A Comparison of Social Stories With and Without a Reinforcement Component

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A COMPARISON OF SOCIAL STORIES WITH AND WITHOUT A REINFORCEMENT COMPONENT

by

Erin Cuneo Perry

Abstract of a Dissertation Submitted to the Graduate School of The University of Southern Mississippi in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

May 2011
ABSTRACT

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by Erin Cuneo Perry

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The purpose of the current study was to compare the effectiveness of Social Stories™ (Gray, 2004) used in isolation and when combined with a reinforcement component to increase appropriate behaviors and decrease inappropriate behaviors. Treatment effects for socially inappropriate behaviors and appropriate replacement behaviors were tracked. The setting of the current study was in a school district. The diagnoses of two of the participants included Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), and the other two participants were diagnosed with Autistic Disorder. All participants read a social story to their teacher prior to the time at which the target behaviors were occurring. The data revealed that the social story combined with reinforcement was more effective for decreasing inappropriate behaviors for two participants. For one of the participants, both treatment phases were equally effective in decreasing the participant’s inappropriate behaviors. Finally, the data revealed that neither treatment phase effectively decreased one participant’s inappropriate behaviors. However, a third treatment phase consisting of a prompting procedure decreased one of the participant's inappropriate behaviors. The results also revealed that social stories were generally more effective when combined with the reinforcement component for increasing appropriate behaviors for three participants. For one of the
participants, minimal increases in appropriate behaviors were observed across all
treatment phases, including a modified treatment procedure which consisted of prompting
for appropriate behaviors.
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CHAPTER I
INTRODUCTION

The prevalence of all Autism Spectrum Disorders has increased over the past 4 decades in the United States, with a recent estimate of 1 in 110 children (CCD, 2009). The reported increases in the prevalence rates of Autistic Spectrum Disorders are likely related to increased awareness and knowledge of Autistic Spectrum Disorders among parents and professional service providers as well as changes in the diagnostic criteria (Wing, 2002). Due to the increase in prevalence rates of Pervasive Developmental Disorders and particularly Autism Spectrum Disorders, there is a continued need for appropriate intervention services across the home and school settings.

The Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR; American Psychiatric Association [APA], 2000) provides a description of the general features of Pervasive Developmental Disorders. These features include deficits in the areas of social skills, communication and a preoccupation with routines. In the area of social skill deficits, a variety of interventions have been developed and evaluated including: (a) social skills training (Nakamura et al., 2000); (b) role-playing, modeling and feedback (Barnhill, Cook, Tebbencamp, & Myles, 2002); video modeling and self-management (Apple, Billingsley, & Schwartz, 2005; Bellini, Akullian, & Hopf, 2007); pivotal response training (Koegel, Koegel, & Brookman, 2003); and prompting procedures (McConnell, 2002; Rogers, 2000). Barnhill et al. suggested future researchers investigate the utility of scripts as an intervention to help facilitate appropriate social skills. Social stories are intervention strategies that utilize a scripted format to help individuals better understand the appropriate social interactions expected
Social Stories

Social stories are brief scripts designed to describe social situations and then explain the appropriate behaviors expected in that specific social situation (Gray, 1995). Scattone, Tingstrom, and Wilczynski (2006) discussed possible reasons why social stories are effective tools to teach new skills to children with Autism Spectrum Disorders. Social stories may serve as an antecedent prompt to teach appropriate behaviors that are expected in a variety of social situations including home, school, and community settings. In addition, social stories may provide written rules that govern the behavior of children with Autism Spectrum Disorders (Scattone et al., 2006). Malott (1992) discussed the concept of rule-governed behavior and noted that sometimes behaviors occur as a result of following a rule instead of the occurring due to the result of direct and immediate reinforcement contingencies. Social stories describe expected behaviors (rules) for a variety of social situations. Therefore, social stories may be effective in teaching appropriate behaviors because the appropriate behaviors are emitted as a result of rule following.

Gray (1995) described several guidelines that are important to consider when social stories are written. She described three different sentence types that should be incorporated into the social stories which are descriptive, directive, and perspective sentences. Descriptive sentences explain what the social situation consists of, who is involved, and why certain features of social situations are important. Directive sentences explain the appropriate behaviors or responses that are expected in certain social
situations. Perspective sentences explain the feelings or reactions of the other people involved in the social situation the story is describing. Gray (1998) described the most effective social stories as combining these three types of sentences into a specific ratio. Gray stated that when a directive sentence was written, two to five descriptive and/or perspective sentences should be incorporated into the social story.

Recently, Gray (2004) trade-marked her guidelines for social stories and provided new guidelines for the stories. Gray included 10 criteria to which all Social Stories™ should adhere in order for the stories to be written correctly. The criteria state that social stories should:

1. convey the meaning of social situations in a positive manner and explain certain skills at which the student excels;
2. include a title, body, and conclusion that clearly explain all information in a clear and organized manner;
3. answer who, what, where, when, why, and how of the particular situation or skill being described in the story;
4. be written from the first or third-person perspective and never from the second person perspective;
5. convey the meaning of social situations in a positive manner and not include any direct references to the participant’s inappropriate behaviors;
6. contain descriptive sentences with a combination of the other sentence types that include perspective, cooperative, directive, affirmative, and/or control sentences;
7. contain twice as many descriptive than directive sentences;
8. be written towards the interests of the individual child and can be interpreted literally;

9. possibly include pictures or drawings to help facilitate the participant’s understanding of the story’s content; and

10. capture the main idea or topic of the social story.

Gray (2004) also outlined the six types of sentences that are written in the social stories. These include descriptive, perspective, cooperative, directive, affirmative, and control sentences as described below.

1. Descriptive sentences are the only required sentences required and include sentences that state the factual information of the social situation.

2. Perspective sentences explain the feelings or opinions of other people that may be associated with the social situation described in the story.

3. Cooperative sentences explain to the participant what other individuals in the social situation will do to help the student in the social situation.

4. Directive sentences explain the appropriate behaviors that are expected in the given social situation.

5. Affirmative sentences are used to inform the reader of cultural norms, rules of society, or references to rules that are enforced in society to keep the environment safe.

6. Finally, control sentences, are designed to help the participant better understand the social situation described in the story by offering them the opportunity to write their own sentence in the story to help facilitate their understanding of the story’s content.
The social stories literature began with case reports and quasi-experimental designs. Swaggert et al. (1995) and Norris and Datillo (1999) utilized quasi-experimental designs to increase appropriate behaviors and decrease inappropriate behaviors in students with Autism. Rowe (1999) reported a case study and discussed how a social story intervention was effective for improving the lunchtime behaviors of an individual diagnosed with Asperger’s Disorder. Although the authors reported the social story produced desirable behavior changes, AB designs lack the experimental control to draw conclusions about treatment outcomes. As the social story research progressed, experimental designs were incorporated, allowing firmer conclusions to be drawn about the effects of social stories. However, authors frequently combined social stories with other intervention components designed to increase appropriate behaviors and decrease inappropriate behaviors. In the following section, a review of the studies using experimental designs to investigate the effectiveness of social stories will be presented, first for studies in which social stories were a part of a larger multicomponent intervention package, followed by a review of studies in which the effects of social stories in isolation were examined.

Review of Studies Using Social Stories

Multicomponent Interventions

Kutler, Myles, and Carlson (1998) utilized a social story intervention to decrease antecedents to tantrum behavior during morning work and lunchtime. An ABAB design was used to examine treatment effects. The participant was diagnosed with Autistic Disorder, Fragile X Syndrome, and Intermittent Explosive Disorder. Two social stories
were created, one targeting unstructured activities and the second targeting transitioning activities. Other intervention components including sticker charts, picture schedules, and verbal prompts were also in place during baseline and treatment phases. The participant’s teacher read the stories immediately prior to morning work time and lunchtime. Contingent on the occurrence of the target behaviors, the teacher verbally prompted the participant to refer to the social story. It should be noted that the prompt differs from the traditional antecedent procedure of social stories when the story is read prior to the occurrence of the target behavior and no prompting procedures occur to prompt the occurrence of the appropriate behavior. Decreases in the precursors to tantrum behaviors were observed in both settings during the first intervention phase. Similarly, during the withdrawal phase, increases in the target behaviors occurred in both settings. In the second intervention phase, decreases in target behaviors occurred for each setting.

A limitation of the study not noted by the authors was the lack of treatment integrity data reported on the steps of the social story intervention (Kutler et al., 1998).

Thiemann and Goldstein (2001) investigated a multicomponent intervention package that consisted of social stories combined with video feedback designed to improve the social skills of five students with Autistic Disorder. Each participant was paired with two peers of typical development to make a total of five triads. The targeted social skills for intervention included securing attention, initiating comments, initiating requests, and contingent responses. The participants received intervention services twice a week consisting of 10 min of social story instruction, social interactions with peers, and video feedback.
In the social story instruction treatment phase, the peers read the social story to the student diagnosed with Autistic Disorder. The participants were also asked comprehension questions about the story’s content. During the social interactions phase, the participants were instructed to practice using the target skills discussed in the story with their peers of typical development. The video feedback phase occurred immediately after the social interaction treatment. The participants watched a video with their paired peers of typical development to determine if the students diagnosed with Autistic Disorder had exhibited the targeted social skill discussed in the story. If the participant had failed to exhibit the social skill during the session, the peers then modeled the appropriate skill for the participant. A multiple baseline design across behaviors was utilized for all targeted skills across participants to examine treatment effects. The data revealed that the multicomponent intervention package produced increases in all of the participants’ social skills (Thiemann & Goldstein, 2001). A possible limitation not noted by the authors was that no treatment integrity data were reported, making it unknown as to whether the treatment components were implemented correctly or consistently across the participants and treatment phases.

Lorimer, Simpson, Myles, and Ganz (2002) utilized social stories to decrease antecedents to disruptive behavior. The participant was diagnosed with Autistic Disorder and reportedly functioned in the average range of cognitive ability. The participant displayed disruptive behaviors at home including yelling, hitting, kicking, and throwing objects. Data from a functional assessment revealed that access to attention and tangible reinforcement were the environmental variables maintaining his aberrant behavior. Prior to the occurrence of disruptive behaviors, he would emit “interrupting vocalizations”
(Lorimer et al., p. 54) such as screaming and yelling when he was not receiving adult attention or was required to complete a task he did not want to do. When the participant did not receive attention or access to his preferred activity, his pretantrum behaviors escalated into tantrum behaviors (Lorimer et al.).

An ABAB design was used to examine treatment effects. The social story intervention was used in combination with other interventions already in place such as a digital timer, emotion worksheets, and a mini-schedule to help the participant transition and wait his turn before he spoke. Two social stories were written for the participant in the morning and immediately prior to therapy sessions. The participant had access to the social stories at anytime throughout the day. Intervention data revealed a decrease in pretantrum and tantrum behaviors during both intervention phases compared to baseline phases. Single participant involvement was noted as a limitation, which limits firm conclusions to be drawn about the likelihood of the results to generalize to other participants (Lorimer et al., 2002). It should be noted that this is a common limitation noted in almost all single case design research studies.

Kuoch and Mirenda (2003) utilized a social story intervention to decrease inappropriate behaviors in two participants diagnosed with Autistic Disorder and one participant diagnosed with Pervasive Developmental Disorder-Not Otherwise Specified. The target behaviors for participant 1 were hitting and screaming when asked to share toys and other materials with his sibling. The target behaviors for participant 2 were placing his hands on his genitalia, spitting up chewed food, and making inappropriate vocalizations. The target behaviors for participant 3 included cheating during competitive games with friends and emitting inappropriate comments about losing a game.
An ABA design was used for participants 1 and 2. In the A phase, baseline data were recorded and contingent on the occurrence of a target behavior, corrective feedback was provided to prompt the participants not to engage in the inappropriate behaviors. In the B phase, the social stories were read to the participants immediately prior to the target setting, and corrective feedback was provided in the same manner as in baseline when an inappropriate behavior occurred. For the third participant, an ACABA design was utilized to examine treatment effects. The same procedures were conducted for the A and B phase that occurred for the first two participants. The C phase was also identical to the other B phases, except that a children’s book was used to describe the expected appropriate behaviors in the situation and the interventionist provided a verbal reminder to the participant to engage in the appropriate behaviors described in the story (Kuoch & Mirenda, 2003).

The results revealed a decrease in all of the participants’ disruptive behaviors. Furthermore, the greatest decrease in disruptive behavior for participant 3 occurred in the B phase. A limitation noted by the authors was that it was unknown as to whether the social stories would have been effective for problem behaviors occurring in other settings (Kuoch & Mirenda, 2003).

Burke, Kuhn, and Peterson (2004) investigated the effectiveness of social stories used with four children with typical development to decrease disruptive bedtime behavior. The target behaviors for participant 1 included destroying property, tantrumming, and refusing to remain in bed. The target behaviors for participant 2 included night awakenings and failure to fall asleep without his parents’ presence.
Participants 3 and 4 were siblings. Their target behaviors included fighting with one another, yelling in bed, and trying to sleep in their parents’ bed at night.

The dependent variables measured were the number of disruptive bedtime behaviors, sleep onset time, night waking, and total sleep time. Data were collected by the participants’ parents through the use of sleep diaries. The intervention was a story (The Sleep Fairy; Peterson & Peterson, 2003) that was read to the participants at bedtime by the parents. The story discussed appropriate bedtime behaviors and explained how a tangible reward would be placed under their pillow if they exhibited the appropriate bedtime behaviors. The tangible reward was the other intervention component combined with the stories. An ABABAB design was utilized to examine treatment effects for participant 1. A multiple baseline design across participants was used for the other participants (Burke et al., 2004).

The authors reported the social story intervention produced favorable outcomes. Disruptive bedtime behavior decreased for all participants. A decrease in night waking occurred for participants 2 and 3, and sleep onset decreased for all participants. The results were variable for total sleep time. An increase in total sleep time was evident at follow-up for participant 1, whereas participant 2 exhibited consistent increases in total sleep time during the intervention and follow-up phase. Participants 3 and 4 were reportedly sleeping at normal levels for their age at baseline so no observed increases in total sleep time were evident. A limitation noted by the authors was that parents recorded data on inappropriate bedtime behaviors through the use of sleep diaries. No direct measures of sleep were collected making it unknown if the parents collected data
accurately. The authors recommended that future researchers use more objective measures of sleep through the use of an actigraphy (Burke et al., 2004).

Scattone (2008) investigated the effects of social stories combined with video modeling to teach appropriate social behaviors to a male diagnosed with Asperger’s Disorder. The social interactions targeted for intervention included smiling, initiations, and maintaining eye contact during conversations. A multiple baseline design across behaviors was used to examine the treatment effects. Baseline data were collected in a school and a clinic setting. The intervention consisted of a video that included a social story and two adults modeling the appropriate behavior for the participant. Treatment results revealed an increase in the participant’s eye contact and initiations during conversation. A slight increase was observed in the participant’s smiling behaviors as well. A generalization probe was conducted for each participant’s behavior in the school setting. Results of the generalization data in the school setting revealed an increase in all of the participant’s target behaviors compared to baseline (Scattone, 2008).

Chan and O’Reilly (2008) investigated the treatment package of social stories combined with role plays to increase appropriate social interactions and decrease inappropriate social interactions. Two participants diagnosed with Autistic Disorder participated in the study. A multiple probe design was used to evaluate treatment effects. The results of the treatment package revealed an increase in both participants’ appropriate social interactions and a decrease in the participant’s inappropriate social interactions in the school setting. Maintenance data were also collected and indicated that the treatment effects were maintained over time.
The studies reviewed thus far largely provide support of social stories’ effectiveness for increasing appropriate behaviors and decreasing inappropriate behaviors for individuals diagnosed with PDDs and individuals of typical development. However, other intervention components (e.g., verbal reminders, video feedback, sticker charts, tangible reinforcers, role plays) were used in conjunction with the social stories. Some of the studies previously discussed had other intervention components combined with social stories only in the treatment phases (Burke et al., 2004; Chan & O’Reilly, 2008; Scattone, 2008; Theimann & Goldstein, 2007) which prevent conclusions to be drawn for social stories used in isolation compared to no treatment. Other studies (Kuoch & Mireda, 2003; Kutler et al., 1998; Lorimer et al., 2002) had intervention components besides the social story present throughout all phases of the study. The systematic introduction and withdrawal of the social stories does allow for an assessment of the controlling effects of the social stories on targeted behaviors in the presence of other intervention components. However, no conclusions about the effects of social stories without the other components can be made. The obtained results may have been a product of the social story, the other intervention components, or a combination of the story and other intervention components. In order to more fully inform practitioners and the research community about the effectiveness of social stories, researchers have also investigated the effectiveness of social stories in isolation, a summary of which follows.

**Social Stories Used In Isolation**

Hagiwara and Myles (1999) investigated the utility of social stories when presented in a computer format for three students diagnosed with Autistic Disorder across three different settings for all participants. Hand-washing was the target behavior for
participants 1 and 2 while the target for participant 3 was on-task behavior. A multiple baseline design across settings was used to evaluate treatment effects.

The results of the study revealed that the social story intervention was successful for producing moderate increases in hand-washing for participants 1 and 2. However, the social story intervention did not result in consistent improvements for on-task behavior across any of the three settings for participant 3 (Hagiwara & Myles, 1999). In addition to the inconsistent findings, the scope of external validity may be limited if educational environments do not have the resources to construct the stories in a computer-based format.

Scattone, Wilczynski, Edwards, and Rabian (2002) implemented a social story intervention used in isolation for three students with Autistic Disorder. The purpose of the study was to investigate whether the social stories would decrease inappropriate behaviors. The three dependent variables targeted for intervention were chair tipping, staring inappropriately at girls on the playground, and shouting in math class. A multiple baseline design across participants was used to examine treatment effects. Participants 1 and 2 read the stories to the teacher, while participant 3 was read the story by the teacher because he could not read independently. Intervention data revealed a decrease in all of the participants’ targeted behaviors (Scattone et al., 2002).

Several limitations were discussed by Scattone et al. (2002). One of the limitations noted was that two of the participants were in the same classroom. One of the participants heard another social story being read to the teacher which may have possibly impacted the results seen in the intervention phase. Another limitation mentioned by the authors was that the teachers were observed on several occasions to verbally prompt the
participants about the appropriate replacement behaviors described in the social story when the participant emitted an inappropriate behavior. The verbal prompts were not systematically programmed into the study. Thus, it is questionable as to what influence the verbal prompts had on decreasing the participants’ inappropriate behaviors. The presence of the verbal prompts also prevented firm conclusions to be drawn about the effectiveness of social stories when implemented without any other interventions in place.

In a follow-up study, Scattone, Tingstrom, and Wilczynski (2006) further investigated the impact of social stories used in isolation to increase appropriate behaviors of two students diagnosed with Autistic Disorder and one student with Asperger’s Disorder. A multiple baseline design across participants was utilized to examine treatment effects. Appropriate interactions for all participants were operationally defined as initiating conversations with peers, answering questions posed by peers, or communicating with peers through the use of gestures. Three social stories were created for all participants and the teacher read the social stories to two participants, because they could not read independently. Only one participant read the story to the teacher. The social story intervention occurred immediately prior to the target settings which were unstructured activities for all participants.

Intervention results revealed that only two out of the three participants exhibited increases in appropriate interactions. One of the limitations noted by the authors was that one of the social stories discussed several topics which provided the participant with several options for play behavior. The story may have prevented the participant from engaging in appropriate interactions because he did not understand the social story
(Scattone et al., 2006). Another limitation noted by the authors was the same limitation noted in the Scattone et al. (2002) study. The teachers were reported to verbally prompt the participants to exhibit the appropriate behaviors discussed in the social story, thus limiting the conclusions that can be drawn about the effectiveness of the social stories used in isolation.

Bledsoe, Myles, and Simpson (2003) investigated the effectiveness of a social story intervention for an individual diagnosed with Asperger’s Disorder and Attention Deficit/Hyperactivity Disorder. The two dependent variables were inappropriate and appropriate behaviors during lunchtime. Inappropriate interactions were operationally defined as any food or drink that fell onto the floor from the participant’s mouth. Appropriate interactions were operationally defined as anytime the participant wiped his mouth with a napkin.

An ABAB design was utilized to examine the treatment effects. Intervention data revealed that the social story intervention decreased the participant’s inappropriate interactions and increased the participant’s appropriate interactions in both intervention phases. A limitation of the Bledsoe et al. (2003) study was that no treatment integrity data were reported. It is unknown if the intervention procedure was implemented correctly or consistently.

Adams, Gouvousis, VanLue, and Waldron (2004) examined the effectiveness of a social story intervention used during homework time for a student with Asperger’s Disorder. The behaviors targeted for intervention were hitting, screaming, crying, and falling. A social story was created that described appropriate, replacement behaviors. The
participant’s parents read the story to the participant immediately prior to homework time. An ABAB design was utilized to examine treatment effects.

Intervention data revealed a decrease in only the participant’s crying behavior in the first intervention phase. However, by the second intervention phase, decreases in all targeted behaviors were observed. Similar to the Bledsoe et al. (2003) study, no treatment integrity data were reported making it questionable as to whether the parents implemented the steps of the social story intervention as intended by the primary experimenter (Adams et al., 2004).

Ivey, Heflin, and Alberto (2004) investigated the effectiveness of a social story intervention for increasing participation in novel events. Three students diagnosed with Pervasive Developmental Disorder-Not Otherwise Specified served as participants. An ABAB design was utilized to examine treatment effects. Four different types of novel events were set up during each therapy session which included changing settings, a new person presenting new toys, making a purchase, and finishing new activities during the sessions.

The participants’ parents were instructed to read the social stories to the participants before the therapy sessions began and then in the mornings immediately prior to the therapy sessions. The results indicated that increases in the participant’s participation in novel events occurred in the intervention phases and decreased during the withdrawal sessions. A limitation noted by the authors was that phase changes in the ABAB design were determined a priori and were not based on stability in the data (Ivey et al., 2004). Hayes, Barlow, and Nelson-Gray (1999) suggested that phase changes in
single case designs should be based on the stability in the data in order to draw firm conclusions about the effect of the independent variable.

Sansosti and Powell-Smith (2006) investigated the effectiveness of social stories for increasing appropriate behaviors in three students diagnosed with Asperger’s Disorder. A multiple baseline design across settings was used to examine treatment effects. The dependent variables targeted for intervention were sportsmanship behavior, maintaining conversations, and joining in during activities or games with peers. The participants read the social stories to their parents before going to school in the morning and one time when they arrived home after school.

The intervention data revealed that the social story intervention was effective for increasing appropriate behaviors for two of the three participants. These results mirror the data reported from the previously discussed Scattone et al. (2006) study. A limitation noted by the authors was that no direct measures of treatment integrity data were collected. Therefore, it is unknown if the intervention was implemented consistently and accurately as intended by the primary experimenter.

Delano and Snell (2006) investigated the effectiveness of social stories to increase the length of time three participants diagnosed with Autistic Disorder engaged in socially appropriate behaviors with their peers. The authors also investigated the utility of social stories to increase the occurrence of several targeted skills that consisted of seeking attention, initiating comments, initiating requests, and making contingent responses. A multiple probe design was utilized to examine treatment effects.

The social stories were read to the participants and a peer immediately prior to a play session. Comprehension checks were also conducted by asking the participants
comprehension questions related to the story to ensure their understanding of the story’s content. Intervention data revealed that the social story intervention was successful at producing increases in the length of time that all the participants spent engaged in appropriate engagements with their peers during play sessions. Furthermore, maintenance data revealed that even when the social story did not occur on certain sessions, the participants still engaged in a longer duration of appropriate interactions with their peers compared to baseline. In addition, all participants exhibited an increase in the targeted skills after the social story intervention was implemented (Delano & Snell, 2006).

The authors mentioned a limitation that limits the conclusions that can be drawn about the intervention effect for one participant. That is, a reinforcement component was combined with the social stories where the participant earned reinforcers for interacting appropriately with his peers. Thus, no conclusions about the effectiveness of the social stories used in isolation can be made for participant 1 (Delano & Snell, 2006).

Soenksen and Alper (2006) investigated the utility of a social story intervention to assist a student with hyperlexia gain the attention of his peers in an appropriate manner. A multiple baseline design across settings was used to examine treatment effects. Data were collected for two dependent variables, calling out a peer’s name to gain attention and looking at a peer’s face while trying to communicate. The three settings targeted for intervention were recess, choice time, and math.

The procedures used in the study consisted of the teacher reading the story aloud to the participant and to two other peers who participated in the social story session. The story was read immediately prior to the target setting. Intervention data revealed an increase in both dependent variables across all settings. The authors noted a limitation
that may have limited the conclusions that could be drawn about the social stories used in isolation. The peers who participated in the social story sessions may have verbally prompted or reminded the participant to exhibit the appropriate behaviors discussed in the story in order to gain the peers attention (Soenksen & Alper, 2006).

Perry (2006) conducted a pilot study to investigate the effectiveness of a social story used in isolation to increase appropriate behaviors and decrease inappropriate behaviors in a participant diagnosed with Asperger’s Disorder. All data were collected in the school setting. The target inappropriate behaviors were talking without the teacher’s permission and making noises during class instruction. The target appropriate interaction was for the participant to raise his hand and wait for the teacher to call on him before he spoke. A social story was read by the participant’s teacher immediately prior to the target setting. An ABAB design was utilized to examine treatment effects.

Intervention results indicated that increases in appropriate interactions were evident in both intervention phases. In the withdrawal phase, the participant’s inappropriate behaviors increased while his appropriate behaviors decreased. One limitation of the study that should be mentioned is that stability in the data during the last treatment phase was not achieved and data collection was terminated because of the end of the school year. Therefore, it is unknown if appropriate interactions would have increased or if the participant’s inappropriate interactions would have continued to decrease.

Perry (2007) further investigated the utility of social stories used in isolation to increase appropriate behaviors and decrease inappropriate behaviors in two students with Asperger’s Disorder. Data were collected in the home and school setting. Both
participants read their respective social stories to the teacher or parent immediately prior to the target setting.

Increases in appropriate interactions occurred for only one participant, while decreases in inappropriate interactions were evident for both participants. A modified treatment phase was implemented for the second participant who did not respond to the social story intervention alone. In the modified treatment phase, the social story was combined with a differential reinforcement procedure. The results indicated increases in appropriate interactions and decreases in inappropriate interactions which did not occur when the social story was implemented in isolation. The comparison of social stories used in isolation versus combined with a reinforcement component provided preliminary data suggesting other intervention components combined with the social stories may be necessary to produce desirable treatment outcomes for students with a PDD. However, due to the end of the school year, only a small amount of data was collected in the modified treatment phase. No replication of the modified treatment phase was conducted, limiting the conclusions that can be drawn about the treatment effects.

Crozier and Tincani (2007) investigated the effectiveness of social stories with picture icons on increasing appropriate behaviors and decreasing inappropriate behaviors in three students diagnosed with Autistic Disorder in the school setting. The targeted appropriate behaviors were talking to peers, appropriate play, sitting appropriately during circle time. The inappropriate behavior targeted for intervention was inappropriate play. The results were evaluated by using an ABAB experimental design for two participants and an ABACBC design for one participant. The B phase consisted of the social story in
isolation while the C phase was the social story intervention combined with verbal prompts.

Treatments results revealed an increase in appropriate behaviors and a decrease in the inappropriate behavior during both intervention phases for two of the participants. For one participant, the social story alone did not lead to an increase in the participant’s appropriate behavior. However, when the social story was combined with verbal prompts an increase in appropriate behavior was observed. Maintenance data were collected at two and three weeks after the intervention. Maintenance data revealed higher percentages of appropriate behavior and lower percentages of inappropriate behavior compared to the baseline phases for all participants (Crozier & Tincani, 2007).

Research regarding the effectiveness of social stories has been conducted with participants diagnosed with Autistic Disorder, Asperger's Disorder, PDD-NOS, typical development, and hyperlexia. Although results of these studies generally support the effectiveness of social stories for producing desired behavioral changes, some authors found mixed or inconsistent results (Crozier & Tincani, 2007; Hagiwara & Myles, 1999; Perry, 2007; Sansosti & Powell-Smith, 2006; Scattone et al., 2006). Some authors failed to systematically assess treatment integrity which ultimately calls into question the veracity of the reported findings. Other findings are limited by the unplanned and inconsistent introduction of extraneous variables, (e.g., verbal prompts, rewards), which when combined with the social stories may have resulted in behavioral changes. To be able to separate the effects of social stories and social stories combined with other intervention elements direct, systematic comparisons must be made.
Purpose

Gray (2004) discussed the theory that lies behind the purpose of social stories. According to Gray, social stories are not created in order to change behavior, per se. Instead, behavior changes that occur as a result of exposure to social stories are theorized to result from an increased understanding of the appropriate behaviors expected in a particular social situation. Practitioners providing intervention services to children with PDDs would benefit from studies that provide direct comparisons of social stories used in isolation versus social stories used in combination with other treatment components to be informed about which intervention is truly more effective. Reinforcement combined with a social story might be a more effective treatment option for some individuals with a PDD because the social story used in isolation may lack the saliency these individuals require. By specifying the desired behavior and providing a reinforcer contingent upon the desired behavior, the individual may readily make a connection between the behavior and outcome. In addition, the social story may eventually serve discriminative stimulus that signals the availability for reinforcement.

To date, there is only one published study in which social stories combined with other intervention components and social stories used in isolation are compared. Barry and Burlew (2004) examined the effectiveness of social stories to increase appropriate play behaviors toward peers and decrease the amount of prompting necessary in order for the participants to choose a center. Prompting was measured by using a point system. Participants could earn a point anywhere from a 0 to 4. A rating of 0 was given when the participant independently chose a center without the teacher’s verbal prompt. A participant was given a rating of a 1 when a center choice was made with a verbal prompt
from the teacher. A rating of 2 was given when the participant made a center choice when the teacher verbally prompted the participant to make a choice and also prompted the participant by pointing to the choice board that had pictures of all the centers. A participant could receive a rating of 3 when no independent choices were made and the participant required physical guiding by the teacher to make a center choice. Finally, a rating of 4 was given to participants who made no choices and did not respond at any prompting by the teacher.

The participants in the study were two male students diagnosed with Autistic Disorder. The authors used an ABCD design to examine treatment effects. The B phase consisted of the teachers reading two social stories to the participants and verbally and physically prompting them to engage in the appropriate behaviors discussed in the story during center time. In the C phase, the procedures were identical to the B phase except that a third story was added which described appropriate play behaviors for center time. Finally, the D phase of the study consisted of only the social stories being read to the participants and the teachers did not prompt the participants to exhibit the appropriate behaviors during center time that were described in the social stories.

The results of the study indicated that both participants required less prompting by the teachers to choose a center and engaged in appropriate play behavior with their peers for increasing amounts of time in the B phase. In phase C, both participants further decreased the amount of prompting necessary to make independent choices. Furthermore, one of the participants further increased her duration of appropriate play behaviors during the C phase while the second participant engaged in approximately the same amount of appropriate play behavior as in the B phase. In the D phase, both participants’ amount of
prompts required to make independent choices further decreased; however, their duration of appropriate play remained at similar levels as the C phase (Barry & Burlew, 2004).

The results from the Barry and Burlew (2004) study indicated that the desired behavior changes maintained when the social story was used in isolation. However, experimental demonstration of treatment effects were not shown as the combined treatment was not systematically withdrawn and then reintroduced. Further, treatment phases were implemented in the same order for both participants; therefore, it is possible that the observed patterns of responding were due to order effects. Delano and Snell (2006) recommended that future research investigating the effectiveness of social stories focus on which components of social stories are necessary to produce the most effective treatment outcomes. The extant literature generally suggests that social stories are an effective intervention for increasing appropriate interactions and decreasing inappropriate interactions when used in isolation or when combined with other intervention elements. As noted, inconsistent findings across participants have been reported more often when social stories are used in isolation. The purpose of the proposed study is to provide a comparison study which will compare social stories used in isolation versus social stories combined with a reinforcement component. In addition, compared to the previous research, this study will allow practitioners and researchers to draw more firm conclusions about which treatment is more effective because the treatments will be counterbalanced across participants to control for order effects. Replication of treatment effects will also be conducted to provide additional experimental control.

Research Questions

The following research question will be evaluated in this investigation:
1. Which intervention will be more effective for producing increases in appropriate interactions: social stories used in isolation or social stories combined with a reinforcement component?

2. Which intervention will be more effective for producing decreases in inappropriate interactions: social stories used in isolation or social stories combined with a reinforcement component?
CHAPTER II

METHOD

Participants and Setting

Four participants, with primary diagnoses of Pervasive Developmental Disorder - Not Otherwise Specified (PDD-NOS) or Autistic Disorder served as participants. One participant lived in a rural, southeastern state, and the other three participants lived in a urban area of a southeastern state. Each participant underwent a comprehensive evaluation consisting of records reviews, interviews, and direct observations. The Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2000) was one of the key instruments that was critical to the evaluation to determine if participants had a valid diagnosis of an Autism Spectrum Disorder. If the participant did not have an evaluation that included the ADOS, the participants were considered to have received a valid diagnosis of an Autism Spectrum Disorder if their assessment had been conducted and completed with instruments that had empirical support at a facility specializing in the assessment and treatment of children with autism and other related disorders. Table 1 describes the demographic data of all four participants.

Table 1

Demographic Data for All Participants

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age</th>
<th>Sex</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sue</td>
<td>6</td>
<td>Female</td>
<td>Caucasian</td>
</tr>
</tbody>
</table>

Table 1 (continued)
One of the participants, Sue, was diagnosed by the primary experimenter at a university-based training clinic. Two participants, Bill and Sam, were diagnosed at an Autism Center, a not-for-profit organization providing integrated advanced clinical, behavioral, education, and family support services to children with autism and related disorders. The fourth participant, Adam, was diagnosed in his school district. The children were referred by either their teachers or parents for exhibiting inappropriate behaviors in a target setting in school. Parent and teacher referrals were verified through interview and direct observations, described in more detail in the Procedures section.

Once participants were identified for potential inclusion, the primary experimenter obtained parent (Appendix A) and teacher (Appendix B) consent prior to proceeding with the procedures of the study. All data were collected in the classroom setting. The following section briefly describes characteristics of the participants.

*Sue*

Sue was in the first grade who was referred by her teacher for inappropriate interactions in the classroom. Demographic data were not available for Sue’s teacher. Sue was educated in a general education classroom but received speech and occupational therapy outside of the classroom. She was diagnosed with PDD - NOS. Her diagnosis was achieved by a variety of rating scales, interviews, and direct behavioral observations.
The rating scales used in the assessment included the Childhood Autism Rating Scale (Renner, Reichler, & Schopler, 1986), Gilliam Asperger's Disorder Scale (Gilliam, 2001) and the Social Skills Rating Scale (Gresham & Elliott, 1980). The direct behavioral observations consisted of conditions that analyzed social interactions and communication. The examiner coded whether or not Sue initiated social interaction, engaged in parallel play, attempted to engage in play with other people, and whether or not she complied with adult demands. Sue’s teacher described her as an intelligent girl with a vivid imagination. The teacher reported that the behavior causing the most difficulty occurred during reading time and consisted of stereotypy in the form of head-rocking. This behavior reportedly drew negative attention to Sue from peers, and at times, made it difficult for Sue to focus on her work.

Bill

Bill was in the first grade who was referred by his mother for inappropriate interactions in the classroom. Bill was educated in a general education classroom that consisted of the teacher and one paraprofessional. Bill received speech and occupational therapy outside of the classroom. He also received individual tutoring for all subject areas twice a week. He was diagnosed with Autistic Disorder. The diagnosis was made based on the results of several rating scales, behavioral observations, clinical interviews, records review, and behavioral questionnaires. The rating scales used included the Gilliam Autism Rating Scale (Gilliam, 2008) and the Social Responsiveness Scale (Constantino, 2005). Other instruments used included the Childhood Autism Rating Scale (Reichler et al., 1986), the ADOS (Lord et al., 2000), and the Vineland Adaptive Behavior Scales-Second Edition (Balla, Cicchetti, & Sparrow, 2005).
Bill’s teacher was 29 years of age and had earned a bachelor’s degree in Early Childhood Education. She reportedly had been teaching for 6 years. His teacher and parent were interviewed to identify the target problem behavior. The teacher and parent reported that the behavior causing the most difficulty occurred during phonics instruction and consisted of off-task behavior. The teacher and parent reported that the participant’s off-task behavior was preventing Bill from completing his work.

Adam

Adam was in the fourth grade and was referred by his teacher for inappropriate interactions in the classroom. He was diagnosed with Autistic Disorder. The diagnosis was made based on the results of several rating scales, behavioral observations, interviews, records review, and behavioral questionnaires. The rating scales used included the Adaptive Behavior Assessment System, Second Edition (Harrison & Oakland, 2003) and the Behavior Assessment System for Children, Second Edition (Kamphaus & Reynolds, 2004). The other instrument used in the assessment included the ADOS (Lord et al., 2000). Adam was educated in a general education classroom for all subject areas. The classroom consisted of the teacher and one paraprofessional. Adam received social skills training outside of the classroom two times a week.

Adam’s teacher was 31 years of age and had earned a bachelor’s degree in Early Childhood Education and Child Development. She also had earned an Education Specialists Degree. She reportedly had been teaching for 8 years. His teacher and parent were interviewed to identify the target problem behavior. The teacher and parent both reported that the behavior causing the most difficulty occurred during social studies class.
The target behavior was nose-picking. The behavior reportedly drew negative attention to Adam from his peers.

**Sam**

Sam was in the second grade and was referred by his teacher for inappropriate interactions in the classroom. Sam was educated in a general education classroom but received speech therapy services two times a week outside of the classroom. Sam was diagnosed with PDD - NOS. The diagnosis was made based on the results of several rating scales, behavioral observations, interviews, and behavioral questionnaires conducted at an Autism Center. Some of the instruments used in the assessment included the Differential Ability Scales-Second Edition (Elliott, 2007), A Developmental Neuropsychological Assessment-Second Edition (Korkman, Kirk, & Kemp, 1998) Scales of Independent Behavior-Revised (SIB-R; Bruininks, Hill, Weatherman, & Hill, 1984), and the Child Behavior Checklist (Achenbach, 1991).

Sam’s teacher was 40 years of age and had earned a bachelor’s degree in Middle School Education. She reportedly had been teaching for 15 years. His teacher and parent were interviewed to identify the target behavior of concern. The teacher and parent both reported that the behavior causing the most difficulty in the classroom was talking out of turn. The behavior reportedly drew negative attention from peers and the teacher and also prevented the student from following the classroom rules.

**Materials**

A social story targeting the problem behaviors of each participant (Appendixes C-F) was constructed. Each story provided the participant with an explanation of the appropriate behavior he or she was expected to exhibit in a particular situation and was
written in first person format. The social stories were typed in 12-point Times New Roman bolded font on white paper before being placed on a sheet of black construction paper and laminated. The sheets were compiled into a book-like format and bound on the side. The social stories adhered to the guidelines (Appendix G) outlined by Gray (2004) which consisted of: (a) twice as many descriptive as directive sentences, (b) positively worded language, (c) written based on the level of functioning and individual interests of the participant, and (d) no direct reference to the student’s inappropriate behavior.

All social stories constructed by the primary experimenter were reviewed by a doctoral level psychologist who had published experimental studies on the effectiveness of social stories. The expert reviewed socials stories to ensure that the story content was written in accordance to the guidelines of the creator of social stories, Carol Gray. Comprehension questions were constructed for the stories. The comprehension questions were included in the social stories to ensure the participants’ understanding of the story content. The questions focused on the main ideas of the social stories and prompted the participants to engage in the appropriate behaviors discussed in the story.

Reading Assessment

The participants’ reading ability was assessed by administering curriculum based measures of reading. The assessment began with administering three probes on the participants’ grade level, and then higher or lower grade level probes were administered until the participant’s instructional or mastery level was determined. The median score of all three probes was used to determine if the student was reading on mastery, instructional or frustrational level using Fuch and Deno’s (1982) standards. According to these standards, for first and second grade levels, students were reading at the
instructional level if they read 40 to 60 correct words per minute (CWPM). If the student read above 60 CWPM, then the student was considered to be reading at a mastery level. For third through sixth grade levels, a student was considered to be reading at an instructional level if 70 to 100 CWPM were read by the participant. Mastery level was defined as reading more than 100 CWPM. In addition, to ensure that the social story was written on the students’ grade level, the story was entered into the Dale Chall readability formula (Dale & Chall, 1948) located on a website (www.interventioncentral.org).

Dependent Variables and Data Collection

Direct observations were conducted in the primary setting in which the target behaviors were reported to occur. All observations were 10 minutes in length. Two dependent variables were recorded for all participants and included (a) inappropriate behaviors and (b) appropriate replacement behaviors. Inappropriate and appropriate behaviors were operationally defined for each participant through consultation with the participants’ teachers. Inappropriate behaviors served as the main dependent variable for the study.

Inappropriate behaviors for Sue were recorded as any time she rocked her head from left to right or front to back for 3 s or longer during a 10-s interval. Appropriate behaviors for Sue were defined as placing her left or right hand on her cheek in order to keep her head still for the entire 10-s interval. Data were collected using a 10 s continuous partial interval recording procedure and a whole interval recording procedure to code for appropriate behaviors.

Inappropriate behavior for Bill was defined as anytime he broke eye contact with an academic task for three or more consecutive seconds during phonics instruction.
Appropriate behavior was defined as any time Bill maintained eye contact with the academic task during phonics instruction for six or more seconds. All behaviors were coded using a 10-s continuous partial interval recording procedure.

Adam’s inappropriate behavior was defined as placing any finger into a nostril. It should be noted that the participant was observed to pick his nose to the point of bleeding. Appropriate behavior was defined as independently using a Kleenex to wipe his nose. All behaviors were coded using a frequency count procedure.

Inappropriate behavior for Sam was defined as any verbalizations made without the teacher’s permission during group instruction time. Appropriate behavior was defined as raising his hand and waiting until his teacher gave permission to talk. All behaviors were coded using 10-s continuous partial interval recording procedure.

Design and Data Analysis

An interaction element design (Hayes, Barlow, & Nelson-Gray, 1999) with counterbalanced treatment conditions across all participants was used to evaluate the effectiveness of the social story with and without a reinforcement component. In order to control for sequencing effects, two participants (Sue and Bill) were exposed to treatment conditions in an A/B/B+C/B/B+C order and two participants (Adam and Sam) were exposed to treatment conditions in a A/B+C/B/B+C/B condition. An additional treatment social story plus prompting procedure was also included for Adam. Within-series phase changes were determined based on stability and trend of the participants’ inappropriate behaviors. The data were graphed and analyzed through visual inspection.

Procedures

*Problem Identification Interview*
Parents and teachers participated in a Problem Identification Interview (PII; Appendix H) with the primary experimenter. The PII is a semi-structured interview designed to identify the problematic behavior, the target setting in which it occurred, duration, and antecedent and consequent events associated with the problem behavior. The administration of the PII allowed the primary investigator and the consultee to establish behavioral goals for the referred student (Kratochwill & Bergan, 1990).

Student Interview

A student interview (Appendix I) was conducted with each participant to assess preferred activities or reinforcers. Sue reported in the interview that she liked Jimmy Neutron and Spongebob. Sue’s social story was written to include the cartoon character Jimmy Neutron. Sue also reported that she liked cartoons and the color purple. When asked about particular reinforcers, Sue reported that she liked teacher praise, tokens, and stickers. Bill reported that he liked Elmo and watching TV. Bill’s social story was written to include the TV character Elmo. When asked about certain reinforcers, Bill reported that he liked stickers, physical touch, teacher praise, encouragement from his teacher, and the opportunity to be a teacher’s helper at school. Adam reported in the interview that he liked Captain Underpants and eating food. Adam’s social story was written to include the character, Captain Underpants. When asked about certain reinforcers, Adam reported that he liked homework passes, candy (Skittles®, M&M®, Smarties®, and cereal), teacher praise, drawing, an opportunity to be a student helper, and extra computer time. Sam reported in the interview that he liked Poptropica® computer games, Super Mario Brothers®, and motorcycles. Sam’s social story was written to include the computer game, Poptropica®. When asked about certain
reinforcers, Sam reported that he liked Webkinz™ animals, erasers, Pokémon® cards, new pencils for school, and McDonald’s Happy Meal™ toys.

**Reading Assessment**

The results of the reading assessment indicated that Sue was reading at a mastery reading level for second grade probes. The results of the reading assessment indicated that Bill was reading at an instructional level for first grade probes. Adam was reading at an instructional level for third grade reading probes. Sam was reading at a mastery level for third grade reading probes.

**Brief Preference Assessment**

A brief preference assessment was conducted with all of the participants to identify a reinforcer to use when the participant exhibited the appropriate replacement behavior. A list of available reinforcers in the classroom that were identified by the participants was listed on a sheet of paper. All potential reinforcers were identified as preferred items by the participants in the student interview. The primary experimenter read the list of all of the reinforcers to the participant and told him or her to pick their favorite choice. After the participant chose their first choice, he or she was then prompted to pick their second and third choice. The reinforcer used was chosen based on the identified item that the teacher reported would be the most conducive to the classroom setting and was ranked the highest on the reinforcer list.

The reinforcer used for Sue was verbal praise from the teacher contingent on emitting the appropriate behavior, keeping her head still for an entire 10s interval. Bill also selected verbal praise from the teacher contingent on remaining on-task during phonics instruction.
Procedures were modified slightly for Sam and Adam. As originally proposed, one reinforcer was to be used. However, for Sam multiple reinforcers were available to prevent satiation. Potential reinforcers were used for Sam and were placed in a prize bag. Reinforcers included Webkinz™ animals, pencil erasers, mechanical pencils, and Pokémon™ cards. Sam was allowed to select a prize contingent on a certain number of talk outs.

Adam first chose candies as his most preferred and then, specifically, chose M&M®’s as his most preferred item. Therefore, the teacher provided the student with an M&M® on a fixed ratio (FR) 1 reinforcement schedule. In other words, every time the student inserted a Kleenex into his nose, he received an M&M® from the teacher. On session 8 (fourth intervention session), Adam reported that he did not want an M&M® and engaged in no inappropriate or appropriate behaviors. Therefore, sessions 9-18 (intervention sessions 5-18) included a brief preference assessment. The preference assessment consisted of the teacher letting the student choose his choice of candy contingent on emitting the appropriate behavior. The teacher would say, “You have a choice. You can pick M&M®’s, Skittles®, or Smarties®.” After Adam would choose a candy, the teacher would say, “Ok, I will give you a _____ every time you use a Kleenex to wipe your nose.” During the 11th session, Adam requested to be left alone contingent on the appropriate behavior during the daily preference assessment. Therefore, beginning at datum point 11, the teacher included avoidance in the preference assessment prior to every treatment session. The teacher would say, “You have a choice. You can pick M&M®’s, Skittles®, Smarties®, or you can be left alone.” Adam chose to be left alone for the remainder of the phase.
**Screening/Baseline**

The participant qualified for participation in the study if his or her percentage of inappropriate behavior was higher than their percentage (or frequency in the case of Adam) of appropriate behavior. Screening data served as baseline data for participants who qualified for the study. Teachers and target students followed their normal classroom routine during baseline.

**Social Story**

An individualized social story was created for the participants’ problem behaviors. The participant read the social story to his or her teacher immediately prior to the activity where the target behavior occurred most frequently. The participants were required to answer all of the comprehension questions at the end of the social story with 100% accuracy after each intervention session. The teacher read the comprehension questions to the participant. If one of the questions was answered incorrectly, the teacher provided the student with the correct answer. The student then was asked the missed questions again to ensure that he or she could articulate the correct answer. Observations were conducted in the same manner as in baseline. No reinforcers for appropriate behavior were provided to the participants in this phase.

**Social Story Plus Reinforcement**

During the social story plus reinforcement phase, participants read the social stories and answered comprehension questions as in the social story alone phase. However, the teacher provided reinforcement to the participants contingent on the appropriate behavior (Sue, Bill, Adam) or contingent on a predetermined number of
inappropriate behaviors (Sam). The following section provides the procedural details for all participants during this phase.

Verbal praise was used as a reinforcer for both Sue and Bill. Initially, verbal praise (e.g., “Good job keeping your head still”) was provided to Sue on a fixed interval (FI) 2 min reinforcement schedule. In other words, after a duration of two minutes had elapsed, the reinforcer was immediately provided after the first occurrence of the appropriate behavior. After an increasing trend occurred in head rocking behavior at this reinforcement schedule, a shift to a FI 1 min reinforcement schedule was made. The change in reinforcement schedule was implemented to decrease the participant’s head rocking behavior and increase the appropriate replacement behavior being taught to the participant. Verbal praise (“Good job keeping your eyes on your work,” “Good job keeping your eyes on your teacher.”) was provided to Bill on an FI 1 min reinforcement schedule.

A full session Differential Reinforcement of Low Rates of Responding procedure was implemented with Sam. Initially, Sam earned an opportunity to select a reinforcer from the prize bag if he emitted a number equal to or below 11 talk outs, the second lowest number of talk-outs observed during baseline. Therefore, Sam was informed on the first day of the B+C phase that he would receive a reinforcer if he emitted 11 or fewer talk outs. If Sam emitted 11 or less talk outs on the first day, the criterion for reinforcement was changed to 10 talk outs for the second day of intervention. The criterion for reinforcement continued to be lower for each treatment session in the B+C phase contingent on the participant meeting the criterion for reinforcement. During B+C treatment phase, the participant read the story and answered comprehension questions.
After this, the teacher would inform the participant that if he emitted a number of talk outs equal to or below the criterion number, he could choose a reinforcer from the prize bag. During the 10 minute observation, the teacher would place a tally mark on a small piece of paper that no one in the classroom could see. Then, after the 10 minute observation period, the teacher would privately inform Sam how many talk outs he had. If Sam emitted a number of talk outs that was equal to or less than the criterion, the teacher allowed him to pick a prize from the prize bag.

Adam first chose the candies listed as his most preferred and then, specifically, chose M&M®’s as his most preferred item. Therefore, the teacher provided the student with an M&M® on an FR 1 schedule. On datum point 8, the student reported that he did not want an M&M® and engaged in no inappropriate or appropriate behaviors. Therefore, the following sessions after session 8 included a brief preference assessment that allowed the participant to choose three different candies. On datum point 11 (intervention session 7), the student requested to be left alone contingent on the appropriate behavior during the preference assessment. Therefore, beginning at datum point 11, the teacher included avoidance in the preference assessment prior to every treatment session. The teacher would say, “You have a choice. You can pick M&M®’s, Skittles®, Smarties®, or you can be left alone.” The student chose to be left alone on session 11 through 18. Therefore, the teacher delivered a contingency statement, “If you use a Kleenex to wipe your nose, I will leave you alone.”

Design Extensions
Although not initially a part of the proposed design, an additional treatment phase was included for Adam after low treatment responsiveness was observed in the initial treatment conditions. A social story plus prompting procedure was implemented to increase Adam’s Kleenex usages and decrease his nose picks. The phase consisted of the same general procedures employed in the Social Story phase. However, the social story was combined with a prompting procedure, which consisted of the teacher standing 2 feet away from Adam with a box of Kleenex. Contingent on nose picks, the teacher immediately handed Adam a Kleenex and said, “Use a Kleenex.” If Adam ripped up the Kleenex and threw it on the floor, the interaction was terminated until the next time he exhibited a nose picking behavior. Contingent on the next occurrence of a nose pick, the teacher immediately handed Adam a new Kleenex and said, “Use a Kleenex.”

Observer Training

The primary experimenter served as the primary data collector for all sessions, and other observers were employed to serve as observers for inter-observer agreement (IOA) data. The primary investigator trained a speech therapist (Sue), pediatrician (Bill), and two school paraprofessionals (Adam and Sam) in the data collection procedures. The data collectors were provided with a written, detailed description of the operational definitions of the dependent variables and data collection sheets specific to the child they were observing. The primary experimenter reviewed the operational definitions and modeled the specific behaviors that were to be recorded. The observer then accompanied the experimenter in conducting classroom observations of the target student participating in the study. Once the trained data collectors reached 80% or higher interobserver
agreement on two observations, they were allowed to conduct observations independently.

Interobserver Agreement

Interobserver agreement was calculated separately for each dependent variable. For Sue, Bill, and Sam, IOA was calculated by dividing the number of agreements of the occurrence and nonoccurrence of the target behaviors divided by the total number of intervals observed and multiplying the quotient by 100. For Adam, IOA was calculated by dividing the number of agreements of the number of occurrences of the target behavior divided by the total number of occurrences observed and multiplying the quotient by 100. IOA was assessed for 44% of Sue’s observations, 30% of Bill’s observations, 25% of Adam’s observations, and 30% of Sam’s observations.

The mean IOA percentages of Sue’s head rocks and head still behaviors were both 96.64% (range = 87% - 100%). The mean IOA for Bill’s off-task behavior was 91.50% (range = 85% - 100%). The mean IOA for Bill’s on-task behavior was 90.33% (range = 80% - 98%). The mean IOA for Adam for nose pick behaviors and Kleenex usages was 100%. The mean IOA for Sam’s talk outs was 99.5% (range = 97% - 100%). The mean IOA for Sam’s hand raising behavior was 98.67% (range = 98% - 100%).

Treatment Integrity

In order to ensure that procedures were implemented correctly, all teachers were provided with a treatment checklist to complete daily (Appendix J). The checklist contained all of the steps necessary to carry out the intervention. The following steps were included in the checklist: (a) the participant read the social story to the teacher at the specified time, (b) the social story was not terminated before the participant answered the
comprehension questions with 100% accuracy, (c) the participant read the social story to teacher at the same location for each intervention session, and (d) the teacher provided the appropriate reinforcer to the participant contingent on the appropriate reinforcement schedule determined by the primary experimenter for the combined intervention condition only. The treatment integrity checklist was modified for Adam to include an additional step (e) to be that the teacher prompted the appropriate behavior each time the student inserted his finger into his nose.

The experimenter reviewed the steps of the checklist with the teachers and provided positive feedback when the steps were implemented correctly. The primary experimenter reviewed the steps of the intervention every day for the first treatment phase for all participants and then every other day for both treatment phases for the rest of the study. If a step was implemented incorrectly, the primary experimenter provided corrective feedback on the appropriate step. Integrity checks also were conducted by either the primary experimenter or the other data collector assisting with the data collection procedures for all intervention sessions across all participants. Mean percentages of treatment integrity were 100% for Sue, 96% (range = 75% - 100%) for Bill, 100% for Adam, and 93.18% (range = 50% - 100%) for Sam.

Social Validity

All teachers were given the Intervention Rating Profile-15 (Martens, Witt, Elliott, & Darveaux, 1985 Appendix K) to assess treatment acceptability for the social story in isolation and the social story combined with reinforcement treatment phases. The IRP-15 assesses consultees’ intervention acceptability using a 15-item Likert scale in which higher scores reflecting greater acceptability of the intervention (1 = Strongly Agree 2 =
Disagree 3 = Slightly Disagree 4 = Slightly Agree 5 = Agree and 6 = Strongly Agree). All items are summarized to form a total score. The results of the teachers’ ratings of the IRP-15 are located in Table 2. The internal consistency of the instrument using Cronbach’s alpha is .98 (Martens et al., 1985). The principle components factor analysis revealed one primary component with item loadings rating from .82 to .95 (Martens et al., 1985). Separate IRP-15 for each condition were completed by teachers at the end of the study. With the exception of Sue’s teacher rating in the social story alone phase, all of the participants’ teachers rated both intervention phases as acceptable. In general, all teachers tended to rate the social story plus reinforcement condition slightly more favorably than the social story alone phase.
Table 2

*Treatment Acceptability Ratings by Teachers for Treatment Phases*

<table>
<thead>
<tr>
<th>Treatment Phase</th>
<th>Social Story</th>
<th>Social Story plus Reinforcement</th>
<th>Social Story plus Prompting Procedure</th>
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</thead>
<tbody>
<tr>
<td>Sue’s Teacher</td>
<td>32</td>
<td>80</td>
<td>NA</td>
</tr>
<tr>
<td>Bill’s Teacher</td>
<td>60</td>
<td>60</td>
<td>NA</td>
</tr>
<tr>
<td>Adam’s Teacher</td>
<td>61</td>
<td>67</td>
<td>83</td>
</tr>
<tr>
<td>Sam’s Teacher</td>
<td>69</td>
<td>71</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Note.* The NA represents teachers’ raw scores that were not applicable due to the social story plus prompting procedure phase only occurring for one participant in the study.
CHAPTER III
RESULTS

Sue

The top panel of Figure 1 presents Sue’s inappropriate (head rocks) and appropriate behaviors (head still) across all phases of the study. Although variable, Sue exhibited more inappropriate than appropriate behaviors during baseline, with mean levels of inappropriate behaviors occurring in 73.17% (range = 48% - 98%) of the observed intervals. During the social story only phase, Sue’s head rocking decreased to a mean of 53.02% (range = 0.07% - 77%). However, with the exception of one session, all data points overlapped with baseline, and an increasing trend of head rocking was observed at the end of the phase. When the social story was combined with verbal praise, Sue’s head rocking decreased immediately when the reinforcement schedule was set at an FI 2-min schedule. After observing an increase in head rocking, the reinforcement schedule was changed to a FI 1-min which led to a decreasing trend in Sue’s head rocking ($M = 25.43\%$, range = 12% - 67%). Overall, mean levels of head rocking behaviors were lower than the head rocking behaviors that were observed in the social story alone phase. When the social story alone phase was implemented again, Sue’s mean levels of inappropriate behaviors remained low ($M = 23.26\%$, range = .03% - 40%), although behavior levels were somewhat variable over the phase.

In the last treatment phase, the social story combined with reinforcement, Sue’s inappropriate behaviors decreased and remained stable throughout the phase ($M = 2.88\%$, range = 0% - 20%). Overall, lower mean levels of inappropriate behaviors were observed
across the treatment phases, but generally there was less variability in the head rock behaviors in the social story plus reinforcement treatment phases.

*Figure 1* Percentage of Inappropriate and Appropriate Behavior for Sue (Top Panel) and Bill (Bottom Panel).
Sue’s baseline data for appropriate behaviors were low, but variable throughout the phase. Initially, an increasing trend in head still behaviors was observed but a decreasing trend in head still behaviors was observed at the end of the phase \( M = 25.35\%, \ \text{range} = 0.02\% - 52\% \). Upon introduction of the social story, Sue’s appropriate behaviors increased initially, but a decreasing trend was evident at the end of the phase \( M = 45\%, \ \text{range} = 23\% - 93\% \). During the social story plus reinforcement phase, a FI-2 minute reinforcement schedule was implemented contingent on the occurrence of the appropriate behavior. An initial increase in Sue’s head still behavior was observed but a decreasing trend was observed after the initial increase. After implementing the FI-1 minute reinforcement schedule, an increase in Sue’s appropriate behavior was observed and stability was evident at the end of the phase \( M = 74.57\%, \ \text{range} = 33\% - 88\% \). Sue’s percentage of head still behaviors remained high, but variable, in the return to the social story in isolation \( M = 75.37\%, \ \text{range} = 60\% - 97\% \). Finally, during the last treatment phase, Sue’s percentage of head still behaviors increased and remained high throughout the phase \( M = 95.14\%, \ \text{range} = 80\% - 100\% \). Similar to the pattern of responding observed in Sue’s inappropriate behaviors, overall, higher mean levels of head still behaviors were observed across the treatment phases, but generally there was less variability in the head still behaviors in the social story plus reinforcement treatment phases.

Bill

The bottom panel of Figure 1 presents Bill’s off-task and on-task behaviors. Consistent with teacher report from the PII, Bill was observed to exhibit more off-task behaviors than on-task behaviors during baseline, with mean levels of off-task behaviors
occurring in 58.33% (range = 55% - 60%) of the observed intervals. Overall, there was a
decrease in the levels of off-task behaviors observed across the treatment phases. In
addition, there was less variability observed in Bill’s off-task behaviors during the social
story plus reinforcement phase.

During the first social story in isolation phase, Bill’s off-task behaviors increased
initially but a delayed treatment effect was evidenced with a decrease in the mean
percentage of off-task behaviors of 39% (range = 22% - 67%). When the social story was
combined with reinforcement in the form of social praise at an FI 1 minute reinforcement
schedule, Bill’s off-task behaviors remained low with a slight decreasing trend ($M =
21.57\%, \text{ range } = 12\% - 30\%$). In the return to the social story in isolation phase, Bill’s
mean levels of off-task behaviors increased immediately and were more variable than in
the preceding phase ($M = 34\%, \text{ range } = 15\% - 48\%$). In the final treatment phase, social
story combined with reinforcement, Bill’s off-task behaviors decreased compared to
levels observed in the first combined treatment phase ($M = 22\%, \text{ range } = 18\% - 28\%$).
Overall, lower mean levels of inappropriate behaviors were observed across the treatment
phases, but generally there was less variability in off-task behaviors in the social story
plus reinforcement treatment phases.

Bill’s baseline data for on-task behaviors were observed to occur at lower
percentages compared to Bill’s off-task behaviors ($M = 46\%, \text{ range } = 43\% - 48\%$). Upon
introduction of the social story, Bill’s on-task behaviors increased and stabilized at high
levels at the end of the phase ($M = 73.17\%, \text{ range } = 48\% - 85\%$). During the social story
plus reinforcement phase, Bill’s on-task behavior was similar to levels observed at the
end of the social story in isolation phase ($M = 84.43\%, \text{ range } = 73\% - 90\%$). When the
social story in isolation phase was re-implemented, Bill exhibited an overall decreasing trend in on-task behavior \( (M = 77.33\%, \text{range} = 68\% - 88\%) \). Finally, during the return back to the social story plus reinforcement treatment phase, Bill’s percentage of on-task behavior increased and remained high throughout the phase \( (M = 86.33, \text{range} = 82\% - 92\%) \). Similar to the pattern of responding observed in off-task behavior, there was overall an increase in the levels of on-task behavior observed across the treatment phases. In addition, there was less variability in on-task behavior in the social story plus reinforcement treatment phases.

Adam

The top panel of Figure 3 presents Adam’s inappropriate and appropriate behaviors across all phases of the study. Adam was observed to exhibit more nose picks than Kleenex usages during baseline, with mean frequencies of inappropriate behaviors occurring 12.25 times \( (\text{range} = 10 - 16) \). During the initial social story plus reinforcement phase from data points 5-8, Adam’s nose picks decreased to a mean frequency of 7.25 \( (\text{range} = 0 - 15) \), although variability in nose picks occurred during these specific data points. For data points 9 and 10, a brief preference assessment was included to allow the student to choose from a variety of edible reinforcers. Adam’s mean frequency of nose picks remained similar at a frequency of 7.5 \( (\text{range} = 0 - 15) \). From data point 11 until the end of the phase, avoidance was included in the brief preference assessment. Adam’s mean frequency of nose picks continued to occur at a relatively similar frequency of 5.25 \( (\text{range} = 0 – 13) \). The overall phase mean for nose picks was 6.14 \( (\text{range} = 0 -15) \). When the social story intervention was implemented in isolation, Adam’s nose picks continued to occur at the same level \( (M = 7.29, \text{range} = 0 - 21) \). Therefore, the two treatment phases
were considered functionally equivalent to baseline. In the next intervention phase consisting of the social story combined with the prompting procedure, Adam’s mean frequencies of nose picks decreased and stabilized at the end of the phase ($M = 3.50$, range = 0 - 10).
Figure 2 Percentage of Inappropriate and Appropriate Behaviors for Adam (Top Panel) and Sam (Bottom Panel).
During baseline, Adam was not observed to use a Kleenex. Upon introduction of the social story combined with reinforcement, Adam’s mean frequency of Kleenex usages increased slightly but remained variable throughout the phase for data points 5-8 (*M* = 5.25, range = 0 - 21). For data points 9 and 10 when a brief preference assessment was included, Adam engaged in no Kleenex usages. From data point 11 until the end of the phase when avoidance was included as a reinforcer, Adam’s mean frequency of Kleenex usages remained low at 1.63 (range = 0 – 9). The overall phase mean for Kleenex usages was 2.43 (range = 0 -21).

During the social story in isolation phase, Kleenex usages remained low (*M* = 0). Therefore, similar to the pattern observed in Adam’s nose picks, the two treatment phases were considered functionally equivalent to baseline. Adam’s mean frequency of Kleenex usages remained low in the last treatment phase in which prompting was used (*M* = 0.33, range = 0 - 2).

Sam

Figure 2 on the bottom panel presents Sam’s percentage of talk outs and hand raises across all phases of the study. Consistent with teacher report from the PII, Sam was observed to exhibit more talk outs than hand raises during baseline, with mean levels of talk out behaviors occurring in 20% (range = 12% - 27%) of the observed intervals. During the first intervention phase, the social story was combined with reinforcement, Sam’s talk outs decreased to a mean of 5.03% (range = 0.03% - 10%) and stability was observed throughout the majority of the phase. When the social story was used in isolation, Sam’s talk outs increased initially but decreased at near zero levels toward the end of the phase (*M* = 5.04%, range = 0.05% - 15%). In the next intervention phase
consisting of a return to the social story combined with reinforcement, Sam’s mean levels of talk outs remained low ($M = 0.03\%$, range $= .0\% - 0.08\%$), and behavior levels were stable over the phase. In the last treatment phase, a return back to the social story in isolation, Sam’s talk outs remained low and stable ($M = 0.06\%$, range $= 0.02 – 0.08$).

Sam’s baseline data for appropriate vocalizations was low ($M = 0.12\%$, range $= 0\% - 0.07\%$). Upon introduction of the social story combined with reinforcement, Sam’s percentage of appropriate vocalizations increased and occurred at higher levels at the end of the phase ($M = 18.50\%$, range $= 10\% - 27\%$). During the social story in isolation phase, a mean decrease in Sam’s appropriate vocalizations was observed and variability was evident throughout the phase ($M = 15.62\%$, range $= 0.08\% - 28\%$). Sam’s percentage of appropriate vocalizations increased and remained higher in the return to the social story combined with reinforcement ($M = 23.40\%$, range $= 17\% - 33\%$). Finally, during the last treatment phase, return back to the social story in isolation, Sam’s percentage of appropriate vocalizations decreased but remained stable throughout the phase ($M = 14.25\%$, range $= 10\% - 20\%$). Overall, decreased mean levels of talk outs were observed across both treatment phases. However, higher mean levels of appropriate vocalizations were observed during the social story plus reinforcement phase.
CHAPTER IV
DISCUSSION

The purpose of this current study was to compare the effectiveness of social stories when used in isolation and when combined with a reinforcement component for individuals diagnosed with Autism Spectrum Disorders. Both inappropriate and appropriate behaviors were monitored to assess the effects of social stories in modifying these behaviors. The current data add to the growing body of empirical studies supporting the use of social stories. The first research question evaluated was whether the social story used in isolation or when combined with a reinforcement component would be more effective for decreasing inappropriate behaviors. The data revealed that, for Sue, the social story combined with reinforcement was more effective for decreasing head rocking behaviors. For Bill, lower mean levels of off-task behavior were observed when the social story was combined with reinforcement. The data for Sam revealed no substantial difference between the two treatment conditions, therefore, making the social story in isolation and combined with reinforcement equally effective for decreasing talk outs. For Adam, there were no differences between the two treatment conditions in decreasing nose picks. However, the modified treatment condition with prompting decreased Adam’s nose picks.

The second purpose was to investigate whether social stories used in isolation or combined with a reinforcement component would be more effective for increasing appropriate behaviors. The data revealed that the social story was generally more effective for increasing appropriate behavior when combined with reinforcement for Sue and Bill. Likewise, for Sam, the social story plus reinforcement phase revealed slightly
higher levels of hand raises compared to the social story in isolation phase. For Adam, minimal increases in Kleenex usages were observed across all treatment phases, including a modified treatment procedure with prompting for Kleenex usages.

The results of the present study are similar to the previous research studies investigating the effectiveness of social stories used in isolation and when combined with other intervention components. Several studies have demonstrated that social stories are effective for increasing appropriate behaviors and decreasing inappropriate behaviors when used in isolation (Hagiwara & Myles, 1999; Ivey et al., 2004; Scattone et al., 2002, 2003). In the current study, the social stories were effective at decreasing inappropriate behaviors and increasing appropriate behaviors when used in isolation for three of the participants (Sue, Bill, and Sam). The results of the present investigation are also similar to the previous studies which demonstrated that social stories were effective when combined with other intervention components (Burke et al., 2004; Chan & O’Reilly, 2008; Scattone, 2008; Theimann & Goldstein, 2007). The data presented from the current study also demonstrated that social stories were effective for increasing appropriate behaviors and decreasing inappropriate behaviors when used in combination with other intervention components (reinforcement and prompting procedures) for all participants. Social stories are also an effective behavioral intervention to include in Behavior Intervention Plans and Positive Behavior Supports. Since social stories are an antecedent manipulation in the environment, social stories can also serve as a preventative approach. Since social stories provide an antecedent prompt that prompts the appropriate behavior to be emitted in a particular situation, it can possibly prevent future occurrences of inappropriate behaviors. In addition, both treatment phases, social stories in isolation, and
social stories combined with reinforcement components were both rated as acceptable interventions to use by most of the teachers in the study. However, the social story combined with a reinforcement component was rated as more acceptable than the social story in isolation phase.

Several limitations exist that are worth noting for the current study. First, procedural changes make it difficult to answer fully the research questions posed in the study. For Adam, changing reinforcement classes (i.e., including a negative reinforcement component of avoidance, ongoing preference assessment) during the middle of the social story combined with reinforcement phase made it difficult to compare the treatment effects between the combined treatment phase and the social story in isolation treatment phase because it is difficult to decipher whether leaving the participant alone (implementing negative reinforcement) and using the social story in isolation functioned as two different treatment components. However, Adam’s data provide an interesting case study demonstrating that, in his case, the social stories were more effective for decreasing inappropriate behaviors when used with a prompting procedure instead of a reinforcement component. The data pose an interesting new research question for future studies investigating the effectiveness of social studies. Future researchers should examine whether or not social stories are more effective when combined with reinforcement components or other intervention components such as prompting procedures.

A second limitation is that no firm conclusions can be drawn with regard to the effectiveness of the social story combined with the reinforcement component for the observed decrease in inappropriate behaviors and increase in appropriate behaviors for
Bill. Only three data points were collected due to the end of the school year. It is unknown whether the observed treatment effects would have remained if more data points were collected.

A third limitation worth noting is that the primary experimenter, who was not blind to the experimental conditions in place, conducted all of the observations for all participants. It is unknown if the results would have been different if independent observers had conducted the observations without the primary experimenter present. However, IOA percentages remained above 80% across all behaviors across all participants.

A fourth limitation of the current study is that no IOA data were collected on the treatment integrity data. However, IOA percentages of 80% or higher were observed across all treatment procedures for all of the participants.

Despite the noted limitations, the present study provides a contribution to the literature by being the first study to provide a direct comparison of social stories used in isolation and social stories combined with a reinforcement component. The studies demonstrating that social stories were effective when combined with other intervention components did not demonstrate experimental control by replicating the treatment effects of the treatment phase which combined social stories with other treatment components (Kuoch & Mireda, 2003; Kutler et al., 1998; Lorimer et al., 2002; Scattone, 2008). The current study used an experimental design with replicated treatment phases for the social story in isolation and combined with a reinforcement component.

A second strength of the current study is that treatment integrity data were collected for all treatment phases of the study across all participants. Several past studies
failed to report treatment integrity data (Adams et al., 2004; Bledsoe et al., 2003; Sansosti et al., 2006). The lack of reported treatment integrity data make it difficult to interpret the results because it is unknown if the study’s procedures were implemented correctly. In this study, procedures were generally implemented with a high degree of treatment integrity, lending credence to the demonstration of treatment effectiveness.

A third strength of the current study is that it poses several future research directions. The data for Adam suggest that social stories may not be effective for participants who are socially avoidant. Since social story interventions require a brief social interaction, some participants may find the social story intervention aversive. Future research should examine whether social stories are more effective at increasing appropriate behaviors and decreasing inappropriate behaviors when combined with reinforcement for appropriate behaviors or when combined with other intervention components (e.g., prompting procedures, picture schedules). Future research should also examine whether social stories are effective for increasing appropriate behaviors and decreasing inappropriate behaviors when used with typically developing peers. Direct comparisons examining social stories in isolation versus combined with reinforcement for appropriate behaviors with typically developing peers would add to the limited research that currently exists on examining which intervention is more effective with typically developing children.
APPENDIX A

PARENT CONSENT FORM

Dear Parent,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the guidance of Dr. Heather Sterling-Turner. As part of my dissertation project, I am researching the effectiveness of social stories used alone and combined with a reward for appropriate behavior. Social stories are short stories or passages that describe social situations and provide appropriate behaviors for the student to perform. You have recently referred your child for exhibiting behavioral difficulties in the school setting and have come to the Coweta County School System for behavioral treatment; therefore, we hope you will consent for your child’s participation in the following investigation. To be a participant in this study, your child must have a diagnosis of Autistic Disorder; Asperger’s Disorder, or Pervasive Developmental Disorder Not Otherwise Specified and possess the skills necessary to read independently. If your child does not qualify for participation in the study, he or she will receive services outside the scope of the study.

If you agree for your child to participate in this study, you will be asked to do some tasks. First, prior to the implementation of the social story, a records review will be conducted to verify that your child has a diagnosis of Autistic Disorder, Asperger’s Disorder, or PDD-NOS. After this, you will complete an interview with me to obtain information pertaining to your child’s behaviors, identify the target behavior and identify items and activities that are of interest to your child. I will observe and record the target behavior of concern here in the Coweta County School System. If your child is eligible to participate at this point, I will then create a social story, written to his/her reading level, for the child. I will also train teachers here in the Coweta County School System to implement the social story and provide all materials.

I or another trained student will collect observations throughout all phases of the study. In the first phase of the study, I will collect several observations of your child in the activity setting where he or she has the most difficulty with appropriate interactions. The social story intervention will not be implemented at this point. Two treatment phases will be implemented in the study. In one phase, the social story will be implemented in isolation. In this phase, the student will read the social story to the teacher immediately prior to the setting in which the target behavior is occurring. In the other treatment phase, the intervention procedures will be the same but the social story will be combined with a reinforcement component. That is, your child will read the social story and be provided access to a preferred activity or reward if he or she engages in an appropriate behavior. The number of days during which the social story intervention will be implemented will vary depending on the behavior of your child. At the end of the first treatment phase for both treatments, you and the teacher will be asked to complete a structured questionnaire in order to assess your satisfaction with the intervention. Additionally, the teacher will be asked to complete implementation checklists to ascertain that the intervention is being carried out as designed.

This study may result in three benefits for your child and the teacher: (a) your child may decrease the amount of inappropriate interactions he/she had displayed prior to the intervention, (b) your child may increase his or her appropriate interactions and, (c)
the teacher may acquire skills to implement a new intervention technique that can be used with subsequent children.

Your child’s behavior will be monitored to ensure undesired effects (e.g., increase in inappropriate interactions; decrease in appropriate interactions) do not happen. If any undesired effects on your child’s behavior are observed, appropriate modifications or discontinuation of the procedure will occur, and your child will be provided with other appropriate services. There would appear to be very few risks for either your child or the teacher participating in the study. The teacher will not read the social story to your child in front of the rest of the children at school. Therefore, no issues of harassment are expected. Your child may experience some discomfort because he or she will be learning a new skill. In addition, your child may feel uneasy due to the new activity introduced into his or her daily routine. In the event that this occurs, your child’s teacher may reassure him/her that the social story is a story that is meant to help your child better understand social situations. If the social story becomes too stressful to your child, your child’s teacher will be asked to discontinue the introduction of the social story to meet your child’s needs. Your child will not be included as a participant in the study but will still have access to the social story upon request and other alternative services will be made available. I will also still be available to your child’s teacher to answer questions about the social story intervention if needed.

All interviews, observations, and other information obtained during this study will be kept strictly confidential. The teacher’s name, child’s name, and other identifying information will not be disclosed to any person not connected with the study. Identifying information also will be excluded from the dissertation project and any subsequent papers submitted to conferences or professional journals for publication. Your participation in this study is entirely voluntary. In addition, you may withdraw your child from this study at any time without penalty, prejudice, or loss of benefits. Further services, if needed, may be provided outside the scope of this study.

Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted) the researcher will take every precaution consistent with the best scientific practice. If you agree to participate, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact Erin Perry or Dr. Heather Sterling-Turner at (601) 266-5255. This project and consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

__________________
Erin Perry, M.A.
Heather Sterling-Turner, Ph.D.
Associate Professor of Psychology
and School Psychology Training Director
THIS SECTION TO BE COMPLETED BY PARENT

Please read and sign the following:

I have read the above documentation and consent to participate in this project. I have had the purpose and procedures of this study explained to me and have had the opportunity to ask questions. I am voluntarily signing this form to participate under the conditions stated. I have also received a copy of this consent. I understand that my child will read a social story and daily observations will be conducted on his or her behavior. I further understand that all data collected in this study will be confidential and that my child’s name and the therapist’s name will not be associated with any data collected. I understand that I may withdraw my consent for participation at anytime without penalty, prejudice, or loss of privilege.

___________________________  _________________________
Signature of Parent       Date

___________________________
Signature of Witness
APPENDIX B

TEACHER CONSENT FORM

Dear Teacher,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the guidance of Dr. Heather Sterling-Turner. As part of my dissertation project, I am researching the effectiveness of social stories used alone and combined with a reward for appropriate behavior. Social stories are short stories or passages that describe social situations and provide appropriate behaviors for the student to perform. A child here in the Coweta County School District has been referred by his or her parents for exhibiting behavioral difficulties in the school setting and has come to the Coweta County School System for behavioral treatment; therefore, we hope you will consent for your participation in the following investigation.

If you agree to participate in this study, the following procedures will be conducted. First, prior to the implementation of the social story, a records review will be conducted to verify that the student has a diagnosis of Autistic Disorder, Asperger’s Disorder, or PDD-NOS. After this, the child’s parents will complete an interview with me to obtain information pertaining to the student’s behaviors, identify the target behavior and identify items and activities that are of interest to the student. I will observe and record the target behavior of concern here in the Coweta County School System. If the child is eligible to participate at this point, I will then create a social story, written to his/her reading level, for the student. I will also train you to implement the social story and provide all materials.

I or another trained student will collect observations throughout all phases of the study. In the first phase of the study, I will collect several observations of the student in the activity setting where he or she has the most difficulty with appropriate interactions. The social story intervention will not be implemented at this point. Two treatment phases will be implemented in the study. In one phase, the social story will be implemented in isolation. In this phase, the student will read the social story to you immediately prior to the setting in which the target behavior is occurring. In the other treatment phase, the intervention procedures will be the same but the social story will be combined with a reinforcement component. That is, the student will read the social story and be provided access to a preferred activity or reward if he or she engages in an appropriate behavior. The number of days during which the social story intervention will be implemented will vary depending on the behavior of the child. At the end of the first treatment phase for both treatments, you will be asked to complete a structured questionnaire in order to access your satisfaction with the intervention. Additionally, you will be asked to complete implementation checklists to ascertain that the intervention is being carried out as designed.

This study may result in three benefits for you and the child: (a) the child may decrease the amount of inappropriate interactions he/she had displayed prior to the intervention, (b) the child may increase his or her appropriate interactions and, (c) you may acquire skills to implement a new intervention technique that can be used with subsequent children.

The child’s behavior will be monitored to ensure undesired effects (e.g., increase in inappropriate interactions; decrease in appropriate interactions) do not happen. If any
undesired effects on the student’s behavior are observed, appropriate modifications or discontinuation of the procedure will occur, and the child will be provided with other appropriate services. There would appear to be very few risks for either you or the child participating in the study. You will not read the social story to the child in front of the rest of the children at school. Therefore, no issues of harassment are expected. The greatest discomfort for you may involve the time required to implement the story. There may also be some discomfort related to implementing a new procedure. To reduced discomfort, I and/or other trained graduate students will provide training materials and will be available to answer any questions you may have. The child may experience some discomfort because he or she will be learning a new skill. In addition, the child may feel uneasy due to the new activity introduced into his or her daily routine. In the event that this occurs, you may reassure him/her that the social story is a story that is meant to help the student better understand social situations. If the social story becomes too stressful to the student, you will be asked to discontinue the introduction of the social story to meet the student’s needs. The child will not be included as a participant in the study but will still have access to the social story upon request and other alternative services will be made available. I will also still be available to you to answer questions about the social story intervention if needed.

All interviews, observations, and other information obtained during this study will be kept strictly confidential. Your name, child’s name, and other identifying information will not be disclosed to any person not connected with the study. Identifying information also will be excluded from the dissertation project and any subsequent papers submitted to conferences or professional journals for publication. Your participation in this study is entirely voluntary. In addition, you may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Further services, if needed, may be provided outside the scope of this study.

Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted) the researcher will take every precaution consistent with the best scientific practice. If you agree to participate, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact Erin Perry or Dr. Heather Sterling-Turner at (601) 266-5255. This project and consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.
Sincerely,

___________________________
Erin Perry, M.A.

___________________________
Heather Sterling-Turner, Ph.D.
Associate Professor of Psychology
and School Psychology Training Director
THIS SECTION TO BE COMPLETED BY TEACHER

Please read and sign the following:

I have read the above documentation and consent to participate in this project. I have had the purpose and procedures of this study explained to me and have had the opportunity to ask questions. I am voluntarily signing this form to participate under the conditions stated. I have also received a copy of this consent. I understand that I will be asked to read or be read a social story daily and observations will be conducted on the child’s behavior. In order to do so, I will be required to complete a structured interview, daily integrity checklists, and a structured questionnaire to assess my satisfaction with the interview. In addition, I will be trained on all of the intervention procedures by the primary experimenter. I further understand that all data collected in this study will be confidential and that my name and the child’s name will not be associated with any data collected. I understand that I may withdraw my consent for participation at any time without penalty, prejudice, or loss of privilege.

________________________________________  __________________________
Signature of Teacher                                Date

________________________________________
Signature of Witness
APPENDIX C  
SUE’S SOCIAL STORY™

My name is Sue. At school, I learn a lot of new things. During reading time, I sit at a

   table. During reading time, I sit at a table. During reading time, I get to read books,

blend letters to make words, and learn new words. During reading time, I will try to keep

my head still like Jimmy Neutron. I can put my left or right hand on my cheek to help

me keep my head still. When I keep my head still, it will help me to finish my work
during reading time.

   Comprehension Questions

1. What will I try to do during reading time?
   Keep my head still

2. What cartoon character will I try to be like during reading time?
   Jimmy Neutron

3. What can I do during reading time to help me keep my head still?
   I can place my left or right hand on my cheek

4. How will keeping my head still during reading time help me?
   It will help me to finish my work
My name is Bill. I go to school. I learn letter sounds. I learn new words. I sit at a desk. I do work at my desk. I will try to keep my eyes on my work like Elmo. I will try to keep my eyes on my teacher if she is talking. When I keep my eyes on my work, I get my work done.

Comprehension Questions

1. **What will I try to do at school?**
   
   Keep my eyes on my work

2. **What character will I try to be like at school?**
   
   Elmo

3. **What will I try to do when my teacher is talking?**
   
   Keep my eyes on my teacher

4. **How will keeping my eyes on my work help me?**

   I will get my work done
APPENDIX E

ADAM’S SOCIAL STORY™

My name is Adam and I am in the fourth grade. In the afternoon, I have social studies class. During social studies, I learn a lot about the government of the United States of America. I also learn about past presidents of the United States. Sometimes during social studies, I have to wipe my nose. During class, I will try to use a Kleenex to wipe my nose like Captain Underpants. When I use a Kleenex to wipe my nose, I will keep my hands clean.

Comprehension Questions

1. **What will I try to do during social studies class?**
   
   Use a Kleenex to wipe my nose

2. **What character will I try to be like?**
   
   Captain Underpants

3. **How will using a Kleenex to wipe my nose help me?**
   
   It will help me to keep my hands clean
APPENDIX F

SAM’S SOCIAL STORY™

My name is Sam and I am in the second grade. In the morning, I attend group instruction time. During group instruction time, I learn how to spell new words. I also learn the days of the week and the months of the year. Sometimes during group instruction time, I like to talk. During group instruction, I will try to raise my hand and wait to be called upon, just like I wait for my turn to play a game in Poptropica. When I raise my hand and wait for my teacher to call on me, I follow the classroom rules.

Comprehension Questions

1. What will I try to do during group instruction?
   I will wait for the teacher to call on me before I talk

2. What will I try to do so the teacher will call on me?
   Raise my hand

3. How will raising my hand and waiting for the teacher to call on me before I talk help me?
   It will help me to follow the classroom rules
APPENDIX G

SOCIAL STORY™ GUIDELINES

1. Provides social information in manner that is patient, positive and encouraging with at least 50% of all Social Stories™ praising achievements. In other words, for every Social story written that describes expected, appropriate behaviors, another Social story™ is written to recognize skills that the child currently does well.

2. Includes an introduction to identify the topic, a body to provide detail, and a conclusion to summarize and restate important points.

3. Provides details of a situation such as who, why, when, where, and how of a particular situation or concept.

4. Is written from either a first or third person perspective (never second).

5. Uses language that communicates what an individual could do, instead of what should not be done.

6. Includes descriptive sentences and possibly includes perspective, cooperative, directive, affirmative, and/or control sentences, or any combination (defined below).

7. Places more emphasis on describing situations and providing information than on identifying responses.

8. Is written with consideration of individual abilities and interests and is accurate if interpreted literally.

9. May utilize personally tailored illustrations to aid in comprehension and application.

10. Contains a Social story™ title that follows the above relevant criteria.

11. Abides by the Social stories formula that requires each story to contain twice as many descriptive sentences as directive sentences.

The Six Types of Social Story™ Sentences

1. Descriptive sentences contain statements of fact that exclude personal biases or opinions.
2. Perspective sentences describe an individual’s thoughts, feelings, or perceptions about an idea, topic, situation, or make reference to an internal state (i.e. illness, etc.)

3. Cooperative sentences inform the reader what other people will do to assist them.

4. Directive sentences provide appropriate responses to a given social situation.

5. Affirmative sentences make statements pertaining to commonly shared values or opinions held within a culture and provide support for other surrounding statements.

6. Control sentences are statements written by the child to help him/her understand the message of the Social Story™.
APPENDIX H
STUDENT INTERVIEW

Student’s Name: __________________________  Sex: _____
School: _________________________________  Grade: _____
Date: ________________________________

1. Do you like school? _____________________________________________________

2. What do you like about school? ____________________________________________
________________________________________________________________________

3. What do you not like about school? _________________________________________
________________________________________________________________________

4. What is your favorite subject in school? Why? ________________________________
________________________________________________________________________

5. What is your least favorite subject in school? Why? ____________________________
________________________________________________________________________

6. Do work as hard as you can in school?
_______________________________________
________________________________________________________________________

7. If not, what would make you try harder in school? _____________________________
________________________________________________________________________

8. What types of things do you like to talk about? ________________________________
________________________________________________________________________
9. Are there any particular activities, objects, or topics that are of interest to you?
________________________________________________________________________
________________________________________________________________________

10. Are there any situations at school where you do not understand how to behave appropriately?
________________________________________________________________________
________________________________________________________________________

11. What types of things could your teacher do to help you to better understand how to behave in school situations?
________________________________________________________________________
________________________________________________________________________

12. Do you have a lot of friends at school?
________________________________________________________________________
________________________________________________________________________

13. If not, why?
________________________________________________________________________
________________________________________________________________________

14. What would make you like school more?
________________________________________________________________________
________________________________________________________________________

15. If you had three wishes that would come true, what would you wish for?
________________________________________________________________________
APPENDIX I

TREATMENT INTEGRITY CHECKLIST-THERAPIST

Therapist: ___________  Date: ___________  Observer: ___________

Directions: Circle the choice that applies if the step in the research procedure was conducted. If the step was not applicable, please place an NA in the space provided.

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<td>The social story was read by the child to the therapist at the specified time.</td>
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<td>The social story was not terminated before the child answered the comprehension questions with 100% accuracy.</td>
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<td>The social story was read by the child to the therapist at the same location.</td>
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<td>The therapist provided reinforcement at the correct reinforcement schedule during the B+C phase</td>
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<td>The teacher prompted the appropriate behavior each time the student inserted his finger into his nose</td>
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Appendix J

HUMAN SUBJECTS REVIEW APPROVAL FORM

THE UNIVERSITY OF SOUTHERN MISSISSIPPI
Institutional Review Board
118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6520
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 21, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: R27112902
PROJECT TITLE: A Comparison of Social Stories With and Without a Reinforcement Component
PROPOSED PROJECT DATES: 11/01/09 to 11/01/10
PROJECT TYPE: Previously Approved Project
PRINCIPAL INVESTIGATORS: Erin Cuneo Perry
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY: N/A
HSPRC COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 11/01/09 to 11/08/10

Lawrence A. Hosman, Ph.D.
HSPRC Chair

11-18-09 Date
REFERENCES


Gray, C. A. (1998). Social stories and comic strip conversations with students with...
Asperger syndrome and high-functioning autism. In E. Schopler, G. B. Mesibov, & L. J. Kunce (Eds.), *Asperger syndrome or high-functioning autism?* (pp. 167-198). New York: Plenum.


McConnell, S. (2002). Interventions to facilitate social interaction for young children


