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Using social stories and behavior skills training involving family members to increase social skills for a child with autism

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Using Social Stories and Behavior Skills Training Involving Family
Members to Increase Social Skills for a Child with Autism

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Masters of Arts
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Jamie Leigh Powell

ABSTRACT

This study compared the effectiveness of a social story intervention with a social story plus behavior skills training intervention involving family members for a child with autism. A multiple baseline across siblings design was used to assess the impact of the intervention on social interaction of the child with autism, as well as the social interaction of the child's siblings. The siblings implemented both phases of the intervention. Social validity measures were taken from the siblings and parents, treatment integrity and generalization were assessed as well. The results indicated that the social interactions of the child with autism and the siblings increased initially, but did not continue to increase when the social story intervention was implemented by the siblings. The addition of BST did not result in any additional improvement. On the other hand, two of the siblings' social interactions increased over time when engaged in the behavior skills training intervention, which resulted in an increase in the social interactions of the child with autism during play with them. The results also indicated that the sibling mediated intervention failed to generalize to a non-trained free play condition in the pool.

Chapter 1

Introduction

The increasing number of children diagnosed with autism has become a concern amongst parents and communities over the past few years. There is a growing need to integrate these children with their typically developing peers both in schools and the community. One main deficit of children with autism is their ability to understand and effectively use social skills to interact and communicate with others (Adams, Gouvousis, VanLue, & Waldron, 2004). Many children with autism have difficulties with social recognition, expressing themselves, social imitation and understanding which include an inability to understand the thoughts or feelings of others or to engage in play (Bass & Mulick 2007). Due to the unique social needs for children with autism, interventions for increasing social skills of these children have become a critical part of supporting children with autism.

Studies have shown a number of intervention programs or models that are associated with increasing social skills of children with autism (Sansosti & Powell-Smith, 2006; Taylor, Levin, & Jasper, 1999; Wolfberg & Schuler, 1993). Much progress increasing the children's social skills has come from interventions that have utilized natural interventionists such as peers and family members (Dodd, Hupp, Jewell, &

Krohn, 2008; Lorimer, Simpson, Myles, & Ganz, 2002; Wolfberg & Schuler, 1993).

Family members play an important role in interventions because they are the ones that the child interacts with most frequently (El-Ghorougy & Romanczyk, 1999). Consistency in the home and school can play a crucial role in the success of an intervention. The more practice the child is able to have with specific skills, the better he or she will become with using those skills. Siblings can act as models for appropriate behaviors through role plays or in natural settings (Thiemann & Goldstein, 2001). Children with autism can be prompted to watch their siblings during natural routines to learn the correct way they should behave. In particular, undirected play with siblings can contribute a great deal in providing the children who have autism with the opportunity to learn social skills. They learn how to interact with each other, problem solve, share, and communicate during play. Social play teaches children about social relationships and is critical for the development of social, cognitive, and cultural competence (Bass & Mulick, 2007). According to Wolfberg and Schuler (1993), a child's play remains inflexible and unimaginative without playmates to share, modify, expand, and negotiate play routines. Social skill interventions during interactions with peers or siblings are an effective way to assist children with autism with developing the social skills that are of such importance to their overall development (Sansosti & Powell-Smith, 2006; Taylor et al., 1999).

Social Story Intervention

Recently, social story intervention has become a popular intervention strategy for children with autism. Research has demonstrated that social story intervention can be effective in increasing social behavior and decreasing inappropriate behavior of children with autism in natural settings (Dodd et al., 2008; Lorimer et al., 2002). The social story

intervention incorporates aspects of priming, written scripts, and self-management during interactions with peers or family members. A social story is a short, individualized story designed to teach a child with autism a certain skill, concept, event, or social behavior (Gray, 1998). It provides information about what is happening and why, who will participate, when an event or activity will take place, and the appropriate response expected from the child during a given social situation (Scattone, 2007). Social stories most often contain a combination of text and picture icons that coordinate with the specific situation described (Lorimer et al, 2002). Typically, social stories are read before the situation the story addresses (Kuoch & Mirenda, 2003). The procedure of the social story intervention can be executed in a variety of ways. The first is by having the focus child read the story while a caregiver or therapist sits behind and slightly to the side of the participant in case the child needs help reading the story (Thiemann & Goldstein, 2001). Another approach is to have a parent, teacher, caregiver, or peer read the story directly to the focus child prior to the situation described in the story (Barry & Burlew, 2004; Kuoch & Mirenda, 2003; Lorimer et al., 2002;). The focus child can also read the story independently before the selected situation (Scattone, Tingstrom, & Wilczynski, 2006). Although a growing body of literature reports the effectiveness of social story interventions in increasing social skills of children with autism (Barry & Burlew 2004; Delano & Snell 2006; Thiemann & Goldstein, 2001), the specific intervention components or procedures using the social stories have not been critically reviewed.

Components of Social Story Intervention

The majority of the studies evaluating social stories have used them in a treatment package. For example, Swaggart and Gagnon (1995) combined a social story intervention

with a social skills training procedure and a response cost for children with autism between the ages of seven and eleven. In their study, the first story was for a greeting procedure which involved the social story being read to the target child by the teacher each morning. It also included either verbal prompts or physical redirection paired with the verbal prompt, given if the child was not in the correct proximity to the appropriate people. The results of the study revealed that appropriate greetings increased, and aggression did not occur. The second story focused on the participant's aggression and used a combination of a social story and a response-cost system. The results showed a decrease in aggressive behavior with a zero recorded on eight different occasions.

Thiemann and Goldstein (2001) combined social stories with written text cues and video feedback to examine social communication of elementary students. The treatment was a thirty minute session which consisted of ten minutes of instruction using the visual stimuli, ten minutes of social interaction, and ten minutes of video feedback. The target behavior of securing attention increased for all five participants. Initiating comments and requests increased for four of the five participants, and contingent responses increased for one participant and stabilized the skill for another.

Brownell (2002) included a very unique element in the intervention procedure that incorporated music with the social stories for a range of six to nine year old children with autism. The study had four case studies in which two used an ABAC design, and the other two used an ACAB design to minimize any order effects of the treatment. During the B condition the social story was read to the participants, and during the C condition the social story was sung. Although the results were variable, the data showed declines

for all participants' problem behaviors. The results also revealed no significant difference between reading and singing the story except for one case.

Sansosti and Powell-Smith (2006) conducted a study using three participants, nine, ten, and eleven years old, in a school setting where the target child read the social story with the caregiver before and after going to school, then answered questions about the story to ensure that it was being read. Although data were variable for one participant, there were increases in social engagement for two of the three participants. All target behaviors increased as a result of the intervention.

Although studies have demonstrated that social story intervention is effective for children with autism, it is not clear whether the social story alone, without other behavioral skills training or strategies, could be effective in improving the social behavior of children with autism. A comparison of social story intervention to other interventions is necessary to further examine its effectiveness for children with autism (Dodd et al., 2008).

Family Involvement in Social Story Intervention

There are few studies that take advantage of the home setting and use siblings and parents to implement interventions. Adams and his colleagues (2004) addressed the limitation of existing literature by involving parents in implementing the social story intervention for a seven year old child with autism. It was the parent's responsibility to videotape the homework sessions in order for the researcher to later watch and record the behaviors. However, the authors did not clearly describe any training provided to the parents or how the social story was read prior to a homework session.

Lorimer et al. (2002) conducted a study which also took advantage of using parents to implement a social story intervention in a home setting. Two stories were made for the child with autism; one focused on attention when other people were talking, and the other focused on waiting. The stories were read by the child's parents each morning and prior to each anticipated situation, and also before each therapy session by the therapist. Prior to implementing the intervention, the parents watched Carol Gray's (1996) videotape presentation, *Social Stories and Comic Strip Conversations: Unique Methods to Improve Social Understanding*. The parents were trained to reliably identify and measure the precursors to tantrum behavior, and interrupting verbalizations so they could collect the data. Both behaviors were shown to decrease and there were only two incidents of tantrums during the intervention phases.

Burke, Kuhn, and Peterson (2004) conducted a study involving four children with autism ranging in age from two to seven years old. The study was done in the home of the participants and involved a social story which addressed bedtime problems such as disruptive bedtime behaviors and night wakings. The parents were instructed to read the social story to the target child at the end of their bedtime routine. The parents were also responsible for the reward portion of the treatment by adding a reward under the pillow of the target child if he or she engaged in the desired behaviors. Parents used a bedtime data form to structure the sleep diary entries which tracked the time of events and frequency of disruptive behaviors. The parents acted as both the primary and reliability data collectors. The parent, who was not responsible for the bedtime routine, was the one that took reliability data. The results revealed the data to be variable, but showed decreases in disruptive bedtime behaviors, and increases in total sleep time.

Kuoch and Mirenda (2003) targeted one child with autism in the home setting and two children in the school setting. The participants ranged from three to six years of age. The mother of the child targeted for the home setting intervention participated in the implementation process. She implemented the social story intervention by reading the social story to her child prior to a situation in which aggression or sharing was likely to occur. The mother was given a first draft of the social story to modify and give feedback about the structure and contents of the story before the final draft was created. The mother was instructed to read the story and give a brief commentary of the story upon completion of reading it. The experimenter trained the parent to record the frequency of the target behavior on a tally sheet according to the time in which it occurred. The results showed the social story intervention to be successful in reducing the child's aggressive behaviors.

Although parents have been involved as interventionists in some studies as described above, siblings have rarely been involved in social story interventions. In a recent study, Dodd et al. (2008) involved both parents and siblings in implementing the social story intervention for two children who were 9 and 12 years of age diagnosed with Pervasive Developmental Disorder-Not Otherwise Specified. The target child with the sibling was asked to read the social story to the parent, and then play with the sibling to see if the story had an effect on the child's behavior. After the story was read, the parents asked the target child three comprehensive questions, and provided the appropriate answer if one was not given by the child. The story was constructed with pictures of the boys playing appropriately, which was the main role the sibling had in the intervention. The child's mother was asked to provide suggestions for the story and to discuss the

contents when the development of the story was completed. Each parent was given a tip sheet for completing the baseline activity and an experimental procedures checklist. The parents collected data by videotaping their children's play sessions. The results showed that all target behaviors changed in the desired direction.

Generalization

The literature has shown measurement of generalization to be a limitation among studies using social stories as an intervention (Sansosti, Powell-Smith, & Kincaid, 2004). Very few studies have been found to include generalization evaluation. One exception is Delano and Snell (2006) who conducted a study with three children with autism in a school setting. Two of the target children had intervention conducted in the play area of a resource classroom, and generalization probes were taken during center time in their respective kindergarten classrooms. The third target child had intervention sessions at a table in an open area between classrooms, and the generalization probes taken during an afternoon break in the second-grade classroom. Generalization probes were taken during baseline, as well as each time the target children met the first or second criterion. The results revealed that duration of social engagement increased in the classroom setting for two of the three target children. The third child showed little improvement through the duration of the study. The results showed similar data for the frequency of seeking attention, initiating comments, requests, and contingent responses in that two of the three target children showed generalization to their classroom settings.

Thiemann and Goldstein (2001) was the second study reviewed that conducted generalization assessment. In this study a media room in the school library was used to conduct the intervention sessions with four target children. Each session consisted of ten

minutes of systematic instruction, social story instruction, written text cue rehearsal, and role play, ten minutes of engagement in a social activity, and ten minutes of self-evaluation using video feedback. The generalization probes were conducted in the classroom for three of the four target children. During these sessions social story instruction and videotaped feedback were omitted from the procedures. The target child read the written text cues once prior to engaging in the ten minute predetermined social activity with the same peers. The classroom activities included reading “big books,” completing math worksheets, working on computers, or doing art projects.

Social Validity and Treatment Fidelity

The lack of emphasis on assessing social validity and treatment fidelity has been another significant limitation of studies using social story intervention (Dodd et al., 2008; Lorimer et al., 2002). Thiemann and Goldstein (2001) was one of the few studies that assessed social validity. The researchers used seven teachers and six graduate students in speech-language pathology to provide subjective ratings of change in social interactions between the children with social impairments and their peers. The thirteen judges viewed video recordings of pre- and post- treatment sessions and independently rated specific social behaviors for the focus child and their peers by answering six questions using a Likert-type scale. Three of the questions addressed the focus child’s social behavior toward the peers, and the other three questions targeted the peer’s social behaviors toward the focus children. All of the judges reported improvements in reciprocal social behaviors between the focus children and their peers. For the focus children’s involvement in the interactions, the ratings went from the low end of the scale which was not at all to the high end which was rated as average for age group.

Burke et al. (2004) assessed social validity using the Treatment Evaluation Inventory-Short Form (Kelley, Heffer, Gresham, & Elliott, 1989). The form is a nine item questionnaire which uses a five point scale to assess parental judgments of treatment acceptability and perceived efficacy. The study used social stories to reduce bedtime resistance and frequent night wakings. Parents rated *The Sleep Fairy* as a highly acceptable intervention for their children's sleep problems. The social story used also received higher treatment acceptability ratings than other empirically based interventions for pediatric sleep disturbance, such as sedative medication, extinction, and graduated extinction.

Adams et al. (2004) assessed social validity with both the target child's parents and teacher. The parents completed a survey independently about how the intervention appeared to affect the target child during homework time and in other contexts. Both parents agreed that after the intervention was implemented, their son was able to find appropriate words and understand that he could ask for help, which decreased his frustration behaviors. They also learned a better way to communicate with their son regarding homework activities and other situations. The teacher reported that the classroom was quieter than in the beginning of the year, and that the social story helped the target child respond to difficulties in a quiet manner. The teacher described the intervention to be successful in establishing strategies for dealing with the child's frustration behaviors.

Delano and Snell (2006) used a social comparison method to assess procedural integrity in their study that evaluated the effects of social stories on the duration of appropriate social engagement in three children with autism. They included a procedural

checklist for about one third of all intervention sessions to assess the accuracy with which the social story intervention was implemented. The checklist included steps for reading the story, asking the comprehension questions, and instructing the children to play in the play area. Before the first observation session was conducted, the experimenter explained the procedures to an observer. The procedural checklist was completed while watching a video of an experimental session.

Kuoch and Mirenda (2003) gathered procedural reliability data during the same observational sessions as used for interrater reliability. A checklist was used to assess the procedural reliability by dividing the number of correct steps by the total number of correct and incorrect steps, then multiplying by 100. The procedural reliability mean across all three participants was 98.4%. If any deviations from the procedure occurred, they were brought up to the interventionist and a review of the procedural protocol followed. The study did not provide a description of what the procedural checklist included. Sansosti and Powell-Smith (2006) created a social story journal for both participating parents and children to assess the treatment fidelity. The journals allowed the participants to keep a continuous record of their progress and any difficulties they may have encountered. Each journal entry assessed with whom and where the social story was read and the child's reaction to the social story. The caregiver indicated whether the child read the social story each day during specified intervention times, as well as recorded any problems that may have occurred. The calculation of the treatment fidelity was computed as a percentage by dividing the number of days the child read the story by the number of total days the story was to be read during the intervention phase.

As discussed above, future research would benefit from further assessment into the effectiveness of social stories as the sole intervention as well as when combined with other treatment procedures. It would also be a benefit to the literature if there were more family involvement with implementing the treatment procedures. Children have the opportunity to have more attention from parents and siblings in a home setting than they would from peers and teachers in a classroom setting. There is a great deal of potential in using a home setting and involving family members, in particular siblings, with implementing social story intervention procedures. Few studies have assessed generalization, social validity, and treatment fidelity, which all play critical roles when it comes to experimentation. Although social story interventions have been shown to be successful, there is substantial variability in the data across studies.

Purpose and Research Questions

The purpose of this study was to determine the effectiveness of a social story intervention in increasing social interaction of a child with autism and her typically developing siblings. The study extended the literature by: a) comparing the social story only condition with a combined social story and behavioral skills training condition; b) involving family members as active participants in implementing the intervention in a home setting; and c) assessing generalization, social validity, and treatment fidelity.

The study addressed the following questions: a) will social story intervention implemented by family members be effective in increasing social interaction of the child with autism; b) will social story intervention be effective in increasing the social interaction of siblings; c) will the combined social story and behavioral skills training

condition be more effective; d) will the intervention effect generalize to a nontrained routine?

Chapter 2

Method

Participants

The participants in the study were Ariel, a 7 year old girl diagnosed with mild autism and her four siblings. Ariel was one in a set of triplets, and the only one with a disability. She had a delayed processing problem, but was academically equivalent with the majority of her classmates. She had a large repertoire for reading, spelling, and vocabulary. However, she showed difficulty with communication skills. Ariel engaged in a self-stimulating verbal behavior where she acted out and repeated scripts to movies. This behavior typically occurred when she played alone, or was not engaged in an activity. Typically her play skills involved the self-stimulating movie talk and response to questions if attention was obtained. Ariel did not typically initiate social interaction unless prompted, or in a close proximity to a preferred person.

Belle was the second girl of the triplets and was the one who engaged in play with Ariel most often. Her cognitive and communication functioning were within normal limits. Belle enjoyed similar interests and activities to Ariel's, although she sometimes dominated the play choices and could manipulate Ariel into playing by Belle's rules. She could also take advantage of Ariel at times when a preferred item is in question.

Timothy was the third of the triplets. He carried a more somber persona and would follow the crowd for the majority of the time. He and Ariel typically engaged in a

type of imaginative play where they acted out movie scenes or pretended to have superpowers. His cognition and communication functioning were also within age-appropriate limits.

Peter was a 9 year old male who interacted with Ariel the least. He extended his assistance if asked, but did not typically initiate play with Ariel. He enjoyed playing rambunctiously with his brothers. His level of academic skills was within age-appropriate limits.

Eric was the oldest at 12 years old. He had great interactions with Ariel when it came to building a repertoire for conversation. He asked how her day was at school, and inquired about various activities she participated in. He helped Ariel if he observed her struggling with an activity or item. He did well when it came to initiating conversations, but not as well with playing activities. His levels of academic skills were within age-appropriate limits.

All five children lived with their parents who had an average middle class family income. Their father's profession required much travel, often leaving the mother alone with the children. The mother was a homemaker and part time substitute teacher.

Setting

All experimental sessions were completed in the participants' home. The target routine was indoor play time in a play room on the second floor of the families' home. The room was equipped with a variety of toys, games, puzzles, art supplies, and a television with movies and video games that all of the children play with. The room also had two couches, a bed with built-in storage, bean bags, and a desk that occupied the space. The children engaged in a variety of play activities both together and

independently in the room on a regular basis. The sessions were implemented by family members (i.e., siblings, mother) during the play time with training and consultation from the researcher. Generalization was evaluated in the families' in-ground pool located in the back of the house.

Dependent Variables

Five categories of social interaction skills were defined for Ariel: sharing; turn taking; appropriate tone of voice; social response; and social initiation. Sharing was defined as giving an object to a sibling, and playing with the same item cooperatively with the sibling. Turn taking was defined as passing an object back and forth from one person to another when they are finished with their turn. Appropriate tone of voice included singing or verbalizations which are audible from a range of 1-3 feet. Social response was defined as answering a question, accepting an object or an offer to play, accepting a physical gesture such as a hug or high-5, giving eye contact to the sibling whom is speaking to Ariel, and visual tracking (following an item being played with or displayed by the sibling with her eyes). Social initiation was defined as a verbal (e.g. asking a question, or making a statement such as "Look at this.", "What's that?") or nonverbal gesture directed toward the participating sibling to initiate conversation, play, or gain access to preferred items or activities. Two categories of social interaction skills were defined for siblings: social initiation and social response. Social initiation was defined as a verbal or nonverbal gesture directed to Ariel to engage in a conversation or cooperative play (e.g. "Can I play?", "Do you want to play?", "Look at this.", "You can use this toy."), providing assistance by helping Ariel complete an activity or other action through a nonverbal or physical action. Social response was defined as answering a

question, accepting an object or an offer to play, accepting a physical gesture such as a hug or high-5, giving eye contact to Ariel when she was speaking to the sibling, and visual tracking with an object Ariel was playing with or displaying.

Data Collection and Inter-observer Agreement

Data on social interaction skills was collected using a 10-second partial interval recording system. Social interaction skills were scored as an occurrence if any of the behaviors defined occurred within the 10-second interval. All sessions were video recorded, and scored by the primary investigator using paper and pencil and an auditory cue emitted from an audiotape. The researcher and a graduate student in the Applied Behavior Analysis program participated in the data collection training. Upon attaining a minimum criterion of 90% inter-observer agreement in training, the second observer simultaneously and independently recorded data during a minimum of 30% of all sessions across participants. Inter-observer agreement for each target behavior was calculated on an-interval-by-interval basis. Inter-observer agreements were calculated by dividing the total number of agreements by the number of agreements plus disagreements, multiplied by 100 to yield a percentage. The mean interobserver agreements for social interactions across the experimental conditions were as follows: Ariel 96%, Belle 95%, Timothy 92%, Peter 91%, and Eric 98% respectively.

Procedural Integrity

Procedural integrity was assessed using a procedural checklist that measured each intervention procedural step as either observed (+) or not observed (-) for each dyad. The items described intervention features for the social story (8 items) and behavior skills training (5 items). The procedural checklist measured whether the mother organized and

instructed the play, discussed the social interaction skills, and provided reinforcement, and measured whether the sibling read the story, initiated or prompted social interaction, and provided contingent praise. Observers (the researcher and a graduate student) coded family's intervention implementation by videotaping and observing 30% of the sessions. The procedural checklist documented that the mother and siblings adhered to the intervention protocols when implementing each intervention procedure. The average scores for procedural integrity assessed by using the checklist were 98.5% (range = 88-100%) during social story phase and 99.1% (range = 88-100%) during behavior skills training phase. Interobserver agreement on the procedural integrity averaged 98%, ranging from 95 to 100% across siblings and conditions.

Design

A multiple baseline across siblings design with an ABC sequence of phases was used to evaluate the effectiveness of the social story intervention (A = baseline; B = social story; C = social story plus behavioral skills training). Baseline measures were taken on the target child's and sibling's social interactions. The first phase of intervention consisted solely of the social story intervention which was introduced when the baseline data showed stability, followed by a second phase of a behavior skills training procedure combined with the social story intervention once the data from phase one showed stability. A new sibling was introduced to each phase sequentially.

Procedures

The siblings served as the primary interventionist throughout the experimental phases. The researcher provided training and consultation to the siblings, collaborating

with the participating children's mother on intervention development and implementation activities.

Baseline. Baseline data was collected before any training or treatment was implemented. Baseline consisted of the target child and a chosen sibling verbally instructed by their mother to play in an upstairs playroom. The siblings engaged in parallel and imaginative play. They would swordfight, pretend to be animals attacking each other, and bring figurines to life by giving them voices and personalities. A sign was placed on the door of the playroom as a prompt to keep the children from leaving the room before the session was completed. The baseline sessions consisted of 10-minutes of one or several play activities that the children chose. There were a variety of activities available to choose from.

Social story development. Two social stories were developed. One story was directed to facilitate social interaction skills, whereas the other was directed toward alternative replacement behaviors for Ariel. The story to facilitate social behavior consisted of how and when to use appropriate cooperative play skills such as appropriate tone of voice, sharing, turn taking, requests, acceptance of play or an idea, and play initiations. The story also addressed the emotions people can feel and terminology likely to be heard when playing appropriately with a sibling. The second story consisted of appropriate replacement behaviors when crying, shouting, and aggression occur. It was designed in a way that helped Ariel problem solve difficult situations that occurred when playing with her siblings. It focused on positive behaviors such as asking for help or items, using words to express feelings, and compromising. The stories were 5 and 6 pages long. The narrative was personalized with the child's name and preferred activities

for the scenarios to assist in keeping the target child's engagement in the stories while they were being read. Two short paragraphs containing two or three sentences were included on each page. The stories were made into a book format with several spiral rings to assist in easy page turning.

Social story intervention. The first phase of intervention consisted solely of a social story treatment. Prior to the intervention, the siblings were verbally instructed by the mother to sit with the target child and read the social stories. During each session, the target child and chosen sibling were instructed by their mother to go upstairs and play. Once they were in the playroom, the sibling asked the target child to sit down and read the social stories together. On completion of reading the story, the children engaged in a ten-minute play session in which the target behaviors for each child were recorded. Upon completion of the session, the mother used a procedural checklist form to review the implementation of the social story intervention. The checklist consisted of "yes" and "no" questions in sequential order of the social story intervention. The researcher was present in the room video recording the sessions and gave a prompt to the sibling when the duration of the session was finished.

After the first sibling went through at least three sessions or the data show a stable pattern, the second sibling began phase 1 social story intervention. Once the first phase of intervention showed stability in the data, the second phase of the intervention was implemented.

Behavior skills training intervention. After the social story intervention was implemented, the siblings participated in a one-day behavior skills training procedure (for approximately 1 hour) delivered by the researcher. Each sibling participated individually

in the training. Training activities focused on teaching the siblings how to prompt social interactions and to respond appropriately with reinforcement procedures when the child with autism, Ariel engaged in appropriate behavior. The training also included appropriate ways to seek attention and deliver social initiations.

The first part of the training was instruction on what to do if Ariel engaged in screaming, crying, or aggressive behavior. The siblings were trained to withhold reinforcement for problem behavior by not providing tangible items or attention, both which have been found to reinforce or maintain Ariel's problem behavior. They were also trained to use prompting techniques (e.g., tell the target child "Use your words", "You need to ask for what you want", "Count to 10" or "Take a deep breathe") during situations when Ariel's problem behavior occurred with the function of accessing a tangible. They were also trained to prompt Ariel to initiate eye contact, by tapping Ariel as they called her name and to wait for eye contact from Ariel before initiating a social request. The siblings were trained to provide positive reinforcement when Ariel engaged in the alternative, replacement behavior (e.g., the siblings were taught to provide the child with what was asked for, or verbal compliments or non-verbal gestures). At the completion of the instructions, the siblings were allowed to ask any questions they had, and were asked to repeat the instructions given by the researcher.

The second part of the training consisted of role-play and practice. The researcher modeled the desired behavior for a variety of situations that may occur during a play session. The scenarios were based upon the possible functions of Ariel's problem behaviors. Several different scenarios were modeled for escape, and tangible functions that motivated Ariel's problem behavior during play or social interaction with siblings.

After the researcher modeled the behavior, the sibling engaged in a role-play with the researcher where the researcher acted as Ariel and the sibling was allowed to practice the skills learned. Seven to ten different scenarios were used in order to give the sibling the most preparation available. The siblings were also asked to create a scenario in which they have had difficulty with Ariel previously.

The final portion of the training was feedback to the sibling. Each sibling was given feedback on his or her performance at the end of each scenario. When the sibling used the skills correctly praise was provided by the researcher; whereas if skills were displayed incorrectly, corrective feedback was delivered and the sibling practiced the scenario until the correct uses of the skills were used for three consecutive trials. The mastery criterion was three consecutive trials of correct performance for both the escape and tangible functions.

The training for the second phase was implemented with the first sibling once the data from the first phase had shown stability. Implementation of the social stories was the same as the first phase. The session mirrored the first phase except that the sibling implemented the skills learned from the behavior skills training.

Technical assistance. The researcher reviewed the video-taped sessions with the mother and the sibling implementing the procedures to provide feedback to the family members for treatment integrity. The feedback was provided at the end of each sibling's first three sessions while viewing the videotaped sessions with the mother and the sibling implementing the procedures. The mother used a procedural checklist to assess the sessions by asking questions to the siblings to ensure they followed all of the procedural steps. The researcher provided brief consultative assistance in the form of positive or

corrective feedback or problem-solving discussions as needed during home visits for videotaping the sessions.

Generalization. The setting used to assess generalization was the families' in-ground pool. The pool was in the back of the house surrounded by a suspended screened in patio. The children had multiple toys to play with both in and around the pool (i.e. rafts, foam boards, nets used to clean the pool, weighted toys that sink to the bottom). Five data points were collected for each child following the behavior skills training intervention. The child's mother verbally instructed Ariel and a sibling to go play in the pool. There were no social stories read, the children simply engaged in playing for 10 minutes. The session was ended by a prompt given to the sibling from the researcher. Generalization was used to assess whether the skills learned from the social stories and behavior skills training interventions carried over and were observable in a novel setting.

Social Validity. Social validity was assessed by giving a questionnaire to each of the siblings as well as the mother. The questionnaire for the siblings consisted of 7 items that were in age appropriate terminology. The questionnaire for the mother consisted of 8 items. Both questionnaires were designed to assess the acceptability of the intervention, which were rated on a 3-point rating scale, with 1 representing not at all acceptable, 2= somewhat acceptable, and 3 = very acceptable. The parent rating scale was adapted from the brief version of the Intervention Rating Profile (IRP, Martens, Witt, Elliot, & Darveaux, 1985) focused on determining the effectiveness, usability, and effectiveness of the intervention. The rating scale questionnaire was administered by the researcher at the end of intervention in the form of an interview for the siblings and in written form for the parents.

Chapter 3

Results

Social Interactions of the Child with Autism

Figure 1 depicts the percentage of intervals of social interaction skills that Ariel engaged in while playing with her siblings individually. The triangle data series represents the percentage of intervals in which Ariel engaged in the social interaction skills of sharing, turn taking, tone of voice, social initiation, and social response. The mean percentages of intervals for Ariel's social interactions with Belle were 23.7% (range = 17-31%) for baseline, 31.6% (range = 27-49%) for the social story intervention, 27.8% (range = 14-40%) for the BST intervention, and 24% (range = 19-29%) for generalization. For interactions with Timothy, Ariel's mean percentages were 21.8% (range = 10-38%) for baseline, 30.5% (range = 22-36%) for the social story intervention, 24.6% (range = 17-33%) for BST intervention, and 15.2% (range = 11-20) for generalization. For interactions with Peter, Ariel's mean percentages were 27.6% (range = 7-40%) for baseline, 36.8% (range = 32-42%) for the social story intervention, 35.1% (range = 22-40%) for BST intervention, and 25% (range = 23-28%) for generalization. Ariel's mean percentage of social interactions with Eric were 29.1% (range = 18-42%) during baseline, 46.2% (range = 32-82%) for social story intervention, 28% (range = 17-37%) for BST intervention, and 25.8% (range = 18-32%) for generalization.

The results show that the social story intervention increased Ariel's overall levels of social interaction skills across all of the siblings. The social story intervention produced an immediate increase of Ariel's social interaction skills during play with two siblings (i.e., Belle and Timothy); however, the data revealed decreasing trends during play with the two siblings. Ariel's social interaction during play with the other two siblings, Peter and Eric did not increase dramatically; however, her social interactions increased as sessions progressed. During play with Peter, her social interactions increased dramatically during the second intervention session (i.e., Session 16), and continued to increase over the course of behavior skills training intervention. During play with Eric, Ariel's social interaction showed a decreasing trend, but her social interactions started increasing again during Session 19. Although the level of social interaction was lower in the BST phase than in the previous intervention phase, there was an increasing trend during interactions with Belle and Peter. For interactions with Timothy there was a decreasing trend. The level of Ariel's social interaction was lower in the generalization phase than in previous intervention phases. Ariel showed a slight increasing trend in social interactions while in the novel setting with Belle, Timothy, and Eric.

Social Interactions of the Siblings

The diamond data series of Figure 1 depicts the percentage of intervals in which the siblings engaged in the social interaction skills of social initiation and social response directed to Ariel. The mean percentage of intervals of the social interactions for Belle toward Ariel were 34.7% (range = 15-56%) during baseline, 57.7% (range = 52-63%) for the social story intervention, 34.3% (range = 21-49%) for BST intervention, and 21.4% (range = 19-25%) for generalization. The mean percentages for Timothy were 26.8%

(range= 11-45%) during baseline, 41.8% (range = 30-60%) for social story intervention, 35.8% (range = 26-48%) for BST intervention, and 12.6% (range = 8-195) during generalization. For Peter, the mean percentages were 41.6% (range = 0-79%) during baseline, 60.8% (range = 55-69%) for social story intervention, 50.4% (range = 21-59%) for BST intervention, and 29.6% (range = 17-44%) during generalization. The mean percentages for Eric were 57.3% (range = 35-77%) during baseline, 64.2 % (range = 53-75%) for the social story intervention, 43.3 % (range = 12-63%) for BST intervention, and 35% (range = 25-43%) during generalization.

The data indicates that overall levels of sibling's social skills increased during the social stories intervention phase; however, all four siblings also showed a decreasing trend in social interactions as the intervention progressed. For all siblings, the level of social interactions during the second phase of intervention was lower than during the social stories intervention, with increasing trends for Belle and Peter and decreasing trends for Timothy and Eric. During the generalization phase, social interaction was lower than the intervention phases for all siblings.

Target Child and Sibling's Social Interactions

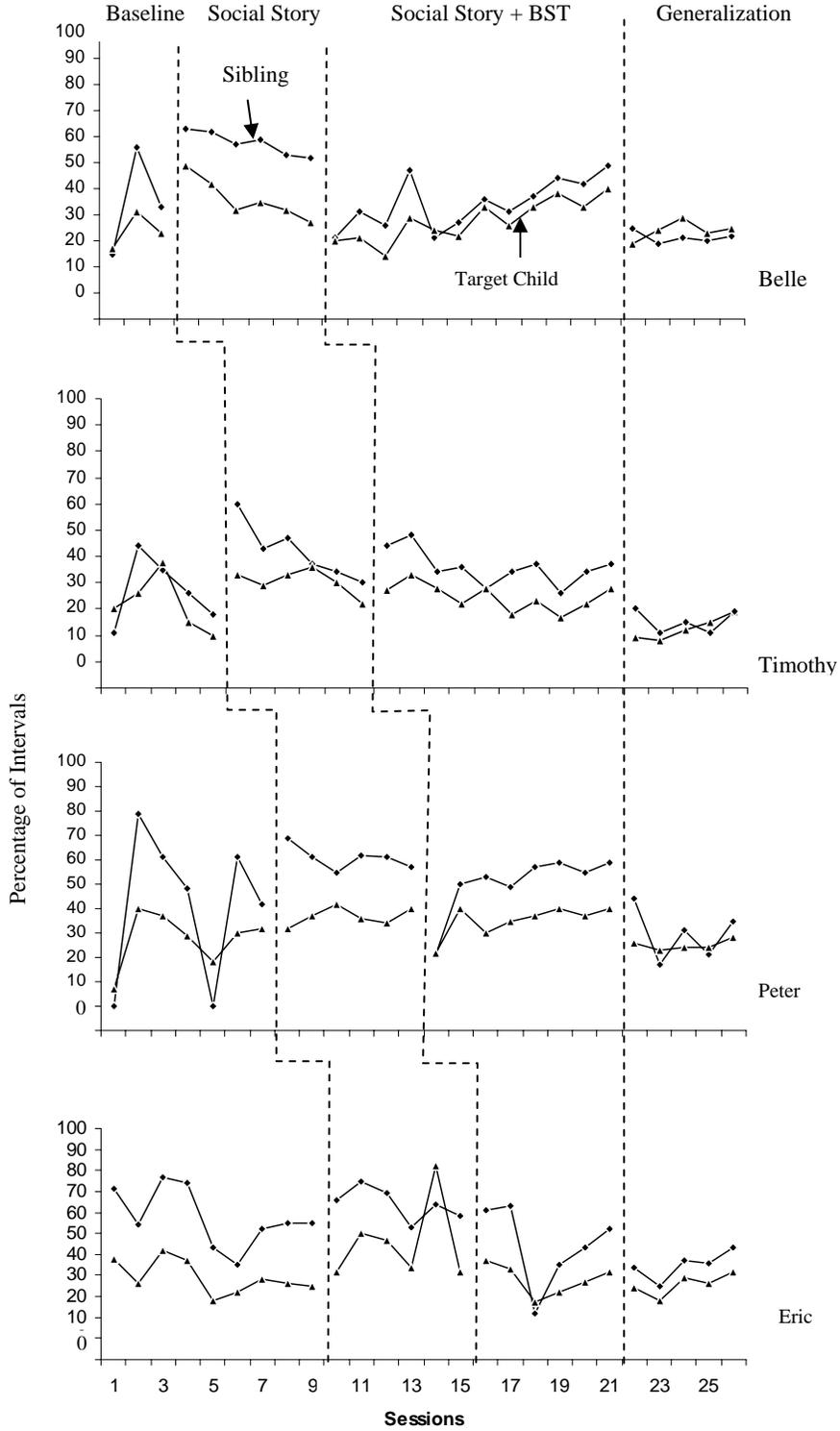


Figure 1. Percentage of intervals of social interactions for the child with autism and her siblings (triangles represent the child with autism, diamonds represent the siblings).

Social Validity

The mean score for the parental social validity scale was 2.6. The mother answered the social validity questions as follows: 1) How comfortable were you having your children implement the procedures? = 3 (Extremely comfortable), 2) Have you noticed any improvements in the interactions between Ariel and her siblings? = 2 (A small improvement), 3) Did the children help Ariel to problem solve and engage in appropriate behavior when she engages in crying or shouting? = 2 (They sometimes help her), 4) How time consuming did you find the procedures to be? = 3 (They took hardly any time), 5) How disruptive to the family schedule did you find the procedures to be? = 3 (They were not disruptive to the family schedule), 6) How difficult did you find the data collection to be? = 3 (It was not difficult at all), 7) How likely are you to use social stories in the future? = 3 (Very likely), 8) How much do you think your children have benefited from these procedures? = 2 (They have benefited a small amount). According to the social validity results, the family members viewed the study as beneficial, not disruptive to the families' schedule, and not difficult to implement. The sibling's social validity scores are displayed in the table below.

Table 1: Social validity sibling questionnaire

Questions	Belle	Timothy	Peter	Eric
Did you enjoy playing with Ariel?	3	3	2	3
Did you feel more comfortable playing with her after you learned what to do if she cried or shouted?	3	3	2	2
Did you think the skills were hard to learn?	2	2	3	3
Did you have a hard time remembering the skills?	2	2	2	3
Were there any parts that you did not like?	3	3	2	3
Do you think Ariel plays with you better now?	3	2	2	2
Would you like to learn more ways to play with Ariel?	3	2	1	2

Table 1: Questions and scores from the sibling social validity questionnaire (3-point rating scale, 1= not at all, 2= a little, and 3 = a lot).

Chapter 4

Discussion

The results of the study indicate that the social interactions of the child with autism increased in part with the implementation of the sibling mediated social stories intervention. The overall levels of Ariel's social interaction increased when she engaged in the social stories intervention; however, the data revealed decreasing trends during play with two siblings. The overall levels of siblings' social interactions directed to Ariel increased during the first intervention session, but gradually or rapidly decreased depending on the child as intervention progressed. The effectiveness of the social stories was difficult to assess based on the data due to the instability in the data.

The results of the study also indicate that although overall levels of social interactions for Ariel and her siblings during behavior skills training intervention were relatively lower than those during social stories condition, two siblings' social interaction increased over time which resulted in an increase in the social interactions of Ariel during play with them.

During the intervention, it was observed that the siblings did not have any difficulty reading the social stories; however they did show resistance to reading them after the third or fourth session. Their resistance to reading the social stories may be a contributing factor for the social stories intervention resulting in the limited improvement of the children's social interactions. The social stories intervention may have been more

naturalistic and effective if it had been implemented at a different time or setting such as before bed or in the morning before school. Dodd et al (2008) conducted a study in a home setting where they used social stories to increase compliments between two brothers during a play session. The study results showed zero compliments during baseline and an increase to 5 compliments over three sessions for one boy. For the second boy the results showed an initial increase from 0 to 7 compliments, but then a decline back to zero compliments over four sessions. The results of Dodd et al's study were consistent with the results of the current study - the initial increase in compliments, followed by a decreasing trend for one participant, which was similar to all four of the siblings in the current study. Sansosti and Powell-Smith (2006) also reported similar results with Asperger syndrome using social stories. The dependent variables were sportsmanship, maintaining conversation, and joining in behaviors for three participants. The study was implemented in a school setting, but the results showed variability similar to the variability shown in the current study. All three participants in the Sansosti et al's study showed increases in the children's target behavior; however only one participant showed relatively stable data after the social story intervention was implemented. Two of the participants in the study showed a progressive increase in target behaviors, one more extreme than the other.

There were a few instances in the current study when the sibling made a reference from the social stories to prompt the target child to behave appropriately (i.e. "Those aren't nice words" or "You're not following what the story said"). The social stories gave good examples of appropriate behavior when interacting with family members, but the BST allowed the siblings to practice the appropriate behaviors which assured that the

skills were in their repertoire. The siblings participated well during the one-hour behavior skills training sessions. All of the siblings asked questions, and gave examples of scenarios they have had difficulties with involving Ariel in the past, then the researcher and sibling engaged in a role play of the scenario based on the sibling's question so they had a model of the correct behavior, and got to practice the correct behavior themselves.

After the first BST intervention session the siblings showed a decrease in social interactions with Ariel during a few sessions, which resulted in a decrease Ariel's social interactions. One reason their social interaction skills decreased might have been because during the BST session they was taught appropriate ways to prompt Ariel (i.e. tapping the target child while saying her name, saying her name followed by a "look at me" prompt) to help her initiate social eye contact. Before the training the siblings repeatedly called Ariel's name until she looked at them, which could have been recorded as social interaction. Also when Ariel refused to respond to their social initiation, they asked again or pleaded until Ariel engaged in shouting or until she agreed to the request. However, during the BST session all of the siblings were taught to prompt a social initiation, wait for a response, and move away from Ariel if she refused to respond or did not respond to the prompt, wait 10-15 seconds, and then provide another prompt. This procedure may have been correlated to the lower percentages of social interactions. Another factor that may have contributed to the lower levels of social interactions during the BST intervention was the duration of time between a refusal from Ariel and a social initiation prompted by the sibling. If the sibling waited longer then 10-15 seconds, it could cause a decrease in the percentages of social interactions. Although it was observed that the siblings displayed more appropriate social initiations during the intervention phases

compared to baseline, the data do not show whether their social initiations were more appropriate during the BST intervention.

There were several occasions when Ariel appropriately refused to play with Eric or Peter (i.e. “I don’t want to play with you right now” or “I don’t want to talk to you right now.”). If Ariel appropriately refused a social initiation, the sibling responded by leaving her to play alone, and later prompted another social initiation. There were some sessions where it was more reinforcing for the sibling to play alone than to play with Ariel, and vice versa. The increase in the children’s social interactions during the later intervention sessions might have resulted from the increase in siblings’ social response skills of verbal compliments. Due to Ariel’s low levels of problem behaviors, the siblings rarely needed to implement the skills learned in the BST sessions. The 2 to 3 occasions when a sibling did have to initiate a prompt for Ariel to engage in an appropriate behavior, Ariel responded appropriately to the sibling delivering the prompt. Another factor that may have influenced Ariel’s problem behavior was the one on one attention she received from her siblings during the sessions. A low demand, high attention environment has little need for engagement in problem behavior. Although the current data do not show the children’s levels of social response skills, it was observed that the siblings provided frequent verbal compliments contingent upon Ariel’s social interactions during the course of the BST intervention which may have resulted in the increasing trend of social interactions between the siblings.

One of the research questions addressed by this study related to generalization. The effects of the sibling mediated intervention failed to generalize to a non-trained free play condition in the pool with levels of social interactions close to the percentages

during baseline. Although overall levels of the social interactions among the children were relatively low in the generalization phase, most of the children's social interactions increased over time. The variability in the children's behavior appeared to be minimal.

A limitation of the study was implementing the interventions without carrying out the length of the phases until the data showed stability. Implementing the BST intervention while there were downward trends in the data in the social stories phase left to questions about how effective the social story intervention was. There is no way of knowing if the social interactions would have continued to decrease, or if they would have increased if the social story intervention was carried out for a longer period of time. Similar questions arose regarding implementing the generalization assessments while the social interactions of the children were on an increasing trend during the social story plus behavior skills training intervention. The results are inconclusive regarding how effective the BST intervention was due to the upward or downward trends in the data.

Another limitation of the study was the potential effect of time scheduling with the participants on their target behaviors. Since the study was done in the home of the participants, the sessions had to be done around school, homework, sporting events, school functions, and appointments. Due to some of the unexpected events in the family environment, sometimes the context of intervention conditions changed. The health of the participants was another limitation associated with the validity of the intervention. Ariel and her sibling's were sick for a period during the study, and they sometimes showed less interest in the play. A third limitation of the study was the resistance from the participants to read the social stories. Engaging in play appeared to be more reinforcing than reading the stories, which caused the siblings to read the social stories quickly, or disguise their

voice while reading which made the stories more difficult to comprehend. A final limitation was associated with using a video camera to record the sessions. The view of the room was restricted when the children were not in close proximity to each other during the session. It was difficult at times to have both children in view with the camera which resulted in missing the opportunities to observe their interactions. The environment was also less naturalistic due to the presence of the researcher. There were several occasions during the sessions when one of the participants referenced the researcher either for a prompt to help problem solve a situation, or for attention when he/she was behaving inappropriately.

This study suggests that future research should focus on a comparison between social story conditions. One intervention condition would have the social stories read before every session, and the other intervention would have the stories read every second or third session. The results would show whether social stories are more effective when they are read more often or less often. Researchers may also want to carefully investigate the effectiveness of the sibling mediated behavior skills training on children with autism. In this study, the four siblings demonstrated different levels of social interaction which in turn resulted in different levels of social interaction of the child with autism during play with different siblings. The sibling's differing social interaction or communication levels may have influenced their ability to initiate or respond to social interaction of the child with autism.

This study has a few implications for practice. The reading level and comprehension of the child should be taken into account before social stories are used to increase or decrease behavior. Although more research needs to establish the proper

schedule for reading social stories, the best way to fade social stories and the best strategies for promoting generalization, this study provides additional support for the use of family members, especially siblings as effective intervention agents for observational learning and facilitating positive social interactions among siblings. Siblings can provide opportunities for engagement in the social interactions of children with autism. A structured sibling modeling procedure incorporating social stories may be an effective strategy for families to use in the home setting.

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Appendices

Appendix A: Target Child and Sibling Data Sheet

Participant _____

Session _____

1 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

2 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

3 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

Appendix A (Continued)

4 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

5 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

6 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

Appendix A (Continued)

7 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

8 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

9 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

Appendix A (Continued)

10 min	10s	20s	30s	40s	50s	60s
Sharing						
Turn Taking						
Tone of Voice						
Soc Response						
Soc Initiation						
Shouting						
Crying						
Aggression						
Soc Initiation						
Soc Response						

Appendix B: Social Stories

Playing with Belle, Timothy, Peter, and Eric

I like to play with Belle, Timothy, Peter and Eric. It is fun to pretend to be dinosaurs, princesses, and to sword fight together. We have fun when we play together!

Sometimes when I play the kids take my toys. Sometimes they do not play the game the way I want to play. This makes me mad.

When I get mad I need to remember my good choices.

I can use my nice words to ask
“Stop please!” or

“Leave me alone,
please!”

I can say :
“Please give my toy back!”, or “I don’t want to play
the game that way.”

When I use my nice words and calm voice, they will listen to me and we can find a solution so we can be happy and have fun!

If I feel mad I can take a deep breathe or count to 10. I can also squeeze my hands or take a break from playing with them.

I should use a nice voice when I am asking for help or for my toys back. Eric, Peter, Belle, and Timothy like it when I use nice words in a nice voice.

Sometimes Eric, Peter, Belle, and Timothy may get mad at me because I don’t want to share or don’t want to play with them. Sometimes it takes me longer to calm down and I like it when they are patient with me.

If Belle, Timothy, Peter and Eric get mad at me they should tell me that they don’t like the way I’m playing. I should share my toys or take turns when they ask me to play differently so we can continue to play together and have fun.

When we use our nice words, share, and take turns we have a lot of fun together. I really like it when we all play together nicely, and Belle, Timothy, Peter and Eric like it when we play nicely too.

Playing with Others

Playing with my family can be a lot of fun. I like to pretend I am a person from a movie or tv show.

When someone is playing with a toy I want to play with

I can say

“Can I please have a turn when you’re done.”

Sometimes they may say yes and I will take my turn. Sometimes they may say no and I will have to wait until they are done playing with the toy.

It is nice to ask to play with my family when they are playing alone or with a toy that I like to play with. When I ask to play I should use my nice words. My family likes it when I use a nice voice to talk to them.

If someone in my family asks me to play

I should say

“ok” if I want to play with them

or

“no thank you”

if I want to play by myself.

If I decide to play with someone in my family, I should remember to share my toys and ideas.

If someone in my family asks me to play with my toy I can say ok and give them a turn. If I am not done with my toy

I can say

“you can have a turn when I am finished.”

My family thinks it is nice when I share and take turns with my toys.

It is important to play nicely with other people. When I play nicely with my family they will want to play with me again. I have a lot of fun when I play with my family. They have fun when they play with me. I am a fun girl to play with.

Appendix C: Procedural Checklist

Observer Name _____

Date of Session _____

Social Story Condition

- | | | |
|--|-----|----|
| 1. Did mom instruct the target child and chosen sibling to “go upstairs and play”? | Yes | No |
| 2. Did the sibling initiate reading the first social story? | Yes | No |
| 3. Did the children read the first social story? | Yes | No |
| 4. When the children finished the first social story, did the sibling initiate the reading of the second social story? | Yes | No |
| 5. Did the 2 children read the second social story? | Yes | No |
| 6. When the children finished reading the second social story, did they use the remaining time of the session to play? | Yes | No |
| 7. Did the sibling implement the social interaction prompt mentioned in the social stories? | Yes | No |
| 8. After the play session is over, did the mother praise siblings for interacting with the child with autism? | Yes | No |

BST Condition

- | | | |
|--|-----|----|
| 1. Did the sibling provide the social interaction prompts to the target child throughout the session? | Yes | No |
| 2. Did the sibling provide contingent praise or tangible item to the target child throughout the session? | Yes | No |
| 3. Did the target child respond appropriately to the sibling? | Yes | No |
| 4. If the target child did not respond appropriate to the sibling, did the sibling initiate another social interaction prompt? | Yes | No |
| 5. After the play session is over, did the mother praise siblings for interacting with the child with autism? | Yes | No |

Appendix D: Social Validity for Parents

1. How comfortable were you having your children implement the procedures?
 - a. Extremely comfortable
 - b. Somewhat comfortable
 - c. Not at all comfortable

2. Have you noticed any improvements in the interactions between Ariel and her siblings?
 - a. A large improvement
 - b. A small improvement
 - c. No improvement

3. Do the children help Ariel to problem solve and engage in appropriate behavior when she engages in crying or shouting?
 - a. They always help her.
 - b. They sometimes help her.
 - c. They never help her and still go to you when the behaviors occur.

4. How time consuming did you find the procedures to be?
 - a. They took a lot of time.
 - b. They took a small amount of time.
 - c. They took hardly any time.

5. How disruptive to the family schedule did you find the procedures to be?
 - a. They were very disruptive to the family schedule.
 - b. They were somewhat disruptive to the family schedule.
 - c. They were not disruptive to the family schedule.

6. How difficult did you find the data collection to be?
 - a. It was very difficult.
 - b. It was somewhat difficult.
 - c. It was not difficult at all.

7. How likely are you to use social stories in the future?
 - a. Very likely.
 - b. Somewhat likely.
 - c. Not at all likely.

8. How much do you think your children have benefited from these procedures?
 - a. They have benefited a great deal.
 - b. They have benefited a small amount.
 - c. They have not benefited at all.

Appendix E: Social Validity for Siblings

1. Did you enjoy playing with Ariel?
 1. Not at all
 2. A little bit.
 3. A lot.

2. Did you feel more comfortable playing with her after you learned what to do if she cries or shouts?
 1. Not at all.
 2. A little bit.
 3. A lot.

3. Did you think the skills were hard to learn?
 1. A lot.
 2. A little bit.
 3. Not at all.

4. Did you have a hard time remembering the skills?
 1. A lot.
 2. A little bit.
 3. Not at all.

5. Were there any parts that you did not like?
 1. A lot
 2. A little bit.
 3. Not at all.

6. Do you think Ariel plays with you better now?
 1. Not at all.
 2. A little bit.
 3. A lot.

7. Would you like to learn more ways to play with Ariel?
 1. Not at all.
 2. A little bit.
 3. A lot.