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Generalization Effects of Social Story Interventions for Individuals with Asperger's Disorder

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Abstract of a Dissertation
Submitted to the Graduate Studies Office
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in Partial Fulfillment of the Requirements
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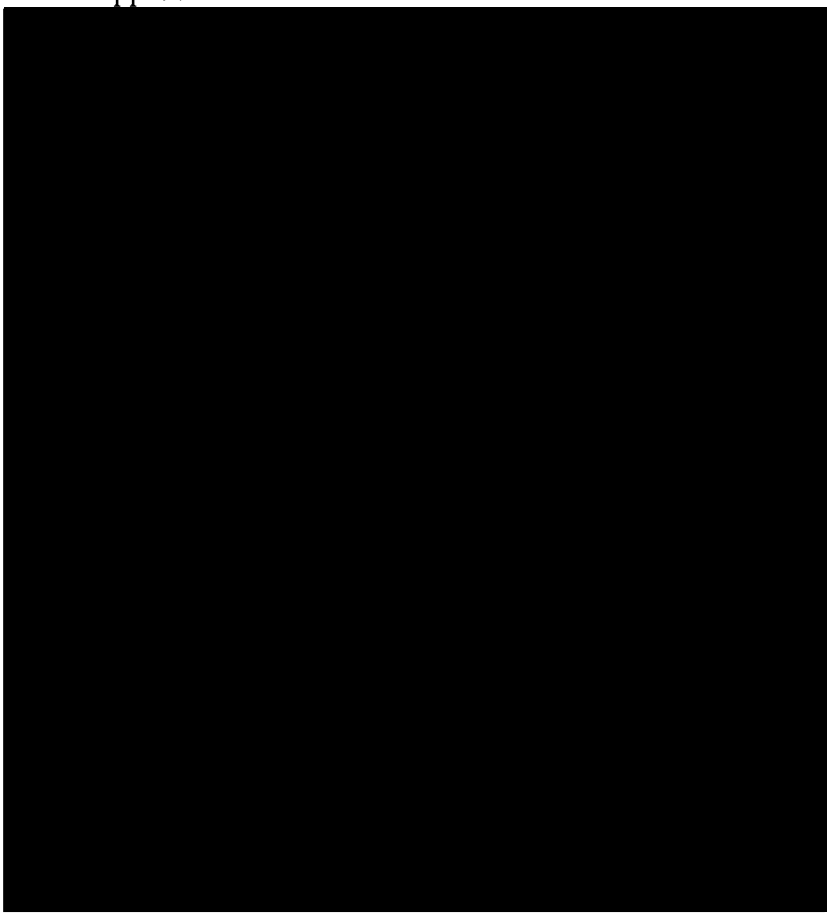

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ABSTRACT

GENERALIZATION EFFECTS OF SOCIAL STORY INTERVENTIONS FOR INDIVIDUALS WITH ASPGERGER'S DISORDER

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Social Stories™ (Gray, 2004) is a relatively new intervention designed to teach appropriate skills to individuals diagnosed with Autism Spectrum Disorders. Although there is preliminary evidence of the effectiveness of Social Stories it has typically been implemented in one target setting. As a result, there are little data to support whether or not the effects of Social Stories will generalize to other settings. The current study examined the effectiveness of Social Stories for increasing appropriate behaviors exhibited by four children diagnosed with Asperger's Disorder. Generalization effects across settings were assessed using a typical Social Story (Train and Hope) format and a story in which generalization tactics were specifically incorporated. A nonconcurrent multiple baseline design across participants with counterbalancing of conditions was utilized across two pairs of participants. A multiple probe technique was also used to assess generalization of skills to the secondary setting for each of the participants. During both the typical format and the generalized format, appropriate behavior increased for three of four participants and inappropriate behavior decreased for all targeted participants. Treatment results overall indicate that some generalization to similar settings did occur even using a train and hope approach. However, greater behavior change tended to occur in both primary and secondary settings when generalization was explicitly programmed.

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CHAPTER I

INTRODUCTION

Autism Spectrum Disorders (ASD) is a heterogeneous classification of disorders that are pervasive both in scope of impairment and duration of effects. Symptoms manifest early in life and impair social, communication, and behavior domains throughout the lifespan (American Psychiatric Association [APA], 2000). Perhaps due to the pervasiveness of these disorders, skill deficits associated with ASD are often difficult to remediate and manage. In addition, individuals with an ASD often display difficulties in generalizing newly learned skills to untrained conditions.

One intervention that has received preliminary empirical support in the ASD literature is Social Stories™, first introduced by Gray and Garand in 1993. Although a growing number of studies have been published demonstrating the effectiveness of Social Stories, many questions remain unanswered. In addition, the available literature on Social Stories reveals a dearth of well-designed studies. To support the effectiveness of Social Stories for the remediation of social and behavioral deficits in individuals with an ASD, additional well-controlled studies demonstrating both immediate and sustainable treatment effects must be conducted. The ultimate goal of intervention with individuals with an ASD is often for newly gained skills to be applied in multiple stimulus conditions. Therefore, not only must the immediate effectiveness of Social Stories be explored, but also the extent to which target skills generalize to non-training conditions. The current study investigated the generalization effects of Social Stories. An examination of the effectiveness of Social Stories for individuals diagnosed with an ASD begins with an understanding of the disorder classification.

Defining Characteristics of Autism Spectrum Disorders

Autism was first identified in 1943 but was not classified as a distinct diagnostic category until the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III; APA, 1980). Asperger's Disorder was not added until the fourth edition of the DSM (APA, 1994). Both Autism and Asperger's Disorder are placed under the category of Pervasive Developmental Disorder in the most recent revision of the DSM-IV (APA, 2000). Together autism and Asperger's Disorder, along with Pervasive Developmental Disorder Not Otherwise Specified, are commonly conceptualized as ASD (Klin, McPartland, & Volkmar, 2005).

ASD is characterized by significant impairment in each of three domains: social, communication, and behavioral (APA, 2000). A brief synopsis of each diagnostic domain follows, along with a discussion of other, related impairments individuals with ASD may exhibit. Domains of primary concern for individuals with ASD include social skills, communication skills, behavioral excesses and deficits, and generalization difficulties.

Although ASD is greatly heterogeneous in behavioral presentation, an impediment in social development is viewed as a central characteristic which may manifest itself in several ways (Bregman, 2005). First, individuals with ASD may fail to use nonverbal behaviors appropriately. For example, an individual with ASD may have an absence of or inaccurately use facial expressions and/or body language during social interactions. They also may be unsuccessful at using or integrating verbal and nonverbal behaviors. Second, individuals with ASD may have qualitative impairments in social interactions. Deficits in social interactions may manifest as increased use of solitary or parallel play, lack of interest in the activities of others, or disinterest in sharing

information or achievements with others. Finally, individuals with ASD typically have fewer social relationships when compared to typically developing individuals (Bregman). Failure to develop social relationships may be due either to lack of interest in forming friendships or deficits in skills required to develop and maintain friendships (APA). Individuals with ASD may fail to demonstrate an understanding of basic social knowledge and "rules" of social interaction (Bregman).

The impairments in social interactions exhibited by individuals with ASD may be further compounded by deficits in communication skills. Communication impairments in ASD include both expressive and receptive difficulties (APA, 2000). Expressive communicative deficits may include impaired language development, use of nonfunctional language such as echolalic and perseverative speech, and use of pronoun reversals and underdeveloped grammar (Scheuermann & Webber, 2002). Related to the lack of social reciprocity, expressive language is typically limited to communicating wants and needs (Bregman, 2005). Receptive language impairments typically include limited language comprehension and a literal interpretation of meaning. Figurative and inferential language may be difficult for an individual with ASD to interpret (Scheuermann & Webber).

Impairments in communication and social interactions may contribute, in part, to behavioral excesses also characteristic of ASD. Behavioral excesses may include stereotypic, repetitive, or ritualistic behaviors (APA, 2000; Bregman, 2005). Excesses may also include an intense preoccupation with a narrow range of interests and an inflexible attention to non-functional routines with intolerance for environmental changes (Bregman). Additionally, individuals with ASD may display other behaviors such as pica,

self-injurious behaviors, tantrums, or self-stimulatory behavior (Scheuermann & Webber, 2002).

Finally, in addition to impairments in social, behavioral, and communication domains, individuals with ASD may display difficulty generalizing new skills to other situations. Generalization is the exhibition of a target behavior in settings, situations, or times in which direct training has not occurred (Stokes & Baer, 1977). Scheuermann and Webber (2002) noted that generalization training is one of the most difficult aspects in teaching individuals with ASD. Therefore, individuals with ASD require structured interventions directed toward generalization for skills to be applied under multiple stimulus conditions (Scheuermann & Webber).

Generalization is an area that has been largely ignored with the implicit assumption that generalization would occur as an inherent part of training. However, generalization does not routinely occur without deliberate programming at the outset of training (Stokes & Osnes, 1989). Stokes and Osnes outline several strategies for targeting generalization in the intervention process. The first broad category for improving generalization focuses on the manipulation of functional relationships, including incorporating naturally occurring reinforcing consequences for the target behavior and providing reinforcement for generalized occurrences of the behavior. The second category of generalization techniques offered by Stokes and Osnes focuses on the methods used for training new behaviors. Strategies in the training category would include increasing the number of conditions (e.g., people, settings) in which training occurs. A similar tactic is to increase the number of response examples the trainee receives (e.g., multiple functionally equivalent replacement behaviors). The third

category is to include functional stimuli in both training and generalization settings. Functional stimuli could be physical objects or people who are present in both the training and generalization settings. Other techniques that capitalize on functional stimuli also include providing instructions that the person could remember and then recall in appropriate situations.

Regardless of what behavior or population is targeted, generalization is an essential consideration in treatment implementation. Any time a behavior is addressed in treatment, it is important to consider whether treatment gains will generalize outside of the treatment setting (Baer, Wolf, & Risley, 1968). However, generalization cannot be an after-thought, but must be planned for at the outset of treatment (Stokes & Baer, 1977; Stokes & Osnes, 1989). Although strategies are available to aid in the programming of generalization (Stokes & Osnes) most researchers fail to take advantage of these strategies and rather assume or "train and hope" that generalization will occur (Stokes & Baer). Research in the field of ASD is not free of this deficiency. A review of 99 research articles on autism published in the *Journal of Applied Behavior Analysis* (JABA) between 1968 and 2003 revealed only 21% assessed treatment effects in a generalization setting (Wolery, Barton, & Hine, 2005). Generalizing new skills is often a challenge in intervening with individuals with ASD (Scheuermann & Webber, 2002). As social deficits associated with ASD are addressed, interventions should include tactics to improve generalization.

The remediation of skill deficits in individuals with ASD is a difficult feat. ASD is characterized by pervasive problems in the social, communication, and behavioral domains. These core areas are often interrelated, compounding the difficulties faced by

an individual with ASD. For example, an individual with ASD who has difficulty communicating needs may behave inappropriately and, therefore, further alienate him or herself socially. Not only are skill deficits pervasive and interrelated, but individuals with ASD may have difficulty applying newly learned skills to multiple situations resulting in a need for additional training. Interventions developed to remediate skill deficits of individuals with ASD must address not only the core domains of impairments, but also the generalization of those skills.

Numerous interventions have been designed to address the problem behaviors exhibited by individuals with ASD. A common strategy is to include training of appropriate social skills in intervention packages. Social skills are often targeted because impairments in this domain may lead to reliance on inappropriate behaviors to achieve objectives (Scheuermann & Webber, 2002). One intervention which seeks to teach social skills to individuals with ASD is Social Stories (Gray & Garand, 1993). A review of the Social Stories literature will follow.

Social Story Interventions for Individuals with Autism

Social Stories are brief scripts which describe the relevant information about a topic (situation, activity, skill, or concept) in a language that is appropriate to the reader (Gray & Garand, 1993). A Social Story may include information on what happens, who is involved, as well as providing appropriate responses for the reader.

Various rationales have been offered regarding the primary change mechanism associated with Social Stories. Reynhout and Carter (2006) outlined three potential hypotheses as to how Social Stories may change behavior. First, using a theory of mind model, it has been suggested that Social Stories may target social-cognitive deficits

prevalent in individuals with ASD. Reynhout and Carter specifically identify perspective-type sentences as benefiting individuals diagnosed with ASD within a theory of mind perspective. Perspective-type sentences provide information to the reader on the thoughts and feelings of others, information that may not be readily accessible to an individual with ASD. A second possible explanation outlined by Reynhout and Carter builds upon a shared knowledge perspective, suggesting that by providing what the target child should do in a target situation, information is being supplied that is easily understood by most people but unclear to the child with ASD. A third rationale for the utility of Social Stories provided by Reynhout and Carter is that it incorporates components demonstrated to be beneficial for individuals with ASD, such as being individualized, visual, and sensitive to language difficulties of the target child.

According to Gray (2004), "the theory is that the improvement in behavior frequently credited to a Social Story is the result of child's improved understanding of events and expectations" (p. 3). Irrespective of theoretical framework, Social Stories appear to work by bridging the gap between information required in a social situation and the ability of the individual to access and apply that information using a format that is ideally suited to individuals with ASD (e.g., information is literal). The idea that Social Stories provide unknown information or rules about a situation as a means for behavior change has been suggested widely in the literature (e.g., Ali & Frederickson, 2006; Reynhout & Carter, 2006; Rust & Smith, 2006).

Several guidelines have been developed for writing Social Stories since the original publication by Gray and Garand. The most recent guidelines offered by Gray (2004) provided several defining criteria (See Appendix A). The primary criteria for

Social Stories focus on the types of sentences used in the story. Although Gray outlines several types of sentences available for use in Social Stories, only descriptive sentences are required. Gray (2004) developed a formula to guide the proportion of describing sentences (those that provide information) to directing sentences (those that give instructions) when other types of sentences are used. The formula dictates that there should be twice as many sentences that describe (descriptive, cooperative, perspective and affirmative sentences) as those that direct (directive and control). It should be noted that Gray offers no empirical basis for the required ratio of descriptive to directive sentences, and there is no systematic, empirical evaluation of its importance available in the literature.

Another important criterion for Social Stories provided by Gray (2004) is that the story is written specifically for the child. That is, the story should be appropriate for the child's cognitive ability and include interests and problems specific to the child. Social Stories are typically brief, 2 to 12 pages maximum, for young children (Gray). Gray's criteria also dictates that a Social Story provide details of a situation (who, what, when, where). It is possible that providing precise detail could foster discrimination rather than generalization. However, the criteria do not prohibit providing multiple exemplars of who, what, when, and where which is a strategy offered by Stokes and Osnes (1989) to aid generalization. Whether Social Story interventions foster generalization to non-target stimulus conditions may depend on the implementation of the intervention (e.g., the number of response and stimulus exemplars).

Social stories have been used to address numerous problem behaviors, teach social skills and daily living skills, and to prepare children for new situations. Although

Social Stories is a relatively new intervention for individuals with ASD, there is a growing body of research examining its effectiveness. However, many of the studies employ non-experimental and case study designs. Studies using an experimental design often are plagued with methodological flaws including combining Social Stories with existing interventions, using corrective feedback, and modifying story presentation (Nichols, Hupp, Jewell, & Zeigler, 2005). Reviews on Social Stories concluded that the literature on Social Stories has demonstrated preliminary evidence for the effectiveness of Social Stories for children with ASD with a wide range of cognitive levels and ages (Ali & Fredrickson, 2006; Nichols et al.; Reynhout & Carter, 2006; Sansosti, Powell-Smith, & Kincaid, 2004). However, whether the intervention is conclusively effective is unknown due to methodological limitations in the existing literature (Sansosti et al.). Utilization of rigorous experimental designs and attention to issues of treatment integrity were recommended for future research on Social Stories. Additionally, the existing research on Social Stories has, for the most part, failed to systematically assess or program for generalization. Reviews of the Social Story literature indicate a need to examine maintenance and generalization in Social Story research (Ali & Fredrickson; Nichols et al.; Reynhout & Carter; Sansosti et al.). The existing literature on Social Stories, including relevant information on generalization, is reviewed in the following section (See Table 1 for a summary of Social Stories studies).

Peer-Reviewed Studies

Studies in which generalization was not reported. The first peer-reviewed article examining the effectiveness of Social Stories was published two years after Gray and Garand's (1993) initial article on the intervention. Swaggart and colleagues (1995) used a

Table 1

Research Articles Incorporating Social Stories

Author(s)	Year	Design	Results	Generalization[1]
Swaggart et al.	1995	AB	Mixed	None Reported
Kuttler et al	1998	ABAB	Effective	None Reported
Hagiwara & Myles	1999	MBL-Settings	Mixed	Inferred
Norris & Dattilo	1999	AB	Mixed	None Reported
Thiemann & Goldstein	2001	MBL-Skills	Effective	Weak Support
Lorimer et al.	2002	ABAB	Effective	None Reported
Scattone et al.	2002	MBL-Skills	Effective	Anecdotal Support
Bledsoe et al.	2003	ABAB	Effective	None Reported
Kuoch & Mirenda	2003	ABA+ABACA	Effective	Anecdotal Support
Adams et al.	2004	ABAB	Effective	Anecdotal Support
Barry & Burlew	2004	ABCD + MBL-P	Effective	Anecdotal Support
Ivey et al.	2004	ABAB	Effective	Unknown
Crozier & Tincani	2005	ABAC	Effective	None Reported
Delano & Snell	2006	MBL	Effective	Mixed Support
Sansosti & Powell-Smith	2006	MBL-P	Mixed	None Reported
Scattone et al.	2006	MBL-P	Mixed	Anecdotal Support
Bernad-Ripoll	2007	AB	Effective	Weak Support
Crozier & Tincani	2007	ABCACBC+ABAB	Mixed	Anecdotal Support
Reynhout & Carter	2007	ABC	Mixed	Moderate Support

[1] Generalization across settings or behaviors; not generalization across time

non-experimental (AB) design to assess the effectiveness of Social Stories targeting several social skills (greeting, aggression, and sharing materials) for three participants. The first participant, an 11-year-old female diagnosed with autism, was observed for 4 categories of greeting responses (verbal or nonverbal greetings, non-aggressive touches, aggressive touches, and ignores). The percentage of appropriate greetings increased from 7% to 74% from baseline to Social Story implementation. The participant's aggressive behavior was targeted next though the combination of a second Social Story with a response-cost system. The authors reported that the participant had one day without any aggressive behaviors during baseline (51 days). During intervention, the participant had 8 days with 0 aggressive behaviors.

The other participants in Swaggart and colleagues' (1995) study were two 7-year-old males, one with autism and one with a diagnosis of Pervasive Developmental Disorder. The target behavior for both participants was appropriate play with the following sub-categories: sharing, parallel play, aggression, screaming, and grabbing. Similar, but individualized stories were developed for each participant. When compared to baseline, target behaviors (i.e., sharing) increased for both participants. However, because of the nature of the methodological design (i.e., AB), changes in participant behavior cannot convincingly be attributed to Social Stories alone. Swaggart and colleagues, however, offered the first documented attempt to alter social behavior through Social Stories. Effects of generalization are unknown because target behaviors were not examined in multiple settings or conditions.

Kuttler, Smith, and Carlson (1998) used an ABAB design to reduce tantrums exhibited by a 12-year-old male diagnosed with autism, Fragile X syndrome, and

intermittent explosive disorder. After determining that the child often exhibited tantrum behaviors during free time and during waiting, Social Stories addressed these times. Specific target behaviors included inappropriate vocalizations and dropping to the floor. The authors developed two separate Social Stories to address inappropriate behavior during morning work time and lunch time. The Social Story intervention was used in conjunction with several previously initiated interventions including a point chart in which the participant was able to exchange stickers for a prize, a classroom picture schedule, and prompting by the teacher and other classroom staff (verbal and physical prompting).

During the baseline and the withdrawal phases, problem behaviors occurred an average of 15.6 and 15.33 times, respectively, for morning work time and 11.6 and 18, respectively, for lunch time. During the two intervention phases, problem behavior decreased to a mean of 0 for morning work and a mean of 2 and 1, respectively, for lunch time (Kuttler et al.).

Although the Social Stories intervention appeared to be effective, a major limitation is the use of multiple ongoing interventions. The Social Story intervention was not implemented in isolation but paired with several other classroom interventions (Kuttler et al., 1998). Thus, it is impossible to know if the Social Story would have been as effective without the multiple other supports that were in place.

Although the authors targeted the same behavior in two settings, they wrote two separate stories rather than writing one story for both settings (morning work and lunch time) (Kuttler et al., 1998). This added to the complexity of the intervention and is a potential threat to generalization. Rather than training loosely, as described by Stokes and

Osnes (1989), the authors wrote stories very specific to each setting. The participant was informed exactly what would happen in each setting and provided a specific person from whom to receive reinforcement. It is possible that instead of training in two settings, the Social Story could have been written with multiple stimulus exemplars and generalized across settings. However, generalization across settings or conditions was not assessed.

Social Stories were again examined in a non-experimental design by Norris and Dattilo (1999) to increase appropriate social behaviors during lunch in the school cafeteria. An AB design was used for a single participant, an 8-year-old female diagnosed with autism. Although only one setting was targeted, the authors developed three Social Stories with similar but varying content. For example, one story described topics the participant could discuss with peers while another directly addressed the inappropriateness of making noises in the cafeteria. One of the three Social Stories was randomly selected to be read with the participant prior to entering the target setting (i.e., the cafeteria). Multiple stories were written to maximize the participant's interest in the task by providing variability in the story content (Norris & Dattilo).

The authors reported a decrease in inappropriate social behaviors (e.g., delayed echolalia, singing to oneself) after implementation of the intervention (Norris & Dattilo, 1999). However, the participant failed to exhibit an increase in appropriate behaviors (e.g., initiating communication with other students). Additionally, while there was an overall decrease in inappropriate behavior from baseline, during the intervention phase, inappropriate behavior continued to be highly variable and tended to overlap with baseline data. It is unknown if reading multiple versions of Social Stories produced the inconsistent results. Another weakness of the intervention was the design. The authors

utilized an AB design, which does not control for numerous threats to internal validity. In terms of generalization, although the authors reported that the participant's inappropriate behavior (i.e., talking and singing to self) occurred in multiple settings (e.g., hallway, recess, free time) the intervention only targeted one setting. No anecdotal data were provided for non-target settings. Generalization was not directly assessed.

Hagiwara and Myles (1999) also targeted disruptive behaviors with a Social Story, but they presented the intervention in a computer format. Three elementary-age participants with a prior diagnosis of autism were selected for intervention in a multiple baseline design across settings. Three settings and one target behavior were selected for each participant. Hand washing was targeted for Participants 1 and 2, while on-task behavior was targeted for Participant 3.

There was a slight increase in the percentage of independently completed hand washing steps during intervention for Participants 1 and 2 in all three settings (Hagiwara & Myles, 1999). However, both participants' level of hand washing during baseline was relatively high, ranging from 75% to 85% for both participants. As a result, there may not have been much of an opportunity for improvement for Participants 1 and 2. Additionally, data were not reported on days in which the participant returned to the classroom without washing his hands.

Participant 3's duration of on-task behavior was assessed for lunch, the resource room, and the general education classroom (Hagiwara & Myles, 1999). Although there was an initial increase in on-task behavior at lunch after intervention implementation, the data subsequently returned to baseline levels. For the resource room setting, only five data points were presented for the intervention phase, of which two indicated an

increased level of on-task behavior. The intervention was not implemented in the third setting, the general education classroom. Overall, there was only weak support of the effectiveness of the Social Story for Participant 3's on-task behavior.

Participants were required to exhibit target behaviors across multiple settings (Hagiwara & Myles, 1999). However, the authors did not program for generalization by constructing a single Social Story that would apply to multiple settings. Instead, each setting was separately trained. However, when intervention was implemented for Participant 3 in the first setting (lunch), a corresponding increase was seen for the second setting (resource room). These carryover effects make assessment of treatment difficult from an experimental standpoint but are an indication of generalization.

Lorimer and colleagues (2002) used the home as the setting of a Social Story intervention to target behavior problems for a single participant. The participant was a 5-year-old male with an existing diagnosis of autism. The authors used an ABAB design to evaluate the effects of a Social Story intended to reduce precursors to tantrums. Specifically, the authors determined that the participant would exhibit tantrums after making a request and being forced to wait for attention. Consequently, two Social Stories were written. One story targeted waiting for someone to be available ("Waiting") and the second story targeted asking for attention appropriately ("Talking with Adults"). Compared to baseline, a reduction in problem behavior (i.e., precursors to tantrums) and fewer tantrums were reported during implementation of the Social Stories intervention. During the withdrawal phase, higher levels of problem behavior were reported. Inappropriate behavior again decreased when the Social Stories intervention was re-implemented during the second B phase. It is important to note that several interventions

used prior to the Social Stories intervention were continued throughout the study, including a picture schedule, digital clock, and emotion worksheets. The Social Stories intervention, then, appeared to influence behavior beyond the effects of interventions previously in place but it cannot be determined whether Social Stories would have the same impact if implemented in isolation. However, Social Stories appeared to be an effective intervention in combination with other behavior supports (Lorimer et al.).

Although not explicitly programmed or assessed, several components of Lorimer and colleague's (2002) intervention may be beneficial for generalization. First, the Social Stories were read multiple times during the day with different people. The Social Stories were read to the participant each morning by his parents, by his therapists at the beginning of each therapy session, and before any opportunity in which the participant would have to demonstrate the skill (e.g., before the participant would have to wait). Second, the Social Stories were always visually present on the kitchen table at home or on the therapist's table during therapy. Also, the Social Stories included multiple stimulus exemplars (e.g., adults might talk to each other, to the participant's brother, on the phone) and multiple response exemplars (e.g., while waiting the participant can watch a video, look at a book, or play a game; Lorimer et al.). These procedures are a departure from the typical Social Story implementation that is reported in the research literature. Although it is hypothesized that these components would contribute to generalization of skills, treatment effects were only assessed in one target setting (the home). Consequently, generalization of treatment effects across unmeasured settings are unknown.

Bledsoe, Myles, and Simpson (2003) used a Social Story intervention with a 13-year-old male diagnosed with Asperger's Disorder and Attention-Deficit/Hyperactivity

Disorder (ADHD). Using an ABAB design, Bledsoe and colleagues implemented a Social Story to address inappropriate mealtime behavior during lunch in the school cafeteria including spilling food and drink and failure to use a napkin to clean food from his face. During intervention phases, the Social Story was read to the participant by the researcher prior to the target setting (lunch). Additionally, the authors reported that the Social Story was given to the teacher so that the participant could request the story or read at the suggestion of the teacher. Using event recording, reported data indicated a decrease in median spills from 4 during baseline to 2 during the first intervention phase. Median spills increased to 3 during the withdrawal of intervention followed by a decrease to 1 spill during the second intervention phase. Median wiping was 0 for baseline and withdrawal phases and 1 for both intervention phases.

Several limitations of the Bledsoe et al. (2003) study are of note. Although results indicated some gains, it is unclear if the behavior change is of a clinically significant level. For example, it would have been beneficial to know whether the change in behavior resulted in the participant having more appropriate interactions with his peers. The authors reported increased peer acceptance and an increase in peer social interactions as a hypothesized outcome of the Social Story intervention (Bledsoe et al., 2003). The authors did not provide other statistical information on occurrences of target behaviors (e.g., range, mean, or percentage of non-overlapping data points) and did not provide a rationale for reporting median data levels. Another limitation is that, although the participant and the participant's teacher had access to the Social Story throughout the day, it us unclear if it was read outside of the observation time and how often it may have been accessed. Because the authors did not assess for comprehension of the story and the

story was read to the participant, it is also unclear if the participant was able to independently access the content of the story.

Additionally, the authors noted that mealtime problems occurred in both school and home settings, and impacted the participant's family's ability to eat in public settings (Bledsoe et al., 2003). Although this is a clear situation in which similar behavior change was needed in multiple settings, the authors did not provide any information on generalization of intervention effects to the home or public setting and did not intentionally program for generalization to non-training setting.

Disruptive behavior was examined by Crozier and Tincani (2005) in an ABAC design with one 8-year-old participant diagnosed with autism. A modified Social Story was used to address the participant's talking without permission in the classroom. The B phase consisted of the Social Story being read to the participant prior to the classroom observation. During the C phase, the participant was also read the Social Story prior to class. In addition, verbal prompts were delivered on a variable interval schedule with an average delivery of 6 min during class during the second intervention phase. Verbal prompts consisted of a reminder to engage in an alternative appropriate behavior (e.g., raise your hand before you talk). Maintenance data were taken 2 weeks after the intervention ended. During maintenance the Social Story was available to the participant in the classroom but was not read to the participant.

Results revealed that the observed incidences of inappropriate talking decreased during both intervention phases (average of 2.3 and .02, respectively). However, the decrease was greater and more stable when verbal prompts were included as part of the treatment. The authors reported that inappropriate talking remained at zero during the

maintenance phase (Crozier & Tincani, 2005). It is important to note that the authors used a Social Story that was modified in several ways. First, the ratio of directive to descriptive sentences was 60% rather than the recommended ratio of 50% (Gray, 2004). Also, the Social Story was shorter than those typically used and did not use abstract words such as "usually" or "sometimes." It is also important to note that while the Social Story was effective in reducing talking out, the behavior dropped to a level of 0 when combined with verbal prompts (Crozier & Tincani). Generalization was not assessed.

More recently, Sansosti and Powell-Smith (2006) applied Social Stories to three individuals with Asperger's Disorder. Participants ranged in age from nine to 11 years and with cognitive functioning in the average to above-average range. Social skills were targeted through an individualized Social Story read to each participant by his parents before and after school. Although each story was individualized, it followed guidelines provided by Gray (2004). Compliance with treatment was assessed via a checklist to be completed by both the participant and his parents. During baseline and intervention phases, trained observers recorded occurrences of the target social behavior (sportsmanship, maintaining a conversation, or joining activities) on the school playground. The researchers included a follow-up phase in which the story was faded to one reading each day for a week and then once every other day for the subsequent week. As an additional measure, peer comparison data were also collected across all phases by observing a randomly selected non-disabled peer for every fifth datum.

Participants 1 and 2 displayed a significant increase in targeted social behaviors during intervention. Additionally, during treatment, they displayed a level of social behavior similar to that of peer comparisons. Participant 1 maintained treatment level of

social behavior during follow-up. Follow-up data for Participant 2 were inconclusive as there were only two data points for this phase. Participant 3 did not exhibit an increase in targeted social behaviors during intervention or follow-up. However, the degree to which the intervention was implemented for Participant 3 in unknown, as the parents failed to complete the integrity checklist (Sansosti & Powell-Smith, 2006). Despite the poor outcome for Participant 3, this study is a demonstration of positive treatment effects of Social Stories for individuals with Asperger's Disorder and the first to compare participant level of behavior to that of non-disabled peers.

In examining the strategies for generalization provided by Stokes and Osnes (1989), there are several components of the Sansosti and Powell-Smith (2006) intervention that could hypothetically affect generalization. The Social Stories written for Participants 1 and 3 targeted very specific activities (football and soccer, respectively). It could be argued that generalization would better be served by training loosely (e.g., writing less specific stories that targeted appropriate sports behavior). Another consideration is that while Participant 1 and 2 expressed interest in the activities presented in their Social Stories, the third participant did not. Participant 3's target behavior was joining in group activities. The authors stated that joining in soccer games may not have been reinforcing for Participant 3. Although it is unknown if the intervention for Participant 3 was implemented with integrity, another possibility for poor results was that engaging in the target behavior did allow the participant to access reinforcement. Generalization may have also been aided by considering the participant's preferences in selecting target behaviors thereby incorporating natural reinforcers (Stokes & Osnes, 1989). Although hypotheses can be made about the potential generalization of

the Sansosti and Powell-Smith study, like the previously mentioned studies, generalization was not assessed.

Studies with anecdotal generalization evidence. Although most of the studies on Social Stories fail to assess generalization effects, several report anecdotal generalization information. Scattone, Wilczysnki, Edwards, and Rabian (2002) made use of a multiple baseline across participants design implemented in the classroom. Social stories were developed to decrease the disruptive behaviors of three individuals diagnosed with autism, ranging in age from seven to 15 years. Specific disruptive behaviors were identified for each child (i.e., chair tipping, staring inappropriately at females, and shouting during class). Based on the reading ability of each participant, the story was either read aloud by the participant or read to the participant by the teacher. Each disruptive behavior was observed in the classroom for occurrence or nonoccurrence. During implementation of Social Stories, all three participants displayed a decrease in disruptive behavior. Participant 1 reduced observed occurrences of chair-tipping from a mean of 50% during baseline to a mean of 4.6% during intervention. Participant 2 reduced inappropriate staring from an average of 66.9% during baseline to 18.3% during intervention. Shouting occurred during 16% of intervals on average with a range of 0 to 40% for Participant 3 during baseline. After implementation of the Social Story intervention, shouting decreased to an average of 5.1% with a range of 2 to 10%.

Although Scattone and colleagues (2002) did not directly assess for generalization, they reported anecdotal generalization information. The authors report that Participant 1 was observed reading his Social Story to a class peer who had engaged in chair tipping. The participant had generalized the story to another person. Another

important point is that the behaviors addressed in the current study may not have been in need of generalization. Participant 3's behavior, shouting, is reported to have only occurred in one setting – the math class. Therefore generalization of appropriate communication behavior to other settings may not have been necessary.

Several limitations of the Scattone et al. (2002) study should be noted. First, Participants 2 and 3 were in the same classroom with the same teacher. It is possible that treatment effects of one participant affected the behavior of the second. Second, the authors mention that the teachers occasionally used verbal prompts to refer to the content of the Social Story. However, the extent to which verbal prompts were used is unknown, making their effect on intervention results unknown.

Social skills were again targeted in a study by Kuoch and Mirenda (2003). The researchers examined the effectiveness of Social Stories with three children with ASD, ranging in age from 3 to 6 years. One participant's intervention took place at home and targeted inappropriate and aggressive behavior when required to share toys with his siblings. The second participant's intervention took place at lunch and snack time at preschool and focused on inappropriate behavior during meals (e.g., making sounds, placing hands in his pants). The third participant's intervention took place at a summer school program. The target behavior for Participant 3 was challenging behavior during board games (e.g., cheating, making negative verbalizations). For the first two participants an ABA design was used to assess treatment effects. An ACABA design was used to evaluate treatment effects for Participant 3. The C phase examined whether effects of Social Stories were due to extra adult attention rather than the Social Story

itself. In the attention control condition, the child was read a fiction book similar in length to the Social Story and then given prompts for appropriate behavior.

The first two participants displayed an immediate decrease in problem behavior when Social Stories were implemented and both maintained a lower level of problem behavior during the withdrawal phase (Kuoch & Mirenda, 2003). Anecdotal reports from the parents indicated a continued reduction in problem behavior four weeks later. For the third participant, use of a fiction book with prompts resulted in no impact on problem behavior. However, like the other two participants, problem behavior decreased during implementation of Social Stories. The parents of the third participant also reported maintenance in the reduction of problem behavior four weeks post-study.

In the Kuoch and Mirenda (2003) study, the Social Stories intervention was implemented in isolation. However, Social Stories had previously been used with two of the participants for other target behaviors. It is unclear whether prior success with Social Stories contributed to treatment gains in the current study.

Like Scattone and colleagues (2002), Kuoch and Mirenda (2003) reported anecdotal generalization data. Participant 1 was reported by his parents to extend appropriately sharing toys with his brother to sharing food and toys with other family members (Kuoch & Mirenda). Participant 2, however, was reported to continue exhibiting problem behaviors during meals at home although behaviors decreased in the target setting (preschool). However generalization was not programmed for or measured in non-target settings.

Adams and colleagues (2004) implemented a Social Stories intervention in a home setting. The authors used an ABAB design to evaluate the effects of Social Stories

in reducing problem behaviors displayed by the participant during homework completion. The participant was a 7-year-old male diagnosed with Asperger's Disorder who attended a mainstreamed kindergarten class with speech/language services. Identified problem behaviors included crying, falling, hitting, and screaming. All four target behaviors were determined to serve the same function, escape from homework; therefore, a single Social Story was developed to address the target behaviors (Adams et al.). The intervention was implemented either by the participant's mother or father during homework completion.

During the first intervention phase, three of the problem behaviors increased. During the second intervention phase, all four of the problem behaviors decreased. The authors discussed possible reasons for an increase in behaviors during the first intervention phase (i.e., the parents of the participant needed additional time to successfully implement the intervention or that the participant required time to learn the skills). Another explanation for the unexpected results is the content of the Social Story mentioned the behaviors the participant should not engage in (i.e., crying, falling, hitting, and screaming). It is possible that mentioning these behaviors in the participant's script increased their occurrence. The guidelines outlined by Gray (2004) specify that Social Stories should focus on appropriate behavior (i.e., tell an individual what to do rather than what not to do). Anecdotally, researchers looked for generalization to the classroom. The participant's teacher reported a reduction in disruptive behaviors from the child during school work. However, no quantitative data were reported regarding generalization to the classroom setting.

Barry and Burlew (2004) used Social Stories to teach choice and play skills to two individuals diagnosed with autism, 7 and 8 years of age. An ABCD multiple baseline

across participants design was utilized to assess treatment effects. The B phase consisted of the introduction of two Social Stories, which focused on choosing a play activity and playing appropriately. After reading the Social Story, the participant was given an opportunity to practice the target skill and given corrective feedback in what the authors termed as "teacher-led instruction." During the C phase an additional Social Story was added which focused on interacting with peers. Teacher-led instruction continued for all three Social Stories. In phase D, Social Stories were read once in the morning and were available to the student throughout the day; however, the stories were not referred to during play time and corrective feedback was not given. Dependent variables were the amount of prompting necessary for the participant to choose play materials and playing appropriately (playing with materials in a manner similar to that of typically developing peers). For example, appropriate play for Lego™ pieces involved creating larger Lego objects or sorting pieces (Barry & Burlew).

During baseline, neither participant was observed to independently choose or engage in a play activity (Barry & Burlew, 2004). During the second phase, both participants chose a play activity after being verbally or physically prompted and played appropriately for an increasing amount of time. During the C phase, both participants again decreased the necessary level of prompts and increased the amount of time spent playing appropriately. During the D phase, Participant 1 made independent choices for play activity and played appropriately for longer periods. Participant 2 required only a verbal prompt to choose a play activity and continued to play appropriately parallel to peers.

One limitation of the Barry and Burlew (2004) study is that both participants were in the same class. It is difficult to determine if intervention implementation for one student influenced the other student's behavior. Another limitation is that the story was read immediately prior to a practice situation and if the participant made a mistake he or she was given corrective feedback and referred back to the Social Story. It is impossible to know how much corrective feedback and practice contributed to the positive treatment effects.

Moving out of the classroom and home setting, Ivey, Heflin, and Alberto (2004) implemented Social Stories in a clinical setting using an ABAB design. Three participants with diagnoses of Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) and between 5 and 7 years of age were included in the study. The goal of the intervention was to increase independent behaviors in unfamiliar or novel situations. Four classes of novel events were examined: setting changes, novel toys presented by an unfamiliar person, purchases, and novel activities occurring within the session. There were four different tasks in each class of events, for a total of 16 activities. Five specific target behaviors were outlined for each task. Specific target behaviors were the same across participants and were observed for occurrence or nonoccurrence using event recording. Each participant could earn one point for exhibiting a target behavior, for a maximum of five points each session. A Social Story was written for each of the 16 activities.

Parents were trained in using Social Stories and were instructed to read the story to the child for 5 days prior to each clinic session. The authors reported that the mean

number of points, across event classes, increased during the intervention phases and returned to a baseline level during the withdrawal phase (Ivey et al., 2004).

Although the authors reported mean levels of improvement, each phase in the ABAB design allowed only one opportunity for each of the event classes. Each phase contained four data points; however, each point within a phase represented a different type of task. For instance, while Participant 3's mean number of points for intervention phases increased compared to the baseline and withdrawal phases, his data for the novel toy activities were less consistent. For novel toys, Participant 3 exhibited 3 target behaviors during baseline, 3 target behaviors during the first intervention phase, 2 target behaviors during the withdrawal phase, and 2 target behaviors again during the second intervention phase (Ivey et al., 2005). Also, because the possible scores ranged from 0 to 5, there was very little opportunity for variation and very little room for treatment gain between phases. Mean differences between treatment and no-treatment phases varied by 1 point. One must question the clinical significance of gaining one target behavior during intervention. Treatment effects may have been better evaluated if target behaviors were assessed separately for each activity.

The study by Ivey and colleagues (2004) would have been a great opportunity to demonstrate generalization of treatment effects for Social Stories. Each participant was required to demonstrate specific behaviors across multiple settings. However, a separate Social Story was written for each of these settings, preventing generalization from being assessed. Further, separate stories would appear to be a time-consuming and costly approach compared to programming for generalization with one Social Story written for each of the four setting types. The two withdrawal phases could have been an opportunity

to assess generalization; however, because of the design flaws mentioned above (i.e., one datum per behavior and small range of data), data analysis would have remained difficult.

A multiple baseline across participants design was used by Scattone, Tingstrom, and Wilczynski (2006) to assess the effectiveness of Social Stories implemented in isolation. Three elementary-aged children diagnosed with ASD participated. The target setting for two participants was recess. Unstructured free time at lunch was used as the setting for the remaining participant. For each participant appropriate social interactions were measured prior to and after the implementation of an individualized Social Story. Appropriate social interactions included either initiating or responding to a peer interaction verbally, physically, or gesturally.

An increase in appropriate social interactions during the intervention phase was observed for two of the three participants. Participant 1 increased from an average of 7% of intervals with appropriate social interactions during baseline to 39% during the intervention phase. Appropriate social interactions were observed for Participant 2 for 13% of intervals on average during baseline which increased to an average of 28% after introduction of Social Stories. No significant change was observed for the third participant who exhibited appropriate social interactions for 0% of intervals on average during baseline and 4% during intervention (Scattone et al., 2006).

Although intervention effects were not observed for Participant 3, he was observed attempting to initiate interactions with peers on two instances. On those occasions the peer did not respond and the participant engaged in disruptive behavior as a result. The authors hypothesized that these negative peer interactions may have punished

his attempts to socialize with peers. It is also possible that Participant 3 did not have the prerequisite skills needed to socialize with peers (Scattone et al., 2006).

What distinguishes the Scattone et al. (2006) study from most other Social Stories research is that no other standardized interventions were used during implementation of the Social Stories intervention. Despite controlling extraneous interventions, at least two teachers participating in the study were observed to prompt a participant to engage in the target behavior. It is unclear to what extent teacher prompts contributed to behavior change.

Although Scattone and colleagues (2006) did not explicitly measure setting or response generalization, anecdotal information was provided for one participant. Additionally, an examination of the Social Stories written for the study, reveal several components that may be beneficial for generalization. Namely, each participant's story included multiple examples of peers with whom to engage (e.g., Mary, Joey, or Missy) and multiple response exemplars (e.g., talk with peers about movies or about pets). Although it is possible that including numerous choices for responses promotes generalization of new skills, Scattone et al. hypothesized that it may also hinder learning. It is possible that providing Participant 3 with multiple choices may have made it more difficult for him to select an appropriate behavior. The available Social Stories literature has not yet revealed whether individuals with ASD are better served by stories seeking to train loosely or those that train more tightly.

Crozier and Tincani (2007) investigated the effectiveness of Social Stories with three preschool children diagnosed with ASD. Participants ranged in age from 3 to five 5 of age. The setting was an educational preschool program. Target behaviors differed

across participants and included sitting during circle time (Participant 1), appropriate play with peers in the block center (Participant 2), and verbal interactions with peers at snack time (Participant 3). Duration recording was used for sitting while event recording was used for speaking to peers and appropriate play. An ABAB design was used for Participants 1 and 2, and an ABCACBC was used for the third Participant. During intervention, the first author read the Social Story to the participant and then asked three comprehension questions. The target observation immediately followed the reading of the Social Story. A third phase (Phase C) was added for the third participant after Social Stories alone failed to result in significant behavior change. During Phase C the Social Story intervention was implemented in the same format as during Phase B but verbal prompts were delivered by the first author. The first author sat behind the participant during snack and delivered verbal prompts on a variable interval schedule with two prompts per minute delivered on average (Crozier & Tincani). The specific content of verbal prompts were not provided.

At the end of the last treatment phase, the participant's teacher was provided with instructions for using the Social Story intervention and each story was made available in the classroom (Crozier & Tincani). Maintenance data were gathered 2 and 3 weeks following the end of the final treatment phase.

The results of the Crozier and Tincani (2007) study indicated an increase in appropriate behavior (sitting during circle time) for Participant 1 during treatment phases with a return to baseline levels of behavior when the treatment was withdrawn. An increase of 64% was reported from baseline to the final intervention phase. Additionally, data for Participant 1 indicated maintenance of gains during two and three week follow-

up observations. For Participant 2 data were reported for both appropriate and inappropriate social interactions. Predicted gains (i.e., an increase in appropriate behavior and a decrease in inappropriate behavior) were reported for both treatment phases. During the withdrawal phase, appropriate behavior initially decreased to baseline levels, but then began to increase to levels observed during the first treatment phase. Inappropriate behavior initially remained low during the withdrawal phase, but then began to increase sharply during the withdrawal phase. Gains were maintained at follow-up for inappropriate behavior but not for appropriate behavior.

During implementation of the Social Story intervention for Participant 3, there was no change in appropriate behavior compared to baseline and withdrawal phases. Average verbal interactions for baseline and withdrawal phases were .2 and .7, respectively. Average verbal interactions for the first Phase B were .6 and for the second Phase B were .5. When verbal prompts were added verbal interactions increased to 4.3, 10, and 6 for each of the respective C phases. Maintenance data, although at a lower level than observed during the C phases, remained above baseline level of behavior ($M = 3.5$). Crozier and Tincani (2007) hypothesized that Participant 3's failure to respond to the Social Story intervention alone, may have been due to communication deficits and the non-reinforcing nature of interacting with peers.

Crozier and Tincani (2007) demonstrated effectiveness of the Social Stories intervention with preschool-aged children for two out of three participants. The third participant required the addition of verbal prompts for the Social Stories intervention to be effective. There are several limitations and unanswered questions for this study. First, the specific nature of prompts provided to Participant 3 is unclear. Additionally, because

verbal prompts were not provided as an intervention in isolation, it is unclear whether the combination of the two interventions was necessary for behavior change. It is possible that verbal prompts alone would have been sufficient to bring about a change in Participant 3's behavior. Another limitation is that the Social Story intervention was implemented solely by the first author, a person unfamiliar to the participants (Crozier & Tincani). Generalization across settings was not directly assessed in the Crozier and Tincani study. Anecdotally, the teacher for the third participant reported that she informally observed an increase in appropriate behavior across other play settings.

Studies with Limited or Direct Assessment of Generalization. Thiemann and Goldstein (2001) targeted social skills (securing attention, initiating comments, initiating requests and contingent responses) through a combination of Social Stories and video feedback for 5 participants. Participant 1 was an 11-year-old male diagnosed with language impairment and scored below the range for autism on the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Rochen-Renner, 1988). Participants 2 and 4 had a current diagnosis of autism and were 6- and 7-years-old, respectively. Participants 3 and 5, were not reportedly diagnosed with autism, but scored in the mild to moderate range on the CARS. They were aged 8 and 12 years, respectively. The researchers matched each of the participants with two typically developing peers to form triads, in a multiple baseline design across behaviors. The authors compared pre-treatment target social behaviors of the participant during a social activity to 10 min sessions during intervention. The intervention contained several components. First, matched peers participating in the study were instructed on the target social behavior (e.g., how to talk to friends) and offered small reinforcers (e.g., stickers) for using the new skill appropriately.

Target participants were also given social skill instruction through Social Stories and text cues consisting of a drawing or photograph of the social skill and brief written reminders. After training, each triad engaged in a 10 min social activity during which target students were prompted through the use of cue cards if the desired response was not displayed. Following the social activity, the triads received video feedback and reinforcers for completing required components.

Overall the intervention successfully increased skills for securing attention and initiating comments for all participants and increased the number of contingent responses for one of two participants (Thiemann & Goldstein, 2001). However, skills were not maintained after withdrawal. Overall, Social Stories was effective, during intervention, when combined with other intervention components.

Thiemann and Goldstein (2001) also collected generalization data for three of the participants for 3 to 4 days. Text cues were briefly presented to target participants in the classroom and subsequent classroom behavior was observed. In regard to the tactics outlined by Stokes and Osnes (1989), the strategy used by Thiemann and Goldstein is most closely related to that of incorporating salient physical stimuli. One participant demonstrated generalization of a skill (i.e., initiating comments and requests) to the classroom.

As noted above, Social Stories were not presented in isolation but as part of an intervention package that incorporated video feedback and picture prompts (Thiemann & Goldstein, 2001). The component selected to present in the generalization setting was picture prompts. Any demonstrated effects of generalization could be attributed solely to picture prompts without any influence of the Social Stories. In other words, the

generalization tactic used in the Thiemann and Goldstein study was external to Social Stories. However, the Thiemann and Goldstein study is the first documented effort to program, a priori, for the generalization of target skills delivered via Social Stories to untrained settings.

Delano and Snell (2006) evaluated the effectiveness of Social Stories using a multiple baseline across participants design with a probe element. Three elementary-aged individuals diagnosed with autism were selected as participants. The target setting was the recreation area of the resource classroom. Generalization probes were also taken during play time in the general education classroom. Dependent variables were appropriate, inappropriate, and absence of social engagement with a target peer and were measured for duration. Frequency data were also collected for the following social skills: seeking attention, initiating comments, initiating requests, and making contingent responses. Generalization of social engagement was assessed through 10 min observations of each participant with a novel peer in the kindergarten classroom. Generalization of social skills was assessed during 5 min covert observations before every fifth session. A set of Social Stories was written for each participant (Delano & Snell). However, the authors do not report the specific number of Social Stories used in the study. As a result, it is unclear the degree to which generalization may have been programmed.

During intervention, a Social Story specific to the day's activity was read to the participant and his matched peer (Delano & Snell, 2006). The participant was then asked four to five comprehension questions. After reaching 75% accuracy on comprehension questions, the participant and peer were directed to the play area where they played for 10

min without any adult interaction. The Social Story was eventually faded to being read every other session and then to every third session and then to a no story condition.

Participant 1's duration of appropriate social engagement ranged from 137 s to 452 s during intervention with no data points overlapping with baseline (Delano & Snell, 2006). Duration of social interactions decreased during each subsequent fading (189 s at the 2 week follow-up) but remained above baseline levels. Participant 1 also exhibited an increase in the frequency of social skills during intervention. The duration of appropriate social engagement for Participant 2 increased after Social Story implementation (range = 30 s – 557 s) with only one datum during intervention overlapping with the baseline data. At follow-up, Participant 2 exhibited duration of social engagement of 287 s. Frequency of social skills for Participant 2 ranged from 1 to 10 during baseline and increased to a range of 2 to 45 during intervention. Participant 3's duration of appropriate social engagement increased after implementation of the Social Story intervention (range = 155 s – 492 s) with no overlapping data points between baseline and intervention. Participant 3 exhibited an increase in frequency of social skills during intervention, but the frequency decreased to baseline levels when the Social Story was withdrawn.

Participants 1 and 2 demonstrated generalization of social engagement to the general education classroom (Delano & Snell, 2006). A similar increase in social skills was observed during generalization probes for Participant 1 and 2. When observed interacting with a novel peer in the general education classroom, Participant 3 did not exhibit an increase in appropriate social engagement. He did, however, demonstrate an increase in social skills in the intervention setting with a novel peer.

There are several limitations that need to be noted. First, an existing behavior contract was in place for Participant 3 and was modified during the intervention phase (Delano & Snell, 2006). The contract was designed to reinforce the participant for appropriate social interaction. It is unclear the effect this ongoing intervention had on treatment effects. Second, because the typically developing peers also received the intervention, it is possible that treatment effects were a result of the newly learned skills gained by the matched peers (Delano & Snell). Additionally, dependent variables were not clearly defined. The authors stated that they used the same social skills (seeking attention, initiating comments, initiating requests, and making contingent responses) as Thiemann and Goldstein (2001) but modified the definitions. The definitions were not provided in the current study. Also, although there were increases in target behaviors, the data were highly variable across phases.

Like Thiemann and Goldstein (2001), Delano and Snell (2006) included the direct and purposeful assessment of generalization through generalization probes. Some level of generalization to an untrained setting was exhibited for two participants. The first two participants were kindergartners and intervention and generalization settings were highly similar, which may have aided generalization. The authors stated that intervention and generalization settings for the third participant, a second grader, were highly different which may have contributed to the lack of generalization. Sample Social Stories are not provided in the study publication prohibiting a content analysis of generalization programming (e.g., whether multiple exemplars are provided). Additionally, the authors report that multiple, specific Social Stories were written for each participant (Delano & Snell). It would appear to be more time and cost effective to produce one Social Story for

each participant that is written "loosely" enough to generalize across sessions. It is also unknown what other factors may have contributed to generalization. For example, the observer may have only been present in both settings and served as a stimulus prompt for social behavior.

Bernad-Ripoll (2007) combined Social Stories and video modeling to target emotional recognition using an AB design implemented in the home setting. The participant, a 9-year-old male diagnosed with Asperger's Disorder, was reported to have difficulty identifying, reporting, and managing frustration, anxiety, and anger at home and school. The participant was videotaped completing both frustrating and enjoyable tasks in the home (10 videos total). During baseline, the participant watched a videotape of himself expressing a positive emotion (e.g., happiness) and a videotape of himself expressing a negative emotion (e.g., anxiety). Following the viewing, the participant was asked the following three questions: (a) How did you feel (b) Why did you feel like this, and (c) What should you do in that situation? The participant's response to the questions served as the dependent variable.

For the intervention phase, a Social Story targeting a specific behavior was paired with each video. A separate Social Story was written for each target emotion (i.e., calmness, frustration, happiness, and anger). Each story included photographs of the participant exhibiting the corresponding emotion and photographs of alternative behaviors in which he could engage. The participant read the story with the author, watched the corresponding video, and was then asked the target questions. The author reported that the participant was given a 10 to 20 min break during the intervention phase, but it was unclear when the break occurred. The participant had access to a small

reward during the break (e.g., a snack) and a larger reward at the end of the session (e.g., a trip to a fast-food restaurant). Although the author notes that the participant could "earn" these rewards, it is unclear what the criterion, if any, was for reinforcement.

Following the intervention phase, a generalization phase was implemented (Bernad-Ripoll, 2007). The generalization phase consisted of allowing the participant to select a Social Story from the intervention phase to review with his parents every day for four days. Following the four days, the participant's parents were instructed to review the corresponding story with him anytime he was observed to exhibit any of the emotional states targeted in the study. Also during the generalization phase, the participant could earn points for correctly answering target questions which could then be exchanged for a reward.

Bernad-Ripoll (2007) reported that the participant was able to correctly label the emotion depicted in the video with a mean accuracy of 55% during baseline and 95% during the intervention phase. Mean accuracy for responses indicating why the participant exhibited a specific emotion in the video and what action he should engage in was 10% for baseline, 100% for the intervention phase, and 100% of the generalization phase. The author reported that when the participant exhibited a negative behavior which typically preceded a tantrum, his father selected the corresponding Social Story, read the story to the participant, and provided three alternative behaviors.

Although Bernad-Ripoll (2007) concluded that the intervention was effective in teaching the participant to recognize emotions and generalize that ability to other settings, the extent of this claim is limited based on the data provided. Several things are unclear about the procedures and results. First, the nature of breaks during intervention sessions

was not specified. The authors noted that the break was for 10 to 20 mins, but it was unclear when exactly the break occurred and what happened during the break. It was also unclear what criterion was set for reinforcement during the break and after the session. Additionally, although the participant exhibited gains during the intervention in terms of being able to label the emotions displayed in a video it is unclear if those skills transferred to actual practice. In other words, although the participant could report what behavior he should do when watching a video it does not mean that he performed the skill during an *in vivo* situation. Even though the generalization phase appears to have been designed to allow the participant to use newly learned skills in a real-life situation, the dependent variable continued to be the number of correct answers following the reading of a Social Story. It should also be noted that the generalization phase appeared to focus more on teaching the participants parents to implement the procedure than on the participant's behavior change. So, although the Bernad-Ripoll study included a generalization phase, it consisted of continuing the intervention in a different setting (continuing training) and not implementing training in only one setting and evaluating any carry-over results in a second setting.

Reynhout and Carter (2007) used Social Stories to target disruptive classroom behavior with an 8-year-old male diagnosed with autism and a moderate intellectual disability. Hand tapping during reading class was identified as the dependent variable. Probe data were taken in a second instructional setting, phonics. An ABC design was utilized. During Phase B the Social Story was read to the participant prior to the observation period by either the first author or the teacher. After reading the story, the participant was asked comprehension questions regarding content of the story. The Social

Story was then made available for the student throughout the course of the day (i.e., it was placed on his desk). Phase C included the components of Phase B; the teacher also reviewed or referred to the story with the participant throughout the target setting (i.e., reading). Throughout all phases of the study, the teacher provided verbal praise to the participant when he was not tapping. An individualized Social Story was written for the participant following Gray's (2004) guidelines and was illustrated using photographs. Twenty minute observations using 10-s partial interval recording was used to record instances of hand tapping. Maintenance data were collected four weeks after the intervention was completed.

During baseline, hand tapping was observed for 63% of intervals on average with an increasing trend. Hand tapping decreased to 49% for Phase B and to 41% for Phase C. Teacher prompting occurred during 5% of intervals during Phase C. Hand tapping also decreased in the probe settings from 35% during baseline to 6% when measured again in Phase C. The observed decrease in hand tapping maintained four weeks post-intervention (M = 13%). The percentage of nonoverlapping data points from baseline to Phase B was 40% and from baseline to Phase C was 50%. However, the percentage of nonoverlapping data points for the last eight data points compared to baseline was 100%.

It should be noted that correct responses on comprehension questions during Phase B remained low (M = 39%) and was not higher than 70% until the tenth session of Phase C. The authors reported that, although the participant had access to the story during Phase B, he used it on 0% of opportunities. The Reynhout and Carter study demonstrates the importance of assessing comprehension when implementing the Social Stories intervention.

Reynhout and Carter (2007) examined generalization of target behaviors in a secondary setting without adding additional training or stories. However, probe data were not gathered during Phase B. It is also of note that hand tapping decreased in the secondary setting before it decreased in the primary target setting. Additionally, although the target behavior did not decrease without the addition of verbal prompts in the primary setting, it decreased in the secondary setting where prompts were not reported to be used. Actual data for frequency of prompts in the second setting were not provided.

Although Reynhout and Carter (2007) did not report intentionally programming for generalization, several components of implementation may have aided the participant's transfer of skills. First, the Social Story was read to the participant by two different people (first author or the teacher) providing more variability in the intervention presentation. Second, the story was made available to the participant throughout the school day which may have served as a physical stimulus to prompt the exhibition of target behavior.

The available Social Story literature provides a growing body of support for the effectiveness of this intervention. This is the case for 12 of the 19 studies reviewed. For the remaining studies there were mixed results. However, few studies examined generalization of treatment results to multiple stimulus conditions (Thiemann & Goldstein, 2001; Delano & Snell, 2006; Bernad-Ripoll, 2007; Reynhout & Carter, 2007). None of the studies reviewed programmed for generalization in an a priori fashion without providing additional training in the generalization setting.

Purpose of the Present Investigation

Social and behavioral impairments are defining characteristics of ASD (APA, 2000). These deficits impair multiple aspects of functioning. Interventions to improve these deficits often focus on teaching appropriate skills. Social Stories appear to be a useful intervention for this purpose. Because of the great deal of heterogeneity among individuals with ASD, they may benefit most from interventions designed specifically for them and that make use of individual strengths and weaknesses (Scheuermann & Webber, 2002).

Although Social Stories were first introduced in 1993 (Gray & Garand), the majority of research has been published in the last 5 years. Despite the recent surge of research on Social Stories that generally reports positive outcomes, there is much that remains unknown. There is a need for more research on Social Stories that use rigorous design methods to demonstrate control (Sansosti et al., 2004). The existing research on Social Stories often pair interventions with other behavioral interventions. Other limitations include reliance on non-experimental designs, inconsistent or unreported methods, and weak treatment effects (Sansosti et al.).

There is nothing inherent in the criteria provided by Gray (2004) that would proscribe generalization based on Stokes and Osnes' (1989) recommendations. Indeed, there are several components of Social Stories which may aid generalization. First, by tailoring the construction of a Social Story to an individual's interests, participating in the intervention may be naturally reinforcing to the individual. For example, the child with a personal interest in trains may have pictures of or references to trains in his or her Social Story. Second, the actual presentation of the Social Story may be reinforcing (e.g., book

or video format). Third, by providing the rules of a situation, Social Stories may offer explicit reminders of expected behavior. The rules provided in a Social Story could then potentially serve as self-mediated verbal stimuli. Finally, the presence of the Social Story in the individual's environment may serve as a physical stimulus to prompt the exhibition of target behavior and, therefore, facilitate generalization.

Despite the features of Social Stories which may promote generalization, there is a dearth of research demonstrating generalization of skills learned in Social Stories (Nichols et al., 2005). Most of the research on Social Stories interventions has failed to consider generalization despite reporting a need for exhibition of target behaviors under multiple stimulus conditions. A few studies provide anecdotal information on generalization; however, only four studies to date have assessed generalization (Bernad-Ripoll, 2007; Delano & Snell, 2006; Reynhout & Carter, 2007; Thiemann & Goldstein, 2001). However, all of the Social Stories studies either adopted a "train and hope" approach (Stokes & Baer, 1977) rather than specifically programming for generalization or combined Social Stories with other interventions used in the generalization setting (i.e., Thiemann & Goldstein, 2001).

Assessing the generalization of Social Stories is a necessary component in evaluating the utility of the intervention. If construction of a separate Social Story is required for each setting in which the individual with ASD is placed, the intervention may not be practical. It is far more resource efficient to train an individual in one setting and observe the newly trained skills in other appropriate settings. Although Social Stories, in theory, are not prohibitive of generalization tactics, in practice they are often written in a proscriptive manner. That is, most provide limited stimuli samples, are

specific to one setting, are read in only one setting, and provide only one sample appropriate response. The "typical" Social Story construction and implementation may be sufficient to promote or program for generalization but the utility of such procedures in isolation has not been assessed. It is likely that in order for generalization to occur, it must be explicitly programmed as recommended by Stokes and Osnes (1989). Programming for generalization should occur while maintaining the Social Story guidelines provided by Gray (2004). In other words, generalization should be programmed for without adding any extra treatment components thereby threatening internal validity. For example, in the Thiemann and Goldstein study (2001) visual prompts were added during non-training settings. Consequently, it is unknown if generalization effects were due to the Social Stories intervention or to the extra component.

Programming for generalization can occur within Gray's guidelines for Social Stories. Under the second category of generalization strategies provided by Stokes and Osnes (1989), training diversely, there are a couple of potential adaptations for Social Stories that maintain the integrity of the intervention. The first component is to provide multiple stimulus exemplars. If the target behavior was appropriately requesting help, the Social Story may provide multiple people from whom to seek help. A second option is to provide multiple response exemplars. Continuing with the previous example, the Social Story may suggest raising one's hand, asking a peer, or working on other assignments until the teacher is available. The third category of generalization tactics provided by Stokes and Osnes, incorporating functional mediators, is another source of possible adaptations for Social Stories. First, the Social Story could be read in multiple places to

aid in generalization. Second, the Social Story could be present in multiple settings, without being read, to serve as a visual prompt of target behaviors. Similarly, the participant could keep the Social Story with him or herself to aid as a reminder of target behaviors. All of these possibilities fit both Stokes and Osnes' recommended strategies for generalization and Gray's guidelines for Social Stories. However, there is no existing evidence to suggest that one particular generalization strategy is more effective than any other.

The current study examined the effectiveness of Social Stories for increasing appropriate behaviors exhibited by children with ASD. Generalization effects across settings were assessed using a typical Social Story (Train and Hope) format and a story in which generalization tactics were specifically incorporated. It was hypothesized that an increase in appropriate behaviors and a reduction of inappropriate behaviors would be observed after a Social Stories intervention was implemented. However, it was hypothesized that less generalization would occur when Social Stories were implemented in a typical fashion than when generalization strategies were explicitly incorporated.

Research Questions

1. Is Social Stories an effective intervention for addressing social and/or behavior deficits for individuals diagnosed with Asperger's Disorder when implemented under a typical format and when implemented in a generalized format?
2. Do potential treatment effects of Social Stories (i.e., an increase in appropriate behavior) generalize to non-training conditions, without a priori programming for generalization?

3. Do treatment effects of Social Stories generalize to non-training conditions, when strategies for generalization outlined by Stokes and Osnes (1989; e.g., by training loosely) are included as an ecological component of the intervention?

CHAPTER II

METHOD

Participants

Four Caucasian male students with a current diagnosis of Asperger's Disorder and who were between the ages of 7 and 14 years participated in the study. The participants were recruited based on teacher report of a social skills or behavior deficit occurring in at least two settings. A student qualified for inclusion in the study if the target appropriate behavior occurred in 50% or fewer of intervals, on average, across 10-min observation sessions. Each participant was also required to answer comprehension questions with 100% accuracy after reading (or being read) a sample Social Story (Appendix B). A sample Social Story was used to determine if a potential participant could understand material presented in a story format and would be appropriate for the study. Informed consent was obtained from both the parent(s) (Appendix C) and the teacher (Appendix D) prior to implementation of the intervention.

The Oral Reading Fluency subtest of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminsky, 2002) was used as a screening measure of reading fluency and accuracy. The DIBELS Oral Reading Fluency subtest was developed to be a curriculum based measure of oral reading fluency consistent with the Test of Reading Fluency (TORF; Children's Educational Services, 1987). The median concurrent validity of the DIBELS Oral Reading Fluency subtest TORF passages is .92 and ranged from .92 to .96. Alternate-form reliability coefficient for the DIBELS Oral Reading Fluency subtest was .95 (Good, Kaminski, Smith, & Bratten, 2001).

Each of the participant's schools conducted school-wide reading screening using the DIBELS three times a year; fall, winter, and spring. Because data were recent and readily available, they were selected as an estimate of reading level. The median score (number of words read correct in one minute) on three grade-level reading passages was used to compare examinees with peers of the same grade level. Median oral reading fluency scores from the winter benchmark were used in the current study as an indicator of each participant's reading level.

Each participant's teacher was interviewed by the primary investigator using the Problem Identification Interview (PII; Appendix E; Kratochwill & Bergan, 1990). The PII is designed to obtain information about a teacher's perception of the student's problem behavior including setting, duration, and antecedent and consequent events associated with the problem behavior. Responses to the PII were used to aid in the construction of the Social Stories and identification of target settings.

Alan was a 9-year-old Caucasian male who was enrolled in a general education third grade class. He was diagnosed with Asperger's Disorder by an outside mental health agency. Alan received testing accommodations under Section 504 but no special education services. He scored a median score of 81 correct words per minute (cwpm) on the winter administration of the Oral Reading Fluency subtest of the DIBELS. His score placed him in the "Some Risk" category indicating he was on grade-level for reading. Additionally, on the state end-of-the-year benchmark test, Alan scored in the advanced level for all three testing domains (i.e., Reading, Language Arts, and Mathematics).

Alan's teacher was a Caucasian female who taught a general education third grade class. According to his teacher, Alan frequently failed to gain permission before talking

in class during academic assignments. He would ask the teacher a question without first raising his hand and would make verbal comments to peers. If the teacher called on another student to answer a question, Alan would sometimes respond with the answer or correct a student if he or she responded incorrectly. Additionally, Alan would talk to peers or the teacher about Pokémon© during instructional periods. Because of Alan's preoccupation with Pokémon, he was prohibited from bringing Pokémon trading cards to school. Alan's failure to speak with permission occurred throughout academic periods but was worst in the morning during reading instruction, according to his teacher. Reading was selected as the primary target setting for Alan and math was the secondary setting.

John was an 8-year-old Caucasian male enrolled in second grade. He received special education in a self-contained classroom for the majority of the day. John was diagnosed with Asperger's Disorder by an outside mental health agency at the age of 7 years and also had a history of seizures. During the school-wide reading screening completed in December, 2006, John received a median score of 54 cwpm on the Oral Reading Fluency subtest of the DIBELS, placing him in the "Some Risk" category for grade-level reading fluency.

John's teacher was a Caucasian female. She was a certified special education teacher and taught a second grade self-contained class. John's teacher reported her primary concern to be that John lacked social interactions with peers. During non-instructional periods (e.g., recess), John would play alone or would follow other children without interacting with them. During observations he would follow other children on the playground without talking or playing with them or would talk to them when they were too far to hear him. John's teacher did not report any behavioral excesses. Morning recess

was selected as the primary target setting and afternoon free play as the secondary setting.

Stan was a 7-year-old Caucasian male enrolled in the same second grade self-contained class as John. He received special education in the self-contained classroom for the majority of the day. Stan was diagnosed with Asperger's Disorder by an outside mental health agency. He received a median score of 59 cwpm on the Oral Reading Fluency subtest of the DIBELS during winter benchmarking. His score on the DIBELS placed him in the "Some Risk" category, indicating he was instructional on grade-level material for reading.

Stan's teacher reported her primary concerns to be a low-rate of on-task behavior and frequent inappropriate vocalizations. Stan would frequently fail to attend to academic tasks and would instead draw pictures of his favorite topic, trains and the circus. He would also talk to himself or make other inappropriate vocalizations (e.g., hum) during academic tasks. His teacher also reported that he would respond inappropriately when she would speak to him (e.g., argue). According to his teacher, Stan's off-task behavior and inappropriate verbalizations occurred anytime he did not receive one-on-one attention. Stan's teacher also noted that problem behavior tended to be worse during morning seatwork (i.e., spelling), which was selected as the primary target setting. However, problem behavior occurred across academic periods, and reading instruction in the afternoon was selected as the secondary setting.

Harold was a 14-year-old Caucasian male enrolled in eighth grade at a local middle school. He received special education support services in general education classes. He was diagnosed with Asperger's Disorder and ADHD by an outside mental

health agency. Harold scored below grade-level on the winter reading benchmark tests. He was therefore administered lower-grade reading passages from the DIBELS by the school's behavior specialist. DIBELS administrations revealed Harold to be "Some Risk" for fourth grade passages and "Low Risk" on third grade passages. Harold's teacher reported him to be an accurate reader but non-fluent due to off-task behavior during reading assignments (e.g., discussing the story with the administrator during timed readings).

Harold transitioned between seven different teachers across academic subjects. He was referred to the school's behavior specialist for disruptive classroom behavior. His English class was identified as being the most impacted by Harold's failure to exhibit appropriate behavior. Harold's English teacher was a Caucasian female, who taught general education eighth grade classes and had no formal special education training. She reported that Harold did not exhibit appropriate verbalizations during class and his verbalizations were frequently off-topic (e.g., questions about the teacher's husband or about football). His English teacher further reported that he spoke frequently about his favorite topics, football, and football statistics. He was referred to the school's behavior specialist for talking without permission in each of his classes. English was selected as Harold's primary target setting and Science as the secondary setting.

Independent Variables

Two Social Stories were developed for each participant addressing his specific area of need. Social Stories took into consideration the individual participant's reading level and interests. Individual reading level was determined by each participant's performance on the DIBELS administered during winter benchmarking. Alan, Stan, and

John performed on grade-level on the DIBELS. Harold required additional DIBELS administration, placing him in the instructional range for fourth grade material. Additional reading testing was administered to Harold before the start of the study.

Each of the Social Stories was written in first person and provided information about the target situation including what happens in that situation, what the child was expected to do, and what role others in the situation had. Construction of each of the Social Stories followed the guidelines outlined by Gray (2004; See Appendix A). Each Social Story was typed in Times New Roman, 20 point font, and printed on plain 8.5 by 11 inch, white paper. Three to four lines were placed on each page, and pages were stapled together for durability.

The first Social Story (Social Story – Typical Format; SS-Typ) followed the Social Story guidelines provided by Gray (2004) and was written in a format similar to what is typically reported in the literature. More specifically, the Social Story included information on one specific situation (the target setting). Additionally, only one response exemplar (e.g., draw a picture while waiting for help) and one stimulus exemplar (e.g., ask math teacher for help) was provided in the Social Story.

The second Social Story (Social Story – Generalization Format; SS-Gen) followed Social Story guidelines (Gray, 2004) but incorporated strategies for theoretically increasing generalization (Stokes & Osnes, 1989). SS-Gen stories were written to generalize to multiple situations (i.e., the target setting and the untrained setting). Multiple stimuli exemplars (e.g., ask the math teacher or the teacher assistant for help) and multiple response exemplars (e.g., draw a picture or read a book while waiting for help) were incorporated in the story.

The reading level for each Social Story was assessed using the Spache readability formula, computed at http://www.interventioncentral.org. Alan's first Social Story was analyzed to be a 2.93 grade equivalent and his second to be a 3.06 grade equivalent (Appendix F). The first and second Social Story for John were determined to be 2.86 and 2.84 grade equivalents, respectively (Appendix G). Stan's typical-format Social Story had a 2.70 grade equivalent, and the generalization Social Story had a grade equivalent of 2.65 (Appendix H). Social Stories for Harold had a grade equivalent of 2.87 for the first Social Story and 2.90 for the second Social Story (Appendix I).

Dependent Variables and Data Collection

Target behaviors were defined for each child based on individual needs. Appropriate behaviors served as the primary dependent variable. Inappropriate behaviors were also recorded for three participants. The appropriate behavior identified for Alan was speaking with permission from the teacher (i.e., after he raised his hand or was called on to respond by the teacher). Inappropriate vocalizations were also targeted for Alan and were defined as speaking or making sounds to self, peer, or teacher without permission from the teacher. Inappropriate vocalizations also included arguing with the teacher.

Appropriate behavior selected for John was social talking, which was defined as speaking to a peer within proximity of 2 feet. No inappropriate behavior was identified for John based on his teacher's response during the PII.

On-task behavior was selected for Stan and defined as keeping his attention on the task at hand without disrupting attention for more than two seconds (i.e., keeping eye contact with the task materials). Inappropriate vocalizations were also targeted for Stan and defined the same as for Alan.

Harold's identified behavior was appropriate responding and was defined the same as for Alan but, in addition, verbalizations had to be relevant to the current academic topic (e.g., a comment about reading during reading class). Inappropriate behavior was also measured and defined as responding verbally in class without permission from teacher or on a nonacademic topic (e.g., a comment about science in reading class).

Target behaviors were measured through observations conducted by trained observers. Observation sessions were 10-min in length and were completed a minimum of three times per week in the target setting. All dependent variables, except on-task behavior, were measured using a continuous 10 s partial-interval recording procedure. On-task behavior was recorded using a continuous 10 s whole-interval recording procedure. Observers used an audiotape that signaled each 10 s interval. The observer recorded occurrences of target appropriate behavior and occurrences of inappropriate behavior in each interval. Because teacher prompts were reported to be potential confounding variables in previous Social Story studies (e.g., Scattone et al., 2006), they were recorded across all phases of the current study. The observer recorded any instances in which the teacher prompted (verbally, physically, or gesturally) the student to either engage in the target appropriate behavior or to not engage in a target inappropriate behavior. A sample observation form can be found in Appendix J.

Design and Data Analysis

A nonconcurrent multiple baseline design across participants with counterbalancing of conditions was utilized across two pairs of participants. The first dyad was completed concurrently. Due to researcher time constraints, the second dyad

was completed nonconcurrently. A probe element was incorporated to assess for generalization effects in the second, untrained setting. Additionally, data on the maintenance of behavior change were collected for both settings 1 week after the intervention had ended and the Social Story had been withdrawn. No Social Story was read during the one-week maintenance phase. Maintenance data were not gathered in the secondary setting for Stan because the teacher stopped providing instruction in the afternoon to allow the teacher time to pack materials to move to a new school building. Dyad 1 consisted of Alan and Stan. Dyad 2 consisted of John and Harold. After baseline, Alan and Harold received Social Stories implemented in a typical format (SS-Typ) followed by Social Stories with generalization (SS-Gen). John and Stan received baseline, Social Stories with generalization using SS-Gen, followed by SS-Typ.

The determination to change phases was based on the stability and trend of the participants' appropriate behaviors. For Alan and John, baseline data were collected for a minimum of three data points and continued until either a stable level or deteriorating trend was observed for the primary dependent variable (i.e., appropriate behavior). The number of data points for the second participant in each dyad (Stan and Harold) exceeded that of the first participant in the dyad by at least two data points and continued until either a stable level or deteriorating trend in appropriate behavior was observed.

A multiple probe technique was used to assess generalization of skills to the secondary setting for each of the participants. Data for appropriate behavior were assessed in the second setting on randomly selected days, with more frequent data collection at the beginning and end of each phase and fewer occurrences during the middle of each phase (Hayes, Barlow, & Nelson-Gray, 1999). The same observation

forms and procedures used in the primary setting were used in the secondary, untrained setting. Target behaviors for each participant in both settings were displayed in a graph. The data were visually assessed for variability, trend, and level of change within phases, between phases, and across participants (Hayes et al., 1999).

Procedure

Screening and Baseline. After a student was referred, the primary investigator obtained informed consent from the parent (Appendix C) and the teacher (Appendix D). Specific behaviors, settings, and conditions were identified through the administration of the PII with the student's teacher. Direct observations were conducted in both a primary and secondary setting for the instances of target appropriate behavior, inappropriate behavior, and the use of prompts by the teacher. Additionally, a sample Social Story was used as screening criterion for inclusion in the study (Appendix B). Each of the participants read the screener story to the teacher or other identified adult and was required to answer 100% of comprehension questions correctly.

Once a student met criteria for inclusion in the study, screening observations were included in baseline data. During both screening and baseline, observations occurred in the primary setting 3 to 4 times a week and in the secondary, untrained setting 1 to 3 times a week. The teacher and student followed their typical school routine.

Following baseline, the teacher received instruction on implementing the Social Stories intervention. Teachers were provided with a Social Story (either SS-Typ or SS-Gen) and an integrity checklist. The teacher was required to implement the intervention with 100% accuracy before training was considered complete. Teachers were instructed not to prompt the student (i.e., to engage in the target appropriate behavior or to not

engage in the inappropriate behavior). Prompts also included making references to Social Story content at times when the Social Story was not being read.

Social Stories – Typical Format. The same observation methods used in the baseline phase were continued for each participant. SS-Typ for each participant was introduced. Alan, John, and Stan read the Social Story to their respective teachers. Harold's English teacher was unable to read the story prior to the target setting because Harold transitioned between classes and teachers throughout the day and there was insufficient time for him to read the Social Story with the teacher. Therefore, Harold read the Social Story to the school's Behavior Specialist with whom he was familiar. Reading of the Social Story occurred immediately prior to the session in the target setting.

Three comprehension questions were developed for each Social Story based on procedures used by Scattone and colleagues (2006). The participant was required to successfully answer the questions after reading the Social Story for each session. If the student responded incorrectly to more than one question, the story was read again and comprehension reassessed. If the student responded incorrectly to more than one question after the second reading, the teacher or Behavior Specialist reviewed the story with the student and attempted to clarify any misunderstandings. The Social Story was read prior to the primary setting in the same location each time. The Social Story was not available or visible to the participant outside of the established reading time.

Social Stories – Generalization Format. Procedures were similar to Social Stories – Typical Format except students received SS-Gen instead of SS-Typ. As reported in the Materials subsection, the Social Stories used during SS-Gen included multiple stimulus

exemplars and multiple response exemplars. Comprehension for story content was assessed in the same way as during Social Stories – Typical Format.

Additionally, implementation incorporated strategies for generalization outlined by Stokes and Osnes (1989). The story continued to be read by the student one time a day. However, the location and time of the reading varied each day. Locations used for Alan, John, and Stan included the teacher's desk, a back table, and the hallway. Locations used for Harold included the hallway, the office, and a table in the classroom. Rather than being read immediately before the primary target setting each day, the time the Social Story was read varied and occurred no more than one hour before the target setting. The person to whom the Social Story was read also varied. Alan, John, and Stan read their Social Stories with either the teacher or teaching assistant. Harold read his Social Story with the school's Behavior Specialist or the office assistant. Although locations and times for Social Story readings varied, the Social Story was not read in the generalization setting during any phase of the study. Decisions on how to vary the readings were based on staff availability.

Observer Training and Interobserver Agreement

Observations were conducted by graduate students trained in the observation procedure. Observers were trained prior to the beginning of the study either individually or through a group practice session. In order to be determined as competent in the procedures, the observer collected practice data with the primary investigator in a school setting to assess interobserver agreement (IOA). IOA was assessed by examining the percent of agreement of intervals of target behavior between two observers. Once 90% agreement was reached, observers were allowed to collect data independently.

IOA for the number of intervals of target behavior were calculated for approximately 30% of observations across each phase. IOA was calculated by 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. If, at any time, IOA data fell below 80%, the observer was retrained in data collection.

IOA was assessed 8 times for Alan, representing 31% of the observations and 7 times for John representing 32% of the observations. For Stan, IOA was assessed 9 times, representing 32% of the observations. IOA was assessed 12 times for Harold, representing 38% of the observations. For Alan, the mean level of IOA for appropriate behavior was 95% (range = 93% - 98%) and for inappropriate behavior was 95% (range = 92% - 98%). For John, the mean level of IOA for appropriate behavior was 95% (range = 90% - 98%).

For Stan, the mean level of IOA for appropriate behavior was 91% (range = 88% - 100%) and for inappropriate behavior was 96% (range = 83% - 100%). For Harold, the mean level of IOA for appropriate behavior was 98% (range = 95% - 100%) and the mean level of IOA for inappropriate behavior was 95% (range = 86% - 100%).

Treatment Integrity

The teacher responsible for implementing the Social Story intervention for each participant was required to record whether the intervention was completed each day. Integrity was assessed via the Social Stories Integrity Checklist for SS-Typ (See Appendix K) or the Social Stories Integrity Checklist for SS-Gen (Appendix L). The checklist used depended on the phase of the study. Teacher-reported integrity primarily included whether the Social Story was read to the participant and if comprehension

questions were asked. Each of the four participants correctly answered 100% of comprehension questions during 100% of sessions.

Additionally, a trained observer observed 30% of the sessions to assess treatment integrity (Appendix M). Similar to teacher-reported integrity, observer-recorded integrity primarily focused on the reading of the Social Story. If at any time treatment integrity fell below 100%, the teacher was retrained and prompted to follow the treatment protocol.

Teacher-reported treatment integrity was 100% for all four participants. IOA by a second rater for treatment integrity was 100% for all four participants. The use of prompts was also recorded as another source of treatment integrity data. For Alan, there was an average of 3.33 prompts per session during baseline, .50 prompts during SS-Typ, and 1.17 prompts during SS-Gen. There was an average of .25 prompts per session for John during baseline, 0 prompts during SS-Typ, and .75 prompts during SS-Gen. For Stan, mean prompts during baseline was 6.8, 4.2 during SS-Typ, and 6.33 during SS-Gen. For Harold there were a mean of 1.83 prompts on average during baseline, .71 prompts during SS-Typ, and .33 prompts during SS-Gen.

Treatment Acceptability

Intervention acceptability was assessed at the conclusion of the study using the Intervention Rating Profile 15 (IRP-15; Appendix N; Martens, Witt, Elliott, & Darveaux, 1985). The IRP-15 is a 15-item scale that uses likert-style rating ranging from 1 (strongly disagree) to 6 (strongly agree) to assess teacher's acceptability of an intervention. Martens et al. reported internal consistency reliability of the IRP-15 to be .98. An intervention is considered acceptable when rated 52.50 or higher (Von Brock & Elliott, 1987)

Alan, John, and Stan's teacher each completed the IRP-15 twice, once for each intervention phase. The teacher was provided with the IRP-15, a description of the intervention phase, and a copy of the participant's Social Story for that phase. Teacher IRP-15 responses for Alan's Social Stories were 77 for SS-Typ and 77 for SS-Gen. For John, teacher responses on the IRP-15 were 74 for SS-Gen and 74 for SS-Typ. Teacher responses for Stan on the IRP-15 were 74 for SS-Typ and 74 for SS-Gen. All scores fell within the acceptable range. Treatment acceptability scores are not available for Harold because his teacher did not implement the Social Stories intervention and was therefore insufficiently familiar with the intervention to accurately rate it.

CHAPTER III

RESULTS

Dyad 1

Primary Setting. Phase means for both dyads across phases and settings are displayed in Table 2 (appropriate behavior) and Table 3 (inappropriate behavior). Appropriate and inappropriate behavior for Alan and Stan are displayed in Figure 1. During baseline, Alan exhibited a low level of appropriate vocalizations in the primary setting (M = 3.89%, SD = 2.55). After the introduction of SS-Typ, mean level of appropriate vocalizations increased (M = 10.00%, SD = 6.50) over baseline levels, although data were somewhat variable across the phase. There was not an immediate change in appropriate behavior for Alan upon introduction of the SS-Gen phase; however, a gradual change in level occurred over the course of the phase with the last three data points showing the greatest increase over baseline (M = 16.39%, SD = 6.78). Maintenance data for appropriate vocalizations, one week post-intervention, were within the range of the SS-Gen phase, although a decreasing trend may have emerged if data collection had continued.

For Alan's inappropriate vocalizations, a decreasing trend was observed during baseline (M = 23.89%, SD = 7.52). Inappropriate vocalizations evidenced an immediate decrease during SS-Typ (M = 3.33%, SD = 2.79) and remained, overall, lower than baseline. A slight increase in inappropriate vocalizations was observed upon introduction of SS-Gen (M = 3.61%, SD = 4.14), but behavior levels returned to a level similar to SS-Typ. Improvements in decreasing inappropriate vocalizations were maintained during the maintenance phase.

Stan was exposed to a counterbalanced order of treatment, with SS-Gen preceding SS-Typ (Figure 1, bottom panel). On-task behavior decreased over the baseline phase (M = 28.33%, SD = 7.82). After the introduction of SS-Gen, on-task behavior was lower in the first session; however, increased sharply over the next two sessions and then stabilized by the end of the phase with a substantially higher level of on-task behavior (M = 50.00%, SD = 23.48) than that observed during baseline. When SS-Typ was implemented, on-task behavior immediately decreased and was variable across the phase with a decreasing trend at the end of the phase (M = 44.33%, SD = 19.60). At one-week maintenance, on-task behavior remained elevated.

Stan's inappropriate vocalizations initially decreased during baseline, with a sharp increase for the last datum (M = 13.60%, SD = 9.60). Inappropriate vocalizations during SS-Gen were low and stable across the phase (M = 1.11%, SD = 0.86). Inappropriate vocalizations remained low during SS-Typ with a slight increasing trend over the phase (M = 3.33%, SD = 3.33). During one-week maintenance inappropriate vocalizations increased to baseline level.

Generalization Setting. Generalization probes were taken for Alan on two occasions during baseline, both at the end of the phase. On both occasions, appropriate vocalizations and inappropriate vocalizations occurred at levels similar to that in the primary setting. After introduction of SS-Typ, 3 generalization probes were taken and indicated little change in appropriate vocalizations, as compared to baseline. Inappropriate vocalizations decreased in the secondary setting with a mean occurrence lower than baseline. During SS-Gen, 3 generalization probes were again taken.

Table 2

Mean Percentage of Intervals by Phase and Setting for Appropriate Behaviors

Participant (Target Behavior)	Baseline	SS-Typ	SS-Gen	Maintenance
		Primary Setting		
Alan (Vocalizations)	3.89%	**10.00%**	16.39%	16.67%
John (Social Talking)	15.83%	46.25%	**43.33%**	34.17%
Stan (On Task)	28.33%	44.33%	**50.00%**	63.33%
Harold (Vocalizations)	1.39%	**3.33%**	4.17%	3.33%
		Probe Setting		
Alan (Vocalizations)	1.67%	**5.00%**	24.44%	10.00%
John (Social Talking)	19.17%	36.67%	**35.00%**	63.33%
Stan (On Task)	14.17%	72.08%	**60.33%**	
Harold (Vocalizations)	0.00%	**2.33%**	4.67%	4.17%

Note. Bold typeset indicates the condition that was presented first.

Maintenance generalization probes are not available for Participant 3

Table 3

Mean Percentage of Intervals by Phase and Setting for Inappropriate Behaviors

Participant (Target Behavior)	Baseline	SS-Typ	SS-Gen	Maintenance
		Primary Setting		
Alan (Vocalizations)	23.89%	**3.33%**	3.61%	0.83%
Stan (Vocalizations)	13.60%	3.33%	**1.11%**	21.67%
Harold (Vocalizations)	20.00%	**10.71%**	3.61%	0.84%
		Probe Setting		
Alan (Vocalizations)	15.00%	**5.00%**	3.33%	0.00%
Stan (Vocalizations)	10.00%	5.42%	**9.33%**	
Harold (Vocalizations)	18.89%	**13.67%**	9.33%	3.33%

Note. Bold typeset indicates the condition that was presented first.

Maintenance generalization probes are not available for Participant 3

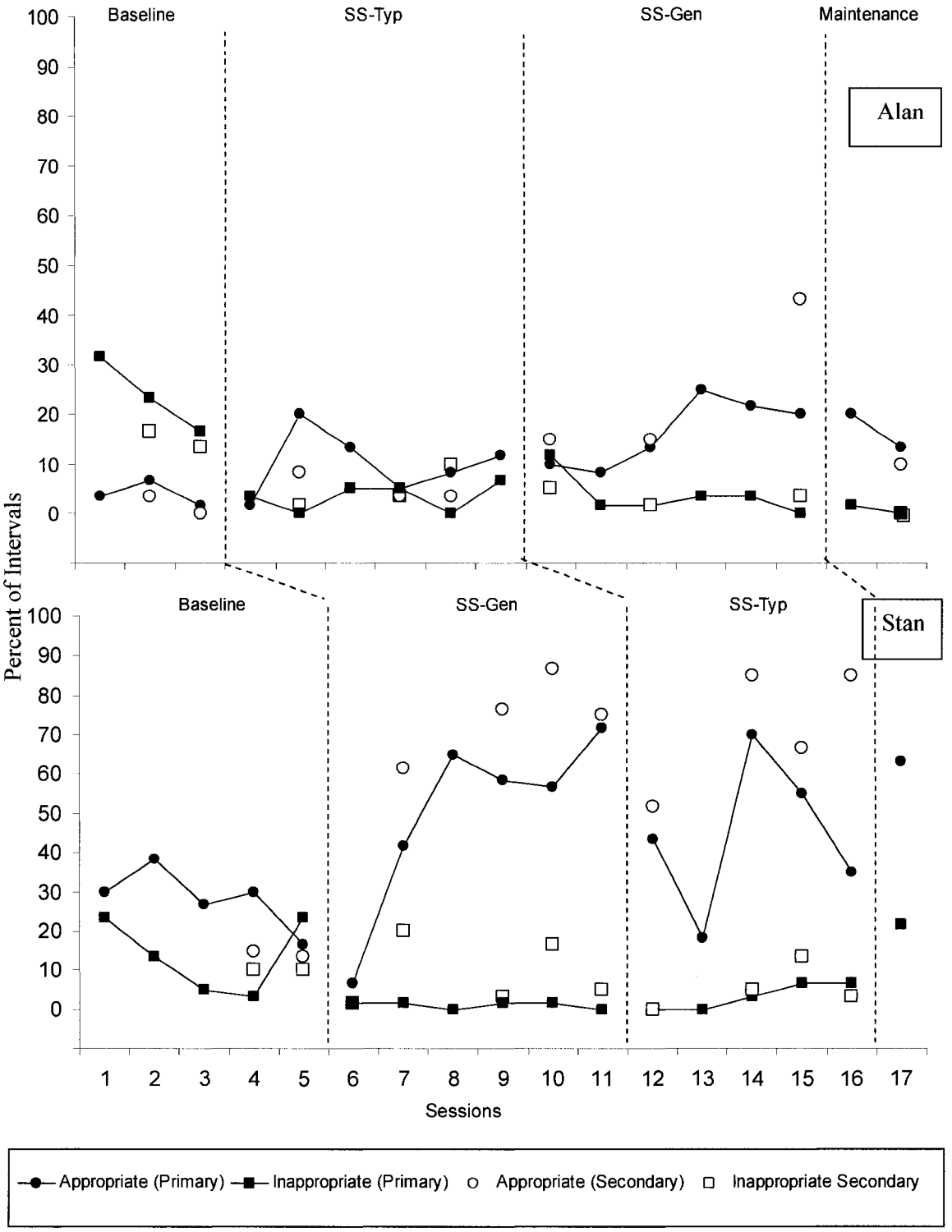

Figure 1. Percentage of intervals of appropriate and inappropriate behaviors across concurrent baseline and intervention phases for Dyad 1.

Appropriate vocalizations increased to levels similar of that in the primary setting with a large increase for the last generalization data point. Inappropriate vocalizations in the secondary setting remained low, comparable to behavior in the primary setting. During maintenance, appropriate and inappropriate vocalizations were similar in both primary and probe settings.

Stan's behavior in the secondary setting was assessed through two generalization probes during baseline, five during SS-Gen, and 4 during SS-Typ. Generalization probes were not gathered during maintenance because afternoon classes were replaced by free play to allow the teacher time to pack materials to move to a new school building. During baseline generalization probes, on-task behavior occurred at a lower level than in the primary setting and inappropriate vocalizations occurred at a lower mean level with more stability than in the primary setting. After the first intervention phase (SS-Gen), generalization probes for on-task behavior tended to occur at a similar level as in the primary setting but with a higher mean occurrence across the phase. Inappropriate vocalizations evidenced little change in the secondary setting during SS-Gen, with two out of the five probes indicating more vocalizations than during baseline. SS-Typ was subsequently implemented, during which on-task behavior continued to occur at a high frequency, similar to that observed during SS-Gen. Generalization probes for inappropriate vocalizations continued to be variable during SS-Typ, with one out of the four probes occurring at a level similar to baseline.

Dyad 2

Primary Setting. Appropriate and inappropriate behavior for John and Harold are displayed in Figure 2. Social talking for John was variable but at a low level across the

baseline phase (M = 15.38%, SD = 10.41). There was no change in social talking on the first day of intervention (SS-Gen), but a large increase was observed beginning on the second intervention session with stability observed on subsequent days (M = 43.33%, SD = 20.32). After the introduction of SS-Typ, there was an initial decrease in social talking. Behavior increased to levels comparable to that during SS-Gen. Social talking then decreased over the remaining SS-Typ phase (M = 46.25%, SD = 11.46). At one-week maintenance, social talking occurred at the same level as the last datum from SS-Typ.

Harold exhibited a low and stable level of appropriate vocalizations during baseline (M = 1.39%, SD = 1.64). SS-Typ was the first intervention presented and no change in appropriate vocalizations was observed (M = 3.33%. SD = 2.15). Little change in behavior was observed for Harold after the introduction of SS-Gen (M = 4.17%, SD = 4.05). Appropriate vocalizations increased slightly towards the end of the phase but decreased for the last datum. One-week maintenance indicated no change after withdrawal of the intervention; appropriate vocalizations continued to occur at a low level.

Harold's inappropriate vocalizations demonstrated a slight increasing trend during baseline (M = 20.00%, SD = 5.58). Inappropriate vocalizations increased slightly after implementation of SS-Typ, then gradually decreased to a mean level (M = 10.71%, SD = 2.52) consistent with baseline. Inappropriate vocalizations decreased slightly during SS-Gen but were less stable across the phase (M = 3.61%, SD = 2.22), as compared to SS-Typ. One-week maintenance indicated inappropriate vocalizations continued to occur at a low level.

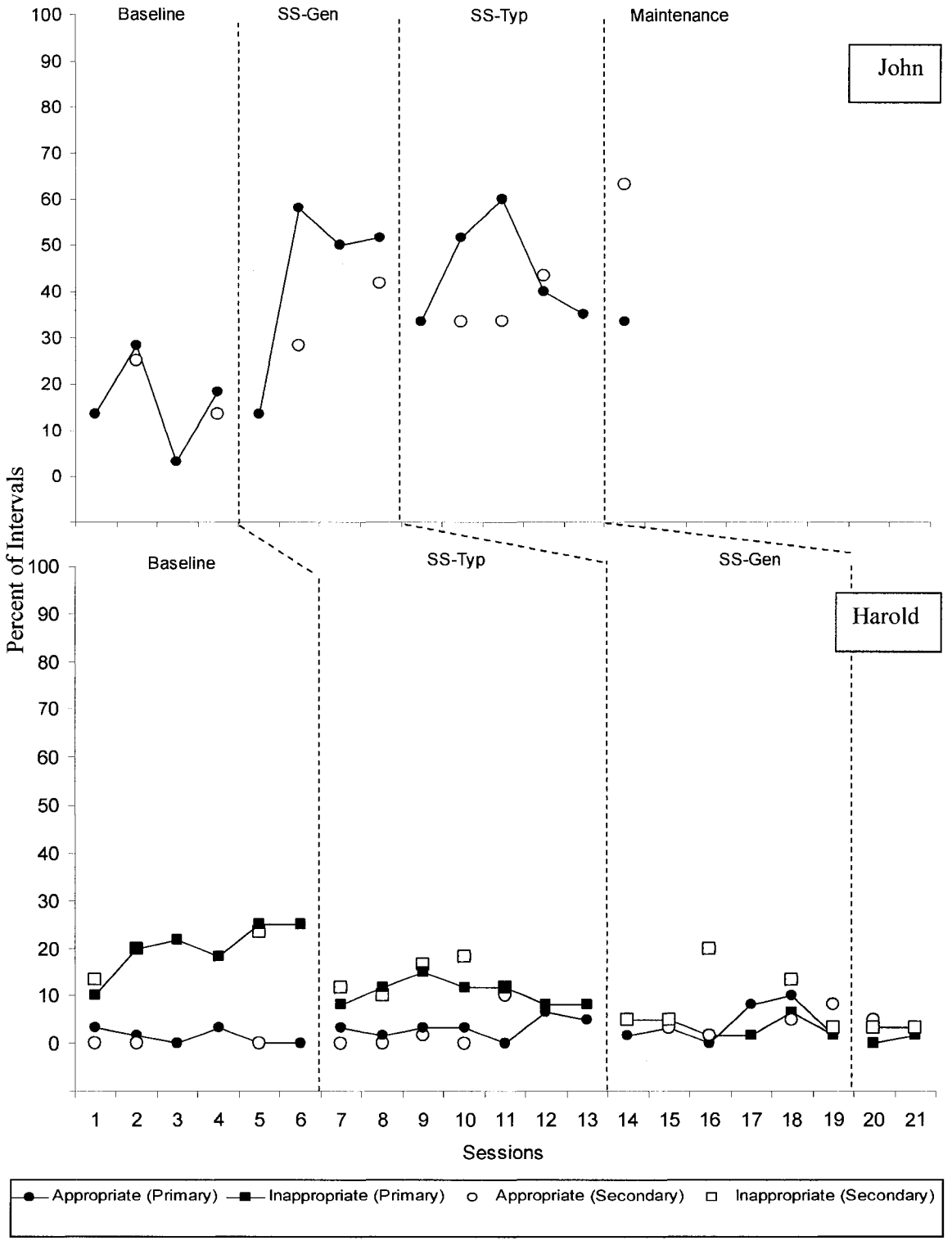

Figure 2. Percentage of intervals of appropriate and inappropriate behaviors across nonconcurrent baseline and intervention phases for Dyad 2.

Probe Setting. Generalization probes were taken for John on two occasions during baseline, two occasions during SS-Gen, and 3 occasions during SS-Typ. Social talking during baseline occurred in the secondary setting at a similar level to the primary setting. During SS-Gen, a change in social talking was evidenced as compared to baseline, but occurred at a lower level than in the primary setting. Social talking occurred at a similar mean level during SS-Typ as compared to SS-Gen. John exhibited the greatest increase in social talking for the secondary setting at one-week maintenance, which exceeded behavior observed during intervention phases.

For Harold, 3 generalization probes were taken during baseline, 5 generalization probes were taken during SS-Typ and 5 probes during SS-Gen. Generalization probes were also taken for 2 maintenance observations, one-week post-intervention. During baseline, generalization probes for appropriate behavior tended to occur at a level similar to the primary setting and were low across the phase. Appropriate behavior during SS-Typ remained low with the last generalization probe increasing slightly. During SS-Gen appropriate behavior continued to occur at a low level, tracking closely with behavior in the primary setting. Inappropriate behavior followed behavior in the primary setting for baseline, SS-Typ, and SS-Gen. As an exception, one generalization probe for inappropriate behavior during SS-Gen occurred at a level higher than in the primary setting. One-week maintenance data in the secondary setting also tended to occur at a frequency similar to the primary setting (i.e., low inappropriate vocalizations and low appropriate vocalizations).

CHAPTER IV

DISCUSSION

Defining characteristics of ASD include impairments across multiple domains of functioning (i.e., social, behavioral, and communication). Remediating deficits in social functioning continue to be a significant focus of training for this population. Impairments, however, rarely occur in an isolated setting but often across multiple stimulus conditions. In order to intervene effectively for children with ASD, interventions should be evaluated to determine how effectively they change behavior across stimulus conditions. One measure of an intervention, then, is how effectively it changes behavior across relevant conditions (i.e., how well it generalizes). Generalization is said to occur when effects are observed across behaviors, persons, or settings without requiring the application of additional training (Stokes & Baer, 1977).

Despite a lack of substantial number of well-controlled, empirical studies, Social Stories have been increasingly recommended as an intervention to address social and behavioral concerns for individuals with ASD (Reynhout & Carter, 2006). There are several reasons Social Stories may be gaining in popularity and use. Social Stories are easy to implement, require little training, and call for few resources (e.g., money, time, materials). Social Stories have been demonstrated to be successfully implemented by teachers (e.g., Smith 2001; Zimbelman et al., 2007), parents, and paraprofessionals (e.g., Quilty, 2007) across a wide range of settings (e.g., home, school, clinic).

Several reviews of the Social Story literature have been published in recent years (Ali & Fredrickson, 2006; Nichols et al., 2005; Reynhout & Carter, 2006; Sansosti et al., 2004). Social Story reviews collectively conclude that Social Stories appear to be an

effective intervention but also note that the available research is plagued by methodological difficulties and a failure to examine generalization effects. Accordingly, the present study attempted to address the limitations of previous studies by implementing Social Stories in isolation and by using an experimental design that controlled for threats to internal validity. Furthermore, generalization was systematically assessed across settings both under a traditional Social Story format, equivalent to a "Train and Hope" approach, and under conditions in which methods designed to increase generalization were incorporated into the story itself and the manner in which the story was used. Generalization was programmed for by providing altering Social Story content to include multiple response and stimulus exemplars and multiple stimulus exemplars as well as by varying when and where the Social Story was read (i.e., training loosely).

Effects of Social Stories without Programming for Generalization

Potential treatment effects of Social Stories (i.e., an increase in appropriate behavior) were assessed in a primary setting and in a non-training setting, without a priori programming for generalization. Social Stories improved behavior for most participants in both a primary setting and in a second, untrained setting. Alan and Harold received a typical format Social Story for the first intervention. Alan evidenced an overall increase in appropriate vocalizations in the primary setting, but data were variable. Harold exhibited minimal increases in appropriate vocalizations. John and Stan received the typical format Social Story as their second intervention. Social Stories were effective at increasing social talking over baseline levels for John, but data were variable across the phase. Stan's on-task behavior also evidenced an increase relative to baseline but, again, data were variable.

With regard to behavior changes in untrained settings using a typical Social Story format, Alan and Harold's appropriate vocalizations in the secondary setting increased minimally, with no substantial improvement. Gains in appropriate behavior were evidenced in the generalization setting for John and Stan when SS-Typ was used. However John and Stan received the typical Social Story format as their second intervention (i.e., after receiving a generalized format), and observed changes may be an artifact of the prior phase.

Inappropriate vocalizations were targeted for Alan, Stan, and Harold. The typical Social Story format was effective for decreasing inappropriate vocalizations for all three participants in the primary setting. Alan demonstrated an immediate decrease in inappropriate vocalizations with slight variability during the typical format Social Story phase, which was the first intervention presented. Harold also received the typical Social Story format first and evidenced a decrease in vocalizations below baseline. Stan was initially exposed to the generalized Social Story format. During the typical format, inappropriate behavior evidenced a low level with a slight increasing trend across the phase.

In the second setting, inappropriate vocalizations decreased for Alan and, although data were variable, they remained below baseline level. Stan also evidenced a decrease in mean level of inappropriate vocalizations in the generalization setting. Inappropriate behavior decreased minimally in the generalization setting for Harold when a train and hope approach was utilized.

Effects of Social Stories with Programmed Generalization

When generalization was programmed as a component of the intervention, Social Stories were effective for improving behavior in primary settings and generalized to non-training settings for three of four participants and decreasing inappropriate behavior for all participants. John and Stan received the generalized Social Story format as the first intervention phase. In the primary setting, social talking for John increased greatly on the second day of intervention and remained at a higher level across the rest of the phase. On-task behavior in the primary setting for Stan initially decreased compared to baseline then evidenced an increasing trend over the remaining phase. Alan and Harold received the generalized Social Story format as the second intervention phase. Alan's appropriate vocalizations increased as compared to baseline and evidenced an additional increase over the typical Social Story format. Harold continued to show only minimal improvement in increasing appropriate vocalizations during the generalized format.

The generalized Social Story format was effective in increasing appropriate behavior in a second, untrained setting for three of four of participants as well. John's social talking increased in the second setting concurrently with behavior in the primary setting for the generalized format and ultimately exceeded behavior levels observed in the primary setting. Stan, who also received the generalized format as the first intervention, evidenced an increase in on-task behavior in the secondary setting, but at a lower level than in the primary setting. Results were more mixed for participants who received the generalized format in the second intervention phase. Alan evidenced an increase in appropriate vocalizations in the generalized setting compared to baseline and compared

to the typical Social Story format. However, Harold continued to show only minimal improvements for appropriate vocalizations.

The generalized Social Story format was also successful at decreasing inappropriate behavior for all three participants in the primary setting. Alan's inappropriate vocalizations increased slightly on the first day of implementation and then evidenced a decreasing trend across the phase. Harold's inappropriate vocalizations exhibited an additional decrease over the levels observed in the typical format, although some variability was observed. Stan received the generalized format as the first intervention. His inappropriate vocalizations decreased immediately upon implementation of the Social Story and had a low level and stability, compared to baseline.

Generalization probes for inappropriate behavior indicated treatment effects for two of the three participants. Alan and Harold evidenced an additional decrease in inappropriate vocalizations during the generalized format, compared to baseline and the typical Social Story format. Inappropriate vocalizations for Stan were variable in the probe setting with a minimal mean decrease.

A Comparison of Programming for Generalization and a Typical Approach

Overall, the best results in the primary setting were found when participants received the generalized Social Story format first, for both appropriate and inappropriate behavior. When the generalized format was presented first (i.e., John and Stan), little to no gains were observed after switching to the typical format, and appropriate behavior tended to decrease at the end of the phase. For the participants who received the typical

Social Story format first (i.e., Alan and Harold), further, and in some cases, substantial gains were made during the generalized format.

Although John and Stan evidenced little additional gains after the introduction of the typical Social Story format in the second intervention phase, they had the highest levels of baseline appropriate behavior and, for Stan, the lowest level of inappropriate behavior. These data reflect that the appropriate behaviors targeted for John and Stan were already in their behavioral repertoire and, thus, potentially more amenable to behavior change. Alan and Harold's appropriate behavior (i.e., appropriate vocalizations) occurred at very low levels during baseline. The observed changes suggest a greater effort may have been required for significant behavior changes to occur.

Results in the primary setting suggest that individuals with ASD may benefit more when Social Stories are presented in a more varied format rather than in highly-controlled conditions typically recommended in the literature. Social Stories written and presented in a format focusing on one specific behavior and setting fosters discrimination in an environment that is often highly variable. School environments, in particular, are subject to inconsistency with regard to staff, peers, and routine. By providing more response exemplars and stimuli examples and by varying where and when the Social Story is read, the target child may be more prepared to deal with unexpected fluctuations.

Great changes in behavior in the second, untrained setting occurred when the generalized Social Story format preceded the typical Social Story format. Alan evidenced only minimal increases in appropriate vocalizations in the second setting during the typical Social Story format ($M = 5.00\%$). Appropriate vocalizations, however, increased to a level higher than what was observed in the primary setting during the generalized

format (M = 24.44%) John had a large gain in social talking during the generalized Social Stories phase (M = 35.00%) compared to baseline (M = 19.17%). During the next intervention phase, SS-Typ, a small additional increase in social talking was observed. Stan increased on-task behavior in the probe setting during the typical Social Story format (M = 72.08%) than for the generalized format (M = 60.33%). However, the first intervention data point for appropriate behavior brought down the overall mean level of effect during the generalized format phase. Overall, visual inspection of probe data for Stan indicates similar effects for SS-Typ and SS-Gen in regard to appropriate behavior.

The order in which participants received the two Social Story formats contributed to the outcomes observed. A crossover element was incorporated into the study design to provide greater internal validity and examine potential order effects. Without counterbalancing the order in which participant received SS-Typ and SS-Gen, treatment effects in the second treatment phase could have been due to having prior exposure to a Social Story intervention. However, SS-Gen tended to be more effective than SS-Typ whether presented first or second in the sequence. The intervention format presented first in the sequence did appear to have a disadvantage, however, when examining the first datum after baseline. Particularly for appropriate behavior, treatment effects tended not to occur until the second reading of the Social Story. This delay in treatment effects tended to deflate the mean level of behavior in the first treatment phase.

Treatment results overall indicate that some generalization to similar settings did occur even using a train and hope approach. However, greater behavior change tended to occur in both primary and secondary settings when generalization was explicitly programmed. Not only were overall better results found with SS-Gen, but it may have

been a more practical presentation to implement. Rather than requiring the same person to read the story with the participant each day, different adults filled this role, based partly on convenience. Additionally, the location and time the story was read varied, allowing more flexibility for scheduling.

Limitations of the Present Study

Several limitations should be noted in the interpretation of study results and in the generalization of those results. First, each of the participants in the current study was diagnosed with Asperger's Disorder. It is possible that individuals with cognitive impairments or with greater impairments in social and behavioral functioning may benefit more from the tighter control used in SS-Typ than the looser training implemented for SS-Gen. Scattone et al. (2006) postulated better treatment results may have been observed for one of three participants, an 8-year-old male diagnosed with autism, if his Social Story had been more specific and provided fewer stimulus exemplars. The relative homogeneity of functioning among participants in the current setting limits the extent to which results can be generalized to other, more heterogeneous populations.

Second, although each of the participants was reported to have a diagnosis of Asperger's Syndome by the school and received services based on that diagnosis (i.e., either an Individualized Education Program or Section 504 Plan) the diagnosis was not confirmed by the researcher through additional assessment or a medical records review. The qualifications of the professional who diagnosed each participant with Asperger's Disorder, the participant's age at diagnosis, and the degree of impairment of each

participant are unknown. The unavailability of detailed participant information limits the degree of external validity.

Third, for Alan, John, and Stan primary and probe settings were highly similar with the same teacher, students, and expectations. Generalization to non-trained settings may be more limited when target settings are more diverse (e.g., school and home). Delano and Snell (2006) noted generalization to secondary settings, using generalization probes, for two out of three participants and noted that settings for the third participant may have been too diverse for generalization to occur in their train and hope approach. The degree to which the current results generalize to heterogeneous settings is unknown.

In addition to targeted settings being highly similar, generalization of training was assessed in only one probe setting. It is possible that treatment effects carried over to multiple settings that were not assessed. The degree of behavior change to other non-trained settings is unknown limiting the degree of external validity.

Another potential limitation is that John and Stan were in the same classroom. However, John's target behavior focused on behavior that occurred outside the classroom during unstructured activities (i.e., recess), and Stan's Social Stories targeted classroom behavior. This resulted in distinct target settings and behaviors but the same teachers and peers for both participants, further limiting external validity.

Another limitation is the variability in baseline levels of behavior across participants. As previously noted, John and Stan had higher levels of appropriate behavior during baseline, as compared to Alan and Harold. John and Stan also received the counterbalanced conditions with SS-Gen preceding SS-Typ. The differences in baseline levels of behavior between the two participants receiving SS-Typ first and the

two participants receiving SS-Gen first make comparisons of these two conditions more difficult.

Another related limitation is that intervention materials (e.g., Social Stories) within participants varied across phases. Attempts were made to control readability and unnecessary changes for stories used in SS-Typ and SS-Gen, but it is unknown if one story may have been more appealing or more beneficial based on an unidentified variable (e.g., the story with multiple exemplars may have mentioned a more preferred stimulus than the story with a single exemplar).

A potential limitation to the study was the use of teacher prompts. In order to control for the influence of teacher prompts, they were tracked across all phases of the study for each participant. All teachers prompted students to either engage in targeted appropriate behavior or to not engage in inappropriate behavior with most teachers prompting less than 3 times, on average, for Alan, Harold, and John. Stan received the greatest amount of prompts overall, occurring an average of 6.8 times during baseline, 4.2 times during the typical Social Story format, and 6.3 times on average during the generalized Social Story format. Qualitatively, for all participants, prompts tended to consist of reminders to engage in appropriate behavior or to not engage in appropriate behavior and were not prompts that directly mentioned the Social Story. For example, teachers were more likely to direct the participant to finish work rather than to remember the story. The use of prompts and reprimands occurred to varying degrees for all participants and may be considered a component of instruction and not necessarily an intervention strategy. The inability to control for factors such as teacher prompts is one

aspect of conducting applied research. Regardless, the impact of prompting on behavior cannot be ascertained for the present study.

Finally, the Social Stories intervention was only successful in increasing appropriate behavior for three of 4 participants, regardless of Social Story format, setting, or order of treatments. Harold decreased inappropriate vocalizations and off-talk comments but did not greatly increase on-topic comments in class. However, it is unclear the frequency at which Harold was expected to participate orally in class. For example, Alan's appropriate vocalizations increased more substantially over the course of the study. However, Alan was in third grade, where there were more verbal demands (e.g., choral responding) whereas Harold's middle school class consisted of more direct instruction and independent seatwork.

General Conclusions and Future Directions

Despite the noted limitations, the current study represents an initial step in assessing the effectiveness of Social Stories in untrained settings with and without training explicitly for generalization. In an extension of previous Social Story literature, the effects on both appropriate and inappropriate behaviors were assessed. A nonconcurrent multiple baseline design across participants with counterbalancing of conditions was utilized across two pairs of participants. This design allowed for two Social Story formats to be compared, while controlling for order effects. The use of generalization probes allowed the effects of the Social Story to be evaluated in an untrained setting. Although a few other Social Story stories have utilized generalization probes (i.e., Delano & Snell, 2006; Reynhout & Carter, 2007) none have explicitly

programmed for generalization without adding additional training in the secondary setting.

The failure of Social Story research in examining and programming for generalization has been commented on in numerous published reviews of the literature. Generalization and maintenance are critical components of all interventions (Gresham, 2002) yet continue to be overlooked in the Social Stories literature and in ASD research in general. The current study is promising in that generalization effects were found when a train and hope approach was utilized. However, greater gains were found overall when generalization was systematically programmed for by altering Social Story content to include multiple stimulus and response exemplars and by varying the conditions under which the Social Story was read.

Although the current study is the first to systematically program for generalization within Social Story guidelines, there remain many questions about the generalization effects of Social Stories. Future research should include an investigation as to which components of generalization programming are most necessary for treatment effects to occur. The current study included multiple strategies to foster generalization. Future research should focus on which one(s) are most beneficial to the child with ASD in both primary and generalization settings. A starting place may be to keep the actual Social Story constant (i.e., use a typical Social Story format) and manipulate external variables in isolation (e.g., varying where and when the Social Story is read). Generalization across time (i.e., maintenance) is another related area in which many unanswered questions remain. The duration of behavior change after withdrawal of the Social Stories intervention has been minimally assessed in the literature with conflicting

results. Future research should examine (1) how long must a Social Story intervention be implemented before skills can be maintained (e.g., are three exposures sufficient), (2) what strategies should be employed to assist in maintenance of treatment effects, (3) what other variables contribute to maintenance of treatment effects and how best to manipulate those variables.

Additionally, the effect of cognitive ability on generalization of story content is unknown. Future studies should include participants with lower cognitive ability to investigate both the degree of generalization and overall treatment effects of Social Stories presented in a generalized format.

The current study is not the first to have inconsistent results in increasing appropriate behavior. A failure for appropriate behavior to increase was also noted by Norris and Dattilo (1999) and for one participant in Scattone et al.'s (2006) study. Gray's (2004) guidelines suggest that Social Stories should aim to teach new skills to individuals with ASD rather than to decrease unacceptable behavior. Gray (2004) states, "the story uses positive language, omitting descriptions or references to challenging behaviors in favor of identifying positive responses" (p. 21). Social Story research, however, has tended to focus more on decreasing inappropriate behaviors (e.g., tantrums) than increasing appropriate behavior (e.g., social engagement). The available Social Story literature focusing on increasing appropriate behavior has tended to combine Social Stories with other interventions (e.g., Thiemann & Goldstein, 2001). More research is needed in determining which variables influence the effectives of Social Stories on appropriate behavior (Scattone et al., 2006).

The current study extends the burgeoning Social Story literature by demonstrating effectiveness with three of four participants diagnosed with ASD and takes the initial step of examining generalization effects of Social Stories. The current study differs from previous studies which examined generalization in an untrained setting (i.e., Thiemann & Goldstein, 2001; Delano & Snell, 2006; Reynhout & Carter, 2007) by systematically programming for generalization without adding external intervention components (e.g., not intervening in the secondary setting). Better results, overall, were found when Social Stories were written and implemented with more variability. These results have important implications not only for planning for generalization of effects to multiple stimulus conditions but also for the best practices in gaining treatment effects in a primary setting.

APPENDIX A

Social Story Criteria as outlined by Gray (2004)

A Social Story . . .

1. Should provide socially meaningful information
2. Should include a title, introduction, body and conclusion
3. Should include information on where, when, why, and how
4. Should be written from a first or third person perspective
5. Should phrase language in a positive manner ("I will listen quietly in class" instead of "I will not talk"
6. Should includes several types of sentences, grouped as either describing or directing
    a. Describing sentences include:
        i. Descriptive are the most frequent type. They state facts, accurately and without assumptions.

        Example: "I attend Walker Elementary School."

        ii. Perspective statements describe the thoughts, feelings, beliefs, opinions, or motivations of others.

        Example: "My teacher likes it when I raise my hand."

        iii. Cooperative statements describe the roles of others and how they may provide assistance.

        Example: "My teacher will help me if I a problem is too hard."

        iv. Affirmative statements describe a cultural or societal value or opinion.

Example: "People brush their teeth in the morning. This is a good idea."

b. Directing sentences includes:

i. Directive statements provide one or more response choices to a situation or concept.

Example: "One thing I may try to say is "May I play with you?""

ii. Control statements are written by the child to aide in recall of information and often contain personal interests.

Example: "I will work hard in school like Thomas the Train."

7. Should include twice as many descriptive than directive statements.
8. Should be written specifically for the target individual Should be literally accurate
9. May be presented in varying formats (e.g., typed books, multimedia)
10. May incorporate illustrations or pictures

Appendix B

Sample Social Story

I Can Wait My Turn

My name is Paul. My teacher is Ms. Walker.

When I am at school I do lots of fun things. In reading class, I read new books.

Sometimes I want to talk to Ms. Walker. Ms. Walker can help me with my work.

Ms. Walker can help me with a word I don't know. Ms. Walker likes to help me.

Sometimes when I want Ms. Walker to help me, she is busy.

She might be helping other students.

I will try to wait at my desk until Ms. Walker can help me.

While I wait, I could do other work.

Ms. Walker likes it when I wait my turn.

I will try to wait quietly like a tiger in the jungle.

Appendix C

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 a classroom-based intervention, Social Stories™, aimed at increasing appropriate interactions for individuals diagnosed with an Autism Spectrum Disorder. I am also interested in determining if newly learned behaviors will be exhibited in a second setting, in which training did not occur. You or your child's teacher has recently referred your child for exhibiting behavioral difficulties at school; 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 present with behavioral difficulties in the school setting. In the event your child does not qualify for participation, he or she will be referred for appropriate services.

If you agree for your child to participate in this study, your child's teacher will be asked to do some tasks. First, prior to the implementation of the Social Story, the teacher will complete an interview with me to obtain information pertaining to your child's behaviors, identify the target behavior and activity settings in which it occurs, and identify items and activities that are of interest to your child. I will also observe and record the target behavior of concern in the activity settings at school to verify the teacher's report of the problematic behavior. Social stories are short stories or passages that describe social situations and provide appropriate behaviors for the participant to perform. The Social Story will be written based on the level of functioning and individual interest of your child. If the teacher reports that your child cannot read independently, then the teacher will read the Social Story to your child. After all of this information has been obtained, a Social Story will be written for your child. We will train your child's teacher to implement the Social Story and provide all materials needed to implement the intervention.

I or another trained graduate student will collect classroom observations throughout all phases of the study. In the first phase of the study, the experimenter will collect several classroom observations of your child in the activity settings where he or she has the most behavioral difficulties. The Social Story intervention will not be implemented at this point. In the second phase of the study, the teacher or child will read the Social Story prior to the primary activity setting in which the target behavior typically occurs. In the third phase, a different Social Story intervention will not be read to or with your child. Your child may be asked to carry the Social Story throughout the school day. The number of days during which the Social Story intervention will be implemented will vary depending on the behavior of your child. During the second and third phases, 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 their teacher: (a) your child may decrease the amount of inappropriate interactions he/she had displayed prior to the intervention, (b) your child may increase in appropriate interactions and, (c) your

child's teacher may acquire skills to implement a new intervention technique that can be used with subsequent students.

Your child's behavior will be monitored to ensure undesired effects (e.g., increase in inappropriate behaviors; decrease in appropriate behaviors) do not happen. If any unanticipated untoward 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 this study. Because the teacher will not read the Social Story to your child in front of the rest of the class, no issues of harassment of students are expected. Your child may experience some discomfort in this study because he/she will be learning a new skill. In addition, your child may feel uneasy due to the new activity introduced into his/her daily school routine. In the event that this occurs, the primary experimenter will advise your child's teacher to 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 in your child's life, the teacher will be advised 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. 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, student's name, and other identifying information will not be disclosed to any person not connected with this 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 voluntarily. 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 Jennifer Abraham or Dr. Heather Sterling-Turner at (601) 266-5255. This project and this 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,

_____

Jennifer Abraham, M.A.
School Psychologist-in-Training

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 or be read a Social Story™ daily and observations will be conducted on his/her behavior. I further understand that all data collected in this study will be confidential and that my child's name and the teacher'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 Parent *Date*

_____

Signature of Witness

Appendix D

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 a classroom-based intervention, Social Stories™, aimed at increasing appropriate interactions for individuals diagnosed with Autism Spectrum Disorders. I am also interested in determining if newly learned behaviors will be exhibited in a second setting, in which training did not occur. A student in your classroom has been referred by either you or his/her parents for exhibiting behavioral difficulties at school; therefore, we hope you will consent for your student's participation in the following investigation. If your student has been referred by his/her parents, you will be asked to participate in a structured interview to validate the parent's referral concern. If you have no behavioral concerns for the student, then he/she will be referred to other appropriate agencies to receive services.

If you agree for your student to participate in this study, we will ask you to do some tasks. First, prior to the implementation of the Social Story, you will be asked to complete an interview with me to obtain information pertaining to your student's behaviors, identify the target behavior and activity settings in which it occurs, and identify items and activities that are of interest to your child. I will also observe and record the target behavior of concern in the activity settings at school to verify your report of the problematic behavior. Social stories are short stories or passages that describe social situations and provide appropriate behaviors for the student to perform. The Social Story will be written based on the level of functioning and individual interest of your student. If you report that your student cannot read independently, then you will read the Social Story to the participant. After all of this information has been obtained, a Social Story will be written for your student. We will train you to implement the Social Story and provide all materials needed to implement the intervention.

I or another trained graduate student will collect classroom observations throughout all phases of the study. Observations of your student will occur in the activity setting where he or she has the most difficulty and in a secondary target setting. During the baseline portion of the study, the Social Story intervention will not be implemented. In the second phase of the study, you or your student will read the Social Story prior to the primary activity setting in which the target behavior typically occurs. In the third phase, a different Social Story intervention will be read to or with the student. The student may be asked to keep the Social Story with him or herself throughout the school day. The number of days during which the Social Story intervention will be implemented will vary depending on the behavior of the student. During the second and third phases, 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 your student: (a) your student may decrease the amount of inappropriate interactions he/she had displayed prior to the intervention, (b) your student may increase in appropriate interactions and, (c) you may

acquire skills to implement a new intervention technique that can be used with subsequent students.

Your student's behavior will be monitored to ensure undesired effects (e.g., increase in inappropriate interactions; decrease in appropriate interactions) do not happen. If any unanticipated untoward effects on your student's behavior are observed, appropriate modifications or discontinuation of the procedure will occur, and your student will be provided with other appropriate services. There would appear to be very few risks for either you or your student participating in this study. Because you will not read the Social Story to your student in front of the rest of the class, no issues of harassment of students are expected. The greatest discomfort for you in this study may involve the time required to implement the Social Story. There may also be some discomfort related to implementing a new procedure in the classroom. To reduce discomfort, I and/or other trained graduate students will provide training, materials, and will be available to answer any questions you may have. Your student may experience some discomfort in this study because he/she will be learning a new skill. In addition, your student may feel uneasy due to the new activity introduced into his/her daily school routine. In the event that this occurs, I will advise you to reassure your student that the Social Story is a story that is meant to help him/her better understand social situations. If the Social Story becomes too stressful in your student's life, you will be advised to discontinue the implementation of the Social Story to meet your student's needs. Your student will not be included as a participant in the study but will still be allowed access to the Social Story upon request. 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, student's name, and other identifying information will not be disclosed to any person not connected with this study. Your name, student's name, and other identifying information will be excluded from the thesis project and any subsequent papers submitted to conferences or professional journals for publication. Your participation in this study is entirely voluntarily. 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) I 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 Jennifer Abraham or Dr. Heather Sterling-Turner at (601) 266-5255. This project and this 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,

_____

Jennifer Abraham, M.A.
School Psychologist-in-Training

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 student's behavior. In order to do so, I will be required to complete a structured interview and daily integrity checklists. 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 student'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 E

Problem Identification Interview (PII)

Client's name: _____ Sex: _____

Address: _____

_____

School: _____ Grade: _____

Consultant: _____

Consultee: _____

	Year	Month	Day
Date of assessment:	_____	_____	_____
Birth date:	_____	_____	_____
Age:	_____	_____	_____

1. Please describe the referred student? _____

   _____

   _____

2. Can you please provide a precise description of the behavior of concern? Please provide specific examples of these problematic behaviors. _____

_____

_____

_____

3. Which behavior is causing the most difficulty? _____

4. On a scale of 0-10, where 0 = no problem and 10 = severe problem, how severe is the problem for you?

   _____

5. In which setting/settings does this behavior occur? Please specify examples.

_____

_____

6. Which setting is the most problematic? Please rate the setting on the same scale from 1-10 as previously used?

_____

_____

7. What happens right before the problem behavior occurs? _____

_____

8. When during the day does the behavior occur and/or what is the pattern of antecedent-
consequent conditions across several occurrences of the problem behavior?

_____

_____

9. What happens after the problem behavior has occurred? _____

_____

_____

10. Consultant summarizes and validates antecedent, consequent, and sequential conditions.

_____

_____

11. How often does the behavior occur? _____

12. How long does the behavior last? _____

13. Consultant summarizes and validates behavior strength.

_____

14. Tentative definition of goal-question. _____

15. What are some skills that the student possesses that he/she is good at? What are the student's strengths?

_____

_____

16. What does it take for the student to try as hard as he or she can in school (i.e. type of reinforcement)? Are there any particular activities, objects, or topics that are of interest to the student?

_____

_____

_____

17. Question teacher about his/her approach to teaching or existing instructional practices.

_____

_____

18. Summarization statement and validation. _____

_____

19. Gather records of behavior in order to aid in data collection procedures.

_____

20. Discuss data collection procedures. _____

_____

21. Summarize and validate recording procedures. _____

_____

22. Establish a date to begin data collection._____

23. Establish date of next appointment. _____

Kratochwill, T. R., & Bergan, J. R. (1990). *Behavioral consultation in applied settings: An individual guide*. New York, N.Y.: Plenum Press.

Appendix F

Alan's Social Stories

Typical Story

Waiting to Talk

My name is Alan. I am in third grade at Sample Primary School. My teacher is Mrs. Sample. Mrs. Sample teaches me Reading. I like Reading. Sometimes when I am in Reading I want to tell Mrs. Sample something. I might want to answer a question. When I want to tell Mrs. Sample something I should raise my hand and wait for her to call on me. While I am waiting for Mrs. Sample to call on me, I will stay quiet. Mrs. Sample likes it when I raise my hand and wait for her to call on me. I will try to wait quietly for Mrs. Sample to call on me. Sometimes Mrs. Sample calls on other kids to answer. This is OK. I will try to talk only when Mrs. Sample calls on me. I will try to wait quietly for Mrs. Sample to call on me like a Pokemon waits for his trainer to call on him.

1. What is my teacher's name? _____
2. What should I do when I want to tell Mrs. Sample something? _____
3. I should wait for Mrs. Sample to call on me like a _____?

Generalization Story

Waiting to Talk

My name is Alan. I am in third grade at Sample Primary School. My teacher is Mrs. Sample. Mrs. Sample teaches me Reading and Math and Spelling. I like learning in class. Sometimes when I am in class I want to tell Mrs. Sample something. I might want to answer a question. I might want to tell Mrs. Sample about a student or about something that happened to me. When I want to tell Mrs. Sample something I should raise my hand and wait for her to call on me. While I am waiting for Mrs. Sample to call on me, I will stay quiet. Mrs. Sample likes it when I raise my hand and wait for her to call on me. I will try to wait quietly for Mrs. Sample to call on me. Sometimes Mrs. Sample calls on other kids to answer. This is OK. I will try to talk only when Mrs. Sample calls on me. I will try to wait quietly for Mrs. Sample to call on me like a Pokemon waits for his trainer to call on him.

1. What is my teacher's name? _____
2. What should I do when I want to tell Mrs. Sample something? _____
3. I should wait for Mrs. Sample to call on me like a _____?

Appendix G

John's Social Stories

Typical Story

Talking With My Friends

My name is John. I am in second grade. My teacher is Mrs. Sample. I can have a lot of fun at school. My favorite time to have fun is at morning recess. Every day at 9:30 we have morning recess. During morning recess I get to go outside to the playground and play with my friends. I can have fun. I can talk to my friend Destiny. It is good to talk to my friends. Talking to kids at morning recess is a good way to make new friends. It is good to make new friends.
When I want to talk to another kid at recess, I can walk up and say, "Let's talk." I can talk to a kid about a good movie that I saw. At morning recess, I will try to talk to the other kids. It is good to talk to other kids. Sometimes a kid may not want to talk to me. This is OK. If a kid does not want to talk to me, I will try talk to someone else. I can have fun talking to kids at recess!

1. When can I have fun at school? _____
2. How can I make friends at school? _____
3. If a kid does not want to talk to me I will _____ .

Generalization Story

Talking With My Friends

My name is John. I am in second grade. My teacher is Mrs. Sample.
I can have a lot of fun at school. I can have fun at recess or during free time. These are my fun times. Every day we can have fun. During recess I get to go outside to the playground and play with my friends. During free time I can play in my classroom. I can have fun. I can talk to my friends. It is good to talk to my friends. Talking to kids during fun time is a good way to make new friends. It is good to make new friends. When I want to talk to another kid during fun time, I can walk up and say, "Let's talk" or I can say, "Do you want to hear a joke?" I can talk to a kid about a good movie that I saw or I can tell a kid a funny joke. My friends like it when I talk to them. During fun time, I will try to talk to the other kids. It is good to talk to other kids. Sometimes a kid may not want to talk to me. This is OK. If a kid does not want to talk to me, I will try talk to someone else. I can have fun talking to kids during fun time!
1. When can I have fun at school? _____
2. How can I make friends at school? _____
3. If a kid does not want to talk to me I will _____.

Appendix H

Stan's Social Stories

Typical Story

Doing My Work

My name is Stan. I am in second grade. My teacher is Ms. Sample. Sometimes at school I can have fun. When I want to have fun I can draw a picture or I can talk to my friends. Sometimes I have to do work in class. When it is time to do work I might have to write my spelling words. I might have to do math work. When it is work time, my teachers want me to put away my drawings and stay quiet. It is important to pay good attention and listen to the teachers during work time. It is important to do my work without talking. When it is time to do work, I will try to put away my drawings and stay quiet. During work time, I will try to listen to the teachers and do my work. When I do my work quietly, my teachers are very happy. It is good to do my work.
A train keeps working on the tracks until it is done. I will try to stay on track and do my work like a train stays on its tracks.

1. What can I do for fun at school? _____
2. What will I try to do during work time? _____
3. I will try to work like a _____ stays on its tracks.

Generalization Story

Doing My Work

My name is Stan. I am in second grade. My teacher is Mrs. Sample. Sometimes at school I can have fun. I can draw a picture for fun. In the morning, I have to do work in class. I might have to write my spelling words. When it is morning work time, Mrs. Sample wants me to put away my drawings and stay quiet. It is important to do my work without talking. During morning work time, I will try to listen to the teacher and do my work. When I do my work quietly, Ms. Sample is very happy. It is good to do my work. A train keeps working on the tracks until it is done. I will try to stay on track and do my work like a train stays on its tracks.

1. What can I do for fun at school? _____
2. What will I try to do during work time? _____
3. I will try to work like a _____ stays on its tracks.

Appendix I

Harold's Social Stories

Typical Story

Waiting To Talk

My name is Harold. I am in eighth grade at Sample Middle School. At school I have many teachers. Ms. Sample teaches me English. Ms. Sample likes teaching me English. Ms. Sample likes when I learn about English. Sometimes when I am in English I want to tell Ms. Sample something. I might want to tell the teacher the answer. When I want to tell Ms. Sample something I should raise my hand and wait for her to call on me. While I am waiting for Ms. Sample to call on me I will stay quiet. If Ms. Sample calls on me in class I should talk about the English lesson. If I talk about the English lesson I will be on topic. Ms. Sample likes it when I raise my hand for her to call on me. Ms. Sample likes it when I am on topic. My friends like it when I am on topic. I will try to wait quietly for Ms. Sample to call on me. I will try to talk only about the English lesson in class. Sometimes Ms. Sample calls on other kids to answer. This is OK. I will try to talk only when Ms. Sample calls on me. I will try to wait quietly for Ms. Sample to call on me like a football player waits to go out on the field.

1. What is my English teacher's name? _____
2. What should I do when I want to tell my teacher something? _____
3. I should wait for my teacher to call on me like a _____?

Generalization Story

Waiting to Talk

My name is Harold. I am in eighth grade at Sample Middle School. At school I have many teachers. Ms. Sample teaches me English. Ms. Smith teaches me math. My teachers like teaching me new things. My teachers are happy when I learn about new things. Sometimes when I am in class I want to talk to the teacher. I might want to tell the teacher the answer. I might want to ask the teacher a question. When I want to tell the teacher something it is important to raise my hand and wait for her to call on me. While I am waiting for the teacher to call on me, it's important to stay quiet and listen. If my teacher calls on me in class I should talk about the lesson. I should talk about the information the teacher is teaching me. If I talk about the lesson I will be on topic. My teachers like it when I raise my hand and wait to be called on. My teachers like it when I am on topic. My friends are happy when I am on topic. I will try to wait quietly for my teacher to call on me. I will try to talk only about the lesson in class.
Sometimes my teachers call on other kids to answer. Sometimes the teacher doesn't call on me. This is OK. I will try to talk only when the teacher calls on me. I will try to wait quietly for my teachers to call on me like a football player waits to go out on the field.

1. What is my English teacher's name? _____
2. What should I do when I want to tell my teacher something?_____
3. I should wait for my teacher to call on me like a _____?

Appendix J

Data Collection Sheet

Student: _____ Phase: _____

Observer: _____ Date: _____

Operational Definitions of the dependent variables typed out on this sheet defined for each particular student.

Directions: Please indicate *AP* if a target appropriate behavior occurred, *IN* if a target inappropriate behavior occurred. Indicate if the teacher or other adult prompted the student to engage in a target appropriate behavior or prompted the student to not engage in a target inappropriate behavior.

Interval	**.10**	**.20**	**.30**	**.40**	**.50**	**1.00**	**1.10**	**1.20**	**1.30**	**1.40**	**1.50**	**2.00**
AP												
IN												
Prompt												
Interval	**2.10**	**2.20**	**2.30**	**2.40**	**2.50**	**3.00**	**3.10**	**3.20**	**3.30**	**3.40**	**3.50**	**4.00**
AP												
IN												
Prompt												
Interval	**4.10**	**4.20**	**4.30**	**4.40**	**4.50**	**5.00**	**5.10**	**5.20**	**5.30**	**5.40**	**5.50**	**6.00**
AP												
IN												
Prompt												
Interval	**6.10**	**6.20**	**6.30**	**6.40**	**6.50**	**7.00**	**7.10**	**7.20**	**7.30**	**7.40**	**7.50**	**8.00**
AP												
IN												
Prompt												
Interval	**8.10**	**8.20**	**8.30**	**8.40**	**8.50**	**9.00**	**9.10**	**9.20**	**9.30**	**9.40**	**9.50**	**10.00**
AP												
IN												
Prompt												

Appendix K

Social Stories Intervention Checklist – SS-Typ

(To be completed by the teacher each day)

1. Date: _____
2. The Social Story was read by _____
3. The Social Story was read (where/when) _____
4. The student was asked comprehension questions? YES NO
5. Did the participant answer comprehension questions successfully (< 2 wrong?)

   YES NO
6. If student failed to successfully answer comprehension questions (# 5) was the

   story reviewed with him/her? YES NO N/A

Comments:_____

_____

_____

Appendix L

Social Stories Intervention Checklist – SS-Gen

(To be completed by the teacher each day)

1. Date: _____
2. The Social Story was read by _____
3. The Social Story was read (where/when) _____
4. The student was asked comprehension questions? YES NO
5. Did the participant answer comprehension questions successfully (< 2 wrong?)

   YES NO
6. If student failed to successfully answer comprehension questions (# 5) was the

   story reviewed with him/her? YES NO N/A

Comments:_____

_____

_____

Appendix M

Treatment Integrity Checklist – Observer

Observer: _____ **Date:** _____

Phase: SS-TYP SS-GEN **Participant:** 1 2 3 4

1. Social story was read to/by participant? YES NO
2. Social story was read _____ (Where) at _____ (Time)? YES NO
3. Participant was asked comprehension questions? YES NO
4. Participant successfully answered comprehension questions (<2 wrong)? YES NO
5. If student failed to successfully answer comprehension questions (# 4) was the story reviewed with him/her? YES NO N/A

Appendix N

Intervention Rating Profile- 15 (IRP-15)

The purpose of the questionnaire is to obtain information regarding the assessment and intervention selection procedure for your student_____. Please circle the number that best describes your agreement or disagreement with each statement.

Strongly Disagree = 1 *Disagree* = 2 *Slightly Disagree* = 3
Slightly Agree = 4 *Agree* = 5 *Strongly Agree* = 6

1.	This was an acceptable intervention for my student's problem behavior.	1 2 3 4 5 6
2.	Most teachers would find this intervention appropriate for behavior problems in their classroom.	1 2 3 4 5 6
3.	This intervention was effective in changing my student's problem behavior.	1 2 3 4 5 6
4	I would suggest the use of this intervention to other teachers.	1 2 3 4 5 6
5.	My student's behavior problem was disruptive enough to warrant use of this intervention.	1 2 3 4 5 6
6.	Teachers would find this intervention suitable for the behavior problems that their student has exhibited in the past.	1 2 3 4 5 6
7.	I would be willing to continue the use of this intervention in the classroom setting.	1 2 3 4 5 6
8.	This intervention did not result in negative side-effects for my student.	1 2 3 4 5 6
9.	This intervention would be appropriate for a variety of children.	1 2 3 4 5 6
10.	This intervention was consistent with those I have used in the classroom setting.	1 2 3 4 5 6

11. The intervention was fair way to handle my student's problem behavior.	1 2 3 4 5 6
12. This intervention is reasonable for the problem behaviors that my student has exhibited.	1 2 3 4 5 6
13. I liked the procedures used in this intervention.	1 2 3 4 5 6
14. This intervention was good way to handle my student's behavior problems.	1 2 3 4 5 6
15. Overall, this intervention was beneficial for my student.	1 2 3 4 5 6

Adapted from:

Martens, B.K., Witt, J.C., Elliott, S.N., & Darveaux, D. (1985). Teacher judgments concerning the acceptability of school-based interventions. *Professional Psychology: Research and Practice, 16,* 191-198.

HUMAN SUBJECTS REVIEW FORM
UNIVERSITY OF SOUTHERN MISSISSIPPI
(SUBMIT THIS FORM IN DUPLICATE)

Protocol # 27022702
(office use only)

Name Jennifer Abraham Phone 601-266-4177

E-Mail Address jennifer.abraham@usm.edu

Mailing Address Box 5025, Department of Psychology, USM
(address to receive information regarding this application)

College/Division Psychology & Education Dept Psychology (School Psychology)

Department Box # 5025 Phone 601-266-5255

Proposed Project Dates: From February 1, 2007 To February 1, 2008
(specific month, day and year of the beginning and ending dates of full project, not just data collection)

Title "Generalization Effects of Social Stories Interventions for Individuals with Autism Spectrum Disorders"

Funding Agencies or Research Sponsors None

Grant Number (when applicable) None

5025 New Project

X Dissertation or Thesis

____ Renewal or Continuation: Protocol # ____

____ Change in Previously Approved Project: Protocol # ____

Principal Investigator — Date 2-22-07

Advisor — Date 022307

Department Chair — Date 2/23/07

RECOMMENDATION OF HSPRC MEMBER

____ Category I, Exempt under Subpart A, Section 46.101 ( ) ( ), 45CFR46.

X Category II, Expedited Review, Subpart A, Section 46.110 and Subparagraph (5).

____ Category III, Full Committee Review.

HSPRC College/Division Member — DATE 2-27-07

HSPRC Chair — DATE 3-6-07

The University of
Southern Mississippi

Institutional Review Board

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Tel: 601.266.6820
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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 26, 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: **27022702**
PROJECT TITLE: **Generalization Effects of Social Stories Interventions for Individuals with Autism Spectrum Disorders**
PROPOSED PROJECT DATES: **02/01/07 to 02/01/08**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Jennifer Abraham**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Psychology**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **03/05/07 to 03/04/08**

Lawrence A. Hosman
Lawrence A. Hosman, Ph.D.
HSPRC Chair

3-6-07
Date

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