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**Pre-service Teacher-Implemented Social Stories™ Intervention
for Students with Autism Spectrum Disorders
in General Education Settings**

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**Pre-service Teacher-Implemented Social Stories™ Intervention
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Dedication

For James and Lincoln

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**Pre-service Teacher-Implemented Social Stories™ Intervention for
Students with Autism Spectrum Disorders in General Education
Settings**

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Jeffrey Michael Chan, Ph.D.

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Social Stories™ are one of the most commonly-used interventions for children with autism (Green et al., 2006; Hess, Morrier, Heflin, & Ivey, 2008; Stahmer, Collings, & Palinkas, 2005). While there is a rapidly-growing literature base of Social Stories research, much of the work has focused on student behavior in special education resource settings; the current study examines the use of Social Stories with students in inclusive general education settings. Six students diagnosed with autism spectrum disorders participated and behaviors that occurred in the general education classroom were selected as targets. Pre-service teachers, autism resource teachers, and a paraprofessional were trained to implement the intervention. Social Stories were presented on a personal computer for 5 of 6 participants; the 6th participant's Social Story was presented in a bound book. Participants were observed in their general education classrooms during 30 min data collection sessions. A multiple baseline across participants design was used. For 3 participants, an alternating treatments design was also used, which examined 2

conditions: an Immediate condition in which classroom probes were conducted immediately following Social Stories intervention sessions, and a Delay condition in which a time delay of at least 3.5 hrs was presented between intervention and observation sessions. Results of the Immediate vs. Delay conditions show no conclusive effects of one condition over the other. Overall, results indicate improvements in target behaviors for 5 of 6 participants. Peer comparison data indicate that participants who showed improvement in their behavior performed the target skills at levels comparable to classmates without disabilities. Treatment fidelity data indicate that pre-service teachers were able to accurately implement the intervention over the course of the study. Social validity questionnaires were distributed to in-service and pre-service teachers, who rated the intervention as acceptable and feasible within the classroom setting. Implications for practice and future research directions are discussed.

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CHAPTER 1

INTRODUCTION

Children with autism spectrum disorders (ASD) often have difficulty with social, communicative, and adaptive behaviors (American Psychiatric Association, 2000). Over the past half century, many treatment approaches have been designed to meet the needs of the ever-growing population of children diagnosed with ASD (National Research Council, 2001). In particular, there is a demand for individualized and specialized services in school settings as the incidence of ASD rises and the number of students with disabilities enrolled in educational settings expands annually (Newschaffer, Falb, & Gurney, 2005; U.S. Department of Education, 2003). As the need for more services continues to grow along with the special needs population, so does the need for research on interventions for children with ASD conducted in school settings. The connection between research-based practices and contextually relevant research is important because of the laws that guide special education and teachers' willingness to adopt interventions for use in the classroom.

However, there is a problematic relationship between intervention research for children with autism and the methods frequently employed in schools. Teachers make use of a wide variety of different treatments for students with ASD, although the methods that they use are not necessarily supported by research, as mandated by the Individuals with Disabilities Education Act (IDEA, 2004). A survey of public school teachers found that most of the practices utilized in the classroom for students with autism did not have a sufficient research support base, with only 28% of strategies classified as *scientifically-based* or having *limited support* (Hess, Morrier, Heflin, & Ivey, 2008). The amount and quality of research available about interventions does not necessarily influence teachers'

adoption of strategies in the classroom, either. Boardman, Arguelles, Vaughn, Hughes, and Klinger (2005) found that special education teachers did not cite research support as a criterion for choosing a particular instructional method for their students. Other factors, such as access to materials, ease of implementation, and ongoing professional development support were key considerations in the decision-making process of selecting interventions. Educationally relevant research conducted on interventions with students with ASD should address these adoption issues as a part of its methodology.

In addition to issues regarding adoption of research-based methods of intervention in special education, research should address issues related to training of teachers who work with individuals with disabilities. A body of literature exists on training staff in residential, home, and school settings (for reviews, see Harchik, Sherman, Hopkins, Strouse, & Sheldon, 1989; Jahr, 1998; Lang et al., in press). The training of pre-service teachers who work with students with severe disabilities in school settings, however, has received less attention from researchers (O'Reilly, Renzaglia, Hutchins, & Korterba-Buss, 1992; O'Reilly, Renzaglia, & Lee, 1994). This shortcoming in the literature reflects a paradox in the skill development of teachers, who are trained as certified teachers and subsequently enter the workforce. However, additional training is often sought by teachers when they encounter difficulties with students with special needs that cannot be addressed with their current level of expertise. In response to this problem, it has been recommended that training practices seek to teach personnel multiple treatment approaches as well as provide ongoing support for teachers who have been trained to implement specialized treatments (Scheuermann, Webber, Boutout, & Goodwin, 2003).

One of the most frequently used specialized intervention techniques by teachers, service providers, and parents of students with ASD is Social Stories (Green et al., 2006; Hess, Morrier, Heflin, & Ivey, 2008; Stahmer, Collings, & Palinkas, 2005). This

approach is ideal for use in the classroom, as it is not a time-intensive approach to treatment, uses basic reading and listening comprehension as its core component, and is easily created (Chan & O'Reilly, 2008; Gray & Garand, 1993). Social Stories are individualized short stories that aim to inform the child with ASD about the observable and unobservable aspects of a social situation in an effort to improve his or her understanding about other people's perspectives and expectations. It is hypothesized that because of the difficulties faced by individuals with ASD related to taking the perspective of others, children with autism experienced trouble in social situations because they do not have sufficient information about such situations (Gray & Garand, 1995). The informative nature of Social Stories seeks to increase the predictability of difficult situations and provide opportunities for children with ASD to practice pro-social and adaptive behaviors. While Social Stories may provide descriptions of the target behaviors that are to be performed by the child, the overarching goal of Social Stories interventions is intended to be informational (Gray, 2004). It is hoped that the better understanding of social situations brought about by Social Stories will lead to improvements in behavior, regardless of descriptions of behaviors within a Social Story.

Previous research on Social Stories has focused on the implementation of the intervention in school settings, although little attention has been paid to its use for behaviors that occur in inclusive classrooms. Chan and O'Reilly (2008) was the only study to use a Social Stories intervention package for the behaviors of elementary school students, while 2 other studies examined behavior change of preschoolers in inclusive settings (Crozier & Tincani, 2005; Kuoch & Miranda, 2003). Teachers have been frequently involved in the implementation of Social Stories, although no research has been conducted in which pre-service teachers were trained to implement the intervention. Overall, results of Social Stories studies are positive whether the Social Stories are

presented as the lone intervention or with other procedures such as reinforcement and prompting. However, the studies that have been published on Social Stories have implemented the treatment immediately prior to data collection sessions and no investigation has examined the effect of a time delay following intervention session on the performance of target behaviors.

The need for contextually-relevant school-based research should focus on the creation of interventions that are likely to be used by teachers in real world settings. To this end, the current study addressed acceptability issues by including teachers from the beginning stages of research. In this study, special education teachers were involved with the planning and implementation of a Social Stories intervention for 6 students diagnosed with ASD. Pre-service teachers and experienced Special Education teachers received training on the Social Stories intervention from the author and ongoing support was available throughout the course of the study. Treatment fidelity data was recorded on pre-service teachers' ability to accurately and consistently implement the intervention. This study also addressed the issue of inclusion for students with ASD by focusing on target behaviors that occurred in inclusive, general education classrooms.

This study sought to extend the Social Stories literature by answering the following research questions.

- What are the effects of a computer-based Social Stories intervention on behaviors that occur in general education classrooms for 6 students with autism spectrum disorders at the primary school level?
- What differences in treatment effects are found if there is a delay between reading the Social Story and performance of skills in the classroom?

- Can pre-service teachers consistently implement a Social Stories intervention that consists of presenting the Social Stories via personal computer and having participants answer comprehension questions about the Stories?

In the next chapter, a systematic review of the literature on Social Stories interventions is presented. The methods and outcomes of the studies will be synthesized and attention will be paid to the use of Social Stories as the sole intervention or in conjunction with additional procedures. Following the literature review, the methodology of the current study is presented in Chapter 3. Chapter 4 will present the results of the study, and discussion of the project is presented in Chapter 5.

CHAPTER 2

EMPIRICAL REVIEW OF SOCIAL STORIES INTERVENTIONS FOR INDIVIDUALS WITH AUTISM SPECTRUM DISORDERS

The first published articles on Social Stories date back about fourteen years; however, there has been an increase in the number of peer-reviewed studies on the topic in recent years. The first systematic literature review of Social Stories was written by Sansosti, Powell-Smith, and Kincaid (2004); Reynhout and Carter (2006) soon followed with a meta-analysis of the literature base (including peer-reviewed articles as well as dissertations) providing a percentage non-overlapping (PND) data analysis. The publication date of the articles analyzed by Reynhout and Carter did not extend past 2004 and many studies have since been published. In all, 18 studies not covered by Reynhout and Carter are included in this review.

METHOD

Searches of the computer databases PsycINFO and ERIC were conducted through January 2009 to find articles for this review, using the terms *social stories*, *autism*, *Asperger syndrome*, and *developmental disabilities*. Manual searches of the reference sections of the articles and literature reviews of relevant articles were also conducted. Articles were included in this review if they met the following criteria: a) articles had to be published in peer-reviewed journals in English; b) at least one participant of the study had to be diagnosed with an ASD (i.e., autism, Asperger syndrome, PDD-NOS); c) the independent variable consisted of a Social Stories intervention; and d) the dependent variable was a quantitative measurement of behavior change. A total of 28 articles are covered in this review.

The articles were catalogued on a number of variables that described the participants, methodology, intervention, and results of each article. In total, 24 variables were coded for each article. Inter-coder reliability was measured by independent coders who read 32% of the articles and recorded information on the same variables originally coded. Agreement was calculated by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100; intercoder reliability was 96%.

Descriptions of the articles are given in Table 1 and are split into two groups: *Social Stories as Single Intervention* and *Social Stories with Additional Procedures*. Each article is described by the number of participants, age range of the participants, diagnoses of participants, target behaviors, experimental design, use of additional procedures besides Social Stories, and reported findings. Descriptions of findings were based on the original authors' interpretations of the results. A positive finding indicates that there was an improvement in behaviors for all target participants with ASD within a study. Mixed findings indicate that there was (a) an improvement in behaviors for some but not all participants or treatment groups, or (b) an improvement in some but not all behaviors for a single participant. Negative findings were defined as no improvement in any target behaviors for all participants within a study. In Table 2, articles are further described by reporting of generalization, maintenance, treatment fidelity, social validity, and parent/teacher involvement.

Table 1. Description of Studies

Study	n; Age range (in years); Diagnosis*	Target Behaviors	Experimental Design	Additional Procedures	Reported Findings
<i>Social Stories as Single Intervention</i>					
Adams et al. (2004)	1; 7; Autism	Challenging behavior: crying, flopping, hitting, screaming	ABAB	None	Positive
Bledsoe et al. (2003)	1; 13; AS	Spilling, wiping	ABAB	None	Positive
Delano & Snell (2006)	3; 6-9; Autism	Appropriate social engagement, inappropriate social engagement, absence of engagement, seeking attention, initiating comments, initiating requests, making contingent responses	Multiple probe across participants	None	Positive
Dodd et al. (2008)	2; 9-12; PDD-NOS	Inappropriate commands, compliments	MB across behaviors and participants	None	Mixed
Hagiwara & Myles (1999)	3; 7-9; Autism	Washing hands, on task	MB across settings	None	Mixed
Ivey et al. (2004)	3; 5-7; PDD-NOS	Participation in novel events	ABAB	None	Positive
Lorimer et al. (2002)	1; 5; Autism	Interrupting, tantrums	ABAB	None	Positive
Norris & Datillo (1999)	1; 8; Autism	Social interaction	AB	None	Mixed
Okada et al. (2008)	1; 13; Autism	Appropriate sitting	ABC	None	Positive
Ozdemir (2008)	3; 7-9; Autism	Using quiet voice, tipping chair, waiting in line	MB across participants	None	Positive

Quilty (2007)	3; 6-10; Autism	Inappropriate requests, aggression, inappropriate behavior	MB across participants	None	Positive
Reynhout & Carter (2007)	1; 8; Autism	Tapping hands	ABC	None	Positive
Sansosti & Powell-Smith (2006)	3; 9-11; AS	Sportsmanship, maintaining conversation, joining in	MB across participants	None	Mixed
Scattone et al. (2002)	3; 7-15; Autism	Tipping chair, inappropriate staring, shouting	MB across participants	None	Positive
Scattone et al. (2006)	3; 8-13; Unspecified Autism Spectrum Disorders	Social interaction	MB across participants	None	Mixed
<i>Social Stories with Additional Procedures</i>					
Agosta et al. (2004)	1; 6; Autism	Screaming	ABCA	Reinforcement	Positive
Barry & Burlew (2004)	2; 7-8; Autism	Appropriate play	MB across participants	Prompting	Mixed
Bernad-Ripoll (2007)	1; 9; AS	Emotion recognition, identification of appropriate social responses	AB	Video modeling	Positive
Brownell (2002)	4; 6-9; Autism	TV talk, following directions, using quiet voice	ABAC/ACAB counterbalanced	Music therapy	Positive
Chan & O'Reilly (2008)	2; 5-6; Autism	Social interaction, raising hand, inappropriate vocalizations, inappropriate comments	MB across behaviors	Role play	Positive
Crozier & Tincani (2005)	1; 8; Autism	Talking out	ABAC	Prompting	Positive
Crozier & Tincani (2007)	2; 3; Autism	Sitting appropriately, talking to peers	ABAB; ABCACBC	Prompting (only 1 participant)	Positive

Kuoch & Mirenda (2003)	3; 3-6; Autism, PDD-NOS	Aggression, crying, yelling, inappropriate mealtime behaviors, game-playing behaviors	ABA, ACABA	Prompting	Positive
Kuttler et al. (1998)	1; 12; Autism & Fragile X	Inappropriate language, flopping	ABAB	Token economy	Positive
Sansosti & Powell-Smith (2008)	3; 6-9; AS, Autism	Joining in, maintaining conversations	MB across participants	Video modeling, prompting	Positive
Scattone (2008)	1; 9; AS	Eye contact, smiling, social initiations	MB across behaviors	Video modeling	Mixed
Swaggart & Gagnon (1995)	3; 7-11; Autism, PDD-NOS	Greetings, aggression, sharing	AB	Response cost (for 1 participant only)	Positive
Thiemann & Goldstein (2001)	3; 6-8; Autism	Contingent responses, securing attention, initiating comments, initiating requests	MB across behaviors	Written cues, video feedback, prompting	Mixed

* AS=Asperger syndrome

Table 2. Measures used in Studies and Parent/Teacher Involvement

Study	Generalization	Maintenance	Treatment Fidelity	Social Validity	Parent/Teacher Involvement
<i>Social Stories as Single Intervention</i>					
Adams et al. (2004)	N	N	N	Y	Y
Agosta et al. (2004)	N	N	N	N	Y
Bledsoe et al. (2003)	N	N	N	N	N
Delano & Snell (2006)	Y	Y	Y	N	N
Dodd et al. (2008)	N	Y	Y	Y	Y
Hagiwara & Myles (1999)	N	N	N	Y	Y
Ivey et al. (2004)	N	N	Y	Y	Y
Lorimer et al. (2002)	N	N	N	N	Y
Norris & Datillo (1999)	N	N	Y	N	Y
Okada et al. (2008)	N	N	N	N	Y
Ozdemir (2008)	N	Y	Y	Y	Y
Quilty (2007)	N	Y	Y	N	Y
Reynhout & Carter (2007)	Y	Y	N	Y	Y
Sansosti & Powell-Smith (2006)	N	Y	Y	N	Y
Scattone et al. (2002)	N	N	Y	Y	Y
Scattone et al. (2006)	N	N	Y	Y	Y
<i>Social Stories with Additional Procedures</i>					
Barry & Burlew (2004)	N	N	N	N	Y
Bernad-Ripoll (2007)	Y	N	N	N	N
Brownell (2002)	N	N	N	N	N
Chan & O'Reilly (2008)	N	Y	Y	Y	Y
Crozier & Tincani (2005)	N	Y	Y	Y	Y

Crozier & Tincani (2007)	N	Y	Y	Y	N
Kuoch & Mirenda (2003)	N	Y	Y	N	N
Kuttler et al. (1998)	N	N	N	N	Y
Sansosti & Powell-Smith (2008)	Y	Y	Y	Y	Y
Scattone (2008)	N	N	Y	N	Y
Swaggart & Gagnon (1995)	N	N	N	N	Y
Thiemann & Goldstein (2001)	Y	Y	Y	Y	N

OVERVIEW OF STUDIES

Many different approaches to intervention have been reported in the Social Stories literature. Roughly half of the studies included in this review examined the use of Social Stories as the sole intervention (n=15) and the remaining studies combined Social Stories with one or more additional procedures (n=13). Some of those additional treatment components include reinforcement, prompting, video modeling, and role play. In the current section, two studies from each of these groups are described. In the following section, results of the research synthesis are presented.

Social Stories as Single Intervention

Scattone, Tingstrom, and Wilczynski (2006) used a Social Stories intervention with three students aged 8-13 years old. The study took place at school during unstructured times such as recess and lunch. The target behavior for all participants was appropriate social interactions, defined by the authors as a variety of behaviors such as (a) verbal, physical, or gestural initiations or responses; (b) making on-topic comments or questions related to a conversation or activity taking place; (c) appropriate responding to a peer; and (d) appropriate gestural responses indicating approval or disagreement. Each participant read their respective Social Story to their teacher 5 min prior to the target social situation. The stories were presented in a spiral-bound book format, with 1-2 sentences written on each page; there were no illustrations included with the Social Stories. Comprehension of the Social Stories was assessed during the first intervention session only. In order to meet the standard for comprehension, students had to answer each question correctly; those who were unable to answer the questions were prompted to answer correctly. Following this initial session, comprehension was not re-assessed. The researchers used a multiple baseline across participants design and the intervention was run three times per week over an 11-week period. Treatment integrity was assessed

during each intervention session by the researchers, although this measure only consisted of an indication of whether or not the Social Story was read at all. However, if the teacher made a procedural error during the session, the researcher gave immediate feedback to correct the error. Results indicate that 2 participants showed improvements in the level of appropriate social interactions, while the third participant demonstrated no instances of the prosocial target behaviors on 26 of 30 intervention sessions. The authors hypothesized that Steven's challenging behaviors may have kept other students from wanting to interact with him. This lack of social reinforcement, in turn, led to decreased attempts at social interaction. Social acceptability of the treatment was measured by administering the Intervention Rating Profile (IRP-15; Martens, Witt, Elliott, & Darveau, 1985) to the teachers involved with the study. The intervention was rated as acceptable for all participants.

In one of the earliest Social Stories studies to appear in the literature, Lorimer, Simpson, Myles, & Ganz (2002) used an ABAB reversal design to investigate the effects of an intervention to prevent challenging behavior for a 5-year-old boy diagnosed with autism. The study was conducted in the participant's home by his parents and therapists. The participant received behavioral, occupational, and speech therapy in his home but the study did not specify which of these therapists were involved. The participant's target behavior was interrupting his mother while she was engaged in a conversation; this behavior was chosen because it acted as a "precursor" behavior to more severe aggression and other tantrum behaviors. A functional assessment found that the behavior was motivated by attention and access to tangible items, so two Social Stories were written to address the participant's ability to wait patiently. The Stories were 9 and 13 pages in length, had 1-2 sentences per page, and included pictures from The Picture Communication Symbols Book (Mayer-Johnson, 1981). During baseline phases, the

participant was exposed to his previously unsuccessful interventions, which included reviewing his schedule, using a timer to practice waiting, and lessons to identify emotions. During intervention phases, Social Stories were read to the participant multiple times per day (e.g., during therapy sessions, immediately prior to instances when adults near him would be engaged in conversations) and he was also allowed access to the Stories whenever he wished. If the participant interrupted an adult during either of the intervention phases, he was prompted to re-read the Story. Frequency data of interruptions show improvements during intervention phases, with the behavior dropping to zero at the end of the study. Tantrums, while infrequent but severe during baseline (0-2 per session, lasting approximately 45 min each), also showed improvement during Social Stories phases with only 2 tantrums occurring out of 14 sessions.

Social Stories with Additional Procedures

In their 2008 article, Sansosti and Powell-Smith presented Social Stories to 3 participants via computer. An added component of video modeling was included with the Social Stories presentation. Two participants (ages 8 and 9) were diagnosed with autism and the third participant (age 6) was diagnosed with Asperger syndrome. The target behavior for participants 1 and 2 were joining a conversation or activity; the target behavior for participant 3 was maintaining conversations. The Social Stories were presented to the participants using Microsoft PowerPoint. Each story was 5-9 slides in length, with 1-2 sentences and 1 Mayer-Johnson (1994) illustration per slide. In addition, a video modeling component was presented following the Social Story. The video featured a similar-aged peer performing the target behavior of the participant. The PowerPoint presentation was designed to automatically progress through each slide and video. Teachers, paraprofessionals, and behavior specialists were responsible for readying the computer presentation and starting it for the participants. Comprehension

was assessed only during the first week of the intervention phase by asking the participants predetermined questions based on the Stories.

A multiple baseline across participants design was utilized and participants were observed on the playground during recess for changes in their target behaviors. During the intervention phase for participants 1 and 2, the researchers implemented a prompting procedure due to decreasing trends in the target behavior data for both participants. The procedure consisted of teachers prompting the participants to engage in the target behavior as well as prompts for peers to engage in activities with the participants. At the end of the intervention phase, the Social Story/Video Modeling intervention package was slowly faded over a 2-week period. Results for all three participants were positive, and follow-up data collected after the completion of the fading procedure show maintained levels of target behaviors. Generalization probes were conducted weekly for all three participants during lunchtime. The researchers examined setting generalization by observing participants 1 and 2 in a different playground setting and participant 3 in the school cafeteria. Generalization results were positive for participant 1 although participants 2 and 3 showed little improvement in the rate of their behavior during generalization probes.

Chan and O'Reilly (2008) investigated a Social Stories intervention package that included a role play component with two Kindergarteners with autism. Both participants attended full-inclusion classrooms. The target behaviors for both participants were raising hand, inappropriate vocalizations, and appropriate social interaction. Six individualized stories – one per target skill per participant – were created. Social Stories were each presented on a single page and contained no illustrations. The participants read the stories aloud and comprehension was assessed during each intervention session using predetermined questions. During role play, the participant and 2 adults acted out

situations in which the participant would perform the target behavior. The participants were given prompts if they made errors in the target behavior during the role play. One Social Story and one role play were practiced for each behavior. Participants were observed in their respective classrooms in 1-hr sessions which included circle time, centers, and free time. A multiple probe across behaviors design was used. Results for participant 1 were positive; participant 2 showed positive results for raising hand and social interaction. The intervention was not introduced for participant 2's inappropriate vocalizations, however, due to a decreasing trend which led to near-zero levels of the behavior. Follow-up data collected during the following school year, in which the participants had moved to 1st grade and into new classrooms, showed that participants had maintained their levels of behavior after the intervention package had been discontinued for up to 10 months.

RESULTS

Participants and Settings

A total of 59 participants with ASD were in the studies covered in this review. Of these participants, 55 were male (93%) and 4 were female (7%). The majority of participants (n=43; 73%) had a diagnosis of autism. Six participants were diagnosed with Asperger syndrome, seven participants were described as having a diagnosis of PDD-NOS, and three participants were diagnosed on the autism spectrum although no specific category was stated.

Twenty-two of the studies were conducted in a school setting (79%); these studies took place at various places, such as the classroom, cafeteria, play yard, and library. Five studies were conducted in home settings (18%) and two were conducted in hospital settings. One study took place in community settings, although the authors did not specify the type of situation.

Target Behaviors

Sixteen studies included social skills as a target behavior (57%), which included behaviors such as getting someone's attention, greetings, responding to a person, maintaining a conversation, using appropriate voice volume, raising hand in class, not staring, and eye contact. Challenging behaviors such as aggression, crying, screaming, and flopping were targeted in eight studies (29%). Adaptive and self-help skills were target behaviors in eight studies as well. Examples of these types of behavior include hand washing, appropriate mealtime behaviors, following directions, sitting appropriately, staying on task, and participating in novel events. Play skills and self-stimulatory behaviors were each targeted in two studies apiece.

Additional Procedures

Thirteen studies in this review utilized other procedures in addition to Social Stories. Prompting was the most frequently used technique, with six studies making use of the procedure (Barry & Burlew, 2004; Crozier & Tincani, 2005; Crozier & Tincani, 2007; Kuoch & Mirenda, 2003; Sansosti & Powell-Smith, 2006; Thiemann & Goldstein, 2001). Four studies provided video modeling/video feedback along with Social Stories (Bernad-Ripoll, 2007; Sansosti & Powell-Smith, 2008; Scattone, 2008; Thiemann & Goldstein, 2001). Various other procedures have been implemented alongside Social Stories, including presentation of music (Brownell, 2002), role play (Chan & O'Reilly, 2008), token economy (Kuttler et al., 1998), response cost (Swaggart & Gagnon, 1995), reinforcement (Agosta, Graetz, Mastropieri, & Scruggs, 2004), and written cues (Thiemann & Goldstein, 2001).

About half of the studies utilized additional procedures concurrent with Social Stories. That is, the additional procedures were used alongside Social Stories at the very beginning of the intervention phase. However, Kuoch and Mirenda (2003) used

prompting in a separate treatment phase, independent of Social Stories, for one participant. In their 2005 and 2007 studies, Crozier and Tincani introduced prompts after initial treatment phases of Social Stories alone did not produce adequate behavior change.

Outcome by Intervention Type

Overall, a majority of studies reported positive findings (71%) and the remainder reported mixed findings (29%). Outcome results were also analyzed by the type of treatment that was implemented per participant. A total of 35 participants received Social Stories as the sole intervention (59%) and 24 participants received a Social Stories intervention package (41%). Further breakdown within each category shows that 28 participants in the Social Stories alone group had positive results (80%) while 7 participants had mixed results or showed no improvement in target behaviors (20%). In the Social Stories with Additional Procedures group, 20 participants were reported to have positive results (83%) and 4 participants were reported to have mixed results or showed no improvement (17%). The similar levels of positive results across intervention groups (Social Stories alone vs. additional procedures) parallels a finding by Reynhout and Carter (2006), who conducted a percentage non-overlapping data (PND) analysis of Social Stories-only vs. Social Stories with additional procedures packages. In that analysis, both groups yielded similar PND scores. Overall, with both intervention types combined, 48 participants had positive results in the current analysis. That is, almost 80% of participants showed improvement in all target behaviors when they received interventions that included a Social Stories component.

Research Design

In the articles in this review, 5 used an AB or similar design (18%), 9 used an ABAB reversal (or similar variation) design (32%), and 14 used a multiple baseline design (50%). A trend in the recent Social Stories literature indicates a preference for

multiple baseline designs, as 11 of the 18 studies published since Reynhout and Carter's literature review are variants of a multiple baseline.

Generalization and Maintenance

A small number of studies (n=5, or 18%) reported generalization data. Bernad-Ripoll (2007) examined stimulus generalization when the participant's parents became implementers of the intervention. Setting generalization was assessed by Delano and Snell (2006) as well as Theimann and Goldstein (2001); in both studies, participants were observed in their classrooms following intervention in other school environments. Reynhout and Carter (2007) also assessed generalization by observing the participant during a different lesson time in the same classroom as the intervention phase. Finally, Sansosti and Powell-Smith (2008) conducted setting generalization probes with their 3 participants at various areas on a school campus.

Forty-six percent of studies reported maintenance data (n=13). Five studies measured maintenance over a period of several sessions, although no specific time frame in terms of days or weeks is reported (Agosta et al., 2004; Delano & Snell, 2007; Dodd et al., 2008; Ozdemir, 2008; Thiemann & Goldstein, 2001). Several studies reported maintenance data up to 2 weeks following the end of the intervention phase (Crozier & Tincani, 2005; Sansosti & Powell-Smith, 2006; Sansosti & Powell-Smith, 2008), and several more reported data as many as four weeks post-intervention (Crozier & Tincani, 2007; Kuoch & Mirenda, 2003; Reynhout & Carter, 2007). Quilty (2007) reported maintenance data at 9 weeks and Chan and O'Reilly (2008) reported maintenance data at 10 months after intervention ceased.

Treatment Fidelity, Social Validity, & Parent and Teacher Involvement

Treatment fidelity, or the extent to which researchers measure the accuracy in which the intervention is implemented, is frequently reported in the literature base. As

described in Table 2, 16 studies reported some variant of treatment fidelity (57%). Just under half of the studies in this review reported social validity data (48%). While the majority of the studies gathered social validity data from parents and teachers, Dodd et al. (2008) is a notable exception in that the authors asked the participants to rate the intervention.

The inclusion of parents, teachers, and professionals in research is a key component of bridging the gap between research and practice. In total, 22 studies (79%) had a component of parent or teacher involvement, which included the use of teachers, parents, paraprofessionals, or therapists during the implementation of the Social Stories intervention or data collection (see Table 2).

DISCUSSION

While the literature on Social Stories spans over 14 years, it is only recently that the amount of data available has become sufficient to draw reasonable conclusions about the effectiveness of the intervention. The publication of 18 articles in the past four years, bringing the total number of peer-reviewed studies to 28, has greatly increased the confidence with which one can assess the outcomes of research. A participant-by-participant analysis of intervention outcomes has shown that Social Stories are an effective treatment method, with positive results reported for 81% of participants. When participant data are analyzed by the use of additional procedures vs. Social Stories alone, the success level maintains across approaches. Although there has been no research conducted which systematically examines the relative effectiveness of Social Stories and any additional procedures that are used as part of an intervention package, the results of this review suggest that an intervention that consists of Social Stories with or without additional procedures may have positive effects on the behavior of a student with autism. However, the reasons underpinning the similarities in outcome between Social Stories

alone vs. with additional procedures remain unclear. Nor are the reasons behind the general effectiveness of Social Stories apparent, either. It is likely that there are several processes at work which lead to children with autism achieving success in difficult situations. One process at work may be a form of priming, in which the participants are exposed to the target situations in advance of the actual experience (Zanolli, Daggett, & Adams, 1996). Predictability is brought about through multiple readings of Social Stories, which in turn prepares the child with autism to function in the target situation. The natural contingencies of reinforcement present in the target situation may also have a role in the success of Social Stories. As the child begins to display the desired behaviors more frequently, peers and adults in the environment may provide natural positive reinforcement to the child which will serve to increase the likelihood of the behavior in the future. Negative reinforcement may also be applied to the child's behavior, as others may no longer respond disapprovingly to the child as he or she begins to decrease unwanted behaviors as well as display the desired behavior.

Social Story intervention packages utilizing additional procedures in the literature have drawn criticism because it is not possible to differentiate the effects of one treatment over the other (Reynhout & Carter, 2006); however, the combination of Social Stories with other strategies within the literature may act to *increase* the validity of the research. Studies that have examined the practices of special education teachers and early intervention providers have found that it is routine to combine methodologies in order to create interventions that meet the individual needs of their students (Boardman et al., 2005; Stahmer et al., 2005). With multiple instances within the literature of ways in which Social Stories can be combined with other well-established procedures, teachers and service providers may find these studies to be more relevant to their daily activities and, therefore, more likely to accept the research as valid. Such acceptance is an

important barrier to overcome in that it may translate to more research-to-practice connections which are encouraged by IDEA. On the other hand, since combining strategies is a widespread practice, it may be that the Social Stories literature is merely playing catch-up with educators with the examination of multicomponent strategies. Regardless of the direction of influence between research and practice, increased teacher involvement at the planning level of research should be a goal for any researcher planning to create educationally-relevant studies (Lang et al., in press). The input from teachers and service providers could serve to either identify areas of research that may be useful for educators or to examine the practices that are already in place in educational settings.

Females are underrepresented in the literature base of Social Stories interventions with individuals with autism. The percentage of female participants in the research (7%) is well below the percentage of females with autism, which is believed to be approximately 20% of the autism population (Fombonne, 1999). Such distinction between males and females with autism is notable, given the hypothesis that gender differences in brain function may account for the increased prevalence of autism in males (Baron-Cohen, 1999). Although successful replication of findings across studies demonstrates the overall effectiveness of Social Stories for children with autism and females' response to intervention is not necessarily different than males, the gender bias in favor of males may act as a hindrance to the external validity of the research base. The literature should be representative of the population which it seeks to describe, with attention to factors such as cognitive functioning, social functioning, ethnic and cultural background, and age of participants. Gender may be overlooked in the case of Social Stories given the applied nature of much of the research and the barriers to participation

that may be present, such as unavailability of female participants or parents' unwillingness to consent to participation.

Schools are overwhelmingly favored in the literature base as the setting of choice. While children with autism are exposed to a variety of environments in their daily lives, it is unclear why schools are the preferred in research studies. It may be that Social Stories are an easily-administered intervention and the use of such procedures may be more conducive to the school environment where the demands of the classroom do not allow teachers much time to devote to one-to-one intervention methods. The flexibility of Social Stories, given that teachers themselves are the authors, may also be appealing in the school environment since teachers are given unlimited control over the content and contexts for usage of the Stories. Social Stories may also meet feasibility standards of teachers, such as fitting easily into the current classroom structure. Reading is a central fixture in all children's education, and the reading aspect of Social Stories seems to be a natural fit with activities that already occur in the classroom. That is, Social Stories may represent a more naturalistic approach to intervention in the educational setting; other, more intrusive interventions (e.g., removal from class or time outs, physical prompts) may not fit as well into the everyday functioning of a classroom.

While Gray (1995) originally intended for Social Stories to be used as a method of improving the social abilities of children with autism, the application of Social Stories to other types of behavior (i.e., self-help, community, tantrum behaviors) demonstrates the usefulness of the intervention to meet various needs demonstrated by this population. In addition to the Social Stories for ASD articles presented in this review, there have been articles published on the use of Social Stories not only with other types of behavior but with other populations as well. For example, papers have been published on Social Stories interventions for children with special needs other than autism spectrum

disorders, such as learning disabilities, hyperlexia, and behavior problems (Moore, 2004; Soenksen & Alper, 2006; Toplis & Hadwin, 2006). Further, Social Stories have been proposed as interventions for sleep problems, physical inactivity, and sexual education (Burke, Kuhn, & Peterson, 2004; Tarnai & Wolfe, 2008; Zimbelman, Paschal, Hawley, Molgaard, & St. Romain, 2007). As is the case with other treatment approaches for autism, such as Applied Behavior Analysis, Social Stories are not necessarily an ASD-specific method. Regardless of the processes that lead to the effectiveness of Social Stories, they are readily available to individuals with special needs regardless of diagnosis and are easily customizable to meet the circumstances of different people.

Generalization was recorded in only a handful of studies in this review. The lack of generalization data may be attributable to the very specific nature of Social Stories intervention. The Social Story guidelines set forth by Gray indicate that each story is to describe very specific situations or environments; this specificity may actually serve to hinder generalization, since there may be limited similarities between environments where behaviors are in need of intervention. For example, Okada et al. (2008) noted that generalization may be negatively affected if the Social Story discusses the perspective of an individual who is specific to a particular situation in a child's environment. Without altering the basic construction of a Social Story (e.g., mentioning several situations within one story), programmed generalization does not seem to be amenable to this approach.

Treatment fidelity of Social Stories intervention, while widely reported in the literature, suffers from a lack of specificity in the steps of treatment. For example, almost all of the studies covered in this review simply measured whether or not Social Stories were read on the days when intervention was scheduled. Although this may satisfy the main goal of Social Stories, where students are simply expected to read a Story, there is

also a component of systematic teaching that is present in the delivery of Social Stories. For example, prompts may be necessary to redirect the child's attention to the story or promote correct responding during comprehension questioning (Chan & O'Reilly, 2008; Crozier & Tincani, 2007). These details warrant inclusion in treatment fidelity data collection, as they reflect the level of support often needed when teaching students with ASD as well as the feasibility of the strategy. The systematic teaching component of any intervention may be essential to its success, and studies should seek to include a measure of how well the interventionist, service provider, or teacher is able to implement the treatment.

Future Directions for Research

There remain several areas of inquiry that can be addressed within the Social Stories literature. First, more research should be conducted on behaviors that occur in inclusive classroom settings. Also, treatment fidelity measures should examine how well systematic teaching is implemented by teachers. Continued involvement of teachers in school-based research is also a priority, with an emphasis on creating socially acceptable treatments through teacher input and ongoing support from researchers.

Current Research Study

This research project will address some of the issues of the literature base. Teachers will play an important role in the development of the project, including identification of participants, choice of target behaviors, creation of Social Stories, and implementation of the intervention. The Social Stories intervention includes having the participants read the Stories and answer questions following the presentation. Teachers will receive training on the implementation of the intervention and continued support will be provided as needed. Data on the participants' behavior change will be recorded in their inclusive, general education classrooms. Teachers will also be observed and data will be

collected on how well they complete the steps of the intervention. This treatment fidelity data will consist of several steps, such as providing clear instructions to the student, providing prompts, and providing reinforcement. Finally, social validity data will be gathered which surveys teachers' views on the acceptability of the intervention in this study.

CHAPTER 3

METHODS

In this chapter, the methods of the study are described. In the first section, characteristics of the participants with ASD and pre-service teachers are described. Next, the target behaviors for intervention and data collection methods are discussed in detail. In the third section, the setting of the study is introduced. The following section describes the materials used in the creation of the Social Stories of this study. Fourth, the procedure for training and supporting the implementers of the intervention are described. Next, the procedure of the study is discussed, including the Immediate vs. Delay conditions, experimental design, peer comparison probes, baseline phase, and the intervention phase. The chapter closes with discussion of interobserver agreement, treatment fidelity, and social validity measures.

PARTICIPANTS

Participants with Autism Spectrum Disorders

The participants were 5 boys and 1 girl who attended public elementary schools in two suburban school districts in the southern United States. The school district's autism specialist chose two schools from which 5 participants were recruited. The sixth participant attended a school in a neighboring school district. Special education teachers at each school identified potential participants. In total, 6 participants were chosen from this pool. David, Alisa, and Lloyd attended School A; Quentin and Zach attended School B; and Morgan attended School C. Participants were each diagnosed with an autism spectrum disorder by an independent source. Information was collected from student files. Table 3 describes the participants of this study including age in years, disability diagnosis, ethnicity, grade level, and school of attendance.

David was an 8-year-old Caucasian boy categorized with mild/moderate autism on the Gilliam Autism Rating Scale (GARS; Gilliam, 1995) and the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & DeVellis, 1980). He was in 2nd grade and attended a general education classroom approximately 75% of the day. The remainder of his day was spent in a special education resource classroom for children with autism spectrum disorders. A paraprofessional was assigned to David's general education classroom, which included two other students with autism. David spoke and wrote in complete sentences. His classroom and special education teachers reported that he had tantrums when he did not get his way. David's IQ was measured using the Wechsler Preschool and Primary Scale of Intelligence, 3rd Edition (WPPSI-III; Wechsler, 2002) and his full scale IQ score was 88. On the Behavioral Symptoms Index of the Behavior Assessment System for Children-2 (BASC-2; Reynolds & Kamphaus, 2004), David was rated in the At Risk range by his parent and Clinically Significant by his teachers. Adaptive behavior scores for David were rated in the extremely low range by parents and teachers on the General Adaptive Composite Score of the Adaptive Behavior Assessment System, 2nd Edition (ABAS-II; Harris & Oakland, 2003)

Alisa was a 7-year-old Hispanic girl who scored in the mild/moderate range autism using the CARS (Schopler, Reichler, & DeVellis, 1980). She was in the same 2nd grade general education classroom as David. She also spent the same amount of time in her general education and resource classrooms as David. Alisa spoke in one- to five-word phrases and was able to follow directions independently, although she required frequent prompting to stay on task. Alisa had an IQ score of 85 on the Differential Ability Scales, 2nd Edition (DAS-2; Elliott, 2007). She was rated within the Clinically Significant range by parents and teachers on the Behavioral Symptoms Index of the BASC-2 (Reynolds &

Kamphaus, 2004). Alisa scored within the Extremely Low range on the General Adaptive Composite Score of the ABAS-II (Harrison & Oakland, 2003).

Lloyd was an 8-year-old Caucasian boy who scored in the mild/moderate range for autism on the CARS. He was in 3rd grade at the same school as David and Alisa; the amount of time that he spent in his general education and special education classrooms was similar to those 2 participants. Lloyd spoke in complete sentences and initiated conversations frequently. On the Preschool Language Scale, 4th Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002), Lloyd scored within the average range for expressive and receptive language. On the ABAS-II, Lloyd's parents rated him in the Below Average range on the General Adaptive Composite score. On the BASC-2, Lloyd's score on the Behavioral Symptoms Index was in the At Risk range on the parent report and in the Clinically Significant range on the teacher report. No IQ score was available for Lloyd.

Zach was an 8-year-old Caucasian boy diagnosed with Asperger Syndrome who attended a 2nd grade general education classroom full time. He spoke in complete sentences and frequently initiated social interactions with his peers and adults. Zach performed at grade level in reading, math, and social studies. On the BASC, Zach was rated in the At Risk range by his parents on the Behavioral Symptoms Index. No IQ score was available for Zach.

Quentin was an 8-year-old Caucasian boy categorized with autism on the GARS and CARS. He attended a 3rd grade inclusion class for approximately half of the school day. He spoke in complete sentences and initiated conversations with adults. On the Stoelting Brief Nonverbal Intelligence Test (Roid & Miller, 1999), Quentin received a brief IQ score of 95. He performed at grade level for reading and social studies, but had difficulties with math.

Morgan was a 9-year-old Caucasian boy who was in 4th grade. He was diagnosed with autism and could communicate in complete sentences. He independently initiated social interactions with adults and read below grade level. On the GARS, Morgan scored 111 on parent report and 106 on teacher report, with the result of an above average probability of autism. On the Oral and Written Language Scales (OWLS; Carrow-Woolfolk, 1995), Morgan's Listening Comprehension score was 63 (1st percentile); 77 (6th percentile) in Oral Expression; and his Oral Composite score was 68 (2nd percentile). On the Kaufman Assessment Battery for Children-2 (KABC-II; Kaufman & Kaufman, 2004), Morgan received a Fluid-Crystallized Index score of 68 (2nd percentile).

Table 3. Description of participants with autism spectrum disorders including disability diagnosis, age in years, ethnicity, grade level, and school of attendance

Name	Disability Diagnosis	Age	Ethnicity	Grade	School
David	Autism	8	Caucasian	2 nd	School A
Alisa	Autism	7	Hispanic	2 nd	School A
Lloyd	Autism	8	Caucasian	3 rd	School A
Quentin	Autism	8	Caucasian	3 rd	School B
Zach	Asperger Syndrome	8	Caucasian	2 nd	School B
Morgan	Autism	10	Caucasian	4 th	School C

Pre-service Teachers

All three pre-service teachers were undergraduate students enrolled in a Special Education certification program at a major university in the southern United States. Ms. Bell was in her fourth semester of pre-service teaching. She worked with approximately 15 students with autism and developmental disabilities during her experience as a pre-service teacher. Ms. Chandler and Ms. Denny were both in their second semester of pre-service teaching and each worked with approximately 10 students with autism and developmental disabilities. All three teachers had previously taken an introductory course on Applied Behavior Analysis. Ms. Bell also completed a course on instructional methods for students with autism and developmental disabilities; Ms. Chandler and Ms. Denny were enrolled in the course during the current study.

MATERIALS

Special education teachers created Social Stories using Microsoft PowerPoint® 2004 on Dell® desktop computers for all participants except Morgan. The special education teachers involved with this study read several texts on the creation of Social Stories (Gray, 1993; Gray, 1995; Gray, 2004) and were asked to create a story for each of their students. Six stories were created (one per participant) which addressed specific situational characteristics and the target behaviors of each participant. Each participant's story was created by his or her respective special education teacher.

Teachers were asked to create stories that made use of three primary types of sentences created by Gray: descriptive, perspective, and directive. Descriptive sentences outline the characteristics of the target social situation. These sentences describe what is happening in the situation and why events occur. *Descriptive* sentences describe the physical setting, activities that the student and others are engaged in, or people in the environment that may interact with the student. Teachers were also encouraged to use

flexible language within their Social Stories in order to avoid rigid interpretation by students. Teachers were asked to include words such as “usually” and “sometimes” in the descriptive sentences in order suggest that particular situational events may not always occur exactly as depicted in the Social Story (Gray, 1995). *Perspective* sentences describe internal states or conditions that are unobservable to the student with autism. Such states include private thoughts, feelings, perceptions, beliefs, expectations, and motivations. Perspective sentences offer vital information that is needed to explain other peoples’ points of view, which in turn may help teach the student how their behavior affects others. *Directive* sentences describe the behavior of interest that the child is to perform in the target situation. Care is given to make sure directive sentences are individualized to meet student’s abilities. Further, attention should be paid to informing the student of the desired behaviors they are to perform, rather describing what the student should not do (Gray, 1993). For example, a directive sentence should read: “I will try to sit appropriately during lessons” rather than “I won’t stand up during lessons.” As with descriptive sentences, directive sentences should consider possibility that students may make literal interpretations of their stories. Therefore, directive statements use language such as “I will try to...,” “I will work on...,” or “Something that I might try is...” in order to account for flexibility when describing the target behavior to be used by the student.

Each story had a title screen which displayed the name of the story. One to four short sentences were present on each slide, with sentences based on a common idea grouped on the same slide. Words were presented in Arial MT Rounded font at approximately 20 points. Sentences were presented along the lower half of the screen and a picture was presented at the top half of the screen; pictures were taken of the

participants in situations relevant to the Social Story using a digital camera. The slide background was white and the text was black.

Morgan's Social Story was printed on 8.5 in by 11 in plain white paper. The content and layout were similar to the computer stories, with 1-4 sentences per page, digital pictures on the top half of the page, and text on the lower half. The pages were laminated and bound with a plastic spiral for durability.

SETTING

Social Stories intervention sessions occurred in the participants' special education resource classroom. Several other students with autism as well as the special education teacher and paraprofessionals were present in the room. The computers used for Social Stories presentations were set on desks with chairs, in the corner of the room. Morgan, though, read his Social Story on a bench located adjacent to his general education classroom.

Participants were observed in their general education classroom during regular school hours. The classrooms had several desks and chairs, a carpeted area with books, a television, and several personal computers. The general education teacher, paraprofessional, and approximately 20 students were present in the rooms.

David's data collection sessions occurred during science. During this period, students sat on the carpeted area and participated in a group lecture/discussion, watched a video presentation, or worked at their desks independently. Alisa's sessions occurred during "tea time," which was a structured session in which groups of 4 to 5 students played academic board games. Lloyd was observed during group lessons, which took place on the carpeted area of his classroom during social studies. All of the students were seated on the floor while the teacher sat in a chair facing the class. Zach was observed during language arts, in which students sat at their desks as the teacher gave a lesson at

the front of the classroom. Quentin was observed during math, in which students sat at their desks and worked on math worksheets. During this time, the teacher and paraprofessional walked around the classroom helping students. Finally, Morgan's observation sessions were conducted in his classroom while the class prepared to leave for the day. The students primarily sat at their desks while the teacher circulated the classroom signing planners.

DATA COLLECTION AND TARGET BEHAVIORS

Observations were carried out by special education doctoral students. Observation sessions were 30 min in length and occurred in the participants' general education classrooms. Observers sat in the classroom, usually against a wall behind or to the side of the students, at least 10 feet away from participants. Target behaviors were measured using 10 s whole interval method, frequency recording, and task analysis. For participants whose behaviors were measured using an interval method, observers listened to pre-recorded audio tracks that contained a brief tone every 10 s. Observers used Apple iPods® to listen to the audio track which was created using Audacity® software and saved in mp3 format. The mp3 file was uploaded to observers' iPods using a personal computer. For the participants whose behavior was measured using frequency recording and task analysis, pen and paper method was used to record the target behavior. Table 4 describes the participants' target behaviors, the classroom activities during which data collection observation sessions were conducted, and data collection methods.

David's target behavior was appropriate sitting. When David was sitting on the floor during a lesson, appropriate sitting consisted of being seated on his bottom with both legs in a crossed position. Non-examples of appropriate sitting on the floor were standing upright, leaning his body in any direction in more than a 60-degree angle from the floor, laying prone, or laying supine. If David was sitting in a chair at his desk,

appropriate sitting was defined as being seated with his feet touching the floor, his bottom on the seat, and his torso within 6 in of the edge of the desk. Non-examples were standing, sitting on the floor, sitting with one leg bent on the chair, and resting his head on the desk or on his arm, resting against the desk. David's behavior was measured using a 10-s whole interval method.

The target behavior for Alisa was appropriate eye contact in response to peer questions or initiations. To meet criteria for correct performance, Alisa had to verbally respond to a peer while looking in the direction of the peer's eyes. No minimum time duration was set for eye contact. Non-examples of the behavior consisted of a lack of eye contact with or without a verbal response. Frequency data was gathered on three behaviors: (a) verbal response with eye contact, (b) verbal response without eye contact, and (c) no verbal response or eye contact. Because Alisa's verbal responses to peers were consistent throughout the study, eye contact was reported as the target behavior.

Lloyd's target behavior was attending to the teacher during group lessons. This behavior was defined as (a) orientation of the body and head towards the teacher, and (b) looking in the direction of the teacher's face or materials. Non-examples of the target behavior included (a) orienting the body/head towards the teacher but looking at something other than the teacher; and (b) putting the head down while resting in the palms. Attending was measured using a 10 s whole interval recording system.

The target behavior for Zach was decreasing inappropriate comments during class time which were defined as statements not related to the lesson topic or the work that the students were engaged in at the moment. Such comments could be made during a group lesson in which students were expected to be silent while the teacher spoke (i.e., interrupting) or during work time when students could speak freely. On-topic interruptions were also counted as inappropriate comments. Play-related sounds, such as

“swoosh” while simulating a sword swing, were also examples of the target behavior. However, if a classmate initiated a conversation with Zach relating to a topic not relevant to the lesson or class activity, Zach was not recorded as being off-topic if he responded to the classmate. Frequency data was collected on Zach’s inappropriate comments.

Working independently was targeted as Quentin’s target behavior. This was defined as writing and/or looking at an assigned work activity. Non-examples include engagement with any materials not associated with the assignment (e.g., reading a story book not related to his class assignment) and the lack of engagement with any materials (e.g., engaging in self-stimulatory behavior, staring). Working independently was measured using a 10 s whole interval system.

Morgan’s target behavior was his end of the day routine. This routine consisted of 11 steps which were completed at the end of each school day prior to leaving campus. The steps included gathering materials, cleaning up, packing up, and leaving the classroom (see Appendix G for a complete list of the behaviors and examples of errors). Each step of the task analysis was recorded as either correct or incorrect by observers.

Additionally, data were collected on participants’ answers to comprehension questions during Social Stories intervention sessions. The implementer recorded whether or not the participant answered the question correctly.

Table 4. Participants' target behaviors, activities during which observations occurred, and data collection method

Participant	Target Behavior	Activity	Data Collection Method
David	Sitting appropriately	Group instruction, video, or desk work (science)	10 s whole interval
Alisa	Eye contact	“Tea Time” – playing Academic board games	Frequency
Lloyd	Attending	Group instruction (social studies)	10 s whole interval
Quentin	Working	Individual work (math) Independently	10 s whole interval
Zach	Inappropriate comments	Group instruction or individual work (language arts)	Frequency
Morgan	End of the day routine	Packing up and leaving school	Task Analysis

PROCEDURE

Implementation Training and Support

Pre-service and in-service teachers, as well as the paraprofessional, were trained to implement the Social Stories intervention by the author. First, teachers were given a reference sheet describing the steps of the procedure and the prompts that may have been necessary during the intervention (see Appendix H). Then the teachers practiced the intervention with the author role playing as the student. Immediate feedback was given to teachers as they went through the steps of the intervention. Mastery was set at 100% of steps successfully completed during one session and was met by all teachers before they were allowed to begin the intervention with students. Throughout the study, ongoing support was provided to the teachers. Observations of the teachers' implementation were conducted periodically and feedback was given at the end of each session. Teachers were informed of which steps they implemented correctly and incorrectly. Praise was given to teachers at the conclusion of the feedback session.

Immediate versus Delayed Classroom Probes

For David, Lloyd, and Quentin, two conditions were present during the intervention phase. Following each Social Stories intervention session, data collection observation sessions were conducted either immediately or after a time delay. In the Immediate condition, participants were observed in their general education classroom following completion of the Social Stories session. In the Delay condition, a time gap of several hours was present between Social Stories sessions and observation sessions. For David, the time delay was approximately 4.5 hr and Lloyd's time delay was approximately 3.5 hr. Because Quentin's observation period occurred early in the school

day, his Social Story sessions in the Delay condition were conducted at the end of the previous school day. As such, the time delay for Quentin was approximately 18 hr.

Experimental Design

The current study utilized a multiple baseline across participants design. In this design, data were collected on participants' behaviors prior to and during the Social Stories intervention. Treatment was introduced in a staggered fashion over time across participants. All participants began their respective baseline phase at similar times. The first participant began the intervention phase after at least 3 baseline sessions were completed; the participant's behavior during baseline had to occur at a stable rate or indicate a trend in the opposite direction of the intended treatment effect. The next participant began intervention at least 3 sessions after the previous participant began intervention, given their baseline data met the same criteria as participant 1. Likewise, the third participant started intervention at least 3 sessions following the start of participant 2's intervention phase, also meeting the same baseline criteria as the others. For this study, two sets of three-person multiple baselines were implemented. The multiple baseline set for David, Lloyd, and Quentin also used multi-element treatment design in which the Immediate and Delay conditions were presented to the participants in an alternating fashion.

Peer Comparison Probes

Peer comparison probes were conducted and the behavior of classmates without disabilities was measured. For each participant, three exemplary classmates were identified by the general education teacher. On separate occasions, these peers were observed on the target behavior that coincided to the participant with ASD in their class (e.g., data was collected on David's classmates' appropriate sitting). For all participants except Morgan, the same operational definitions of behavior were used for peers and the

corresponding participants with ASD. The task analysis created for Morgan was adjusted to fit the end of the day routine of his peers; the two task analyses were identical except for the removal of 2 items on the peer task analysis (*place behavior chart in planner* and *set schedule*). For all participants, observation session conditions were identical to those of the participants with ASD. Each peer was observed once and three peer comparison probes were conducted for each participant.

Baseline Phase

During baseline sessions, participants did not receive the Social Stories intervention. The participants' teachers and paraprofessionals continued to use instructional and behavior management techniques (e.g., prompts, praise) already in place. Participants were observed in their general education classrooms and data were collected on target behaviors. Researchers did not interact with the participants during this phase.

Social Stories Intervention Sessions

Pre-service teachers implemented the Social Stories intervention with each individual student once per day at a predetermined time. The stories were presented on desktop computers in the participants' resource classrooms, except Morgan, who read his bound Social Story on a bench outside of his general education classroom. The teacher informed the participant that it was time to read their story, told the student to sit at the computer, and began the PowerPoint presentation. The participant was then allowed to read the story aloud, silently, or partnered with the teacher (e.g., the teacher and participant took turns reading sentences). If the participant chose to read the story aloud, the teacher followed along and ensured that the student read each sentence correctly. If the participant skipped any words, made errors, or was unintelligible, the teacher prompted the participant to re-read the sentence. If the participant chose to read silently,

they were allowed to move through the story at their own pace. All participants were allowed to use the computer mouse or keyboard to manually progress through the slides of the presentation, although the teachers prompted participants to return to a skipped slide. Morgan received the same instructions and prompts as the other participants for reading his Social Story, although his instructions revolved around his paper Social Story rather than a computer-based story.

Following the Social Stories presentation, teachers asked three comprehension questions about the Social Story. A pool of 6-8 questions was created for each participant and teachers randomly chose questions on any given day. If the participant answered a question correctly, they were given positive reinforcement in the form of praise and the teacher asked the next question. If the participant answered incorrectly or did not attempt to answer, the teacher prompted the participant to re-read the sentence or sentences in the story that corresponded to the question. After the participant read the section, the teacher reiterated the correct answer and moved to the next question. Once all 3 questions had been asked and answered, the participant returned to their general education classroom. Data collection on target behaviors continued in the same manner as baseline.

INTEROBSERVER AGREEMENT

Interobserver agreement (IOA) data were collected by doctoral students who had experience working with students with moderate to severe disabilities. All observers were trained on data collection techniques using videotape vignettes of behavior and had to record at 80% correct or better prior to *in situ* data collection. Definitions of agreement varied based on data collection method. For participants whose behavior was measured using an interval system (David, Lloyd, Quentin), agreement was defined as agreement between both observers that the behavior occurred or did not occur on an interval-by-interval basis. Similarly, agreement for Morgan's target behavior (measured using a task

analysis) was defined as agreement between observers that the behavior did or did not occur on a step-by-step basis. For the two participants whose target behaviors were recorded using a frequency measure (Zach and Alisa), agreement was defined as the total number of agreements that the behavior occurred. IOA was calculated using the following formula:

$$\frac{\text{Interobserver Agreement}}{\text{Agreement}} = \frac{\text{Agreements}}{\text{Agreements} + \text{Disagreements}} \times 100$$

The mean IOA was 96% (range = 80%-100%) and was collected over 34% of sessions.

TREATMENT FIDELITY

Treatment fidelity was measured on 42% of Social Stories intervention sessions. As shown in Appendix I, a checklist was created that listed the steps of the intervention (i.e., teacher indicates that it is time to read Social Story, participant and teacher sit in front of the computer, participant reads the Social Story, teacher prompts student to make corrections, teacher asks comprehension questions, instructor provides corrective feedback as needed, teacher praises student for correct answers). During treatment fidelity observations, the observer marked the checklist if the instructor completed each step satisfactorily. The author, doctoral students, and a special education teacher acted as observers. All observers were trained to collect data at 100% prior to the study through role plays of the author implementing the treatment. Treatment fidelity was calculated by dividing the number of correct steps completed by the total number of steps required and multiplied by 100 to formulate a percentage.

SOCIAL VALIDITY

Social validity questionnaires were sent to in-service and pre-service teachers who were involved with this study. Respondents answered questions on a 5-point scale. The questions addressed issues such as ease of implementation, importance of target behaviors, usefulness of the intervention, and willingness to use the intervention in the future (see Appendix J).

CHAPTER 4

RESULTS

In this chapter, the results of the study are described. First, the performance of participants with ASD on the dependent measure is described. Next, the results of the peer comparison data collection are discussed. The following section provides the results of participants' answers to comprehension questions. Finally, the treatment fidelity results of the pre-service teachers are presented as well as social validity results.

PARTICIPANTS WITH AUTISM SPECTRUM DISORDERS

As shown in Figure 1, David showed low rates of appropriate sitting behavior during 4 of 5 sessions in baseline. Upon introduction of the Social Stories intervention, David's behavior immediately improved during the Immediate condition. However, under the multi-element design, the next data point (representing the Delay condition) shows a lower rate of performance of the target behavior. This differentiation, in which performance is better in the Immediate condition, is maintained over the next 4 data points of each condition. On the 9th session, David's performance in the Delay condition surpasses his performance in the Immediate condition. Although there is improvement up to almost 100% correct responding during the Immediate condition (session 22), David performs at a higher rate during the Delay condition toward the end of the intervention phase.

Lloyd showed variable responding during baseline. His average performance during baseline was 29% correct intervals with a range of 8% to 51%. Introduction of the intervention indicated moderate improvement in attending. Although the first two data points of the intervention phase show that Lloyd responded at a higher rate than during the Delay condition, his mean performance in each condition is roughly equal. In the

Immediate condition, Lloyd's mean percentage of correct intervals was 40%; in the Delay condition, his mean performance was 43%. Lloyd's average rate of performance during the intervention phase as a whole (Immediate and Delay conditions combined) was 41% with a range of 25% to 62%.

Quentin also showed variable rates of responding during the baseline phase, as all but one data point occurred below 50% correct responding (M=29%, range=13%-80%). During the intervention phase, all but one data point are below 50% correct responding (M=36%, range=26%-67%). During the Delay condition, however, Quentin shows improved responding consistently above 50% correct (M=57%, range=51%-70%).

Zach's performance during baseline indicated a variable level of inappropriate comments and vocalizations, with 1 to 11 instances of the behavior occurring per session (see Figure 2). With the introduction of the Social Stories intervention, there was an initial decrease in inappropriate comments and vocalizations followed by a short period of very low levels (i.e., frequency occurrence of 1 instance) of the target behavior during sessions 15 through 17. Throughout the rest of the intervention phase, however, the behavior increased and remained variable with a range of 1-6 instances. Very high levels of the target behavior were also recorded during the intervention phase (e.g., 15 occurrences), although these sessions were notable due to major disruptions in Zach's daily routine. Specifically, Zach had a substitute teacher on 3 days (sessions 9, 10, and 24) and was pulled out of class for 50% or more of the school day on 2 days (sessions 18 and 19).

During baseline, Alisa's eye contact (reported as the percentage of opportunities in which the behavior was correctly performed) was highly variable, occurring with a range between 0% and 100% correct (M=58%). During the intervention phase, Alisa performed the target behavior at 100% correct during all sessions.

Morgan's performance of his end of the day routine was variable during baseline, starting at 55% correct with a drop in performance to 9% within 4 sessions. His performance made a slow improvement to 45% over the duration of the baseline phase, although a drop occurred just prior to implementation of the intervention. A quick improvement occurred at the start of the intervention phase and Morgan's correct performance reached 80% within 5 sessions.

PEER COMPARISON PROBES

Data from the peer comparison probes can be found in Figures 1 and 2. The three peers in David's class performed the target behavior, on average, during 92% of intervals. This is comparable David's peak performance under both the Immediate and Delay conditions in the intervention phase (100% and 82%, respectively) as well as the average of his three best performances (M=88%). During the baseline phase for Lloyd, peer comparison data was at 64% while Lloyd's best performance during baseline was 51% and his best performance during intervention was 62%. During the intervention phase, however, both peer data points (50% and 39%) fell within Lloyd's correct performance range. For Quentin, peer performance was slightly higher than Quentin's best performance during baseline and intervention phases. The average peer performance was 82% and average of Quentin's top 3 data points was 72%. Peer data for Zach shows that inappropriate comments were not made by any of his peers during observation sessions. On average, Alisa's peers performed the target behavior (making eye contact) during 97% of opportunities. Finally, Morgan's peers performed the end-of-the-day routine with 100% correct performance on all three sessions.

Figure 1. Percentage of intervals with correct performance of target behaviors for David, Lloyd, and Quentin. Open triangles represent peer comparison data. In the intervention phase, closed circles represent the Immediate condition and closed squares represent the Delay condition.

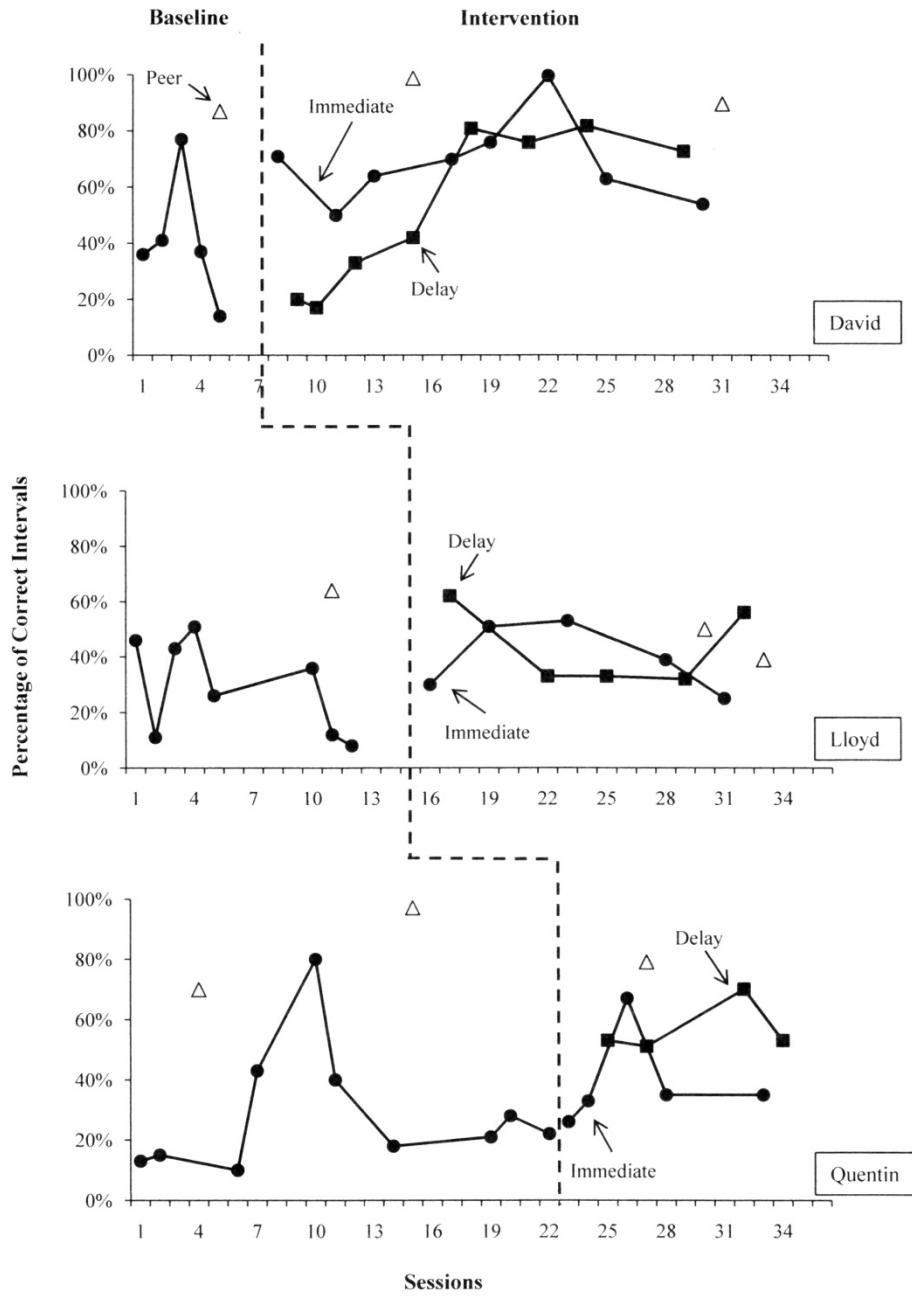
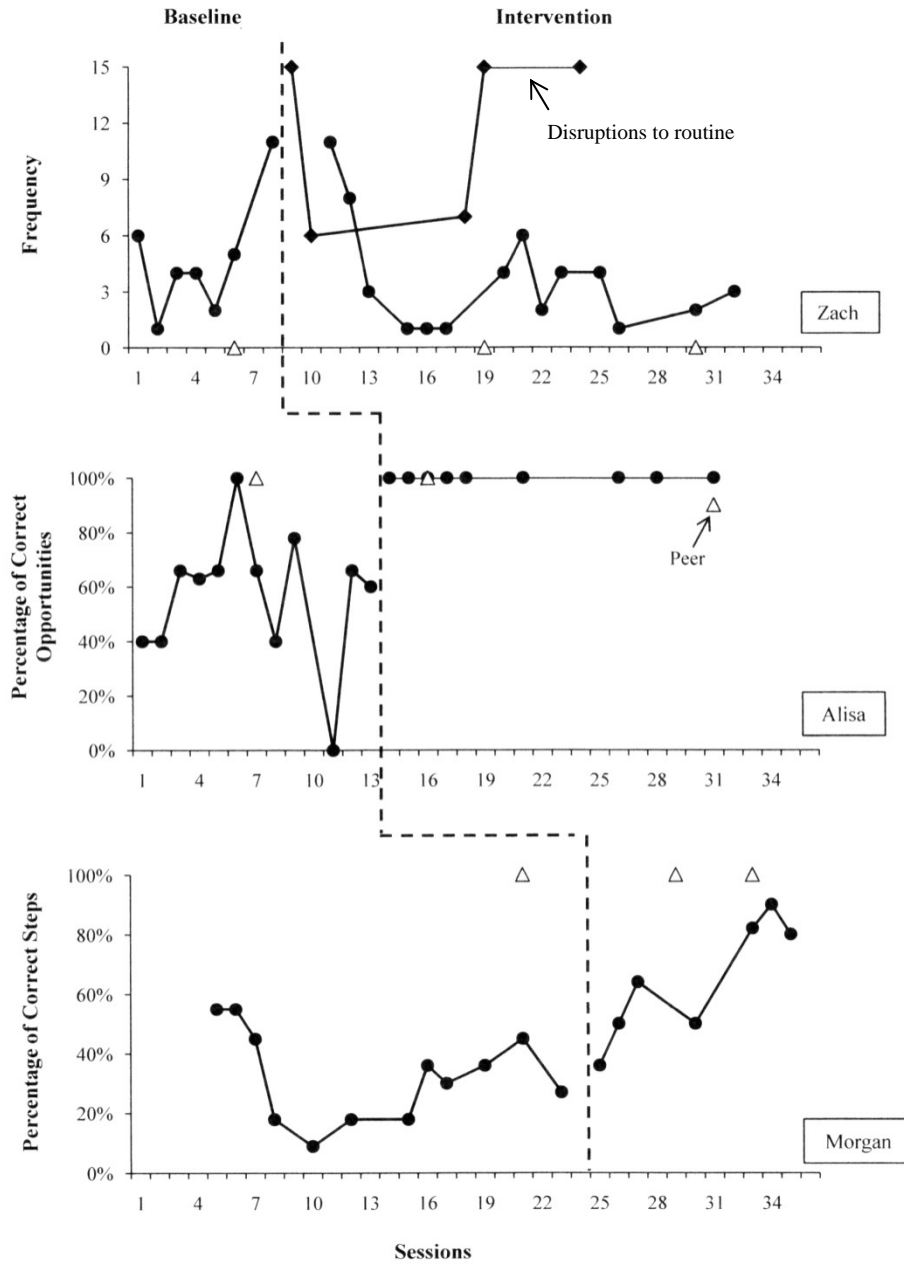


Figure 2. Frequency of Zach’s inappropriate comments, percentage of opportunities with eye contact by Alisa, and percentage of steps completed correctly by Morgan. Open triangles represent peer comparison data. Closed diamonds represent sessions in which Zach had substitute teachers or pull out assessments.



COMPREHENSION QUESTIONS

Participants answered comprehension questions with mean correct responding at 95%. Alisa's correct responding was the lowest of the group at 89%. The majority of her incorrect answers came during the first two intervention sessions when she did not attempt to answer and instead asked if she could look them up in the Social Story. Morgan answered 18 of 20 questions correctly (90%). All four other participants answered comprehension questions at 97% correct.

TREATMENT FIDELITY

For all treatment sessions in the study (i.e., sessions conducted by pre-service teachers, in-service teachers, and the researcher), mean treatment fidelity was 97% (range=82%-100%). Pre-service teachers conducted 84% of the Social Stories interventions for David, Lloyd, Quentin, Zach, and Alisa. Treatment fidelity data were collected on 36% of sessions conducted by Ms. Bell, with a mean of 98% (range=82%-100%). For Ms. Chandler, treatment fidelity was conducted of 60% of the intervention sessions that she conducted. Ms. Chandler's mean treatment fidelity was 94% (range=83%-100%). Finally, Ms. Denny's mean treatment fidelity was 93% (range=83%-100%), collected during 50% of her intervention sessions.

SOCIAL VALIDITY

Social validity questionnaires were returned by two pre-service teachers, two special education teachers, and three general education teachers. The mean response rating was 4.57 (range=2-5, SD=0.70). Table 5 lists the mean scores and standard deviations of all questions on the social validity questionnaire.

Table 5. Mean Scores and Standard Deviations of Questions on the Social Validity Questionnaire.

Question	Mean Score	Standard Deviation
1	4.29	0.76
2	4.57	1.13
3	4.57	0.53
4	4.57	0.53
5*	5	0
5**	4.67	0.58

* Answered by pre-service and special education teachers only

** Answered by general education teachers only

CHAPTER 5

DISCUSSION AND CONCLUDING COMMENTS

This study evaluated the effectiveness of a Social Stories intervention on the behaviors of six students with autism spectrum disorders. Participants and target behaviors were chosen by special education teachers at three primary schools. Five pre-service teachers who were enrolled in a special education certification program at a 4-year university were trained to implement the intervention for five students in the 2nd or 3rd grade. Additionally, a paraprofessional was trained to implement the treatment for a 4th grade student. The effect of a time delay between reading the Social Stories and performance of target behaviors was examined for 3 of 6 participants in this study (David, Lloyd, and Quentin). Results (as depicted in Figure 1) show that there was improved performance in the Immediate condition for one participant, no differentiation between conditions for the second participant, and better performance in the Delay condition for the third participant. Results for the remaining three participants (Figure 2) indicate a treatment effect for two participants. Treatment fidelity data indicate that all three pre-service teachers accurately implemented the Social Stories intervention.

EFFECTIVENESS OF THE SOCIAL STORIES INTERVENTION

Overall, the data of the current study indicate mixed results. After an initial learning phase at the start of the intervention, David showed high, stable rates of the target behavior throughout the study. Similarly, Morgan showed a learning trend in his data at the start of the intervention phase which led to performance of his target routine at 80% or better. Alisa showed marked improvement over her highly variable performance during baseline, with consistent 100% responding during all sessions of the intervention

phase. Based on the results of these three participants, it can be determined with a high degree of confidence that Social Stories are an effective intervention.

Lloyd and Quentin showed modest, if any, improvement with the introduction of the Social Stories intervention. Lloyd's performance in the intervention phase did not improve beyond the levels of behavior during baseline; however, some of the variability in his responding was diminished. That is, while his performance ranged from 8% to 51% intervals correct throughout the intervention phase, attending during the intervention phase did not drop below 20% intervals correct as it did in baseline. The range of correct intervals during all of Lloyd's intervention sessions was 25% to 60%. The improvement in Lloyd's target behavior is related to consistency of responding rather than absolute increases in level of responding. Although Quentin's target behavior does not show much change over baseline in the Delay condition, there is marked improvement in the Immediate condition. Social Stories appeared to have some impact on the behaviors of Lloyd and Quentin, although in the case of Quentin, this impact may only be related to particular circumstances (i.e., time delay between reading the Social Story and performance of the target behavior). The results of Lloyd and Quentin indicate that Social Stories can be judged as an effective intervention with a low level of confidence.

There did not appear to be an intervention effect for Zach. Not only did the target behavior remain at comparable levels between baseline and intervention, but it appears to worsen during the intervention phase. However, the instances in which high frequencies of inappropriate comments were observed were under atypical circumstances, such as the presence of substitute teachers and being pulled out of class for assessment. Regardless of these factors, the Social Stories intervention did not seem to be an effective treatment for Zach's target behavior.

IMMEDIATE VS. DELAY CONDITIONS

The results of the comparison between the Immediate and Delay conditions are inconclusive. For David, differential responding at the start of the intervention phase indicated that there was improved responding during the Immediate condition relative to the Delay condition. This improvement is reflected in the fact that there are mirroring trends in both conditions, with a drop in responding between the first and second sessions of each respective condition, followed by an increase during the third, fourth, and fifth sessions of each condition. The differentiation is lost, though, possibly indicating that a learning effect had taken place. Following this learning effect, David's behavior occurred at high rates regardless of time delay condition. Interestingly, the final four sessions of the Delay condition indicate a high and relatively stable rate of behavior, whereas the final four sessions of the Immediate condition show variable rates of responding. Further, the final two data points of each condition show parallel drops in performance, but with the Delay condition showing an advantage over the Immediate condition. It should be noted, though, that David's performance during the entirety of the Immediate condition is relatively stable, with the exception of the session in which he performed the target behavior in 100% of intervals.

For Lloyd, the results do not indicate an advantage of one condition over the other. At different points during the intervention, each condition showed improved responding over the other. The inverse relationship between the data paths makes it very difficult to come to a conclusion regarding the time delay conditions. Overall, though, performance rates averaged out to equal proportions for both of conditions. Since there are a limited number of data points per condition, it is possible that differentiation may be hidden by the relatively small amount of data that was collected. Continued data collection may have shown differentiation between the conditions.

Quentin's results show a possible advantage of the Delay condition over the Immediate condition. His performance in all four Delay sessions shows higher rates of responding over 4 of the 5 sessions of the Immediate condition. While this shows a likely advantage of the Delay condition, it should be noted that there is one session in the Immediate condition that shows a nearly equal and high level of responding to the Delay condition. While judgments on the relative effectiveness of one condition over the other should be based on overall patterns of responding rather than comparison of two data points, consideration should be taken as to what could cause differential responding within a condition. And, as with Lloyd, data collection during the intervention phase was relatively brief and further observation of Quentin's behavior may have led to different results.

PEER PERFORMANCE

The results of the peer comparison probes also provide insight into the impact of the Social Stories intervention. For the three participants who showed the greatest improvement in target behaviors (David, Alisa, and Morgan), peer comparison data show that participants with autism performed at or near the level of exemplary students. While Alisa matched the near-perfect performance of her peers, the best performances of David and Morgan came close to the performance of their peers. Quentin's peak performance during the intervention phase also came close to his peers; it is notable that Quentin performed at a higher rate than two of the peer data points during his baseline phase. Finally, for Lloyd, peer data indicates that he performed the target behavior at levels similar to peers during the intervention phase, despite little improvement of his behavior that did not greatly exceed the range measured during baseline.

The peer comparison data highlights an important consideration for interventions for individuals with autism. The selection of target behaviors may oftentimes be subject to misconceptions on the part of adults within the individual's environment (e.g., teachers, therapists, caregivers). These decisions are based on adults' opinions that the individual is performing the target behavior at a particularly unsatisfactory level. The level of criterion for acceptable performance, though, may reflect a bias in favor of near-perfect performance rather than what is actually performed by others within the environment. In the case of Lloyd, it was determined prior to the study that his attending did not occur at an acceptable level within the classroom. Indeed, data collection during the baseline phase indicated that his behavior occurred at a rate well below what was measured with a classmate. However, further observations showed that Lloyd's performance, although modest, matched that of his peers. Therefore, when determining goals for individuals with disabilities, practitioners should seek to evaluate their expectations for the rate of acceptable behavior as well as the rate at which the behavior is performed by others in the environment. Clinical decisions should be made by taking both of these factors into account.

IMPLEMENTATION BY PRE-SERVICE TEACHERS

The results of this study show that pre-service teachers can be trained to implement specialized interventions for children with autism spectrum disorders. Individual training of pre-service teachers coupled with ongoing, direct feedback led to high fidelity of implementation of the Social Stories intervention. This supports previous work with pre-service teachers and paraprofessionals in which direct feedback was a core component for success (LeBlanc, Ricciardi, & Luiselli, 2005; Machalicek et al., 2009; Machalicek et al., in press; O'Reilly, Renzaglia, Hutchins, Koterba-Buss, 1992; O'Reilly,

Renzaglia, & Lee, 1994). In practical settings, however, there are some difficulties associated with implementing this model. The first problem relates to supervisor availability: supervisors may not be readily available to provide feedback each and every time a pre-service teacher utilizes an intervention. University-based supervisors cannot be present at the practicum site daily; likewise, in-service teacher supervisors may be occupied with other students at the time when an intervention is to be used in the classroom. The second problem relates to experience. In-service teachers will need to be trained in the specialized intervention of interest in order to provide accurate feedback. However, in-service teachers may not necessarily have the training required in order to be an adequate supervisor that provides intensive feedback (Scheuermann, Webber, Boutot, & Goodwin, 2007). One solution was investigated by Machalicek and colleagues, in which videoconferencing software and personal computers were used as a means of communication between a university-based supervisor and teachers at remote school settings. The results of the study showed that teachers were able to implement functional analysis techniques with fidelity while receiving ongoing feedback from a supervisor. While implementation of a videoconferencing supervision model may face challenges based on economic feasibility (e.g., purchasing new computers) and the lack of appropriate infrastructure (e.g., the presence of wireless internet access in public school classrooms), this model remains very promising as technology evolves and the availability of such technology increases.

CAUSES OF THE EFFECTS OF SOCIAL STORIES

There exists very little discussion on what causes Social Stories to lead to behavior change for individuals with autism. First, a parallel with another treatment method for individuals with autism should be discussed. Social Stories seems to closely

resemble an intervention method known as priming (Wilde, Koegel, & Koegel, 1992). Priming is a technique in which an individual is exposed to a target situation prior to the activity. Very little demand is placed on the individual during the priming session and reinforcement is readily available. Like Social Stories, research on priming found that this method is useful for teaching social and academic skills to individuals with autism, as well as decreasing challenging behavior (Koegel, Koegel, Frea, & Green-Hopkins, 2003; Sawyer, Luiselli, Ricciardi, & Gower, 2005; Zanolli, Daggett, & Adams, 1996). Although no research has been conducted to determine the reasons for positive outcomes from Social Stories interventions, it is possible that the effectiveness of Social Stories comes from modeling or practice that occurs when the individual is exposed to a particular situation through text or pictures. Similarly, the success of priming may be due to modeling or practice that occurs during priming sessions although this has not been investigated by researchers. It is possible that the same unidentified mechanism that drives priming also drives Social Stories, which accounts for improved behavior reported in the literature.

Identification of reinforcement may be another key component of Social Stories. Each Social Story should address important reinforcers that are available as natural or contrived consequences for the targeted behavior. For example, Morgan's story discussed the consequences for timely completion of his end of the day routine: going home, getting a snack, and playing with his dog. These may have been highly reinforcing activities for Morgan, which in turn motivated him to pack up quickly at the end of the school day. Likewise, for Quentin, the mention of a favored activity within his story (getting to read a book of his choice) may have motivated him to do his work in class. Difficulty in identifying and addressing the salient source of reinforcement for Zach may explain the lack of intervention effect seen in his results. While Zach's Social Story

addressed the importance of being quiet based on the effects his behavior had on his classmates (e.g., they couldn't focus on their work if he talked), the story failed to take into account other possible sources of reinforcement. It is possible that Zach's behavior was maintained by attention from peers or the teacher; yet another source of reinforcement could have been automatic reinforcement brought upon by stimulation of the vocal cords or other physiological processes. These sources of reinforcement, though, are problematic because they aren't easily addressed through Social Stories. That is, the format of a Social Story does not allow for the alteration of others' behaviors (e.g., teaching peers to ignore Zach) or to convince an individual that they do not find an activity to be reinforcing when, in actuality, they do (e.g., "talking out is not fun for me").

Another possible explanation of the effect of Social Stories could be concrete interpretation or adherence to rules, which are two characteristics often displayed by individuals with autism spectrum disorders (Jordan, 1993). The Social Stories were written in a manner suggested by Gray (1993), in which the use of rigid language is avoided, and terms such as "sometimes" are utilized to indicate irregularity or possibility within the target context. For example, instead of stating "the teacher will ask students questions," a Social Story might state, "sometimes the teacher asks questions." The use of flexible language also applies to description of behaviors within the Social Story. A story might state "I should try to raise my hand" or "I can try to remember to raise my hand" in order to avoid the appearance of commanding the student to engage in a behavior. However, it is possible that despite the use of flexible language within the story, participants interpreted the stories concretely or viewed the stories as rules that should be followed as closely as possible. This may have been the case with Alisa. For example, one day Alisa's teacher was giving instructions to the class but Alisa was not attending. Angie's special education teacher happened to be in the room and prompted Alisa to pay

attention. Alisa quickly responded, “Look at my friends’ eyes,” which was paraphrased from her Social Story. The original sentence was “When I answer [my classmates], I should try to look at their eyes.” In this situation, Alisa showed that she remembered the central idea from the Social Story and even though the story used flexible language, she focused on the exact behavior she was to perform in a situation that closely resembled her target situation (i.e., somebody was talking and she was expected to listen).

SOCIAL VALIDITY

The teachers who responded to the social validity questionnaire in this study rated the intervention highly, indicating that Social Stories were a useful and practical method of teaching new skills to students. High ratings on the social validity measure are important for studies in which interventions are provided to students in school settings, because it reflects the willingness of teachers to use such interventions in the future. While it has been found that research support alone is not a compelling reason for special education teachers to adopt an intervention (Boardman, Arguelles, Vaughn, Hughes, & Klinger, 2005), the direct experience gained from the involvement of teachers may serve to increase the likelihood that these teachers will continue the use of Social Stores in their classrooms. High ratings on social acceptability are important because they may also influence other teachers to adopt intervention strategies reported in the literature.

However, the questionnaire used for this study was not standardized, and therefore has unknown reliability or validity. While the questionnaire addressed factors such as targeted behaviors, amount of behavior change, and implementation, these items may not necessarily reflect the core components of social validity itself. There are other issues related to teacher training in specialized interventions that may tackle acceptability more directly. For example, Machalicek (2008) notes social validity measures regarding

teacher training programs should include items regarding behavior change on the part of the teacher, the quality of the training procedures, and issues regarding the supervisor(s) during training. Further, it may be possible that the high ratings of social validity reported by teachers did not result from the perceived effectiveness of the Social Stories intervention, but rather positive feelings of competence associated with providing an intervention. Despite lack of improvement in the target behaviors of some of the participants, teachers involved with this study might have rated the intervention as socially acceptable due to their ability to accurately implement the intervention with positive feedback from the supervisor. Unfortunately, the nature of the social validity questions used in this study do not account for the specific reasons why respondents rate an intervention as acceptable. Future studies should seek to address the distinction between teachers' perceptions of effectiveness of the intervention versus proficiency and how the two affect social validity ratings.

IMPLICATIONS FOR PRACTICE

The current study found that pre-service teachers, including those with limited experience working one-to-one with students with developmental disabilities, were able to implement a specialized intervention for children with autism spectrum disorders in school settings. The pre-service teachers were provided training at the start of the study and they also received performance feedback on a regular basis. Treatment fidelity measures indicated that pre-service teachers were able to implement with a high degree of accuracy throughout their involvement in the study, and the results of a social validity measure indicated that they felt confident in their ability to implement Social Stories in the future. These promising results indicate that pre-service teacher training programs should consider the inclusion of specialized intervention techniques as a target for

training, and perhaps more importantly, ongoing support for the implementation of those techniques is a necessity. In the district in which the majority of the current study was conducted, autism specialists were employed at the district level to oversee the needs of students with autism spectrum disorders. The duties of the specialists include conducting functional behavior assessments, development of IEP goals, and consultation on interventions for students. The autism specialist is an ideal support position to provide the feedback needed by teachers who seek additional guidance and feedback on interventions for students with autism. By providing desired support, teachers are more likely to adopt interventions that are supported by empirical research (Boardman, Arguelles, Vaughn, Hughes, & Klinger, 2005).

LIMITATIONS

The current study has several limitations. First, there were a limited number of data points in each intervention condition for Lloyd (5 Immediate sessions and 5 Delay sessions) and Quentin (5 Immediate sessions and 4 Delay sessions). This amount of data established a preliminary trend and level of performance, but further data collection may have yielded useful results, including a clear differentiation of condition effects for Lloyd.

Another limitation is that there may possibly be other explanations for the change in behaviors observed in participants. Teachers and paraprofessionals were instructed to maintain their current behavior management plans during the course of the study. That is, they did not change how they dealt with appropriate or inappropriate behaviors regardless of the participant's status in the baseline or intervention phases. Changes in behavior between the two phases may be due to changes in teachers' behavior, such as increased prompts. The presence of paraprofessionals in the classroom may also act to alter a

behavior. Paraprofessionals were observed to frequently prompt students to perform a behavior as well as give feedback in the form of praise or reprimands. These paraprofessional behaviors could account for differing levels of behavior on the part of the participants. Likewise, the absence of a paraprofessional from the room on any given session could serve to increase the inappropriate behavior of participants as well as decrease appropriate behaviors.

Morgan's results may also be interpreted with some caution. Although the final session of the baseline condition showed a decrease in performance from the previous session, there seems to be an overall trend of improved responding starting at session 10. With the introduction of the Social Stories intervention, the upward trend in the data continued. It is notable, however, that the rate of correct responding improves significantly upon introduction of the intervention, with an increase of 30% within 3 sessions and 50% improved responding over the first 5 sessions of intervention. These data indicate that there is an intervention effect associated with Social Stories. To demonstrate increased experimental control, it would have been ideal to continue the baseline phase. Unfortunately, extending the baseline phase beyond its present length was not feasible due to the already lengthy period in which baseline data were collected as well as time constraints due to the approaching end of the school year. Further, extension of the baseline phase may not have been warranted, as the improvement during the baseline phase was modest when compared to the improvement seen during the intervention phase.

A limitation of the research design involves the multiple baseline conditions of the participants Zach, Alisa, and Morgan. Zach's target behavior was reported in a way that desirable clinical effect is in the downward direction, while the other two participants' therapeutic effect was in the upward direction. In general, researchers strive

to have consistent measures across baselines for all behaviors being observed within a study: one would expect to see behavior change in a uniform direction across all intervention phases in a multiple baseline design. For example, if three different behaviors were measured using a multiple baseline design (either across participants or within a single participant), therapeutic effect would be reflected in a consistent upward or downward trend on all three behaviors. The current study, however, uses varying measurement indices across participants, resulting in a graph with behaviors with differing directions of therapeutic effect. This leads to difficulty in interpretation of the results, as level of meaningful change across behaviors is not consistent. This difficulty regarding the measurement of behaviors in a multiple baseline design highlights the balance that must be struck in research scenarios involving teachers: more involvement of teachers in the design and implementation of an intervention may lead to less control on the part of researchers in regards to issues of soundness of methodology and experimental control. Conversely, less involvement of teachers is likely to lead to greater control by researchers. The involvement of teachers in school-based research is a vital factor that should not be overlooked; however, researchers need to be mindful that compromises made to increase teacher involvement may have adverse effects on the validity or replicability of their studies.

Another issue is that the amount of time delay during the Delay condition varied for David, Lloyd, and Quentin. While this was due to factors such as convenience in administering the intervention at the start of the school day (David and Lloyd) as well as the early period in which Quentin was observed in the general education classroom (which necessitated that the Social Story be read the day before), comparisons of the results across the three participants should be made with caution. While it is possible that differences across participants (i.e., the three Delay conditions) and within participants

(i.e., Immediate vs. Delay) were due to the amount of time that elapsed following the Social Stories intervention during the Delay condition, it may be that there is a particular length of time following exposure to a Social Story that will lead to optimal performance of the target behavior. Any extension of that time delay could act to suppress the effects of the Social Story, leading to lower rates of behavior during the Delay condition. Such may be the case for David: perhaps the length of time delay in the Delay condition (4.5 hr) was too great, causing his behavior to occur at lower rates relative to the Immediate condition.

On the other hand, it is also possible that reading a Social Story suppressed the target behavior in the Immediate condition. His behavior during the Immediate condition did not appear to improve over baseline levels, and despite the extended time delay for Quentin (18 hr), there appears to be improved responding in the Delay condition. Previous research on priming found a similar result. In a study by Sawyer, Luiselli, Ricciardi, and Gower (2005), verbal sharing was shown to increase following introduction of a treatment package that included priming. The behavior, though, decreased as the intervention phase continued. Upon removal of the priming component of the package, verbal sharing once again showed improvement. In the case of Morgan in the current study, it is possible that Social Stories had a similar suppressive effect on working independently; the extended time delay acted to ameliorate these suppressive effects and perhaps it was practice effects (i.e., prior exposure to Social Stories) or access to external reinforcement that led to higher levels of the behavior during the Delay condition.

This study was also limited in scope in that it did not include any data on generalization or maintenance of participants' behaviors. Generalization measures of behavior performance outside of the general education classroom were not collected.

Such information would be of interest because different environmental variables might be present (e.g., different peers, alternate contingencies for reinforcement) but the behavior expectations (e.g., sitting appropriately on the floor) may be consistent. Because of the specific nature of Social Stories, in which situational variables are explicitly described within the story, generalization does not seem to be an expected outcome through simple exposure to the intervention. On the same token, however, Social Stories are meant to be written with flexibility in mind (Gray & Garand, 1993). Gray (1995) states that words such as “usually” and “sometimes” should be used in stories to describe the environment and other situational variables (e.g., “Sometimes my teacher will call on me when I raise my hand. Other times she might call on my friends.”). These flexibility words are written in order to avoid literal interpretation of the text by children with autism. While there is a level of generality that is expected from terms such as “usually” or “sometimes,” they do not necessarily ensure that a student will be able to apply the content from a Social Story from the target environment to a different environment. For example, if a Social Story targeting patience while waiting in line addressed situational variables related to waiting in line at school, where mostly children are present, it is unclear how the story would change a student’s behavior while waiting in line at a community site, where adults and children might be present in line. The ability of Social Stories to aid in behavior change in situations not directly addressed in the stories themselves is a key variable that remains to be examined in great detail.

Further, maintenance of the target behaviors in this study was not assessed. The effectiveness of any treatment relies partially on its ability to continue the levels of behavior change brought about during intervention, once the intervention has been withdrawn. Without such information, the results of this study may be conservatively interpreted as “temporary” effects of Social Stories on behavior. The examination of

maintenance effects could yield interesting implications: for example, if Social Stories did not lead to post-intervention maintenance of behaviors, then it could be suggested that Social Stories be used for an extended period of time. However, this may be problematic for students to have to read the same story repeatedly; the story may become so familiar to a student that reading it becomes boring or even aversive. This may have been the case for David and Zach, both of whom were exposed to their respective stories for extended periods of time. Zach may have become bored or disinterested with his study, as evidenced by a session late in the intervention phase. In order to make the story more interesting, Zach sang the story to the pre-service teacher (with 100% accuracy). It was possible that repeated exposure to the Social Story was unpleasant for David. At the beginning of a Social Story session towards the middle of the intervention phase, he asked the instructor: “Do I have to read the story *again*?” Although David was known to ask such questions about numerous activities in which he participated, it was an indicator that he had some concerns about the numerous presentations of the story. However, there is no direct evidence to indicate that David’s feelings of displeasure regarding the Social Story came about gradually; it is also possible that he did not find it to be enjoyable at the very start of the intervention. If extended exposure to Social Stories does lead to unpleasant circumstances for students, teachers or interventionists must consider if changing the behavior of interest is worth the discomfort to the student.

Another aspect of maintenance that was not explored in the current study was the effect of withdrawing supervisor feedback on the ability of pre-service teachers to maintain high levels of treatment fidelity. Previous research has shown that removal of feedback leads to maintenance of pre-service teacher skills such as providing contingent reinforcement and the systematic use of prompts (O’Reilly, Renzaglia, Hutchins, & Korterba-Buss, 1992; O’Reilly, Renzaglia, & Lee, 1994). These same skills were core

components of the Social Stories intervention of the current study. Such maintenance effects are critical to the success of pre-service teachers, who will likely have little to no direct support in specialized interventions when they become in-service teachers. Therefore, the assessment of pre-service teachers and their ability to maintain high levels of treatment fidelity for months or even years following training are of interest to researchers and supervisors alike.

DIRECTIONS FOR FUTURE RESEARCH

Based on the findings of this study, there are several directions for future research to be mentioned. First, given the multiple sources of prompts and feedback available to students within the general education classroom (e.g., paraprofessionals, general education teachers, special education teachers), future intervention studies should include data on the delivery of prompts by adults in order to demonstrate experimental control over the dependent variable. Some researchers have done this in the past (Goldstein & Cisar, 1992). Such measures are necessary in studies in which participants are exposed to their typical classroom environments and it is not the goal of the research to change teacher or staff behavior. Further, such data collection would be prudent because it is possible that teachers and staff may inadvertently alter their own instructional behavior (e.g., increase or decrease rates of prompting, reinforcement, or reprimands) due to the presence of researchers or observers (Bond & Titus, 1983; Marlowe & Crowne, 1961).

While special education teachers were involved with the identification of participants, selection of target behaviors, and writing of the Social Stories in this study, future research conducted in school settings should seek to involve special education teachers and pre-service teachers with the development of the intervention itself, including the decision of how to use prompts and reinforcement during Social Stories

sessions. In this study, concern was raised regarding the amount of praise that was to be delivered, as set forth by the procedural guidelines. Specifically, one teacher commented that the amount of praise for successful reading and question answering seemed excessive. While the pre-service teachers were able to implement the intervention with a high degree of fidelity and the treatment was rated favorably in the social validity measure, it seems ideal to involve teachers when designing the methods to be used with students during research projects in order to create procedures that reflect teachers' current, favored practices and level of expertise. Through teacher involvement, it is hoped that the instructional practices created through researcher-teacher collaboration will have a greater likelihood of being adopted in the classroom.

Greater emphasis on generalization and maintenance is also desirable in future studies on Social Stories. There are several avenues of research that are possible. First, researchers could examine how learning a skill from a Social Story that is context-specific translates to behavior generalization in other, unrelated environments. Another research question relates to story composition and generalization. Since most stories are grounded in a specific situation within a child's environment, how would a story that doesn't mention specific situations or persons in the environment affect a behavior in several different settings? Research has yet to address this issue. Future research should also examine maintenance of behavior change. Long-term maintenance was only examined in one study (Chan & O'Reilly, 2008) and other studies should seek to determine the effects of Social Stories as students progress from one grade to the next, or into new classroom environments. Research studies should also seek to determine how many intervention sessions are necessary before the Social Stories can be discontinued. Many studies on Social Stories have examined short-term maintenance of behaviors, although most do not describe the criteria used to determine the removal of the

intervention (e.g., Crozier & Tincan, 2007; Dodd, Hupp, Jewell, & Krohn, 2008; Quilty, 2007). Two studies described the criteria used to decide when to begin fading the frequency of presentations of Social Stories (Delano & Snell, 2006; Ozdemir, 2008); the criteria were the implementation of at least 15 intervention sessions and at least 40% change in the rate of the target behavior between baseline and intervention over 4 of 6 sessions. However, such criteria are arbitrary and do not necessarily reflect the number of intervention sessions or the amount of behavior change that must occur before an intervention effect can be judged as acceptable. For example, in the current study, Lloyd did not show much improvement from baseline to intervention. However, Lloyd's behavior change was judged as educationally significant in the sense that the target behavior was consistently performed at levels similar to his peers. Therefore, reaching a pre-determined high level of behavior change does not seem to be a requisite condition for intervention fading or removal. Performance-based criteria for determining intervention withdrawal may not be necessary because in some cases, it may even be possible for behavior to continue to improve after removal of the Social Stories intervention. In such cases, other external factors, such as delivery of natural sources of reinforcement, may exert influence over the behavior in question and lead to post-intervention changes. Future research studies should determine how many intervention sessions are needed before the effects of Social Stories have reached a ceiling. A minimum number of intervention sessions (i.e., readings of the Social Story) may not necessarily be as high as 15; it is plausible that many fewer readings are necessary before the student can easily recall the main ideas of the story and there may exist a point where repeated exposure will not have an appreciable effect on behavior.

CONCLUDING COMMENTS

The current study contributes to the literature in several ways. First, it extends the research conducted on Social Stories in general education settings. Previously, a small number of studies examined the effects of Social Stories on behaviors that were observed in general education settings (Chan & O'Reilly, 2008; Crozier & Tincani, 2007). The addition of the results of this study to the literature base will enable researchers, parents, and professionals to make informed decisions about the usefulness of the Social Stories in inclusive school settings, where more and more students with autism are enrolled every year. Social Stories are one of the most widely used intervention strategies for children with autism spectrum disorder, but most of the research on the topic has examined behavior change in special education resource settings. While the results of such studies are very informative, it cannot necessarily be implied that the effects of the intervention will carry over to general education settings. Further, general education teachers may not have the requisite training or experience to support positive behavior change for students with ASD, whereas special education resource teachers are more likely to have received such training. These differences, couple with the possibility that students with disabilities may display different behavior profiles in different education environments (Lang et al., 2008), highlights the need to examine behavior change in all situations. The current study also adds to the literature by exploring how a time delay following Social Stories sessions differentially affects behavior. Previous studies on Social Stories have provided intervention immediately prior to the situation in which the dependent variable is observed. While Social Stories can be read in a very short amount of time, it may not be practical under some circumstances to read Social Stories just before placing a child into a problematic situation. This study also contributes to the literature on pre-service teacher training in autism and developmental disabilities, which thus far has rarely examined the

ability of student teachers to implement specialized intervention techniques. Such training seems to be a crucial component of student teaching, as new teachers are placed into classroom situations where there are diverse student needs and there is the expectation that a variety of instructional and assessment methods will be utilized.

In summary, the current study found that a computer-based Social Stories intervention implemented by pre-service teachers led to improvements in behavior for some students with autism spectrum disorders. Three of six participants showed improvements in target behaviors, two participants showed questionable improvement, while the sixth participant did not appear to benefit from Social Stories. An analysis of the effects of a time delay following intervention sessions was inconclusive, although there is evidence that performance of target behaviors may be better when there is no delay after reading a Social Story. Pre-service teachers implemented the intervention with a high degree of fidelity, with training occurring prior to the start of the study and direct feedback presented to them on an ongoing basis. Social validity measures indicate that the intervention was acceptable to in-service and pre-service teachers, and responses suggest that the teachers would be willing to implement the procedure with students in the future.

APPENDIX A: DAVID'S SOCIAL STORY

SITTING NICELY

My name is David. I am in the 2nd grade at Coldstone Elementary!

When I am in Mrs. Medina's class, we do many different activities and there are many places where I may sit.

Sometimes my friends and I listen to Ms. Medina give a lesson and we sit on the floor.

Other times, we have to do work at our desks.

Sometimes, the class watches a video and I can sit in my chair.

Ms. Medina and Mr. Terrence would like me and my friends to sit nicely when I am in class.

I can show Ms. Medina and Mr. Terrence that I am responsible and have self control by sitting nicely.

When I sit on the floor on the carpet, I should sit criss cross with my bottom on the floor. I should sit up straight. My hands should be together in my lap.

When I sit at my desk to do work, I can try to sit with my bottom in the seat as far back as I can. Both of my feet should be on the floor. My body should be close to my desk. I will sit up straight. I will use my hands to do work.

When I sit in my chair to watch a video, I can try to sit with my bottom in the seat as far back as I can. Both of my feet should be on the floor. I will sit up straight. My hands should be together in my lap.

When I sit nicely, Ms. Medina might notice and she will be happy. Sitting nicely makes Mr. Terrence happy, too. They will tell Ms. Kory when I sit nicely and she will be proud of me.

APPENDIX B: ALISA'S SOCIAL STORY

LOOKING AT MY FRIENDS' EYES

I am Alisa. I am in 2nd grade at Coldstone Elementary. Ms. Medina is my teacher.

During tea time, I like to play games with my friends.

We take turns when we play games. We talk to each other a lot, too.

When friends talk to each other, they look at each others' eyes to show they are listening.

My friends talk to me while we play games. When I answer them, I should try to look at their eyes.

Looking at my friends' eyes shows that I am a good listener and lets Ms. Medina and Mr. Terrence know that I can make good decisions.

Ms. Medina and Mr. Terrence might tell Ms. Kory when I do a good job looking at my friends' eyes. Ms. Kory will be so happy!

APPENDIX C: LLOYD'S SOCIAL STORY

PAYING ATTENTION TO MS. ELLA

My name is Lloyd. I am in 3rd Grade at Coldstone Elementary School. My teacher is Ms. Ella.

When Ms. Ella begins talking to the class, it is time to pay attention.

Some children may want to keep talking to their friends, but it is time to stop talking.

When my friends hear Ms. Ella speaking, they should show her that they are paying attention. There are many ways to show attention.

When my friends sit on the floor, they sit criss cross applesauce and sit up straight.

When my friends sit in a chair at their desks, they sit with their feet on the floor and their bottoms in the seat. They turn their bodies and chairs to face Ms. Ella.

Their hands are quiet and shouldn't be playing with anything.

My friends look at Ms. Ella when she speaks and try hard to listen to her.

Ms. Ella will be happy to see all the children being quiet, sitting up straight, looking, and listening.

When Ms. Ella is speaking, I can try to show her that I am paying attention. My body should be facing Ms. Ella, my hands are quiet, and I will try to look at Ms. Ella.

Ms. Ella will tell Ms. Kory when I do a good job of paying attention. Ms. Kory will be happy, too!

APPENDIX D: ZACH'S SOCIAL STORY

TALKING IN CLASS

My name is Zach. I am in the second grade in Mrs. Pelly's class. Second grade is lots of fun! We learn new things everyday.

Mrs. Pelly stands at the front of the class to teach us new things. It is important for me to listen to Mrs. Pelly when she is speaking. It is important to be quiet so I hear what Mrs. Pelly says.

There are other kids in my class. If I am quiet in class they can hear Mrs. Pelly and they can finish their work. If I have something to say I can wait until Mrs. Pelly tells the class it is O.K. to talk and then I can raise my hand.

There are other kids in my class. If I am quiet in class they can hear Mrs. Pelly and they can finish their work. If I have something to say I can wait until Mrs. Pelly tells the class it is O.K. to talk and then I can raise my hand.

When I am talking in class my friends cannot do their work. They are unhappy. They come to school to listen and learn.

If I have a question about my work I can raise my hand and ask for help. I wait for Mrs. Pelly to come to me before I start to talk. I only talk about my work or Mrs. Pelly's lesson.

When I am quiet and do my work everyone can learn! If I want to talk about other things I can wait for recess or lunch to talk to my friends.

When I am quiet in class, Mrs. Pelly is very happy. My friends will be happy, too!

APPENDIX E: QUENTIN' SOCIAL STORY

DOING MY WORK

My name is Quentin. I am in the 3rd grade at Barnhill. My teacher's name is Mrs. Bond.

3rd graders do a lot of work. When I am in class it is important that I do my work by myself.

When I am working I have to stay in my seat and look at my papers. My friends are also working so it is important that I do my own work.

If I am asking my friends for help and making noise it is hard for them to finish their work.

Finishing my work is very important. Mrs. Bond and Ms. Shana look unhappy when I don't do my work.

When I have work to do I look at my work and try hard to do my work by myself. Before I ask for help, I might do my best to figure the problem out by myself.

If I am finished I can raise my so my teacher can check my work.

If I have finished my work by myself and did a good job I might be able to find a book to read.

When I do my best I am proud of my work. Ms. Shana and Mrs. Bond are very happy!

APPENDIX F: MORGAN'S SOCIAL STORY

PACKING UP

Every day, all the kids pack up their things to go home. I need to pack up to go home, too. Ms. Conn will tell the class when it is time to pack up. That's how I know to start packing.

Sometimes we might pack up and go to the library, an assembly, or another activity, then leave for home. Other times we might pack up but not have an extra activity.

If I get ready and pack up on time, I get to leave the room with my class and go home. There are a lot of great things at home. I can see my mom, play, and eat a snack. I also get to see Ollie!

I should try to get ready and pack up quickly and independently. Ms. Conn will tell the class to put their chairs up. When my classmates put up their chairs, then I can, too.

After my chair is up and my bin is on the desk, I should stand at my desk and Ms. Conn will call me to go outside.

Ms. Summers also doesn't like having to bug me to pack quickly. My mom and Ms. Summers like it when I leave on time with the rest of the class. It's great to get out of school!

**APPENDIX G: MORGAN'S TARGET BEHAVIORS AND
EXAMPLES OF ERRORS**

Behavior	Examples of Errors
<i>All behaviors</i>	<ul style="list-style-type: none"> • Martin does not commence behavior within 20 sec of completing the previous behavior • Martin does not complete the behavior or skips the behavior entirely and commences next behavior on list (except behaviors 1-4) • Martin stops for more than 2 sec while completing task • Martin receives prompt or reminder from Ms. Sanders or Mrs. Conn to initiate the behavior
1. Get out planner	<ul style="list-style-type: none"> • Does not retrieve planner within 20 sec of SD by Mrs. Conn
2. Place behavior chart in planner	<ul style="list-style-type: none"> • Martin whines or talks about behavior chart issues
3. Set picture schedule	
4. Clean up materials (pens, papers)	
5. Pack backpack	<ul style="list-style-type: none"> • Places planner in tub instead of backpack
6. Put chair on table	
7. Put tub on chair	
8. Wait by chair until called	<ul style="list-style-type: none"> • Martin leaves his desk before Mrs. Conn calls him • Mrs. Conn & all students leave the room before Martin is ready
9. Get lunch box	<ul style="list-style-type: none"> • Martin leaves room without lunch box • Mrs. Conn & all students leave the room before Martin is ready
10. Get in line	<ul style="list-style-type: none"> • Mrs. Conn & all students walk away before Martin is ready
11. Walk with students	<ul style="list-style-type: none"> • Mrs. Conn & all students walk away before Martin is ready

APPENDIX H: TEACHER TRAINING REFERENCE SHEET

Social Stories Intervention

Reading the Social Story

1. Instruct the student that it is time to read their Social Story
2. Have the student sit at the computer.
3. Sit beside the student.
4. Start the Power Point presentation of the student's Social Story.
5. Instruct the student to read the story out loud.
6. The student reads the Social Story one slide at a time. The student may use the keyboard or mouse to click through to the next slide.
 - a. If the student makes an error while reading or is unintelligible, prompt them to re-read the sentence.
 - b. If the student moves to the next slide after making an error, verbally prompt them to return to the previous slide or change the slide yourself.
 - c. Continue to the next sentence after they successfully read the slide.
7. When the student reaches the end of the slideshow, praise them.

Answering Comprehension Questions

1. Randomly select 3 questions from the question bank.
2. Tell the student that they are going to answer some questions about the story they just read.
3. Ask the question.
 - a. If the student answers correctly, praise them and move on to the next slide.
 - b. If the student answers incorrectly or does not attempt to answer, return to the slideshow and have them read the sentence that corresponds to the question. After they read the sentence, provide them with the correct answer. Move on to the next question.
4. When the student has completed all three questions, praise them and let them leave the teaching session.

APPENDIX I: TREATMENT FIDELITY WORKSHEET

Student initials: _____ Date: _____

Instructor: _____ Data taken by: _____

Key: + Instructor correctly completed step
 - Instructor did not complete step, incorrectly implemented step, or omitted step
 n/a Step was not needed during session

STEP OF INTERVENTION	RATING
Teacher calls student to the computer	
Teacher sits or stands next to the student	
Teacher instructs the student to read the story	
If student makes error(s) during reading, teacher prompts student to re-read the sentence	
If student skips a slide without reading it, teacher prompts student to return to skipped slide	
When student finishes reading story, positive social reinforcement (e.g., praise, high-fives) is delivered	
Teacher informs student that it is time to answer questions about the story	
Instructor asks 1st question about story	
If student answers question correctly, positive social reinforcement (e.g., praise, high-fives) is delivered	
If student answers question incorrectly or does not know the answer, teacher prompts student to (1) re-read the sentence related to the question and (2) provides the student with the correct answer	
Instructor asks 2nd question about story	
If student answers question correctly, positive social reinforcement (e.g., praise, high-fives) is delivered	
If student answers question incorrectly or does not know the answer, teacher prompts student to (1) re-read the sentence related to the question and (2) provides the student with the correct answer	
Instructor asks 3rd question about story	
If student answers question correctly, positive social reinforcement (e.g., praise, high-fives) is delivered	
If student answers question incorrectly or does not know the answer, teacher prompts student to (1) re-read the sentence related to the question and (2) provides the student with the correct answer	

Total Number of Steps Correct:
 Total Number of Steps Possible within Session:
 Treatment Fidelity percentage:

Please give feedback to instructor regarding accuracy of implementation.

APPENDIX J: SOCIAL VALIDITY QUESTIONS

Please type in your answers to the following questions using a 1 to 5 scale. You may base your answers on all of your students that participated in this study.

- 1: Strongly Disagree
- 2: Disagree
- 3: Neutral
4. Agree
5. Strongly Agree

___ The students have learned important skills.

___ Social stories have been an effective instructional method for teaching new skills.

___ Social stories are an appropriate method of instruction for the students given their abilities.

___ The use of social stories did not disrupt classroom functioning.

___ I feel confident that I have the ability to implement social stories as an instructional method in the future. (Pre-service teachers and special education teachers only)

___ I would consider using social stories as an instructional method in the future.
(General education teachers only)

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