. Once the means were calculated, they were represented by a horizontal line on the graph. This technique provided a clear visual effect to compare the change in the dependent variable from the baseline to the treatment phases and withdrawal phase.

The data was also analyzed by observing the variability of the data. The variability of data within the baseline, treatment, and withdrawal phases is often considered to better indicate an intervention's effectiveness (Wolery & Harris, 1982). Baseline data measures the level of behavior as it occurs naturally. It is important for baseline data to be stable, so there can be confidence regarding the conclusions that are made about the intervention's effectiveness (Alberto & Troutman, 2009). As a general rule, the greater the variability in the data, the more difficult it is to draw conclusions about the effects of the intervention (Kazdin, 2011). Therefore, the literature has set guidelines regarding baseline data variability. Where variables can be rigorously controlled, a research criterion within a 5% range of variability can be used (Sidman, 1960). In less controlled therapeutic settings, a 20% criterion is

considered (Repp, 1983). However, when a setting is less controlled, a more lenient parameter of 50% variability is recommended (Alberto & Troutman, 2009). Therefore, considering the nature of the home setting, in which variables are more difficult to control, the parameter of 50% variability of baseline data was applied in this study. Additionally, to assess the variability of the treatment phases, the range of data points during treatment is calculated (Ambrose, 2017). Therefore, the range of data points of the treatment phase was used to assess the treatment data's variability in this study.

**Social Validity.** As there were only two participants, a comparison of overall mean scores of the before and after treatment observations was used to measure the social validity of this study. Items 1 to 12 of the pre-test were identical, and worded in past tense in the post-version of the social validity scale. Item 13 of the post-version is an additional question that is not found in the pre-version of the social validity measure. As previously reviewed earlier in the method section, the creators of this measure included Item 13 asked so the participant could rate if “The intervention is one that she would recommend to others”. Due to item 13 of the post-version of the measure not being in the pre-version of the measure, it was excluded when the comparison of overall means was examined. This was done so the post-test overall mean score was not skewed by an additional score. Therefore, Item 13 of the post-version of the measure is referenced separately in the results sections.

**Treatment Fidelity.** The total percentage of correct intervention implementation was calculated for each checklist by dividing the total sum of ‘yes’ responses by the total sum of ‘yes’ and ‘no’ responses. The quotient of this calculation was multiplied by 100 to determine the percentage of treatment fidelity. Additionally, a mean value will be calculated using all of the checklists to determine an overall treatment fidelity score. The individual treatment fidelity checklists that were completed after each treatment session contributed to further interpretations of results by providing more information as

to why the treatment was not implemented as intended. Furthermore, the overall treatment fidelity score (mean value) contributed to the discussion of treatment effectiveness and the importance of parent participation in treatment.

### **Thematic Analysis**

Within qualitative research, grounded theory and thematic analysis are terms that are often used interchangeably. However, thematic analysis is actually the precursor to grounded theory. Thematic analysis uses the same procedures as grounded theory in that similar coding techniques are used, and coder bias is assessed using analyst triangulation (Braun & Clarke, 2006). These approaches differ because the goal of each qualitative data analytic strategy is slightly different. Thematic analysis is appropriate when researchers are attempting to investigate specific research questions (Braun & Clarke, 2006). After initial research questions have been thoroughly supported, grounded theory attempts to develop an overarching theory that can generalize to a broader population by analyzing findings from various sources (interviews, qualitative surveys, etc.; Fassinger, 2005; Pidgeon & Henwood, 1997). Therefore, because this study explored initial research questions, thematic analysis appeared to be the most appropriate qualitative data analytic strategy to use.

In turn, the research team coded data collected from this study and generated themes from the coded data. A *code* in qualitative inquiry is often a word or short phrase that represents a specific description of collected data (Saldana, 2013). The coded data can then be interpreted in terms of themes. *Themes* are abstract constructs which investigators identify before, during, and after data collection (Ryan & Bernard, 2000). Themes emerge from the phenomena being studied (Bulmer 1979), already-agreed-upon professional definitions (Strauss 1997), as well as the researchers' values, theoretical orientation, and personal experience with the subject matter (Maxwell 1996). Furthermore, in the

majority of published articles where coding and theme generation serves as a form of data analysis, the specifics of the coding process are not specifically described (Ryan & Bernard, 2000). Nonetheless, there are several types of coding and techniques that can be used to code data and generate meaningful and interpretable themes.

**Coding and theme identification.** Structural coding was used in the thematic analysis of the data gathered from this study. Structural coding is a theoretical approach to qualitative data analysis and is considered to be appropriate for most qualitative studies (Saldana, 2013). Structural coding is widely used among qualitative researchers because this approach is considered to be content-based. With this approach, content is structured or categorized using broad topics that are determined by the specific research questions of a study (MacQueen et al., 2008). Once this structuring occurs, further analysis continues and themes are identified (MacQueen et al., 2008).

Different techniques of coding and theme identification can be used within the structural coding framework. Specifically, word and grouping-based coding techniques are the most common coding techniques used in the structural coding framework (Ryan & Bernard, 2000). Word-based techniques like ‘word repetitions’ are often considered the least labor-intensive, and are typically used to assess large complex works, such as Shakespeare or the Bible (Ryan & Bernard, 2000). In contrast, grouping-based techniques like ‘pawing’ and ‘cutting and sorting’ are often used for short answer responses and interviews (Saldana, 2013).

The grouping-based techniques known as ‘pawing’ and ‘cutting and sorting’ were the specific techniques of coding and theme development used in this study. Moreover, these techniques of coding and theme identification were easily determined with nVivo coding software (Ryan & Bernard, 2000). Therefore, the ‘pawing’ and ‘cutting and sorting’ techniques used within the structural coding

framework was the most appropriate to investigate the treatment's effectiveness and maintenance, social validity, and treatment fidelity.

Pawing involves the researcher manually highlighting key phrases in the text that are commonly expressed by participants or which appear important to the purpose of the research study (Sandelowski & Barroso, 2007). After highlighting has commenced, researchers look for patterns shared across participants and/or within specific topic areas (Ryan & Bernard, 2000). This approach is critiqued, for it heavily relies on the coders' familiarity with the subject matter and their ability to identify themes (Dey, 1993). Nonetheless, qualitative researchers have identified this approach as a sound research technique, as the alternative involves following hunches and intuitions (Dey, 1993). Furthermore, because the coders of this study used software to analyze data, the highlighting and grouping of texts was completed using Nvivo. The software approach of highlighting and gathering segments of data was conducted the same way as the manual pawing. The coded data that relates to a pattern observed by the researcher that was then stored in what nVivo refers to as a *node* (Nvivo Workbook, 2012).

Furthermore, the technique of cutting and sorting is often used in theme identification and generation. Cutting and sorting is actually a more structured form of the pawing technique (Ryan & Bernard, 2000). The manual approach of the cutting and sorting technique uses the same pawing approach of highlighting key information, while also physically cutting out the key information and sorting the coded data into piles with information about where the coded data came from (i.e., from which specific participant, interview questions, etc.). Again, because the coders used Nvivo software, this coded data was stored in nodes.

In addition to the physical sorting of coded data, the sorting and cutting technique also takes a more structured approach to theme identification than the pawing technique. As discussed, pawing relies

on hunches and intuition to identify themes. The cutting and sorting technique, however, starts coding with established but very general themes that directly relate to the research questions or purposes of the study (Ryan & Bernard, 2000). Therefore, coders of this study started by looking for six conceptual categories in this study—acceptability, generalization, maintenance, barriers, effectiveness, and miscellaneous. These original codes were conceptualized by the research team before the study was conducted. Each code was created to parallel the research questions of this study in attempts to explore each research questions using qualitative methodology. To promote consistent coding of the raw data, the original codes were operationalized as follows:

*Acceptability: encompasses parents' perceptions of the intervention including positive and negative opinions.*

*Generalization: evidence of participant using social skills outside of treatment sessions*

*Maintenance: treatment is implemented outside of treatment sessions*

*Barriers: any variable that may interfere with treatment; may include but not limited to behaviors, attentions, medication, instrumentation, etc.*

*Effectiveness: parent perception of the intervention improving their child's social skills*

*Miscellaneous: any raw data that appears significant to the intervention and cannot be categorized using the other codes.*

As outlined earlier when describing the structural approach of coding, conceptual categories were identified, after which more specific analysis occurred. Therefore, the data from this study was first coded within the defined conceptual categories above. Then, further data analysis occurred and more specific themes and subthemes emerged.



**Ensuring Trustworthiness.** A number of strategies were used to ensure trustworthiness of the qualitative data. Analyst triangulation and the measuring of coder consistency was used to account for potential coder bias (Saldana, 2013; Ryan & Bernard, 2000). Analyst triangulation involves members of the research team coding and developing themes independently from each other. Once the initial codes and themes were identified, the research team convened to compare and contrast their interpretations of the data. A strategy like analyst triangulation provided a check on selective perception and illuminated blind spots in the interpretive analysis (Creswell, 1998). The goal was not to seek consensus, but to be able to understand the data in multiple ways (Angen, 2000).

Coding comparison analyses also occurred to ensure consistency across the coded material, and any differences in coding was better determined (Namey, et al., 2008). Measuring the coding consistency over multiple coders better informed theme development by providing more confidence in how the material is coded across multiple perspectives (Namey, et al., 2008). Moreover, coding comparisons was easily conducted using Nvivo software and produced the percentage of coder agreement for each identified node as a way of interpreting coding consistency (Nvivo Workbook, 2012). The percentage of coder agreement refers to the actual percentage coders agreed or disagreed upon regarding how material should have been coded. If coders completely agree on how specific information is coded, then the percentage of agreement (POA) would be 100%.

Thus, analyst triangulation and coder comparisons occurred in attempts to account for coder bias. Such strategies strengthened the confidence regarding the analysis of the qualitative data. Percent agreements of 75% or greater is considered to possess high inter-rater reliability (Nvivo Workbook, 2012). After the initial round of coding, all coded material met the 75% or greater threshold for appropriate inter-rater reliability and conceptual theme development continued. Various members of the

research team met via phone conference or video chat to conceptualize the coded material and determine themes found within the coded data.

## **Chapter IV: Results**

This study examined the effectiveness of combining EBPs, including parent-implemented intervention, video-modeling, and social narratives to improve the social skills of children with ASD. It also examined the maintenance of treatment effects and parent perceptions of the home-based intervention. First, treatment fidelity and the baseline, intervention, and follow-up phases for each participant using graphs for visual analysis to identify changes in level and variability are described. Then, the maintenance of treatment effects was explored by examining the follow-up observation and follow-up parent interview. Lastly, parent perceptions of the intervention were investigated by examining the pre- and post- social validity scales and further examination of the parent interviews (exit- and follow-up interviews) and parent logs.

### **Treatment Fidelity**

Mrs. Smith completed a treatment fidelity form (Appendix G) after each implementation of the treatment to determine if the intervention was implemented as intended. The form used in the current study was adapted from a treatment integrity checklist used in previous video-modeling research (Whittington-Barnish, 2012). This form listed 5 components of the treatment's procedure, to which Mrs. Smith either replied 'yes' or 'no' to each item. An overall percentage of treatment fidelity was calculated by calculating the average percentage of all 12 implementations.

For the parent-implemented intervention, Mrs. Smith was required to implement the intervention 12 times during the intervention phases of the study (two times per week for six weeks). First, when working with Greg, Ms. Smith was successful in implementing the treatment 8 out of the intended 12 treatment sessions. Ms. Smith failed to complete four of the treatment sessions, so the mean treatment fidelity scores for those four treatment session were scored as zero. For Greg, Ms. Smith had an overall

treatment fidelity percentage of 53.3%. Therefore, the treatment was implemented as intended only 53.3% of the time.

For Alex, Ms. Smith was successful in implementing the treatment 8 out of the intended 12 treatment sessions. Ms. Smith failed to complete 4 of the treatment sessions, so the mean treatment fidelity scores for those four treatment session were scored as zero. For Alex, Ms. Smith had an overall treatment fidelity percentage of 50%. Therefore, the treatment was implemented as intended only 50% of the time.

To further understand reasons for why components of the treatment were not being implemented as intended, Ms. Smith was asked to follow-up with additional information. That is, if a 'no' response was selected, Mrs. Smith completed a qualitative item of the fidelity checklist to identify the specifics of why the implementation procedure was not completed as intended. Ms. Smith's responses to this item included a number of challenges to implementation. For example, she identified that there was difficulty implementing the intervention in a quiet place without distractions. Mrs. Smith reported that her other children would often interrupt the treatment sessions. Moreover, there was one implementation where Mrs. Smith forgot to charge the I-Pad that was provided to her during the study which prevented Mrs. Smith from reviewing the video model with her sons. Lastly, Mrs. Smith reported life events such as school starting made it difficult for her to remember to implement the intervention.

### **Effectiveness and Maintenance of the Intervention**

Visual analyses using level and variability of data was used to examine the effectiveness of parent-implemented interventions for Greg and Alex. The percentage of non-overlapping data was also used to determine the intervention's effectiveness. Descriptive data from the observation periods and parent consultations are also explored in this section to provide a more comprehensive depiction of the

data. Furthermore, the maintenance of treatment effects was explored by using visual analysis of the follow-up observation and thematic analysis of the follow-up parent interview.

**Greg’s treatment.** For Greg, social communication was identified as the target behavior. To improve Greg’s social communication, three individualized social narratives and corresponding video models were used. Treatment planning with Mrs. Smith was completed to individualize the intervention for Greg’s specific needs. To improve Greg’s social communication, the social narratives and corresponding video models focused on 1) Initiating conversation with peers; 2) Advocating for himself when bullied; and 3) Maintaining friendships using a phone to call or text. Figures for Greg depicting the analysis method of level are presented below. Greg was not observed attempting to maintain friendships/relationships using a phone, therefore, no observation data were included was used to display the absence of this skill during observation sessions.

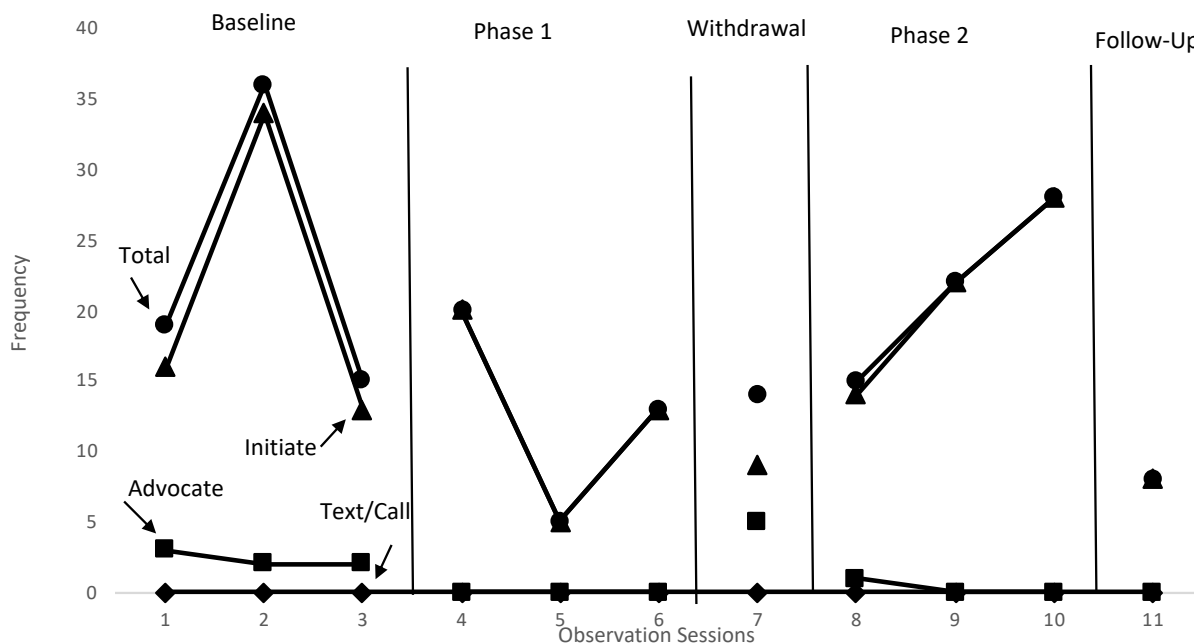


Figure 2. Greg’s Social Communication

Greg's overall ability to socially communicate was analyzed by comparing the change of mean score between each phase of the intervention (Baseline, Phase 1, Withdrawal, Phase 2, and Follow-up). The level of Greg's behavior changed from a mean rate of 23 times per half hour during baseline, 13 times during Phase 1 of the intervention, 14 times during the withdrawal, 22 times during Phase 2, and 8 times during the Follow-up session. Greg showed variable rates of social communication during the baseline phase. Specifically, his rates of socially communicating ranged from 15 to 36 times per half hour during the baseline phase, which is in excess of the recommended 50% of variability around the mean. The variability observed during the baseline phase of the intervention is problematic because a stable baseline is needed for confident interpretations of treatment effects to be made (Alberto & Troutman, 2009). During the treatment phases of the intervention, variability in the data ranged from 5 to 28 times per half hour.

Given that the PND is 0%, this suggests that the treatment was not found to be effective for Greg. Greg participated in less social communication during the intervention phases when compared to the baseline phase. Furthermore, the follow-up observation corroborates that the treatment was not effective and that Greg participated in less social communication. Limitations during baseline and the treatment phases of the treatment are further discussed in chapter 5.

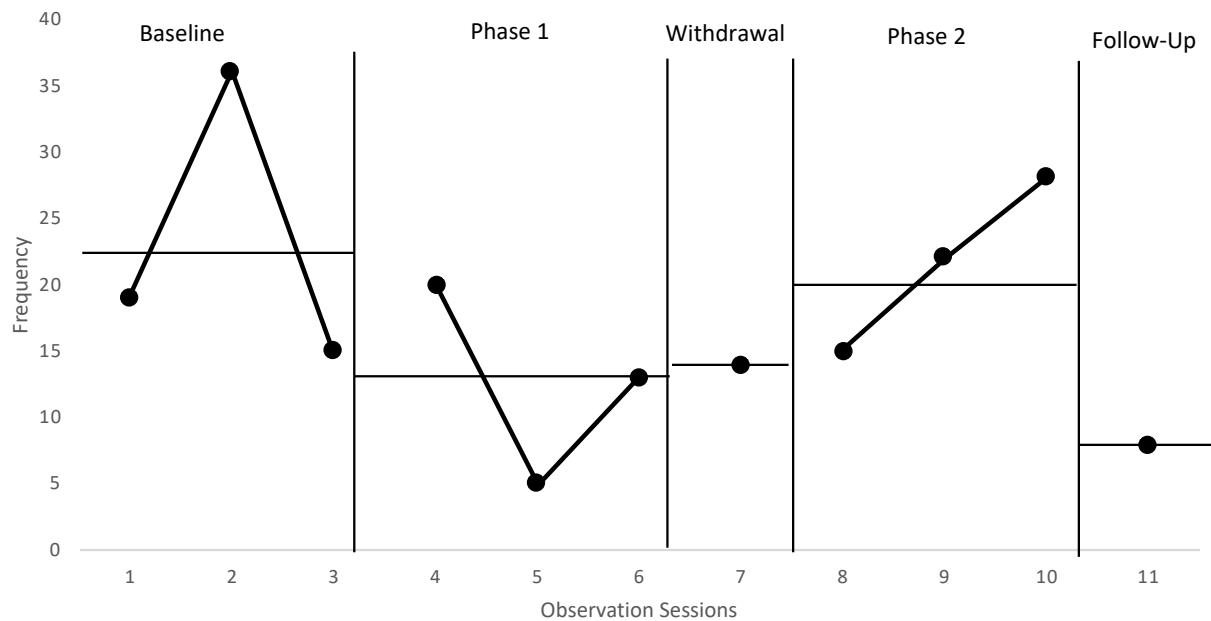


Figure 3. Greg's Social Communication Level

The individual social skills that contributed to Greg's overall social communication were further explored. Specifically, visual analysis was used to explore the effectiveness of initiating communication and advocating for himself in improving overall social communication. The last social skill of maintaining friendships using the phone was not analyzed because Greg was not observed participating in this skill during observations sessions.

**Skill 1: Initiating Conversation.** Greg was primarily observed attempting to initiate conversation as compared to the other observed social skills during treatment. The level of Greg's ability to initiate conversation was analyzed by comparing the change of mean score between each phase of the intervention (Baseline, Phase 1, Withdrawal, Phase 2, and Follow-up). The level of Greg initiating conversation changed from a mean rate of 21 times per ½ hour during baseline, 12.6 times during phase 1 of the intervention, 9 times during the withdrawal, 21.6 times during phase 2, and 8 times during the follow-up session. Greg showed variable rates of initiating conversation during the baseline phase.

Specifically, his rates of initiating conversation ranged from 13-34 times per ½ hour during the baseline phase, which is in excess of the recommended 50% of variability around the mean. The variability observed during the baseline phase of the intervention is problematic because a stable baseline is needed for confident interpretations of treatment effects to be made (Alberto & Troutman, 2009). During the treatment phases of the intervention, variability in the data ranged from 5-28 times per ½ hour.

The PND is 0%, which constitutes ineffective treatment because Greg initiated conversation less during the intervention phases when compared to the baseline phase. The follow-up observation indicates that treatment was ineffective and Greg initiated conversation less. Limitations during baseline and the treatment phases of the intervention are further discussed in chapter 5.

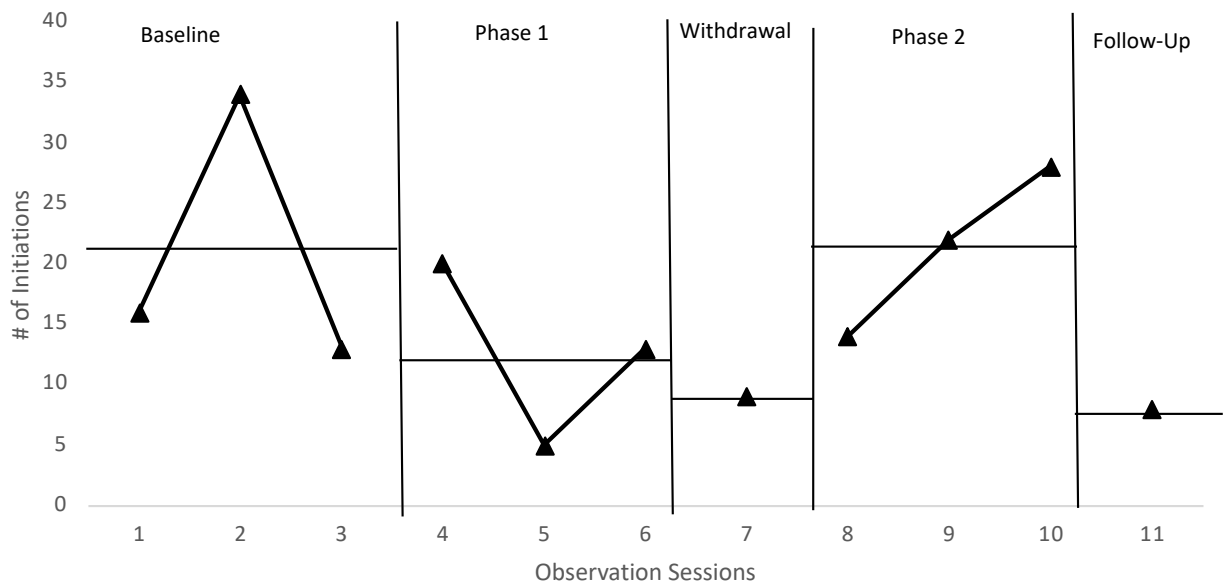


Figure 4. Greg Initiating Conversation-Level

**Skill 2: Advocate for Self.** The level of Greg’s ability to advocate for himself was analyzed by comparing the change of mean score between each phase of the intervention (Baseline, Phase 1, Withdrawal, Phase 2, and Follow-up). The level of Greg advocating for himself changed from a mean rate of 2.3 times per ½ hour during Baseline, 0 times during Phase 1 of the treatment, 5 times during the



Withdrawal, 0.3 times during phase 2, and 0 times during the Follow-up session. Greg showed a stable Baseline of advocating for himself. Specifically, his rates of advocating for himself ranged from 2-3 times per ½ hour during the Baseline phase, which is within the recommended 50% of variability around the mean. During the treatment phases of the intervention, variability in the data ranged from 0-1 times per ½ hour.

Moreover, a decrease in Greg advocating for himself occurred from Baseline to the Phase 1 of treatment indicating the intervention to be ineffective. During the withdrawal phase, Greg was observed advocating for himself more than in Phase 1 and 2 of the intervention. There were no observations of Greg advocating for himself during the follow-up phase of the study. Lastly, the PND is 0%, which constitutes ineffective treatment because Greg advocated less for himself during the intervention phases when compared to the baseline phase.

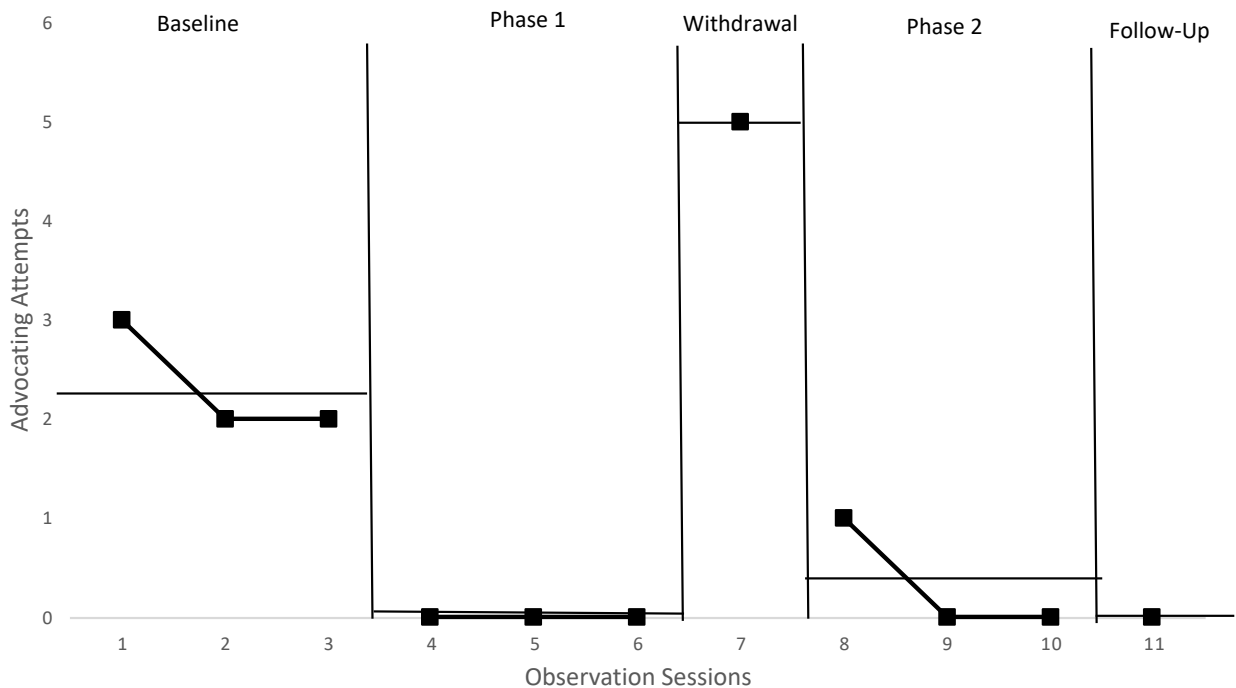


Figure 5. Greg Advocating for Himself-Level

**Descriptive observations and consultations.** Along with making notations every time a participant was observed partaking in the specific social skill, research assistants also made descriptive observations regarding the participants' environment and overall behavior. These additional observations provided a more holistic understanding of the observation sessions. These descriptive observations noted that Greg did not have ready access to a phone, therefore, maintaining friendships using a phone to call or text was not possible during observational sessions. At times, Greg would also be observed entertaining himself alone in his room where socialization with others was difficult to observe. Specifically, the research assistants noted this behavior during observation session 5.

Short consultation sessions between Ms. Smith and the primary investigator also occurred each week to discuss Ms. Smith's experiences and to problem-solve any difficulties that may have been encountered during the intervention. Consultation sessions with Mrs. Smith revealed that Greg did not like watching the video multiple times as it was outlined in the study's procedure, but enjoyed the discussions and roleplaying components of the intervention. Furthermore, Mrs. Smith stated that Greg seemed bothered by focusing on the topic of friendships at first and that it had been a topic Greg has not been willing to discuss in the past. Furthermore, during the Baseline phase of the study Ms. Smith stated that she was trying to encourage Greg to interact more frequently with her and his siblings. After consultations with the primary investigator, the primary investigator recommended that Ms. Smith interact with Greg like she would any other day. This recommendation most likely decreased Greg's opportunity to socially communicate because Ms. Smith would no longer artificially try to get Greg to participate during observation sessions. Lastly, throughout the length of the study, Ms. Smith reported having difficulty remembering to implement the treatment. This was specifically observed during week 8 of the intervention when she forgot to implement the study because she was preparing for her children

to start school the upcoming week. Mrs. Smith also reported that she attempted to implement the intervention directly before observation session 8.

**Alex's treatment.** The target behavior of this treatment was to improve Alex's social-emotional skills. To target these skills, three individualized social narratives and corresponding video models were used. Treatment planning with Mrs. Smith was completed to individualize the intervention for Alex's specific needs. To improve Alex's social-emotional skills, the social narratives and corresponding video models focused on 1) Using a 5-point scale to identify emotions; 2) Using 'Take-5' to take a break; and 3) Using belly breathing to help regulate. Alex was also observed for the frequency of disruptive behaviors or tantrums. Unfortunately, Alex was not observed independently using the social-emotional skills during the observational sessions, however, the frequency of tantrums during observational sessions were recorded. Figures for Alex depicting the analysis methods of level and trend are presented below.

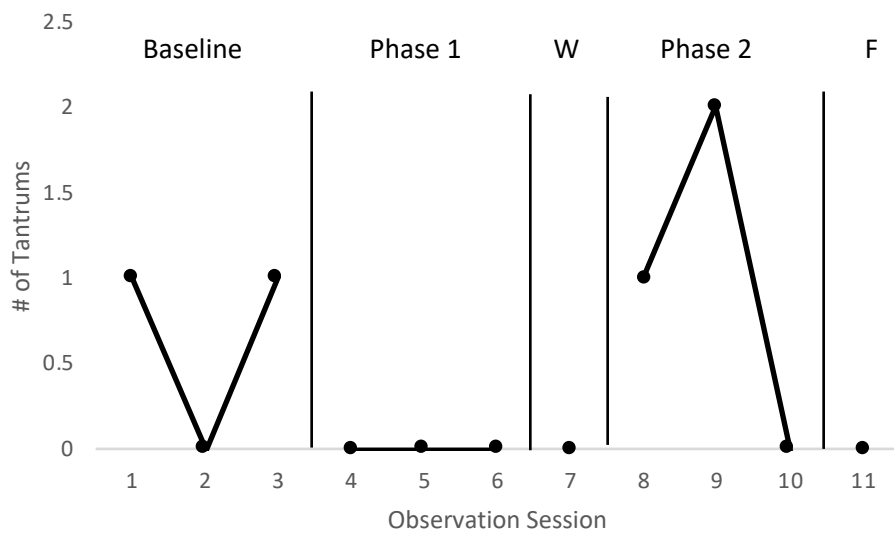
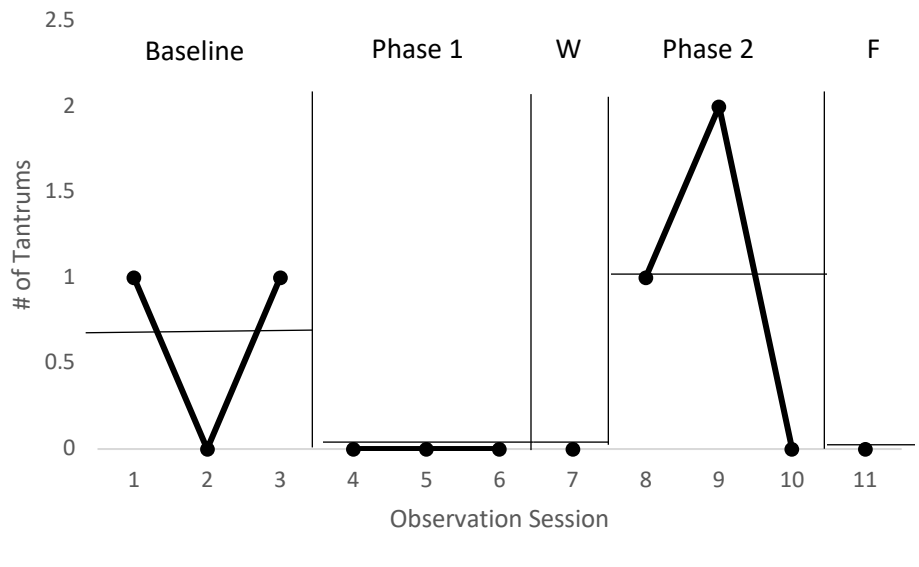


Figure 6. Alex's Emotion Regulation



*Figure 7. Alex’s Emotion Regulation-Level*

During data collection session in the home environment, research assistants recorded the frequency of each intervention strategy, as well as the frequency of emotion dysregulation or tantrums during 30-minute observation sessions. Alex was not observed independently participating in identifying emotions, taking a break, or using belly breathing to regulate his emotions during the observational sessions. Therefore, the frequency of these behaviors being observed in the home during were zero and figures were not created to conduct a visual analysis. However, the effectiveness of the intervention designed to improve Alex’s social-emotional skills was analyzed by exploring the frequency of tantrums observed during each observation session.

The level of Alex’s emotion regulation was analyzed by comparing the change of mean score between each phase of the intervention (Baseline, Phase 1, Withdrawal, Phase 2, and Follow-up). The level of Alex regulating his emotions changed from a mean rate of 0.66 tantrums per ½ hour during Baseline, 0 times during Phase 1 of the intervention, 0 times during the Withdrawal phase, 1 time during Phase 2 of the intervention, and 0 times during the Follow-up phase of the treatment. A stable baseline

within the recommended 50% of variability around the mean was observed. The PND is 83.33% and is considered to be moderately effective (Scruggs & Mastropeiri, 1998). Limitations will be discussed in chapter 5.

**Descriptive observations and consultations.** Similar to Greg, descriptive observations and consultations with Ms. Smith were also completed to provide a more holistic understanding of the observation sessions. Throughout the observation sessions, Alex was observed seeking attention from adults frequently. Alex would often go to the research assistants and try to seek their attention. He would pull their hair and try to interact with them. The research assistants ignored these attempts of attention-seeking.

Short consultation sessions between the parent and primary investigator also occurred every week to discuss the parent's thoughts and to problem-solve any difficulties that may have been encountered during the intervention. Consultation sessions with Mrs. Smith involved navigating multiple unforeseen factors including: medication introduction and changes, Alex's level of attention seeking behaviors, and Alex's resistance in learning new strategies.

Throughout the intervention, Mrs. Smith reported that Alex's attention seeking behavior made it difficult for her to keep Alex on task during the implementation of the study. She explained that he really enjoyed watching the videos, but would often refuse to discuss the social narratives or practice the treatment strategies. Mrs. Smith also reported that Alex's attention seeking behavior would often affect her ability to implement the intervention with Greg because Alex would often come into the designated intervention space and seek her attention.

Lastly, Mrs. Smith explained that some of the treatment strategies used in this study were similar to other strategies used in previous interventions Alex has participated in. Alex noticed the discrepancy

between a 5-point scale used in a previous intervention and the 5-point scale used to identify emotional states in this treatment. Mrs. Smith explained that Alex would argue with her regarding this discrepancy and avoid practicing the skills taught in the study. However, Mrs. Smith stated that she was able to prompt Alex to use the skills in their daily life and he would attempt to better regulate himself. For example, Mrs. Smith would ask if he is at a '5' on the 5-point scale indicating emotion dysregulation, she would prompt him to take a break, and she stated that Alex along with one of his younger siblings enjoyed practicing belly-breathing.

### **Social Validity of the Treatment**

Mrs. Smith completed pre-intervention and post-intervention social validity surveys for both Greg and Alex to explore Mrs. Smith's perceptions and acceptability of the individualized interventions using video-modeling and social narratives in the home environment. The pre-intervention social validity survey, parent training sessions, and Mrs. Smith's participation in the treatment planning for both Greg and Alex were conducted to examine the social validity before the intervention began. The post-intervention social validity survey and parent interviews were used to examine the Mrs. Smith's acceptability of the intervention after the intervention concluded for both of her sons. Additionally, the thematic analysis of the parent interviews (exit- and follow-up), as well as the parent logs were used to explore Mrs. Smith's overall perception of the intervention regarding its' effectiveness, maintenance, and generalization of skills. This interview data was analyzed using NVivo Version 10 qualitative software (NVivo, 2012).

**Social validity of Greg's treatment.** Mrs. Smith completed the pre-intervention social validity survey directly after the treatment planning and parent trainings were completed. To analyze the social validity of the intervention for both Greg and Alex, the overall mean score of the pre-intervention social

validity scale was compared to the post-intervention social validity scale excluding the 13<sup>th</sup> questions. Item 13 of the post-intervention survey required Ms. Smith to rate if she would recommend this treatment to others. Items 1-12 on both the pre- and post- social validity scales are identical (post=past tense), and adding an additional rating into the mean equation of the post-version of the measure may have skewed the data. Therefore, item 13 on the post-version of the measure is described separately below. Lastly, a summary of Mrs. Smith's comments and opinions are presented in this section for both Greg and Alex.

Mrs. Smith rated the social validity of Greg's intervention on the pre-intervention survey with an overall mean score of 6.3 with ratings ranging from 5-7 on the 7-point Likert scale. Mrs. Smith rated the social validity of Greg's treatment on the post-intervention survey with an overall mean score of 6.16 (range 4 – 7). On the post-intervention survey, Mrs. Smith also rated the item 13 at a '7—strongly agree,' indicating that she strongly agrees that the intervention is one that she would recommend to others. Mrs. Smith reported in the post-intervention Comments/Opinions section that she was not sure if the treatment improved Greg's self-confidence and that the skills did not come quickly; however, she explained that he has gained some self-awareness of peers and acknowledges that he wants to be around peers.

**Social validity of Alex's treatment.** Mrs. Smith also completed pre- and post- social validity scales for Alex. Mrs. Smith rated the social validity of Alex's intervention on the pre-intervention survey with an overall mean score of 6.3 with ratings ranging from 5-7 on the 7-point Likert scale. Mrs. Smith rated the social validity of Alex's treatment on the post-intervention survey with an overall mean score of 5.75 with ratings ranging from 4-7 on the 7-point Likert scale. On the post-intervention survey, Mrs. Smith also rated the item 13 at a '7-Strongly Agree' indicating that she strongly agrees that the

intervention is one that she would recommend to others. Mrs. Smith reported in the post-intervention Comments/Opinions section that although Alex had difficulty paying attention and didn't want to follow some of the treatment procedure, she did see improvement with Alex using belly breathing.

### **Thematic Analysis of Parent Reports**

Through qualitative analysis, a more comprehensive outlook of the results for this study is observed. Through multiple rounds of coding and discussions held by the research team, themes emerged from the qualitative data. In this section, the results discovered using qualitative methodology and the procedures used to discover themes within the data is outlined below.

Following the structural coding framework, the raw data was sorted into six conceptual categories: acceptability, generalization, maintenance, barriers, effectiveness, and miscellaneous. These original codes were conceptualized by the research team before the study was conducted. Each code was created to parallel the research questions of this study in attempts to explore each research questions using qualitative methodology.

Further analysis was then conducted by the research team. To check for selective perception and highlight blind spots in interpretive analysis, the research team used analyst triangulation by coding material separately then convened as a team to discuss discrepancies. Moreover, coding comparisons were conducted to ensure coding consistency across the multiple members of the research team. The primary themes include (1) Parent Inconsistent Implementation, (2) Perceived Effectiveness and Generalization, (3) Indirect Maintenance of Treatment Outcomes, and (4) Strong Social Validity. The following section will provide detail about the identified themes.

**Theme 1: Inconsistency in parent implementation.** For this study, the raw data initially coded as 'Barriers' encompassed the most complex data across participants. That is, several factors contributed



to Ms. Smith's ability to implement the treatment consistently. Moreover, it was determined by the research team through coding, analyst triangulation, and interpretation that the overarching barrier to treatment fidelity was the parent's inconsistent implementation of the treatment. Through the data obtained through the parent logs and parent interviews (exit- and follow-up interviews), Ms. Smith reported having difficulty implementing the treatment for various reasons. Three primary factors were determined to contribute to Ms. Smith's difficulty implementing the treatment and these three factors were coded as subthemes.

***Subtheme 1: Impeding behaviors.*** This subtheme included data that reference any behavior that may have made the implementation of the treatment difficult for Ms. Smith. Impeding behaviors were observed across participants and this thematic analysis determined primary impeding behaviors for each participant. For Greg, results indicated that his anxiety or worries about the content discussed during treatment was a barrier for Ms. Smith to navigate during the implementation of treatment. The social narratives and video models were designed for Greg to improve his social communication in order to navigate friendships. Prior to treatment, the topic of friendship was consistently avoided and Ms. Smith reported that Greg believed he did not need friends but felt concerned when she would try to discuss the topic of friendship with him. Therefore, during the implementation of the treatment Ms. Smith encountered anxiety in the form of avoidance. Specifically, Ms. Smith reported, "There's a lot of anxiety. And so there wasn't a real want to focus on the interventions this week" which suggest that managing Greg's anxious behaviors (avoidance of the treatment) affected how Ms. Smith was able to implement the treatment with fidelity.

Alex was also described as having impeding behaviors that made it more challenging for Ms. Smith to implement the treatment consistently. Ms. Smith described several instances where Alex

exhibited impulsive and attention-seeking behaviors. Specifically, Alex had difficulty staying on-task throughout the implementation of the treatment and was only interested in specific components of the treatment. For example, Alex disliked the use of the social narratives and only liked viewing the video models. Furthermore, when Alex lost interest in the video model, he was described as urging his mother to do other activities. Ms. Smith stated, “So we tried to just discuss the stuff on the papers and the booklets, and Alex wasn't having that because he wasn't watching the videos and that's all he was willing to do”. Therefore, Alex only being attentive to specific components of the treatment made it very difficult for Ms. Smith to implement the treatment consistently and with fidelity.

Impeding behaviors were also observed across both participants. Results showed that at various points throughout the treatment, Greg and Alex struggled with maintaining motivation to participate in the treatment at home. This was highlighted through Greg asking why he needed to watch the video three times. Also, it was reported that Alex would even avoid or exit the room where the treatment was implemented. When Greg and Alex were less motivated to participate, Ms. Smith had to navigate various behaviors that made it more difficult to implement the treatment consistently.

***Subtheme 2: Family Stressors.*** This subtheme included coded information that involved extraneous variables that caused additional stress on the family unit or Ms. Smith. Ms. Smith is the mother of five children, which can make it difficult to manage family dynamics and distribute attention to each child. Therefore, when two of her five children were receiving what was perceived as special attention from their mother, other children would interrupt the implementation of the treatment and seek out attention by requesting to participate in the study or ask questions about various topics. For example, Ms. Smith stated that, “my four-year-old was probably the only problem. He would always try to sneak in, and I worry that it was distracting Alex or Greg. I would have to stop the intervention and tell my

four-year-old that he can't come in...One time, when we were belly breathing, I heard him in the hallway, and I'm like, 'Fred (pseudonym), get out of here' and he's like 'I was getting my stuffed animal to belly breath with you'." Therefore, the treatment for both Alex and Greg were often interrupted and not fully implemented as intended (i.e. quiet space with no interruptions).

Furthermore, other life events outside of the parameters of this study may have affected Ms. Smith's ability to implement treatment consistently. Specifically, Ms. Smith identified events such as her eldest daughter moving out of the home and the start of the school year to be particularly stressful for the family. The family adjusting to a new routine in the home (summer vs. school schedules) made it more challenging for Ms. Smith to remember to implement the intervention all together. For example, Ms. Smith explained, "I completely dropped the ball on everything, and I forgot to do the interventions. School is starting soon and I am trying to get everyone ready". Thus, such factors created additional stress on the family unit that made it more difficult for Ms. Smith to implement the treatment consistently.

***Subtheme 3: Additional intervention.*** There were additional outside factors that may have influenced the results of this study. Such factors (i.e. previous intervention and introduction of medication) were coded as 'Additional Intervention'. Both participants received additional interventions either before or during the implementation of this study. Moreover, such additional services may have influenced Ms. Smith's ability to implement the treatment consistently. Specifically, Ms. Smith stated multiple factors that may have affected the treatment for Alex.

During treatment, Alex started a medication intervention and the dosage was adjusted throughout his treatment in this study. Ms. Smith observed behaviors that she believed was caused by the medication intervention. For example, Ms. Smith would explain in her parent logs that "Alex was not

having a great week. We don't know if he wasn't feeling good or it is his meds, but he was not able to do any kind of intervention on Monday or Tuesday of this week...Alex was really crabby with everyone and I had to keep him under control”.

Furthermore, Ms. Smith noted that Alex had some difficulty accepting differences between his current treatment and some treatment strategies he was exposed to in other treatments (i.e. social skills group). Specifically, “Alex had a hard time at first with the social narratives. By the third time, he did pretty well. With the first one, we did the scale, and he noticed that it was different than a scale he used in YETI (social skills group)”. Therefore, Alex’s previous knowledge gained from previous treatment made it difficult for him to fully accept the use of the 5-point scale used in his current treatment.

Additionally, Ms. Smith explained how Greg was hesitant to participate in the study at times. Ms. Smith explained that during his hesitation, Greg would explain that it (treatment) felt like therapy at home which he was not enthusiastic about. “At first, he (Greg) was adverse to doing it because it was one more thing and he hated doing the therapies and stuff...but he does it”. Therefore, Greg expressed some hesitation in participating in his treatment because he was already involved in other treatments that he was not enthusiastic about. Thus, the research team determined that this subtheme was necessary because Ms. Smith identified specific components of other treatments that may have influenced why Alex and Greg partook in various behaviors essentially contributing to Ms. Smith’s difficulty with implementation.

**Theme 2: Perceived effectiveness and generalization.** For this study, the raw data initially coded as ‘Effectiveness’ and ‘Generalization’ highlighted the parent’s perspective on the treatment’s effectiveness and generalizability. Through coding, analyst triangulation, and interpretation of the parent logs and parent interviews (exit- and follow-up), the theme of Perceived Effectiveness and

Generalization emerged. The coded data that supports this theme referenced an unclear certainty of the effectiveness of the treatment. For example, Ms. Smith stated, “Overall, as I've said many times, truly amazing experience. I think the biggest part for me is seeing just the evolution and improvement with some things that I truly believe has come out at least from us talking about these interventions”. This statement, along with other statements made by Ms. Smith, references improvement but do not specify which components of social skills were improved by strategies used in treatment. Therefore, the research team determined that Ms. Smith has some uncertainty regarding the treatment’s effectiveness in improving the specific social skills of her children.

However, Ms. Smith did attribute some specific improvements and interactions with her children to their participation in the study. Specifically, Ms. Smith explained that “Greg's noticing peers, he's talking about things with peers, whether they're good or bad, he is expressing things now, and that's great, and I really do think these interventions are a big part of that”. Here, Ms. Smith attributes Greg’s new interest in friendships with his treatment.

Furthermore, Ms. Smith claimed to observe some improvements in Alex’s ability to regulate emotions and maintain attention; however, she was uncertain regarding the magnitude of improvement for at least some of the time. For example, Ms. Smith stated, “We are seeing some positive things with the interventions. I've noticed Alex paying a little bit more attention each week to what we're doing”. This quote highlights how Ms. Smith is having difficulty observing larger changes in her childrens’ behavior making it difficult to associate improvements with the treatment.

In contrast, Ms. Smith reported the possible generalization of social-emotional skills when Alex was able to self-regulate quickly with some guidance. Ms. Smith explained that Alex stubbed his toe and became very escalated and angry toward his sibling. However, Ms. Smith was able to help Alex identify

his intensity of emotions on the emotion scale, take a breath, and later problem-solve until Alex was able to regulate his emotions. Ms. Smith stated that “He (Alex) was willing to talk to me and just go back and problem solve what happened. So that's a big one, because we have never been able to just move on like that”. Although, Ms. Smith was able to observe some improvements in her children’s behaviors, and at times, it was unclear to Ms. Smith if the observed improvements were the result of participation in this study. However, other reports made by Ms. Smith clearly attributed improvement in her children’s behaviors (skills) to the participation in this study.

**Theme 3: Indirect maintenance of treatment outcomes.** For this study, the raw data initially coded as ‘Maintenance’ explored if treatment outcomes were maintained over time due to independent implementation of the intervention strategies used in the treatment. Through coding, analyst triangulation, and interpretation of the parent logs and parent interviews (exit- and follow-up), the theme of *Indirect Maintenance of Treatment Outcomes* emerged. Analysis of this coded data revealed that Ms. Smith had the intention of continuing to implement the treatment using the video models and social narratives as she did during the treatment phases of the study. She was unsuccessful, however, in implementing the intervention with the same fidelity and frequency she did during treatment. Instead, she found it easier to use the treatment strategies with Alex by adapting them. For example, Ms. Smith and Alex created a new emotions rating scale. They wrote next to each picture of the scale “Alex feels “emotion” (happy, sad, tired, etc.). Moreover, Ms. Smith stated that she had more success guiding Alex to use treatment strategies as opposed Alex independently knowing when to use them while escalated. With Greg, Ms. Smith felt that the treatment opened a platform for her and Greg to discuss friendships and decipher social situations. For example, Ms. Smith explained that “He (Greg) has never expressed anything about friends for 11 years, or a desire to have friends, or desire to interact. And now we discuss

all sorts of interactions about interactions with kids on the bus and how he didn't understand why one girl walked away after talking to him". Therefore, Ms. Smith is having conversations about social situations that she was unable to have with her son before this treatment occurred.

Additionally, Ms. Smith also explained that she has attempted and intends to continue advocating for the use of these strategies to be used in the school setting. Ms. Smith reported that at first, the school was very resistant to using any of the strategies from this study at school. Ms. Smith stated that the principal said, "You can do anything you like at home, but we have our own interventions here at school". Ms. Smith also stated that by advocating more with the school psychologist and speech therapist, the school is now using the strategy of taking a break for Alex, which the school has adapted for their own use. Furthermore, during the 1-month follow-up interview, Ms. Smith stated that they are talking about using belly breathing in school, as well. Although, the continued implementation of the treatment using the formal procedural and actual video-models did not occur, Ms. Smith has continued to implement the treatment with a more organic approach as new/problem behaviors occur or situations naturally emerge in the family unit.

**Theme 4: Strong social validity.** Strong social validity indicates that parents believe in the intervention's usefulness to a great extent, while weak social validity would indicate little or no belief. Through this data analysis, the theme of strong social validity encompasses material from the parent logs and interviews coded as social validity. Moreover, Spear and colleagues (2013) described how the strength of a treatment's social validity can be determined by examining specific quality components. Such quality components examine the social importance of the dependent variable, the magnitude of change, and the practicality of the treatment implementation (Spear et. al., 2013).

During the thematic analysis of this coded information, the research team used the quality components described by Spear and colleagues (2013) to help determine the strength of social validity. That is, the research team considered Spear and colleagues' (2013) quality when conceptualizing that the parent's social validity was 'strong'. Multiple statements by Ms. Smith showcased her concern about wanting to improve her children's social skills. Specifically, Ms. Smith explained how Greg was going into middle school and that he needed to learn how to interact with others so he wouldn't be taken advantage of in the future. In the following quote, Ms. Smith showcases the importance of the DV as well as the importance of the magnitude of change: "He's actually telling me, 'Hey. I need help with this, or hey, I need help with that (social situation).' And that's been good, because it's middle school and it's a little harder. So I'm super glad he's saying, 'I need this extra help'...and then he advocated to me too, which he never advocates, that he was having problems with some social situations in PE that he wasn't sure about how to go up and talk to people." Thus, it is important for Greg to improve his social skills because he is going into middle school and social situations are more complex. Moreover, the magnitude of change was also deduced when Ms. Smith reports Greg advocating for himself (i.e., never advocating compared to currently advocating for self).

Ms. Smith indicated the practicality and utility of the treatment in the following quote: "it (the treatment) is easy to implement; I just need to remember to do it". Thus, the treatment was viewed to be feasible and implemented with ease despite the barriers to implementation that were previously reviewed. Lastly, Ms. Smith continued to explain how difficult it is to actually get in-home services for children with autism. She also expressed the lack of opportunity to be involved in the treatment. Furthermore, Ms. Smith also commented that she would love the opportunity to participate in a study like this in the future. Therefore, the research team determined that strong social validity occurred after



quality components were identified and Ms. Smith endorsed a desire for future participation in similar treatments.

## **Chapter V: Discussion**

Overall, the results of this study found that treatment fidelity is an important factor that may influence the effectiveness of EBPs in the home. Furthermore, social validity of parent driven treatments can be promising even when impeding behaviors presented by participation make the implementation and maintenance of treatment challenging. To my knowledge, there are few, if any, research studies that have investigated the use of combined video modeling and social narratives among children with autism, particularly with attention to the use of parent-implemented interventions. This chapter will discuss the findings of each research question included in the study and outline the limitations of the current study. Additionally, this chapter will discuss the contribution the findings of this study make to the existing literature on combining EBPs and using parent-implemented interventions. This chapter also includes discussion of the practical significance and implications of this study.

### **Effectiveness of Parent-Implemented Interventions**

The purpose of the study was to examine the effectiveness of parent-implemented interventions in improving the social skills of children with ASD, and the results of this study were not conclusive. Results showed a discrepancy between the qualitative and quantitative data when examining the effectiveness of the treatments for both Greg and Alex. Qualitative results consistently demonstrated favorable reports from the parent in this study, while the quantitative results of this study highlighted less favorable outcomes. Nevertheless, these contradicting results emphasize the importance of examining research questions using multiple perspectives and methods, so a more holistic picture of the phenomenon being studied can be obtained.

The quantitative results of this study found that the treatment designed to improve Greg's overall social communication was not shown to be effective. There were a number of potential reasons as to

why there was not improvement in the target behavior (i.e., social communication), as hypothesized. The parameter of 50% variability of baseline data was applied in this study. During Greg's treatment, the data in the baseline phase exceeded the prescribed variability cutoffs in the baseline phase. Therefore, clear causal relationships could not be determined, making Greg's treatment ineffective. Indeed, more variability in baseline data of studies within naturalistic settings (i.e. home and school) is acceptable unlike that of controlled environments (i.e. a clinic setting) (Alberto & Troutman, 2009). However, when too much variability is present, causal conclusions should not be made (Kazdin, 2011). If feasible, scholars recommend that several data points are collected until a stable baseline is established when using an ABAB design (Cooper, Timothy & Heward, 2007). However, due to the treatment timeline approved for this study (10 weeks with 1-month follow-up) , it was not feasible to collect more data points during the baseline phase or to ensure participants received enough treatment.

Another potential reason for the lack of effectiveness of the treatment was Ms. Smith's inconsistent implementation of Greg's treatment. The goal of the treatment was to improve Greg's social communication by using the combined use of EBPs (i.e., social narratives, video modeling, and PII). Studies have shown that EBPs are often ineffective if treatment fidelity is poor (Wall, 2015). Specifically, Wall (2015) explored the effectiveness of social narratives and found that inconsistent or unfavorable outcomes were the result of weak and inconsistent implementation of treatment. Social narratives were a component of Greg's treatment, and Ms. Smith only implemented Greg's treatment as intended approximately 53% of the time. Ms. Smith's inconsistent implementation of the treatment likely affected the outcome of the treatment.

Additionally, the specific type of video model used in treatment may have contributed to the ineffectiveness of Greg's treatment. Video modeling may be the most researched EBP that has shown

favorable outcomes when improving the social skills of children with ASD (Franzone & Collet-Klingenberg, 2008), as it fosters improvements in the social communication of children with ASD (Victor, Little & Akin-Little, 2011). Therefore, Greg's treatment incorporated the use of video peer-modeling to improve his overall social communication. However, determining the type of video model to best foster skill acquisition and maintenance can be challenging.

A study by Sherer and colleagues (2001) that focused on improving conversational skills claimed that conversing with others is best taught using peer models. Therefore, video peer-modeling appears to be an appropriate strategy when teaching social communication skills due to the specific components of the target behavior (i.e., communicating with others). In contrast, literature also supports the use of video self-modeling in improving social communication. A meta-analysis investigating the efficacy of video self-modeling determined that video self-modeling was particularly effective in improving various components of social communication in preschool- and elementary-aged participants with ASD (Mason et al., 2016).

Furthermore, a study by Marcus and Wilder (2009) determined that video self-modeling may be more effective than video- peer modeling when teaching new skills to children with ASD. Though Marcus and Wilder (2009) showcased more favorable outcomes in using video self-modeling in a reading intervention and did not focus on improving social communication, the authors recommend the use of self-modeling to teach a variety of skills. As Greg was learning new social communication skills, therefore, video self-modeling may have aided in skill acquisition.

Research also shows that video peer-modeling may be less effective in teaching new skills when peers used in video models are dissimilar to the participant in some important way (e.g. gender, speech articulation, etc.; Marcus & Wilder, 2009). The peer models used in the video peer- modeling

component of Greg's treatment were of similar age and race to Greg, however, they were both of a different gender. Therefore, the gender of the peer models used in Greg's treatment may have affected the outcomes of treatment.

Although Greg's treatment was not shown to be effective, Alex's treatment, which was designed to improve his emotion regulation, was determined to lead to moderate improvement. Specifically, results indicated that Alex improved his emotion-regulation, as evidenced by a decrease in frequency of disruptive behaviors. Research has shown the use of social narratives and video modeling to be effective in decreasing disruptive behaviors similar to those that Alex exhibited, such as hitting, kicking, and screaming (Mason et al., 2016; Delano & Snell, 2006). Findings from the current study further contribute to existing research related to emotion regulation of children with ASD because this study explicitly focused on the combined approach of using social narratives, video-modeling, and PII to improve emotion regulation and decrease disruptive behaviors. To my knowledge, no previous studies have focused on combining these EBPs to improve emotion regulation of a child with ASD; however, it is also important to note that Alex was introduced to a medication intervention and dosage adjustment throughout the study (dosage unknown) and received services from an occupational therapist which may have influenced the results of this study.

Though the frequency of Alex's disruptive behaviors decreased, results showed that the treatment was ineffective regarding Alex's independent use of the social –emotional skills taught in this study. Alex was not observed independently using the 5-point emotion scale, he was not observed asking to 'Take-5' or take a break strategy, nor was he observed using belly-breathing. Nonetheless, Alex was able to use some of these strategies when prompted to by Ms. Smith. Specifically, Alex could identify when he was a '5' on the 5-point scale, and he could take a break when prompted.

Though Alex was not observed independently using the skills taught in this treatment, Ms. Smith did report that Alex could use some skills to regulate his emotions when she used co-regulation techniques (i.e. prompting). That is, Alex could use the emotion regulation skills taught in this treatment with additional support and guidance from his mother. Thus, Alex's treatment may have benefitted from the integration of parent co-regulation techniques. A study by Ting and Weiss (2017) investigated the relationship between parent co-regulation techniques (e.g. prompting, scaffolding, emotion following) and the emotion regulation of school-aged children with ASD. Findings indicated that parental co-regulation and overall scaffolding have important associations with the child's externalizing problems (Ting & Weiss, 2017). Therefore, Ting and Weiss (2017) recommend that interventions for children with ASD targeting emotion regulation should encourage parents to use scaffolding techniques when their child is exhibiting anger or are overly emotional aroused (Ting & Weiss, 2017).

### **Maintenance of Treatment Outcomes**

In the current study, I hypothesized that a modular approach to treatment for improving social skills in the home setting would demonstrate maintenance of treatment effects at one-month follow-up, as demonstrated by comparing data collected during intervention phases to data collected during the maintenance phase. For both Greg and Alex, results indicated that the maintenance of treatment outcomes was not observed at the one-month follow-up. Results indicated that Ms. Smith intended to continue treatment after the conclusion of the treatment phase of the study; however, she stated that various barriers interfered with her ability to implement the treatment strategies after the treatment phase concluded.

Results of this study also highlighted how the impeding behaviors presented by Greg (i.e., anxiety) and Alex (i.e., attention-seeking) made it more challenging for Ms. Smith to implement the

treatments as they were intended. Moreover, family stressors, such as changes in the family's routine with the start of the school year and parenting five children in the home made it more difficult for Ms. Smith to continue the treatment after the last treatment phase of the study concluded. The extant literature is unclear about reasons for why the generalization and maintenance of social skills of children with ASD is so difficult (Autism Ontario, 2011), as there are few research studies that have specifically examined the barriers to generalization and maintenance. The existing literature suggests that conducting studies that focus on the maintenance and generalization of skills are challenging due to concerns regarding logistics, potential biases, and possible measurement error (Gao & Harris, 2014; Kukull & Ganguli, 2012).

The current study provided an initial exploration of specific factors (participant impeding behaviors and family stressors) that may account for some of the difficulty as to why the generalization of social skills and maintenance of treatment outcomes in the home setting is challenging when treating individuals on the spectrum. Specifically, results showed that events like the school year starting and managing behaviors at home and school made it difficult for Ms. Smith to continue implementing treatment after the initial treatment phases were completed. Given that this is a single-subject research study, more research needs to be conducted to explore the factors that contribute to the successful maintenance of social skills for children on the spectrum so the generalization of skills may occur.

An important result of the current study was the implementation, and lack of implementation, of the EBPs (i.e., video modeling, social narratives) in both the home and school settings. On the one hand, results indicated that after the study concluded, Ms. Smith attempted to collaborate with her children's school district so the treatment strategies used in this study may be also used in the school setting. Specifically, Ms. Smith advocated for the use of the same social narratives and video models used in

Alex's treatment to be used at school; however, she reported that she encountered significant resistance from the school district in regards to adopting such EBPs. Unfortunately, such resistance from the school district is not surprising. Although there is a growing trend since 1990's in the fields of psychology and education to implement EBPs, there continues to be a *research to practice gap* (Cook, 2015; Schutz, 2016). Despite the development of practices that have shown to be highly effective, these EBPs have not often been fully adopted and sustained in the school setting (Lucyshyn, 2016). Several proximal factors attribute to the research to practice gap, such as inadequate practitioner training, a poor fit between treatment requirements and existing organizational structures, insufficient administrative support, and practitioner resistance to change (Gotham, 2006).

On the other hand, some of the strategies used in this study were adopted and used as part of Alex's treatment package in the school. For example, the school adopted the Take-5 (taking a break) and belly breathing strategies to help Alex regulate his emotions when he was at school. In this case, parent advocacy may have made the use of these EBPs possible in his school. These results parallel the arguments made by Cook and colleagues (2012), who indicated that parent-teacher collaboration is the key to facilitating the effective implementation of EBPs in schools. Furthermore, the practice of implementation science explores factors that promote and hinder the implementation of EBPs (Fixsen et al., 2010) and findings from such studies highlight the importance of parent involvement when implementing new curriculum in schools (Olibie, 2014). Therefore, the results of this study draw attention to how parent involvement can influence how EBPs can be implemented in the school setting.

### **Social Validity and Treatment Fidelity of Parent-Implemented Interventions**

Overall, the results of this study supported my hypothesis that parents would perceive the combining of PII, social narratives, and video-modeling as an acceptable and feasible treatment for



targeting social skills development. Results from the social validity scales and follow-up parent interview indicate that Ms. Smith was invested and committed to the treatment goals, the procedures of the study, and the usefulness of the treatment strategies. Ms. Smith had difficulty, however, implementing the intervention as intended; thus there was a discrepancy between the social validity and treatment fidelity of this study.

The discrepancy observed between the social validity and the treatment fidelity of this study is interesting, because research suggests that levels of social validity and treatment fidelity are often positively correlated (Grandstaff-Beckers, Saal & Check, 2013). That is, if a treatment has high social validity, then there is also likely to be high treatment fidelity. Many studies fail to investigate treatment fidelity altogether, despite researchers emphasizing the importance of treatment fidelity in intervention research (O'Donnell, 2008; Moncher & Prinz, 1991). To align with these recommendations, this study explicitly included measures of treatment fidelity. For instance, a treatment manual was provided (a binder including materials, the treatment procedure, and a schedule) and the parent (interventionist) participated in role-plays to help troubleshoot problems that might occur during the implementation of treatment. As the primary investigator, I also provided weekly phone consultation sessions and was available as needed when troubleshooting was necessary. Three parent-training sessions were designed for the interventionist's current skills level and educated the interventionist regarding the theory, treatment procedure, and materials of the study. Moreover, treatment fidelity was monitored by using a treatment fidelity measure after each implementation. Lastly, the treatment receipt was assessed by the data collected during the observation sessions.

These methods to reinforce treatment fidelity align with current research. Gearing and colleagues (2011) conducted a review of the literature and identified four core elements of fidelity in intervention,

clinical, and behavioral research. These elements included a treatment manual, training, the monitoring of treatment delivery, and treatment receipt (Gearing et. al., 2011). When considering fidelity, a ‘treatment manual’ should include how a program is organized and delivered (e.g. equipment and materials needed; Bond et al., 2000) and guidelines for when troubleshooting is needed to address specific problems (Bellg et al., 2004). The element of ‘training’ involves the necessary training and supervision based on experience and education of the interventionist (Bellg et al., 2004). The ‘monitoring of fidelity’ during the implementation of treatment is the heart of fidelity and various measures can monitor fidelity (Gearing et. al., 2011). Lastly, the element of ‘treatment receipt’ measures if the participant comprehends and uses the skills during treatment sessions (Borelli et al., 2005).

Despite the various methods to enhance treatment fidelity, there was a lack of fidelity in the implementation. Ms. Smith reported moderate to high social validity of the treatments for both Greg and Alex; however, she implemented Greg’s treatment as intended for only 53% of the time, while she implemented Alex’s treatment for only 50% of the time. It is unclear why there was not a strong association between social validity and treatment fidelity in the current study. Ecological factors, such as the family context (e.g. Ms. Smith was a mother of five children who worked full time), may explain why treatment fidelity was affected.

Ultimately, the poor treatment fidelity observed in this study affected the intended treatment dosage each participant received. It is recommended that an accumulation (may include various services) of 30 hours of treatment is needed to improve skills of children with ASD, while other researchers indicate 30 hours is insufficient (Bellini et al., 2007; Gresham et al., 2001). Specifically, Bellini and colleagues (2007), as well as, Gresham and colleagues (2001) suggest that 30 hours of instruction over 10 to 12 weeks is insufficient to improve social skills. Therefore, future studies that use

parent-driven treatment should consider how the treatment dosage participants receive may affect the overall effectiveness and maintenance of treatment outcomes.

Additionally, the current study was unique in that the parent was the *primary* interventionist of the treatment, rather than a trained professional (e.g., a behavior therapist or psychologist). Many research studies (e.g. Bellini et. al., 2007) focusing on intervention effectiveness for children with autism use research assistants as the primary interventionist. Further, Gearings and colleagues' (2011) recommendations for treatment fidelity were important; however, they reviewed studies in which the primary interventionists were research assistants.

Thus, this study provides additional insight into several challenges in research and practice for children with autism. First, the goal of the study was to understand the effectiveness of the parent-implemented interventions, which by definition would have the *parent* implement the intervention, rather than a research assistant. This required a reliance on the parent to adhere to treatment fidelity to align with rigorous single-subject methodology. In an ideal world, the parent would implement the intervention with true fidelity. The reality, however, is that parents with children with autism experience challenges that are likely to affect the ability to implement PIIs. This research study thus highlights the inherent challenges of investigating parent-implemented interventions, yet also emphasizes the critical role of these types of studies to address the research-to-practice gap.

### **Future Research and Implications**

Future research involving parent participation with the treatment of their children with ASD is needed to better bridge the gap between results observed in a controlled research setting and the use of social skills in 'real world' situations. Within a clinic setting, a researcher or clinician can only replicate real life situations to a certain degree (Gresham et al., 2001). Therefore, future research should focus on

providing comprehensive treatment packages that include treatment in the home, school, and clinic settings. The generalization of learned social skills is difficult for children on the spectrum (Gao & Harris, 2014; Kukull & Ganguli, 2012); therefore, providing consistent support and intervention across settings may foster better treatment outcomes. Within this section, recommendations about how to improve treatment fidelity and maintenance of treatment outcomes are reviewed. Furthermore, suggested considerations for treatment within the home, clinic, and school settings are also provided.

**Improving Treatment Fidelity.** As I previously discussed, treatment fidelity appears to play an important role when exploring the effectiveness and social validity of the treatments used in this study. Furthermore, this study is unique in that the parent is the primary interventionist who implements treatments opposed to a research assistant or trained clinician. Therefore, future research should explore how to better assess and improve treatment fidelity when parents are the interventionists that are implementing EBPs like video modeling and social narratives. Weekly phone consultations with the primary investigator of this study were used to help monitor treatment fidelity and troubleshoot obstacles to the implementation of treatment. Despite the additional support provided by the primary investigator through these consultations, treatment fidelity was still a concern. Therefore, the role of consultation within a treatment context should be considered when monitoring fidelity and alternative methods of consultation should also be explored.

Currently, Fischer, Erchul, and Schultz (2018) are conducting exciting research on teleconsultations with schools. They consider teleconsultation as the new frontier of educational and psychological consultation. Therefore the delivery of consultative services using videoconferencing and other technologies is currently being explored and the support for the use of teleconsultation as an acceptable platform to deliver services is growing (Fischer, Erchul & Schultz, 2018). ‘Telehealth’,

‘telepsychology’, ‘telepractice’, and telemental health’ are all terms that have described the use of technology to provide psychological services to a wide range of clients without needing to physically meet with the clients in person (Novotney, 2011). Telepractice has grown significantly in the field of psychology and has been shown to be effective in overcoming several barriers to treatment and improve accessibility to services (Novotney, 2011). Therefore, the potential role teleconsultation could play within a consistent treatment program across settings should be considered and could provide parent interventionists with the support they need to implement EBPs with fidelity. Furthermore, the type of consultation, duration, and frequency of consultation are variables to consider when developing a treatment program to improve the social skills of children with ASD in the home, clinic, and school settings.

**Improving Maintenance and Generalization of Social Skills.** Indeed, the results of this study parallel findings of previous research that display how the maintenance and generalization of social skills is difficult for children on the spectrum (Gao & Harris, 2014; Kukull & Ganguli, 2012). This study investigated if parents providing EBPs to their children with ASD in the home environment could foster greater maintenance of social skills. Unfortunately, the maintenance of treatment outcomes was not observed. Therefore, future research needs to focus on how to improve the maintenance and generalization of social skills of children with ASD.

The use of parent driven treatments (i.e., parent-mediated interventions, PIIs) may still be successful in fostering greater maintenance and generalization of social skills, as long as parents receive appropriate support and training. Specifically, treatments that provided parents with verbal and written instructions, modeling, review of videotaped sessions in the home, and feedback during weekly home visits have shown to improve generalization and maintenance of treatment outcomes (Anderson &

McMillan, 2001). Thus, future research might adapt such strategies (instruction, modeling, feedback) for social skills interventions, and study how strategies designed to support parent driven treatment affects the maintenance and generalization of social skills.

Specific treatments like *Floortime* (Greenspan & Weider, 1979) train parents to work with children with ASD on their developmental level and interact with them during child-directed play. During these interactions, therapists teach parents to direct their children in increasingly more complex interactions that improve their child's communication skills, shared attention, and self-regulation (Greenspan & Wieder, 2003). Additionally, *Pivotal Response Treatment* (PRT; Koegel & Koegel, 1987) uses individualized treatment and focuses on training parents how to address "pivotal" areas of their child's development (motivation, response to multiple cues, self-management, and initiation of social interactions) instead of working on one specific behavior. Moreover, PRT is considered to be a lifestyle adopted by the whole family and more than 20 studies have shown PRT to be effective in improving communication skills of children with ASD (Vernon et. al. 2019). Lastly, *Parent-Child Interaction Therapy* (PCIT; Eyeburg, 1988) is an EBP that coaches parents using 'bug-in-the-ear' technology to address behavioral concerns in the moment. In doing so, parents learn and practice how to manage emotional or behavior problems, language issues, developmental disabilities, or mental health disorders (Ginn et. al, 2017). Therefore, treatments that focus on parent involvement with developing their child's skills have shown to be effective. Thus, the development of future social skills interventions should consider the use of parents in treatment.

**Home-based interventions.** Results of this study highlight how difficult it can be for parents to implement a strict research protocol within the home setting. Therefore, it is important to discuss the training parents receive to successful implement EBPs in the home. Parent training, consultations with

the primary investigator of this study, and all of the tools needed to implement the treatment were provided to the parents to implement the intervention with fidelity; however, multiple barriers to treatment prevented the intervention to be implemented with fidelity in the home setting.

The implementation of treatment was difficult due to impeding behaviors presented by the participants of this study. Specifically, attention seeking and/or impulsivity can make the implementation of a strict research protocol very difficult to manage and implement treatment successfully (Perepletchikova & Kazdin, 2005). *Parent Management Training* (PMT) and parent training that involve general behavioral techniques have been shown to be effective in improving behavior such as defiance, impulsivity, and inattention (Loren et al., 2013; Lees & Ronan, 2008). Thus, the parent trainings and consultations components of this study may have benefitted from incorporating strategies to manage such impeding behaviors before teaching the child new skills.

However, providing parent trainings in an efficient manner that balance both behavioral strategies for specific impeding behaviors and EBPs used to improve social skills can be challenging. This study provided 3 parent training sessions to teach parents how to implement EBPs in the home. However, parent trainings that use PMT or general behavioral techniques may require several more sessions in order to be effective. For example, Loren and colleagues (2012) effectively observed behavioral change after delivering parent training in a group setting within 8-sessions. Furthermore, a study by Lees and Ronan (2008) successfully taught behavioral techniques to parents individually and observed behavioral change after delivering twenty sessions over a 2-year timeframe.

Therefore, parent trainings may need to incorporate elements that focus on behavioral management of impeding behaviors, if they are to effectively use EBPs in the home environment. Moreover, the future development of such parent trainings will need to investigate how to efficiently

provide trainings that are simultaneously effective in meeting child's treatment goals (to improve social skills and manage problem behaviors). Thus, future research needs to focus on the development and implementation of parent trainings that teach behavior management alongside the implementation of EBPs in the home.

Furthermore, assessing parents' abilities and potential psychopathology may also be useful information to consider when providing parent trainings designed to foster parent driven treatments. Indeed, children may have impeding behaviors that interfere with the implementation of treatments at home. However, parents may also have their own challenges that interfere with their ability to implement treatment with fidelity. Therefore, a screening process that gathers parent background may be useful when considering parent driven treatments in the home environment.

**Clinic-based interventions.** Often, treatment gains in social skills of children with ASD within the clinical setting are not maintained over time or observed at home or school (Bellini et al., 2007). Again, this study determined that impeding behaviors complicated the consistent implementation of treatment strategies in the home. Such behavioral presentations that contributed to the complexity of treatment concerns in this study may also be observed in the clinic setting. Therefore, individualizing treatment to address impeding behaviors should also be considered when attempting to foster more long-term treatment outcomes of social skills acquisition.

As previously discussed in chapter 2, comorbid diagnoses are very common for individuals on the spectrum (Tantam, 2000). Specifically, individuals with ASD are often diagnosed with ADHD (DiQuattro, 2014), anxiety (Chang, Quan & Wood, 2012), affective disorders and/or conduct disorders (Tantam, 2000). Moreover, correlational studies have found an association between individuals diagnosed with high functioning ASD and increased suicide ideation (Richa et al., 2014). Therefore,



individuals with ASD may have several treatment concerns that need to be focused on within the clinic setting as opposed to the home setting.

Furthermore, determining the most appropriate treatment for individuals with ASD and comorbid diagnoses may be challenging for clinicians (DiQuattro, 2014). Literature suggests participant's comorbid conditions may have an impact on their ability to engage in treatment (Perepletchikova & Kazdin, 2005). Thus, it is important for research to continue exploring individuals with ASD and their comorbid diagnoses, so effective treatment strategies can be developed to address social skill acquisition and co-occurring difficulties.

**School-based Interventions.** Schools should focus on engaging parents in their children's social skills treatment. Indeed, several different social skills interventions within various school districts are designed to be implemented and monitored primarily within the school setting (Kasari & Locke, 2011). However, consistent treatment across settings is assumed to foster greater generalization and maintenance of skills (Bellini and colleagues, 2007; Gresham et al., 2001). Therefore, schools should engage parents so that school-based treatments can be further supported by parents in the home.

Parent-teacher communication has shown to improve parent engagement in treatment at school and such engagement has shown to improve behavioral outcomes within the general education classroom (Jurbergs, Palcic & Kelley, 2007). Specifically, the use of school notes and teacher ratings of student behavior helped communicate the concerns and improvements observed in the classroom (Jurbergs, Palcic & Kelley, 2007). Therefore, communication between the parent(s) and individuals on the school-based treatment team can improve behavioral outcomes in school.

Such findings by Jurbergs, Palcic, and Kelly (2007) are not surprising because best practice standards in education already indicate that parents should be equal partners in the development of

Individual Education Plans (IEPs) and other intervention practices. However, the results of this study indicate that Ms. Smith initially encountered a lot of resistance from the school when she advocated for using the video models and social narratives from this study within the school. Therefore, schools may benefit from communicating with parents and try to adapt home-based intervention strategies into the school's treatment package.

### **Limitations**

This study provides insight into the effectiveness of parent-implemented interventions in improving the social skills of children with ASD, as well as the feasibility, mobility, and utility of evidence-based practices. However, there are limitations of this study that should be discussed. Limitations include extraneous variables, factors that contributed to recruitment difficulties, the structure of the intervention, and impeding behaviors presented by the participants of the study.

A major limitation to this study was having both participants come from the same family with the same parent providing the treatment to the participants. Though having the participants come from the same family unit was beneficial for data collection and parent training purposes, it also increased the risk of having an extraneous variable influencing the results of the entire study. Indeed, the unexpected variable of Alex starting a medication to help manage his impeding behaviors may have influenced the results of this study for both Alex and Greg. Results indicate that Alex's behaviors fluctuated as he tried different dosages of medication. This fluctuation in behaviors provided more stress on the family unit, which may have influenced the treatment integrity of the study for both Alex and Greg.

Moreover, both participants received services from various services providers prior to the research study and occupational therapy during the study could not control for previously learned or concurrently acquired skills and practices. For example, one of Alex's social narratives and video

models involved providing him with an emotion rating scale. This scale was different than one used in a previous treatment and Alex fixated on that discrepancy instead of the content of the treatment.

Moreover, a large portion of this study was conducted during the summer months before the academic school year started for the participants. Results indicated that the start of the school year affected Ms. Smith's ability to implement the intervention. During a consultation session with the primary investigator and a parent log, Ms. Smith explained that she completely forgot to implement the intervention during the first week of the school year because she was worried about getting all of the school supplies for her children and the change in schedule through off their summer routine.

Recruitment of participants for this study was more difficult than originally predicted. The screening criteria required a diagnosis and/or special education qualification of autism, a specific age range, and specific cognitive and communication abilities. This screening criterion was intended to recruit a similar population of children with higher functioning autism for whom the improvement of social skills was the primary treatment concern. However, few potential participants were able to be recruited for this study.

Recruitment for this study may have benefited from a less restrictive inclusion criteria. If the inclusion criteria included children with autism and related disorders (rather than having a diagnosis of only ASD), then it is likely that a larger pool of potential participants would have been obtained and may have captured the variety of diagnoses that often children with social skill deficits. Multiple parents of children with related disorders were excluded from participating in the study due to their child not meeting inclusion, even though they were interested in participating. Recruitment efforts may have also benefitted from a rolling or continuing recruitment cycle opposed to the limited time frame that was allotted to this study which was required. Furthermore, future studies that focus on implementing parent-

implemented interventions may consider aligning itself with an already established social skills program (i.e. social skills group) so recruitment efforts can be made easier.

Additionally, unforeseen cultural factors, such as being in a rural community, may have contributed to the difficulty with recruitment. Rural communities encounter significant difficulties accessing available mental health and ASD resources resulting in delayed ASD screening and diagnosis (Antezana et al., 2017). Often, rural areas have difficulty recruiting professionals with specialized training, creating a severe lack of available services. Therefore rural communities may have less trained professionals available to provide competent assessment and treatment, potentially resulting in misdiagnosis or an under identifying of children with high functioning ASD (Antezana et al., 2017). Montana is considered to be a very rural state and it is likely that Montana residents encounter difficulties accessing ASD services that may delay or misdiagnose ASD ultimately decreasing the pool of eligible participants to be recruited for this study.

Moreover, the potential for misdiagnosis, the lack of available services, and the difficult accessibility to such services, reinforce the stigma regarding mental health. Such stigma creates a culture of self-reliance and decreases the likelihood of parents seeking services for their children (Antezana et al., 2017), which possibly made recruitment for this study more difficult. For example, Mr. Smith agreed to have the intervention and observations to occur in his home; however, he wanted no part in the treatment or be around when research assistants were collecting observational data. In contrast, Ms. Smith had a completely different view and did not have any hesitation about the treatment and observations occurring in her home. Therefore, some parents may have conflicting views or hesitation allowing outside professionals coming into their home while other parents may not. Thus, it is important for researchers to account for this potential cultural or familial factor when recruiting participants.

Additional limitations of this study may include the actual structure of the treatment for each participant. This study was tasked with balancing individualized treatment while simultaneously providing a structured research methodology. Issues with the intensity and duration of a treatment are variables that are frequently cited as limitations to a social skills interventions ability to be effective (Bellini and colleagues, 2007; Gresham et al., 2001). The sample of two participants in this study was not homogeneous and this study may have benefitted from a more flexible research protocol to adjust the intensity and duration of treatment for each individual participant's needs. Qualitative results indicated that the different developmental levels of the participants may have complicated the implementation of the intervention and the participants may have benefited from using different treatment protocols. For example, the younger participant responded well to the video models, but an increase in impeding behaviors were observed when the parent attempted to further teach and discuss the content of the social narrative and video model after it was implemented. The parent also explained how the younger participant needs more repetition in order to grasp new concepts. The older participant, on the other hand, responded better to the discussion and teaching component of the intervention, but disliked the repetition of implementing the video models. Therefore, the participants may have benefitted from different intensities and durations of treatment based on their individualized presentations.

Additionally, the specificity of the treatment goal or target behavior has been cited as another variable that can contribute to the ineffectiveness of social skills interventions (Gresham et al., 2001). Specifically, Greg's target behavior of social communication may have been too broad, and the skills addressed in his treatment may have been too different to see explicit improvement in behavioral observations. As discussed in the literature review of this study, social communication is possibly the

largest domain of social skills. Therefore, the study may have benefitted from focusing on a more specific social skill. For example, the skill of initiating communication could have been the target behavior, and different video models and social narratives could have been designed to address initiating communication within different situations or settings. Moreover, Greg's treatment was focused on interacting with individuals that he was less familiar with or individuals that were not a part of the family unit. Therefore, observing Greg's social communication in the home environment may be different if observed in other environments.

For Alex, the target behavior appeared to be specific enough, however, the goal of Alex using the treatment strategies (identifying emotions, taking a break, and belly breathing) independently may have been too ambitious. Qualitative results indicated that Alex was able to use the treatment strategies in moments of escalation only when Ms. Smith could prompt him about identifying his emotions and taking a break. Therefore, Alex needed additional support or a form of scaffolding in order to use the treatment strategies effectively.

This study may have also benefitted from collecting additional observational data. If the opportunity to use a social skill was recorded, then a ratio of skill used/opportunity to use skill could have been examined. For example, Greg did not appear to have an opportunity to use a phone to maintain friendships or advocate for himself against bullies during the observation periods of data collection. Therefore, accurately recording the ratio of the participants' use of social skill and the specific opportunities to use that skill may have been more informative and would be a better representation of the participants' use of social skills/target behaviors. Moreover, examining this ratio of participant participation may also provide insight to the participant's motivation to use skills taught

during treatment. Specifically, measuring the participants' motivation during treatment may provide better insight on the usefulness and social validity of treatment in future studies.

Though the results of this study should be interpreted with caution due to the small number of participants, it should be noted that finding a balance between individualizing treatment while conducting a sound research design to study the effectiveness of PIIIs and other EBPs in the home is challenging. First, each child on the spectrum is very different and presents with their own unique needs (APA, 2013). Therefore, so many variables should be considered when designing the treatment for each client. Using an active problem-solving model approach to treatment would have been beneficial for addressing the various responses to treatment. However, when a research protocol is considered and a strong level of control is trying to be obtained in the study, frequent changes and adjustments to various components of the treatment threatens that control in the study, and threats to validity increase (Cooper, Heron & Heward, 2007).

Lastly, the participants of this study presented with impeding behaviors that may have influenced the outcomes of this study. During the screening and treatment planning for the participants of this study, potential impeding behaviors were identified for each participant and the social narrative and video models attempted to address some of the participants' unique difficulties in addition to their social skill deficits. For example, 'Greg' was identified as having difficulty with social communication while simultaneously having anxious behaviors. Therefore, the social narratives and video models were designed to address the social skill deficit and possible anxiety. Moreover, 'Alex' was identified as having some impulsivity and difficulty regulating. Therefore, his treatment was focused on building social-emotional regulation skills. However, despite the treatment tools attempting to address these impeding behaviors, the impeding behaviors further complicated the implementation of the treatment

and/or influenced the observations in the home environment. For future studies, having observation periods before treatment planning occurs may better help identify potential impeding behaviors that can be later incorporated during treatment planning. Having observations of the child interact with other peers and the child's parents will provide information that may better inform treatment planning instead of only relying parent reports.



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## Appendices

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## Family Information Form

Instructions: Please complete this form in as much detail as possible. All information will be kept confidential and will be used to identify and prioritize goals for intervention in the home and community.

Child's Name: \_\_\_\_\_

Date of Birth: \_\_\_\_\_

Identified Gender: \_\_\_\_\_

Current Age: \_\_\_\_\_

Biological Sex: \_\_\_\_\_

Is your child or family currently receiving in-home support services?    YES    NO

How old was your child when he/she was diagnosed/qualified for Autism Spectrum Disorder?

---

### *Parent Information*

Parent 1 Name: \_\_\_\_\_ Parent 2 Name: \_\_\_\_\_

Address: \_\_\_\_\_ Address: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_ City, State, Zip: \_\_\_\_\_

Living with child? \_\_\_\_\_ Living with child? \_\_\_\_\_

Phone (H): \_\_\_\_\_ Phone (H): \_\_\_\_\_

Phone (W): \_\_\_\_\_ Phone (W): \_\_\_\_\_

Phone (C): \_\_\_\_\_ Phone (C): \_\_\_\_\_

Occupation: \_\_\_\_\_ Occupation: \_\_\_\_\_

Preferred way to contact you? \_\_\_\_\_ Preferred way to contact you? \_\_\_\_\_

\*If child lives with individual other than own parents, please provide information for primary caretaker:

---

*Circle all that apply.*

What race/ethnicity is your child?

American Indian or  
Alaska Native

Native Hawaiian or  
Other Pacific Islander

Asian

White

Black or African  
American

Hispanic or Latin

Other

*Check all that apply.*

My child was diagnosed with Autism Spectrum Disorder by:

- Medical Physician                       Speech and Language Pathologist  
 Psychologist                               Only by School District  
 Not Applicable

My child qualifies for special education services in school for Autism.

- Yes                       No

If yes, what services does your child receive from the school?

Does your child currently receive any services (e.g., group social skills intervention in clinic; individual therapy) outside of school for their Autism Spectrum Disorder?

- Yes                       No

If yes, please list the service provider and treatment provided.

Has your child received autism related services in the past?

- Yes                       No

If yes, please list the service provider and treatment provided.

If you child has received autism-related services, how long has your child been receiving services?

Please list any other diagnoses/medical condition your child may have and the treatment for that challenge?

Please list any current medications that your child is receiving.

Please briefly describe your child's behavior at home and at school.

Describe your concerns in the following areas of development.

---

Communication:

---

Social Interaction:

---

Play:

---

Self-help:

---

Rigid/Restricted behavior:

---

Repetitive behavior:

---

Aggressive or Self-injurious Behavior:

---

Other information that may be helpful:

---

## Parent Pre-Intervention Acceptability Rating Survey

Date: \_\_\_\_\_ Your Child: \_\_\_\_\_

Parent Name: \_\_\_\_\_ Parent 1\_\_ Parent 2\_\_ Step/Foster\_\_ Other\_\_

Target Behavior: \_\_\_\_\_

For each item, please circle the number that most closely represents your opinion about the proposed intervention

---

	Strongly Disagree		Neutral 50/50		Strongly Agree
--	----------------------	--	------------------	--	-------------------

---

The proposed intervention will:

- |  |   |   |   |   |   |   |   |
|--|---|---|---|---|---|---|---|
| 1. be easy for my child to stick with    | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. be acceptable in our home             | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. teach important skills                | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. be a fair way to handle the behavior  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. be appropriate given the behavior     | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. be suitable given our family values   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. be easy for me to assist with at home | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. be within my skill level to help      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. quickly improve my child's skill      | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. be encouraged at home                | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. have lasting positive effects        | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. improve my child's self-confidence   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Comments/Opinions: \_\_\_\_\_

**Parent Post-Intervention Acceptability & Importance of Effects Survey**

Date: \_\_\_\_\_ Your Child: \_\_\_\_\_

Parent Name: \_\_\_\_\_ Parent 1 \_\_ Parent 2 \_\_ Step/Foster \_\_ Other \_\_

Intervention ended (date): \_\_\_\_\_ Goals were reached: \_\_Yes \_\_No \_\_Some

For each item, please circle the number that most closely represents your opinion about the intervention for your child’s problem.

	Strongly Disagree			Neutral 50/50			Strongly Agree
<u>The intervention:</u>							
1. was easy for my child to stick with	1	2	3	4	5	6	7
2. was acceptable in our home	1	2	3	4	5	6	7
3. taught important skills	1	2	3	4	5	6	7
4. was a fair way to handle the behavior	1	2	3	4	5	6	7
5. was appropriate given the behavior	1	2	3	4	5	6	7
6. was suitable given our family values	1	2	3	4	5	6	7
7. was easy for me to assist with at home	1	2	3	4	5	6	7
8. was within my skill level to help	1	2	3	4	5	6	7
9. quickly improved my child’s skill	1	2	3	4	5	6	7
10. was easy to encourage at home	1	2	3	4	5	6	7
11. will have lasting positive effects	1	2	3	4	5	6	7
12. improved my child’s self-confidence	1	2	3	4	5	6	7
13. is one I would recommend to others	1	2	3	4	5	6	7
Comments/Opinions: _____							

## **Guided Intake-Interview Schedule**

The following statements and questions will help the primary researcher gather important information for treatment planning and individual goal planning and development.

### Interview Script

Welcome. Thank you for participating in this interview. For approximately the next 20 minutes, I will be asking you different questions to learn more about you, your child, and the goals you have for your family. You will be asked to discuss topics such as your concerns regarding your child, motivations for your child, your child's strengths, and your thoughts about implementing an intervention at home.

The information you provide during the interview will be kept confidential. That is, we will make sure that we do not link you or your child's name with any information we share through publications or presentations. Additionally, we will be audiotaping and taking notes to make an accurate record of your answers to the open-ended questions. There is no right or wrong answer to the questions, the important thing is that you share your experiences and opinions.

The information you provide in the interview will be kept confidential. Members of the research team will analyze the information collected during this study. This information will be kept in a locked research lab on the University of Montana campus. No one else outside of the research team will see your responses.

Do you have any questions about the informed consent or how we will be spending the next 20 minutes?

### Open-ended Questions

1. What are some of your child's strengths?
2. What are some items or activities that are motivational to your child?
3. What are your primary concerns regarding your child in the home?
4. What are your primary concerns or potential barriers that might impact your ability to implement an intervention in the home?
5. Is there anything else you want to share?

### Ending the Interview

Thank you again for taking the time to participate in this important research. We want to remind you that your name will be kept confidential and separate from any of your answers in the interview. If at any point you have any questions or are concerned about your comments being used, please contact me, at the contact numbers provided in the informed consent. Do you have any questions before we end? Thank you.

## **Guided Exit-Interview Schedule**

The following statements and questions will help researchers' understand if parent implemented interventions are effective in improving the social skills of children with autism. In addition, the interview will aid in finding the aspects of the intervention that are most effective at teaching children with autism specific social skills. The interview will commence with an initial statement, listed below, and then address aspects of the intervention.

### Interview Script

Welcome. Thank you for participating in this interview. For approximately the next 20 minutes, I will be asking you different questions to learn more about your experiences implementing the parent implemented intervention. Moreover, I will be asking questions about your overall perceptions about the intervention and its effectiveness in improving specific social skills.

The information you provide during the interview will be kept confidential. That is, we will make sure that we do not link you or your child's name with any information we share through publications or presentations. Additionally, we will be audiotaping and taking notes to make an accurate record of your answers to the open-ended questions. There is no right or wrong answer to the questions, the important thing is that you share your experiences and opinions.

The information you provide in the interview will be kept confidential. Members of the research team will analyze the information collected during this study. This information will be kept in a locked research lab on the University of Montana campus. No one else outside of the research team will see your responses.

Do you have any questions about the informed consent or how we will be spending the next 20 minutes?

### Open-ended Questions

1. Overall, how successful do you think this intervention was for your child? Why? How could it be improved?
2. To what extent do you think this intervention helped your child learn specific strategies and social skills
3. What about the intervention did you find most beneficial?
4. What about the intervention did you find least beneficial?
5. Would you recommend this intervention to other parents of children with autism? Why or why not?
6. Did you find it difficult to implement the intervention at home? Why or why not?
7. Do you see yourself using this intervention on your own at home?

8. Is there anything else you want to share?

Ending the Interview

Thank you again for taking the time to participate in this important research. We want to remind you that your name will be kept confidential and separate from any of your answers in the interview. If at any point you have any questions or are concerned about your comments being used, please contact me, Zachary Shindorf, at the contact numbers provided in the informed consent. Do you have any questions before we end? Thank you.



## **Guided Follow-up Interview Schedule**

The following statements and questions will help the researchers understand if the treatment effects of parent implemented interventions are maintained after the intervention has concluded. The interview will commence with an initial statement, listed below, and then address aspects of maintenance.

### Interview Script

Welcome. Thank you for participating in this interview. For approximately the next 20 minutes, I will be asking you different questions to learn more about your experiences after participating in a study that required you to implement a parent implemented intervention. Moreover, I will be asking questions regarding your child's current behavior and use of social skills.

The information you provide during the interview will be kept confidential. That is, we will make sure that we do not link you or your child's name with any information we share through publications or presentations. Additionally, we will be audiotaping and taking notes to make an accurate record of your answers to the open-ended questions. There is no right or wrong answer to the questions, the important thing is that you share your experiences and opinions.

The information you provide in the interview will be kept confidential. Members of the research team will analyze the information collected during this study. This information will be kept in a locked research lab on the University of Montana campus. No one else outside of the research team will see your responses.

Do you have any questions about the informed consent or how we will be spending the next 20 minutes?

### Open-ended Questions

1. Can you describe your child's behavior since the intervention has concluded?
2. Have you seen continued improvement toward the established goal of the intervention?
3. Have you attempted to implement the intervention on your own in your home? Why or Why not?
4. Is there anything else you want to share?

### Ending the Interview

Thank you again for taking the time to participate in this important research. We want to remind you that your name will be kept confidential and separate from any of your answers in the interview. If at any point you have any questions or are concerned about your comments being used, please contact me, Zachary Shindorf, at the contact numbers provided in the informed consent. Do you have any questions before we end? Thank you.

## Parent Treatment Fidelity

Please complete this form by recording 'yes' for correct implementation or 'no' for incorrect implementation.

- |  |     |    |
|--|-----|----|
| 1. Did you watch a video and use its' corresponding social narrative in a quiet space, and without interruptions?              | YES | NO |
| 2. Did the video work, playing without interruptions?  | YES | NO |
| 3. Did you provide 5-minutes of preferred activity before each implementation of the video and corresponding social narrative? | YES | NO |
| 4. Did you watch the video and use the corresponding social narrative 3 times within one intervention session?                 | YES | NO |

If no, how many times did you view the video and use the social narrative in session?

- |  |     |    |
|--|-----|----|
| 5. Did you discuss and practice the reviewed skill after each implementation of the video and its' corresponding social narrative? | YES | NO |
|--|-----|----|

If no, how many times did you discuss and practice?

### Event Recording Form

Participant Initials: \_\_\_\_\_

Setting: \_\_\_\_\_

Observer Name: \_\_\_\_\_

Date: \_\_\_\_\_

Start Time: \_\_\_\_ End Time: \_\_\_\_\_

Goal: Improve Emotion regulation skills

Behavior: uses appropriate coping skills—5-point scale; take-5; and/or belly breathing

Observation Period	Tally every time the behavior occurred	Total
0-10 minutes	5pt:  Take-5:  Belly B:	
10-20 minutes	5pt:  Take-5:  Belly B:	
20-30 minutes	5pt:  Take-5:  Belly B:	

Notes:

**If a tantrum occurred, how long did it last/what did it look like?**

Tantrum=escalation that results in disruptive behaviors like kicking, yelling, and hitting.

Other notes?

### Event Recording Form

Participant Initials: \_\_\_\_\_

Setting: \_\_\_\_\_

Observer Name: \_\_\_\_\_

Date: \_\_\_\_\_

Start Time: \_\_\_\_ End Time: \_\_\_\_\_

Goal: Improve Social interaction/engagement

Behavior: Initiate interaction/communication (verbally in person/asking questions); maintain relationship through text or call; and/or advocate for self when bullied/teased

Observation Period	Tally every time the behavior occurred	Total
0-10 minutes	Initiate:  Text/Call:  Advocate:	
10-20 minutes	Initiate:  Text/Call:  Advocate:	
20-30 minutes	Initiate:  Text/Call:  Advocate:	

Notes: Does the client have opportunity to exhibit appropriate behaviors? Describe.

Any factors that may prevent client from participating in appropriate behaviors (i.e. anxiety)?

Other notes?

## Authorization to Use and Disclose Protected Health Information for Research Purposes

---

**Purpose.** I authorize \_\_\_\_\_ to disclose to *Zachary Shindorf*, M.A. under the supervision of Dr. Anisa N. Goforth, the following protected health information:

*demographic information, comprehensive psychological reports, psychoeducational reports, treatment plans, medical history, and school-based records.*

This protected health information is to be used/disclosed by Zachary Shindorf, M.A. and the researcher's staff only for the purpose of conducting the research project entitled 'Investigating the Effectiveness of Parent-Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder'.

**Right to Refuse.** I may refuse to sign this authorization if I so choose. If I decide not to sign the Authorization, I will not be allowed to participate in this study or receive any research related treatment that is provided through the study. However, my decision not to sign this authorization will not affect my current or future other treatment, current or future payment, enrollment in health plans, or eligibility for benefits at The University of Montana (if applicable).

**Right to Revoke.** At all times, I retain the right to revoke this Authorization. Such revocation must be submitted in writing to \_\_\_\_\_. Withdrawal of this Authorization shall be effective *except* to the extent that Zachary Shindorf, M.A. has already used or disclosed information released prior to receiving notice of the revocation.

**Potential for Re-disclosure.** I understand that once my health information is disclosed under this Authorization, there is a potential that it could be re-disclosed outside this study and no longer covered by this Authorization. I also understand that there are laws that may require my individual health information to be disclosed for public purposes, such as if required for mandated reporting of abuse or neglect, judicial proceedings, health oversight activities and public health measures.

---

This Authorization does not have an expiration date.

I am the research participant or personal representative authorized to act on behalf of the participant. I have read this information, and I will receive a copy of this authorization form after it is signed.

---

Participant's Name

---

Signature of research participant  
or research participant's personal representative

---

Date

## **Informed Consent & Parental Permission Screening Process**

**Research Title:** Investigating the Effectiveness of Parent Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

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**Purpose:**

Children with Autism Spectrum Disorders (ASD) experience difficulties with social interaction and friendship development. Parent-Implemented Interventions (PII) may teach children with autism specific skills to appropriately interact with their peers. Furthermore, the evidenced-based practices of video-modeling and social narratives have been shown to be effective in the clinical setting, but are rarely used in the home setting.

You are being asked to give permission for your participation in the screening process for a research study investigating the effectiveness of PIIs, specifically the use of video-modeling and social narratives, in improving the social skills of children with ASD. This screening process will determine if you and your child are eligible to participate in the study. Please note that there is the possibility that you and your child may not be eligible and will not have the opportunity to participate in the study.

**Inclusion and Exclusion Criteria:**

To account for the wide range of communication and behavioral manifestations, ASD is considered to be diagnosed using a spectrum or range of patterns and symptomology. In other words, two different individuals may be diagnosed with ASD, but the types of social deficits and severity of deficits may vary from person to person. To account for the wide range of symptomology, strict inclusion and exclusion criteria will be implemented to qualify for this study.

All participants should have a minimum of low average cognitive abilities as demonstrated by a standard score of 85 or greater on an individualized, norm-referenced test of intelligence. Furthermore, participants should have a minimum of low average receptive and expressive language abilities on an individualized, norm-referenced test of language. Potential participants will be excluded from the study if they have an intelligence score lower than 85 (e.g.,  $SS < 85$ ) and/or low language ability (e.g. no verbal language skills). Furthermore, documentation of the cognitive and language functioning of participants will be provided by the legal guardians of the participant or in collaboration with members of the participant's school-based multidisciplinary team (e.g., school psychologist, speech-pathologist).

The primary investigator Zachary Shindorf, M.A., under supervision from a faculty supervisor, will determine if a participant meets the cognitive and language functioning requirement after reviewing results. Dr. Goforth, the faculty supervisor, is a licensed psychologist with all of the qualifications to interpret test results and eligibility criteria.

**Procedures:**

All potential participants will be screened to determine if they are eligible for participation. This will involve the completion of a family information form and rating scales. Additionally, an authorization to Use and Disclose Protected Health Information for Research Purposes form will be used to gather information verifying the diagnosis of Autism Spectrum Disorder and other related disorders, as well as, current intellectual and language functioning. If documentation of current intellectual and language abilities do not exist or have been determined more than three years ago, brief intellectual and/or language assessments will be used to determine such abilities. It is important to note that if additional testing is conducted, the scores obtained from this screening process are not to be used for diagnostic purposes and are solely meant to be utilized within the screening process. The results from this testing will not supersede or alter any legal documentation that affects the services provided to your child.

After this screening process has concluded, you will be contacted and the determination of you and your child's eligibility for the study will be communicated to you. If you and your child are found to be eligible, the primary investigator will contact you further for an intake interview and review the procedures of the study with you. If you voluntarily agree to participate, all of the information gathered through the screening process and intake interview will be used for intervention planning purposes.

Please note, participation in this study is voluntary, and you and your child may withdraw at any time. Even if you have completed the study (or parts of the study) and no longer wish to participate, all identifiable information will be destroyed. If these results are used in publications or presentations, the only information kept from your profile will include your child's age, sex, identified gender, race, age of ASD diagnosis, and reason for not participating in the study. If you are not eligible for the study, all identifiable information will be destroyed. If these results are used in publications or presentations, the only information kept from your profile will include your child's age, sex, identified gender, race, age of ASD diagnosis, and reason for not being eligible to participate.

**Risks/Discomforts:**

You may experience some mild risk and discomfort from participating in this study. Some individuals may be hesitant to share their thoughts and opinions about specific topics due to how others may perceive their comments. Furthermore, individuals may be worried about the sharing of their identities or the identities of their children. Please note, if you or your child ever experience these discomforts you may speak with the primary investigator at any time and he will provide you with further resources.

**Benefits:**

You and your child may not benefit from this screening process. However, your participation in this screening process is important to determine if you and your child are eligible to participate in this study.

**Confidentiality:**

All records will be kept private and will not be released without your consent except as required by law (i.e., if harm is reported). Only the researchers will have access to the files and the data will be stored in a locked file cabinet. Both your and your child’s identity will be kept private. If the results of this study are written in a scientific journal or presented at a scientific meeting, neither your nor your child’s name will be used.

**Voluntary Participation/Withdrawal:**

Your decision to take part in this screening process is entirely voluntary. You may refuse to take part in or you may withdraw from the screening process at any time. You may leave the screening process for any reason.

**Questions:**

You may wish to discuss this with others before you agree to allow your child to take part in this screening process. If you have any questions about the research now or during the screening process contact: Zachary Shindorf at 419-450-2196 or Dr. Anisa Goforth at 406-243-2917. If you have any questions regarding your rights as a research subject, you may contact the Chair of the IRB through the University of Montana Research Office at 243-6672.

**Statement of Consent:**

I have read the above description of this research study and voluntarily agree to participate in the screening process. I have been assured that a member of the research team will also answer any future questions I may have. I understand that I will receive a copy of this permission form.

**Disclosure of Personal Health Information:**

I authorize *Zachary Shindorf, MA* and the researcher’s staff to use my child’s individual health information for the purpose of conducting this screening process. My child’s individual health information that may be used to conduct this research includes: *demographic information, results of comprehensive psychological reports, psychoeducational reports, treatment plans, medical history, and school-based records*. If I or my child receives compensation for participating in this study, identifying information about me and my child may be used as necessary to provide compensation.

\_\_\_\_\_  
Printed Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date



**Parent’s Statement of Permission**

I have read the above description of this screening process. I have been informed of the risks and benefits involved, and all my questions have been answered to my satisfaction. Furthermore, I have been assured that a member of the research team will also answer any future questions I may have. I voluntarily agree to have my child take part in this screening process if additional testing is required to determine current intellectual and/or language functioning. I understand that I will receive a copy of this permission and informed consent form.

Printed name of child participant: \_\_\_\_\_

\_\_\_\_\_  
Signature of Parent or Legally Authorized Representative

\_\_\_\_\_  
Date

## Minor Assent-Screening Process

**Research Title:** Investigating the Effectiveness of Parent Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

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We are doing a research study which helps us learn about you. We will use videos and stories to help you learn new ways to talk and play with your friends and family. Before we can do this, we need to ask you and your parents some questions to learn more about you to see if you are a good match for this study. We may also have you participate in some activities which will last no longer than 2 hours.

If you choose to be part of this screening process, you will spend some time with one adult in a private room where they will ask you some questions and you will do some activities together with you. We will take notes to see if you are a good match for this study.

Not everyone who takes part in this screening will be a good match for this study and that is okay. This process is focused on learning more about you. If you are a good match, you will learn more about the study and decide if you want to be a part of this study.

You do not have to participate in this screening process if you do not want to. If you decide to stop after we begin, that's okay too. Your parents already know about the screening process.

If you choose to be in this screening process, please sign your name.

I, \_\_\_\_\_, want to be in this screening process.

\_\_\_\_\_  
Sign your name here

\_\_\_\_\_  
Date

**Minor Assent-Screening Process  
Verbal Form**

**Research Title:** Investigating the Effectiveness of Parent Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

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[anisa.goforth@umontana.edu](mailto:anisa.goforth@umontana.edu)

We are doing a research study which helps us learn about you. We will use videos and stories to help you learn new ways to talk and play with your friends and family. Before we can do this, we need to ask you and your parents some questions to learn more about you to see if you are a good match for this study. We may also have you participate in some activities which will last no longer than 2 hours.

If you choose to be part of this screening process, you will spend some time with one adult in a private room where they will ask you some questions and you will do some activities together with you. We will take notes to see if you are a good match for this study.

Not everyone who takes part in this screening will be a good match for this study and that is okay. This process is focused on learning more about you. If you are a good match, you will learn more about the study and choose if you want to be a part of this study.

You do not have to participate in this screening process if you do not want to. If you choose to stop after we begin, that's okay too. Your parents already know about the screening process.

If you choose to be in this screening process, please tell me that you want to.

\_\_\_\_\_ Subject's Name Date

The researcher's signature below indicates that the subject has verbally assented to participate.

\_\_\_\_\_ Researcher's Signature Date

## Informed Consent & Parental Permission

**Research Title:** Investigating the Effectiveness of Parent-Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

Zachary Shindorf, M.A.  
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**Purpose:**

Children with Autism Spectrum Disorders (ASD) experience difficulties with social interaction and friendship development. Parent-Implemented Interventions (PII) may teach children with autism specific skills to appropriately interact with their peers. The evidenced-based practices of video-modeling and social narratives have shown to be effective in the clinical setting, but are rarely used in the home setting.

You are being asked to give permission for your participation and the participation of your child in a research study. This research study will investigate the effectiveness of PIIs, video-modeling and social narratives in improving the social skills of children with ASD.

**Inclusion and Exclusion Criteria:**

To account for the wide range of communication and behavioral manifestations, ASD is considered to be diagnosed using a spectrum or range of patterns and symptomology. In other words, two different individuals may be diagnosed with ASD, but the types of social deficits and severity of deficits may vary from person to person. Therefore, to account for the wide range of symptomology, strict inclusion and exclusion criteria will be implemented to qualify for this study.

All participants should have a minimum of low average cognitive abilities with a standard score of 85 or greater on an individualized, norm-referenced test of intelligence (e.g., WISC-5; *Wechsler Intelligence Scale for Children- Fifth Edition*). Furthermore, participants should have a minimum of low average receptive and expressive language abilities on an individualized, norm-referenced test of language (e.g., CELF-5; *Clinical Evaluation of Language Evaluation- Fifth Edition*). Potential participants will be excluded from the study if they have a low intelligence score (e.g., SS < 85) and/or low language ability (e.g. no verbal language skills). Furthermore, documentation of the cognitive and language functioning of participants will be provided by the legal guardians of the participant or in collaboration with members of the participant's school-based multidisciplinary team (e.g., school psychologist, speech-pathologist).

The primary investigator with supervision from the faculty supervisor will determine if a participant meets the cognitive and language functioning requirement after reviewing results. Dr.

Goforth, the faculty supervisor, is a licensed psychologist with all of the qualifications to interpret test results and eligibility criteria.

**Procedures:**

First, all potential participants will be screened to determine if they are eligible for participation. If you and your child are found to be eligible to be included in this study, the primary investigator will contact you further for an interview to gather information on your child's strengths, interests, potential barriers to your participation in the study, and your primary concerns regarding your child's social development. All of the information gathered through the screening process and intake interview will be used for intervention planning purposes.

Once an intervention plan has been made, the primary investigator will contact you to participate in three parent training sessions lasting approximately one hour for each session. Each training session is different and will teach you how to implement the designed intervention at home.

Before the investigational intervention is implemented, you will complete rating scales regarding aspects of the investigational intervention. The observations and the investigational intervention will take approximately 10 weeks to complete with a one-month follow-up observation and interview. First, members of the research team will take observational data in the home. A researcher will conduct a 30-minute observation in your home once a week. These observations will take place during your normal family routine (e.g. during dinner, doing homework, in the living room, etc.) and will not be during the implementation of the investigational intervention. Once a stable pattern of behavior has been observed, the primary investigator will let you know to begin implementing the investigational intervention. Members of the research team will then take observational data in the home during the intervention phase to observe any changes in your child's behavior. Moreover, you will complete a checklist after each intervention session and complete parent logs using an audio application on a tablet each week. Additionally, the primary investigator will provide weekly consultations lasting no longer than 10-minutes over the phone to problem-solve any difficulties or concerns during the intervention phase.

You will be provided with three video-models with accompanying social narratives, and will implement the investigational intervention two times a week. The days of the week when the intervention will take place will be outlined in your intervention plan (e.g., Monday and Wednesday). Moreover, the specific setting within the home where the investigational intervention will occur will also be determined and outlined in your intervention plan (e.g. dining room). You will choose from the three video-models provided to you with the corresponding social narratives to implement during the week. You will administer one video model with its corresponding social narrative three times during one intervention session. It is not permitted to use the same video-model consecutively over the different intervention sessions. Therefore, each week of investigational intervention will include two different video models and social narratives. For example, week one may entail the use of Video/Social Narrative 1 and Video/Social Narrative 2, while week two may draw upon Video/Social Narrative 3 and Video/Social Narrative 1.

Each investigational intervention session will repeat the same intervention sequence. The first 5 minutes of the investigational intervention will be spent having the child participate in a

preferred activity. A visual timer on the tablet provided to you by the researcher will indicate when the 5 minutes of the preferred activity has concluded. You will use the visual schedule provided to you to help the child transition between tasks. Once the preferred activity has concluded, you will implement the video-model and read the corresponding social narrative. You will also discuss and practice the video-model and social narrative with your child. This sequence of 5 minutes of engaging in a preferred activity, followed by video model/social narrative implementation, discussion, and practice, will be repeated two more times during a single intervention session. This intervention sequence will be repeated throughout each intervention session. It is estimated that each investigational intervention session will last approximately 45-minutes to an hour.

After each intervention session, you will complete an intervention fidelity checklist. Moreover, you will complete parent logs every week using the tablet provided by the researcher. This data will then be collected weekly by members of the research team who will conduct observations in the home environment once a week, as outlined in the intervention plan.

The primary investigator will notify you when the intervention has concluded. You will complete a rating scale at the end of the investigational intervention and the primary investigator will conduct an exit interview to learn more about your experiences and perceptions of the intervention. Lastly, the primary investigator will conduct a follow-up phone interview while a member of the research team will conduct a final observation approximately one month after intervention has concluded.

### **Research Team:**

The research team will consist of the primary investigator, a faculty supervisor, graduate students studying psychology and speech-language pathology, and undergraduate research assistants. The primary investigator is a doctoral candidate who has specialized training under supervision of a licensed psychologist in treating children with autism and providing individual and family interventions within the home setting. The faculty supervisor is a licensed psychologist with specialized experience in assessment and treatment of autism. It is important to note that the primary investigator is not a licensed provider and all proceedings of this study will be supervised by the faculty supervisor. The graduate students have advanced training in behavioral techniques and psychological treatment, while the undergraduate research assistants have been trained by the primary investigator to conduct observational data collection and have gained knowledge about behavioral techniques and treating children with autism.

### **Risks/Discomforts:**

You may experience some mild risk and discomfort from participating in this study. Some individuals may be hesitant to share their thoughts and opinions about specific topics due to how others may perceive their comments. Furthermore, individuals may be worried about the sharing of their identities or the identities of their children. There is also no guarantee that the intervention will change your child's behavior. Additionally, your child may experience some mild risk and discomfort from participating in this study. Some children may not be motivated to participate or may experience some anxiousness while learning and practicing social skills. It is also possible that your child's behavior may worsen if the investigational intervention is not implemented as it is intended.

**Benefits:**

You and your child may benefit from this study. With this study, your child will receive an individualized intervention and you will be provided with the tools and knowledge to continue intervention in the home. Moreover, you will be awarded a \$25 Amazon gift card for your participation.

**Alternative Therapy:**

If you choose not to take part in this study, other treatments can be used/may be available. These treatments would include outpatient therapy, group-based social skills interventions, and school-based supports. All of the treatments modalities listed above may be advantageous in improving the social skills of your child with ASD.

**Confidentiality:**

All records will be kept private and will not be released without your consent except as required by law. Only the researchers will have access to the files and the data will be stored in a locked file cabinet. Both your and your child's identity will be kept private. If the results of this study are written in a scientific journal or presented at a scientific meeting, neither you nor your child's name will be used.

**Voluntary Participation/Withdrawal:**

Your decision to take part in this research study is entirely voluntary. You may refuse to take part in or you may withdraw from the study at any time. You may leave the study for any reason.

**Questions:**

You may wish to discuss this with others before you agree to allow your child to take part in this study. If you have any questions about the research now or during the study contact: Zachary Shindorf at 419-450-2196 or Dr. Anisa Goforth at 406-243-2917. If you have any questions regarding your rights as a research subject, you may contact the Chair of the IRB through the University of Montana Research Office at 243-6672.

**Statement of Consent:**

I have read the above description of this research study and voluntarily agree to participate in the study. I have been assured that a member of the research team will also answer any future questions I may have. I understand that I will receive a copy of this permission form.

**Disclosure of Personal Health Information:**

I authorize *Zachary Shindorf, MA* and the researcher’s staff to use my child’s individual health information for the purpose of conducting this research project. My child’s individual health information that may be used to conduct this research includes: *demographic information, results of comprehensive psychological reports, psychoeducational reports, treatment plans, medical history, and school-based records*. If I or my child receives compensation for participating in this study, identifying information about me and my child may be used as necessary to provide compensation.

\_\_\_\_\_  
Printed Name of Participant

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

**Statement of Consent to be Audio-recorded**

I understand that audio recordings may be taken during the study. I give permission to be audio recorded and understand that if audio recordings are used for presentations of any kind, names or other identifying information will not be associated with them

\_\_\_\_\_  
Signature of Participant

\_\_\_\_\_  
Date

**Parent’s Statement of Permission**

I have read the above description of this research study. I have been informed of the risks and benefits involved, and all my questions have been answered to my satisfaction. Furthermore, I have been assured that a member of the research team will also answer any future questions I may have. I voluntarily agree to have my child take part in this study. I understand that I will receive a copy of this permission and informed consent form.

Printed name of child participant: \_\_\_\_\_

\_\_\_\_\_  
Signature of Parent or Legally Authorized Representative

\_\_\_\_\_  
Date

**Compensation for Injury:**

In the event that you are injured as a result of this research you should individually seek appropriate medical treatment. If the injury is caused by the negligence of the University of Montana or any of its employees, you may be entitled to reimbursement or compensation pursuant to the Comprehensive State Insurance Plan established by the Department of Administration under the authority of M.C.A., Title 2, Chapter 9. In the event of a claim for such injury, further information may be obtained from the University’s Risk Manager (406-243-2700; [kathy.krebsbach@umontana.edu](mailto:kathy.krebsbach@umontana.edu)) or the Office of Legal Counsel (406-243-4742; [legalcounsel@umontana.edu](mailto:legalcounsel@umontana.edu)). (Reviewed by University Legal Counsel, May 9, 2013)



## Minor Assent

**Research Title:** Investigating the Effectiveness of Parent Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

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We are doing a research study about using videos and stories to help you learn new ways to talk and play with your friends and family. A research study is a way to learn more about people. If you decide that you want to be part of this study, you will be asked to watch some videos and read some stories about practicing new ways of talking to your friends and family. A researcher will come to your house each week to see how you are doing with learning these new skills. It might feel a little funny to have a researcher visit you at home each week.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think these benefits might be that you learn new ways to talk and play with your friends and family. We hope that this will make it easier to get along with your friends and your family, and maybe even make new friends.

When we are finished with this study we will write a report about what we learned. This report will not include your name or that you were in the study. But may include basic information like your age and your gender.

You do not have to be in this study if you do not want to be. If you decide to stop after we begin, that's okay too. It is always yours and your parents' decision whether you want to be in the study.

If you decide you want to be in this study, please sign your name.

I, \_\_\_\_\_, want to be in this research study.

\_\_\_\_\_  
Sign your name here

\_\_\_\_\_  
Date

## Minor Assent-Verbal Form

**Research Title:** Investigating the Effectiveness of Parent Implemented Interventions in Improving the Social Skills of Children with Autism Spectrum Disorder

**Investigator(s):**

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We are doing a research study about using videos and stories to help you learn new ways to talk and play with your friends and family. If you choose to participate, you will be asked to watch some videos and read some stories about new ways of talking to your friends and family. A researcher will come to your house each week to see how you are doing with learning these new skills. It might feel a little funny to have a researcher visit you at home each week.

Not everyone who takes part in this study will benefit. A benefit means that something good happens to you. We think these benefits might be that you learn new ways to talk and play with your friends and family. We hope that this will make it easier to get along with your friends and your family.

When we are finished with this study we will write about what was learned. This report will not include your name or that you were in the study.

It is okay if you do not want to participate in this study. If you choose to stop after we begin, that's okay too. Your parents already know about the study.

If you choose you want to be in this study, please tell me that you want to.

\_\_\_\_\_ Subject's Name Date

The researcher's signature below indicates that the subject has verbally assented to participate.

\_\_\_\_\_ Researcher's Signature Date

## 5-point scale

The 5-point scale is how I show others how I feel. If an adult asks me how I feel, I hold my fingers up. One finger tells the adult that I am tired. Three fingers tells the adult that I am happy. Five fingers tells the adult that I am frustrated or angry. When I am confused about how I feel, I can look at the pictures on the 5-point scale.



## Taking a Break

When I am a '5' and I am frustrated or angry, I need to take a break so I can calm down. When I need to take a break, I tell an adult that I need to *Take-5*.

After I tell an adult that I need to *Take-5*, the adult will tell me where to take my break for 5 minutes. I take breaks so I can calm down and relax.

Sometimes I take a break by myself or with an adult. The adult will tell me when my break is over.

## Relax



## Belly Breathing

When I am a '5' and I am frustrated or angry, I need to relax and calm down. If I need to calm down, I use belly-breathing. To do belly breathing, I need to lie down and put a stuffed animal on my belly. I take a deep breath in with my nose. Then, I exhale until I feel my belly rise and see my stuffed animal move up with my belly. I keep using belly breathing until I feel calm and relaxed.



## How to make a friend while nervous

Sometimes I get nervous when I meet new people. Many people are nervous when they meet a new person or want to make a friend. To be less nervous, I take a deep breath and start a conversation. The best way to start a conversation is by asking questions. I could say “what do you like to do in your free time?” or “where is a special place you like to go?” People like it when I listen to them and I hear their words. When meeting new people, I will ask questions and listen to their answers.





## Maintaining Friendships

Sometimes I don't see my friends every day. Friends like friends who text or call and make plans to play together. When I want to see a friend, I will ask my parent if I can call my friend and invite them to play. If my parent says "Yes," I will call and invite them to play. If my friend and their parent say "Yes," I will get to play with them.



## Bullying

Sometimes people say and do hurtful things to other people. When people say hurtful things to me or my friends, we may feel sad or upset. Sometimes people tell me to do things so they can laugh at me or get me in trouble. When someone says mean words to me or tells me to do something I do not like, I will walk away. If they keep saying mean words, I will tell them to stop. If they do not stop, I will find an adult I trust and ask for help.





Video Modeling Scripts, Alex Script A:

Setting: 'One-Button Studio' + 5-Point scale in background

\*Voiceover: The 5-point scale is how I show others how I feel. If an adult asks me how I feel, I hold my fingers up.

Adult: "How do you feel?"

Peer: Holds 3 fingers up and says "happy."

\*Voiceover: One finger tells the adult that I am tired.

Peer: Raises 1 finger and yawns.

\*Voiceover: Three fingers tells the adult that I am happy.

Peer: Raises 3 fingers and smiles.

\*Voiceover: Five fingers tells the adult that I am frustrated or angry.

Peer: Raises 5 fingers and grits teeth.

When I am confused about how I feel, I can look at the pictures on the 5-point scale.

Peer: Directs arms toward big poster of 5-point scale.

Video Modeling Scripts, Alex Script B:

Setting: 'One-Button Studio'

\*Voiceover: When I am a '5' and I am frustrated or angry, I need to take a break so I can calm down. When I need to take a break, I tell an adult that I need to *Take-5*.

Peer: Looks at adults and says, "I need to take-5" while showing 5-fingers.

Adult: Okay.

\*Voiceover: After I tell an adult that I need to *Take-5*, the adult will tell me where to take my break for 5 minutes.

Adult: "You can take your break in your chair."

Peer: Nods head and sits in chair.

\*Voiceover: I take breaks so I can calm down and relax.

Peer: Takes a deep breath (inhales and exhales).

\*Voiceover: Sometimes I take a break by myself or with an adult. The adult will tell me when my break is over.

Adult: "Okay, your break is over now."

Peer: Nods head and walks out of frame.

Video Modeling Scripts, Alex Script C:

Setting: 'One-Button Studio'

\*Voiceover: When I am a '5' and I am frustrated or angry,

Peer 1 and Peer 2: March into frame stomping with arms crossed.

\*Voiceover: I need to relax and calm down. If I need to calm down, I use belly-breathing. To do belly breathing, I need to lie down and put a stuffed animal on my belly.

Peer 1: Lies down and puts stuffed animal on stomach.

Peer 2: Lies down and puts stuffed animal on stomach.

\*Voiceover: I take a deep breath in with my nose.

Peer 1: Inhales through nose.

Peer 2: Inhales through nose.

\*Voiceover: Then, I exhale until I feel my belly rise and see my stuffed animal move up with my belly.

Peer 1: Exhales.

Peer 2: Exhales

\*I keep using belly breathing until I feel calm and relaxed.

Peer 1 and Peer 2 : Continue to use belly breathing until video ends.

Video Modeling Scripts, Greg Script A:

Setting: 'One-Button Studio'

\*Voiceover: Sometimes I get nervous when I meet new people.

Peer 1: Looking anxious, eyes pointed at ground, twiddling thumbs.

\*Voiceover: Many people are nervous when they meet a new person or want to make a friend. To be less nervous, I take a deep breath and start a conversation.

Peer 1: Takes a deep breath and walks toward Peer 2.

\*Voiceover: The best way to start a conversation is by asking questions. I could say "what do you like to do in your free time?" or "where is a special place you like to go?"

Peer 1: "Hey, what do you like to do in your free time?"

Peer 2: "Play with my dog."

Peer 2: "What is a special place you like to go?"

Peer 1: "I like to go camping."

Peer 2: "Cool."

\*Voiceover: People like it when I listen to them and I hear their words. When meeting new people, I will ask questions and listen to their answers.

Video Modeling Scripts, Greg Script B:

Setting: 'One-Button Studio'

\*Voiceover: Sometimes I don't see my friends every day. Friends like friends who text or call and make plans to play together. When I want to see a friend, I will ask my parent if I can call my friend and invite them to play.

Peer 1: "Hey dad, can I call my friend and invite them over to play?"

\*Voiceover: If my parent says "Yes," I will call and invite them to play.

Adult: "Of course you can."

Peer 1: Takes cell phone, dials, and asks friend, "Hey, do you want to come over and play?"

Peer 2: Enters frame, uses phone, and says, "Ya, let me ask my dad first."

Peer 2: "Dad, can I go and play with my friend?"

\*Voiceover: If my friend and their parent say "Yes," I will get to play with them.

Adult: ' Of course you can, go play with your friend!"

Peer 2: "My dad said yes, see you later."

Peer 1: "Okay, see ya! Bye!"

Peer 2: "Bye!"

Video Modeling Scripts, Greg Script C:

Setting: 'One-Button Studio'

\*Voiceover: Sometimes people say and do hurtful things to other people. When people say hurtful things to me or my friends, we may feel sad or upset.

Peer 1: "You're dumb. You're short." Points at Peer 2.

Peer 2: Looks down and frowns.

\*Voiceover: Sometimes people tell me to do things so they can laugh at me or get me in trouble.

Peer 1: Points and laughs.

\*Voiceover: When someone says mean words to me or tells me to do something I do not like, I will walk away.

Peer 2: Walks away.

Peer 1: Rolls eyes and acts annoyed,

\*Voiceover: If they keep saying mean words,

Peer 1: "You're dumb, you're still short."

\*Voiceover: I will tell them to stop.

Peer 2: "Stop."

Peer 1: "Whatever."

\*Voiceover: If they do not stop,

Peer 1: "You're still dumb, still short."

\*Voiceover: I will find an adult I trust and ask for help.

Peer 2: Adult enters frame. "I need help with a bully".

Adults: "Okay, let's go talk about that." Adult and Peer 2 walk out of frame.

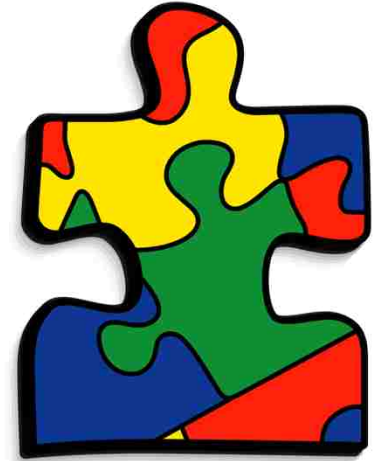
# University of Montana

## Autism Research

Conducting an innovative research program aimed at improving outcomes and quality of life for children with Autism Spectrum Disorder

Does your child have a diagnosis of **Autism Spectrum Disorder** and is 6-11 years old?

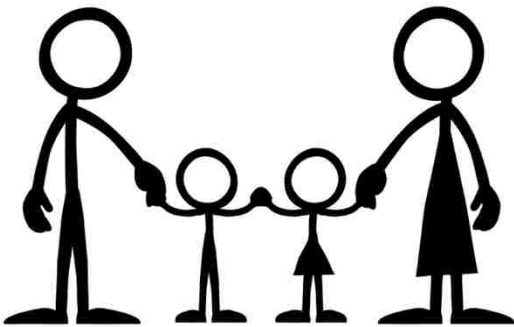
Are you a parent who would want more *therapeutic tools* to use *at home* to help your child with *social skills*?



## We need your help!

### *Participation may include:*

- Activities, Interviews, and Questionnaires
- Parent Trainings
- Individualized Intervention Planning
- In-home Observations
- Collaboration with schools and other providers
- Consultation



To learn more about this research project, please contact

**Zachary Shindorf, M.A.**

Phone: 419.450.2196 Email: [zachary.shindorf@umontana.edu](mailto:zachary.shindorf@umontana.edu)

Research is Supervised by Dr. Anisa N. Goforth, NCSP, Department of Psychology