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A COMPARISON OF SOCIAL STORIES AND SCRIPT FADING TO INCREASE
APPROPRIATE SOCIAL INTERACTIONS OF SECONDARY STUDENTS
WITH DISABILITIES WITH THEIR NON-DISABLED PEERS

by

Kristi Dudleston

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Special Education

Approved:

Robert Morgan
Major Professor

Tom Higbee
Committee Member

Kimberly Snow
Committee Member

James Barta
Committee Member

Byron R. Burnham
Dean of Graduate Studies

UTAH STATE UNIVERSITY
Logan, Utah

2008

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ABSTRACT

A Comparison of Social Stories and Script Fading to Increase Appropriate
Social Interactions of Secondary Students with Disabilities
with Their Non-Disabled Peers

by

Kristi Dudleston, Master of Science

Utah State University, 2008

Major Professor: Dr. Robert Morgan
Department: Special Education and Rehabilitation

The effects of social stories and script fading were investigated on increasing interactions of students with disabilities with their non-disabled peers. Social stories and script fading are treatments typically used for persons with autism spectrum disorder. This study examined effects on students with intellectual disabilities and multiple disabilities. In sequential treatments, social stories and “scripts” were read to students just prior to their lunch, so each could be assessed on their effectiveness in increasing initiations and responses in social situations in a lunch line with typical students. Social stories and script fading were analyzed in the context of a multiple baseline design across three participants, all 12- to 14-year-old youth with significant intellectual disabilities. The study was conducted in a cafeteria as participants and other students stood in line, selected lunch items, and sat at tables to eat lunch. Data on social interactions were initially collected on five students without disabilities to serve as a benchmark for study

participants. Results indicated that social stories were largely ineffective or minimally effective in increasing social interactions in the cafeteria for three participants. In contrast, the second treatment, scripts and script fading, was immediately and consistently effective in increasing social interactions. Generalization probes were consistent with intervention results. Results are discussed in terms of variables affecting efficacy of the two interventions and directions for future research.

(55 pages)

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Kristi J. Dudleston

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INTRODUCTION

Children with autism spectrum disorder (ASD) have difficulties referencing social skills when interacting with their peers. Typically, they withdraw because they have limited skills in interacting effectively in many social situations (Landa & Goldberg, 2005). Landa and Goldberg studied language, social, and executive functioning in school-aged children with high functioning ASD. They found deficits in executive functioning and theory of mind. Deficits in executive functioning means children with high-functioning ASD cannot plan what they will say in social situations and set shift (follow changes in conversation that require flexibility) in social situations, which includes joint attention and means they cannot follow new meanings in social interactions and typically interpret messages literally. Theory of mind is found to be deficient in individuals with high-functioning ASD, as they are unable to predict and understand others' behaviors, mental states and beliefs (Landa & Goldberg). (This also means that children with lower functioning ASD may have the same deficits, including less ability to process social awareness with their peers.) Joint attention is a skill, typically developed between ages 6 months to 18 months (Vismara & Lyons, 2007). Murdock, Cost, and Tieso (2007) define joint attention as, showing, pointing, shared social smiling or sharing a gaze between an object and a third person. Joint attention also includes playing in groups with attention on the same book, toys, and each other. Parallel play is not considered joint attention (Murdock et al.). The Landa and Goldberg study incorporated 19 participants with idiopathic autism, ages 7 to 17.5 years of age, and used a control group of 19 typically developing participants to study in comparison. The researchers discovered useful information about the deficits in children with HFA, as described as

theory of mind, and difficulty in planning tasks (the task may be planning what to do as well as what to say). The findings are applicable when using treatment to increase social initiations and interactions between children with autism and non-disabled peers (Landa & Goldberg).

Social stories can be used as an intervention to help improve social skills by teaching children how to follow conversation and meaning (Gray & Garand, 1993). Social stories are short stories written for the individual with current language used by peers, written on a level the child with ASD can understand. Social stories use words to suggest and direct appropriate social behavior, which includes interacting with peers. A social story may describe where children interact and give examples of what they might say, such as “What’s up?” (i.e., greetings), “My dog’s name is Buddy” (i.e., response to a question), “Kids like it when I say hi back.” Much of the earlier focus on using social stories was to decrease inappropriate behaviors, such as, screaming, hitting and, throwing. Because social stories are a fairly simple intervention for teachers and practitioners to use, they are typically created as a tool to teach appropriate social behaviors, such as, greeting peers and responding to greetings and comments in a positive, appropriate manner. Social stories are used to transfer the stimulus control from peers and teachers directly to the child with ASD, similar to other interventions like self-management and written scripts. Social stories focus on describing and explaining the cues in a specific social situation as well as teaching the appropriate response (Scattone, Tingstrom, & Wilczynski, 2006).

Scattone et al. (2006) examined the effects of social stories on increasing appropriate interactions of children with autism by “priming” the appropriate responses

in given social situations. By using social stories that were individually created for each participant, Scattone et al. read or had the students read their stories just prior to their free time activity. This intervention was evaluated for its effectiveness for each participant and used Gray's (1998) social story structure. Results indicated social stories increased appropriate initiated interactions and responses of children with ASD with peers.

This study followed many of the procedures used in the Scattone et al. (2006) study and extended the research literature on the effect of using social stories to improve social interactions of secondary students with varying disabilities with non-disabled peers. Script-fading procedures (see research on scripts and script fading) are replicated in part in the study by Krantz and McClannahan (1993).

LITERATURE REVIEW

All of the articles were found on the Utah State University web site. I began with the library home page and first selected Find Resources. I then highlighted Electronic Resources and Data Bases. I checked the box on EBSCOHost and Professional Development Collection and Psychology and Behavioral Sciences Collection. Key words were autism, social stories, peer relationships, social skills, and autism and reciprocity. The search yielded approximately 23 articles. Thirteen articles were eliminated because they were irrelevant to the purposes of this research. The remaining 10 articles are described below.

Research on Social Stories

The effectiveness of using social stories as interventions to increase social behavior in students with ASD was found in numerous studies. The most effective use of social stories suggested using stories to decrease disruptive behavior, for instance, in Crozier and Tincani (2005), a boy, aged 8, diagnosed with autism, was treated using social stories in an ABAC reversal design (A-baseline, B-social story treatment, A-return to baseline, C-social story with prompts). The study was conducted to see if social stories would decrease the disruptive behavior of talk-outs. The findings demonstrated social stories as an effective tool and two maintenance sessions at the end of the study reported zero talk-outs with and without prompts. (Prompts were verbal reminders to follow classroom rules and to refrain from disruptive behavior and decreased talk out behavior to the lowest average of 0.2 per 30-min observation session [Crozier & Tincani]).

In Agosta, Graetz, Mastropieri, and Scruggs (2004), Robert, a 6-year-old boy with autism, was treated with social stories to decrease screaming, yelling, humming and making other distracting noises during circle time (a natural setting). An ABCA (A-baseline, B-treatment 1, C-treatment 2, A-baseline) design was used with a reinforcement system (treatment 1 used candy and praise, treatment 2 used praise). Robert responded to the social stories as evidenced by decreased disruptive behavior in the classroom.

Adams, Gouvousis, VanLue, and Waldron (2004) used social stories to decrease four target behaviors of Peter, a seven-year-old boy with autism. Behaviors included crying, falling, screaming and hitting. A single case subject design was used. Not only did Peter's behaviors decrease but also more appropriate behaviors generalized to his school classroom, such as, the report by Peter's teacher that an increase in Peter's use of oral language to express his needs and concerns had occurred and, that he was able to "quietly" ask for help (Adams et al.). This finding is significant as it demonstrates that social stories can be used to decrease inappropriate behaviors and increase socially acceptable behavior.

Using social stories, researchers (Delano & Snell, 2006) observed that two out of three male students diagnosed with autism, ages 6, 6, and 9, made significant gains in social interactions with peers. Researchers demonstrated that these children made significant gains in social interactions which approximated behaviors of their non-disabled peers in general education classrooms. It was noted participants maintained increased levels of engagement over baseline on a maintenance check, but each student's performance was variable (prompts and reinforcers were not measured). Authors recommended empirical research with older, middle and high school students.

Ivey, Heflin, and Alberto (2004) investigated the effects of social stories on behaviors of students with ASD during transitions and unscheduled events. They found that certain social behaviors could be taught to students with ASD. Their study followed observable behaviors during novel events, such as, transitioning from one activity to another that is not in a typical routine. The participants in this study were three boys ranging in age from 5 yrs. 1 month to 7 yrs. 8 months. The study used a reversal ABAB design and found that two out of three participants demonstrated a significant increase in participation skills from social stories intervention. The findings were that social stories increase desired target behaviors by 15 – 30%. Two of the boys increased social behavior 30% above baseline levels in both phases of the treatment. Another participant had a 15% increase in the first phase of treatment and a 20% increase in the second phase of treatment. The results also demonstrated a by-product of extended child-parent communication. Parents reported that their children made comments about liking and disliking activities and discussed their insights and wishes with parents such as, “I want to read the books, Mommy.” and “I think the frogs are pretend.” (Ivey et al.)

Given results of research using social stories to increase desired social interactions, most of the studies focused on young, elementary or preschool aged children. Children entering secondary schools are pressured to interact effectively with their peers or face isolation (Calkins & Walker, 1990). Most of the studies investigate effects of social stories with children aged nine or younger. Delano and Snell (2006) suggested using social stories with older students in order to find which social skills would be most useful. Their study with young children demonstrated low rates of initiated requests and attention seeking behaviors, both behaviors they found to be critical

in developing social relationships. (Children entering junior high and high school are typically moving into years of beneficial social relationships because of future job prospects and competition in the job market.)

Scattone et al. (2006) examined the effects of social stories on the social interactions of three children with ASD ages 8 - 13. The study used a multiple baseline design across participants to investigate the effects of social stories to increase appropriate social behaviors for some children with ASD. The researchers used partial interval recording of appropriate social interaction. Following social story intervention data collection, researchers found increased skills (relatively small gains) in two of three participants, the most successful being Drew, a boy, age 13, with high functioning ASD. Drew did not initiate with peers and was observed with low rates of responding or initiating with others. Drew's mean percent of social interaction in baseline was 7%. With the treatment, Drew completed the study with a mean of 39%. Billy also responded well to social stories as his baseline mean was 13% and he increased in treatment with a mean of 28%. Steven was the least successful. His mean at baseline was 1% and he increased over the course of treatment to a mean of 4%. Two of the limitations were availability of peers supporting social interactions and potential problems with treatment integrity across phases of the research. The findings of this study are especially important as they demonstrate that older children can gain skills and abilities in initiating and responding to peers from social story intervention.

Soenksen and Alper (2006) examined the effects of social stories on making eye contact with peers and stating their names. The participant was a boy TJ, aged 5 diagnosed with Hyperlexia, a disability with similar symptoms to ASD. TJ was

introduced to social stories to teach him to look at peers' faces and say their names to gain attention. A multiple baseline design across settings (recess, choice time and math) was used. TJ increased his target behaviors across all three settings. Peers also increased interactions with TJ, which may have been associated with the implementation of social stories. The limitations of this study were lack of follow-up data or maintenance phases. Soenksen and Alper used Gray's 1995 guidelines, for constructing social stories.

Gray (2000) posited the effects of social stories may be related to how the story is constructed. Gray recommends a ratio of directive sentences to perspective and descriptive sentences of 1:2-5. Crozier and Tincani (2005) recommended a ratio of 3:5, and omitted the words *sometimes* or *usually*. (The words omitted are used to protect against the literal expectations of students with autism.)

Limitations of Existing Social Story Literature

One limitation of the previous studies was the omission of secondary student studies. The student's ages in existing research ranged from 5 to 13 years of age (there was one 13 year old, all others were between the ages of 5 and 9). Soenksen and Alper (2006) argue social stories are acceptable as a treatment for young children with ASD because story reading is age-appropriate and early intervention may result in social skill gains approximating those of same age peers. However, the absence of research on the effects of social stories with adolescents prevents generalizability to more complex social contexts. Social skills are critical targets for adolescents and reading of literature and other material to them is commonplace, therefore, the applicability of social stories interventions with older children was explored in this study. Social stories were also

examined with students with disabilities other than autism, whom have social deficits (Adams et al., 2004). While deficits in social skills are a definitive characteristic of ASD (Landa & Goldberg, 2005), they represent critical skills for all students in schools, recreation, and employment (Calkins & Walker, 1990; Westling & Fox, 2004).

Another limitation in the studies on social stories is the effects of reinforcement were not examined. Reinforcement can be a critical key when introducing new treatments to students with limited social skills. The studies on script fading included reinforcement as part of the treatment compared to a lack of reinforcement documentation and encouragement in social stories literature. Some of the social story studies mentioned using reinforcement but did not elaborate on its use or effectiveness. Other noted weaknesses were many of the studies only had one participant, treatment gains were relatively small and most studies dealt with behavior reduction rather than increasing social skills.

Research on Scripts and Script Fading

Script fading is another procedure that identifies problem areas in communication for children with ASD, and intervenes by concentrating on transferring stimulus control to children with ASD and on joint attention through the use of “scripts” written for the individual. Scripts are comprehensive sentences or phrases written to increase spontaneous language, typically for individuals with ASD, recorders can also be used. As learners hold and use scripted language to interact the scripted phrase or sentence is faded in steps, from end to beginning (Brown, Krantz, McClannahan, & Poulson, 2007). Several studies on script fading focused on increasing initiated interactions (Krantz &

McClannahan, 1993), promoting natural environment stimulus control of verbal interactions (Brown et al.) and using scripts and script fading to promote bids for joint attention (MacDuff, Ledo, McClannahan, & Krantz, 2007). The success of this intervention is evident in results demonstrating that four participants in the Krantz and McClannahan study were within range of sampled non-disabled youngsters. MacDuff et al. trained three male, preschool age children with ASD to identify stimuli they could share with others. Prompts were used as bids for joint attention when encountering stimuli, such as, a picture of a butterfly on the wall both the participant and the observer could see. Hallways were used as the setting and stimuli were placed within eye level of the participants. The observer would point to a stimulus and say, “see” to initiate a response of joint attention. All three participants made unscripted bids for joint attention in settings that were not associated with teaching, and they maintained bids for joint attention when rewards and prompts were absent. Maintenance levels remained relatively unchanged from teaching with unscripted bids for joint attention, without scripts and prompts (MacDuff et al.).

Script fading also promotes interaction independent of teacher prompts and encourages maintenance based on peer interaction. The term “spontaneity” was used to describe preferred outcomes in several studies reviewed by Brown et al. (2007). Three participants, ages 13, 9, and 7 participated in a multiple-baseline-design-across-settings. All three increased in interactions per minute across settings. The boys’ verbal interactions increased from near zero to a range of 2-13 interactions per minute. In this study scripted interactions fell away as unscripted interactions increased, including generalization to untrained stimuli (Brown et al.). Script fading is a procedure that

identifies current stimuli students can share with others. The researcher systematically eliminates words from the “script” allowing students to use unscripted communication, thus transferring controlled stimuli to spontaneous stimuli (Krantz & McClannahan, 1993).

Scripts can be faded depending on the levels of reading and verbal skills of the student. Students with low reading levels may have audio and/or pictures that fade. The scripts can be faded in stages for more advanced readers by removing the text. The first text removal covers the last words of the script. The second text removal would be the last two words of the script. Next, all but the first two words of the script are removed, and then, all but the first word is removed. The final text removal would reveal blank pages, then no page at all would be provided (McClannahan & Krantz, 2005).

Krantz and McClannahan (1993) used scripts with 10 statements and questions for 4 student’s ages, and 9 to 12 in three art activities in a multiple baseline design across participants with ASD. The scripts used current activities and activities the students had completed and reflected activities the students were planning. Data were taken on script use and unscripted sentences. As the students progressed through script fading, their initiated script responses decreased while unscripted initiations increased. That is participants demonstrated more independent initiated interactions compared to scripted phrases as their script faded to quotation marks. The scripts were reintroduced as initiated interactions dropped off in the first three generalization sessions. The reintroduction increased initiated interactions and participants’ peer initiations were at levels similar to those of non-disabled peers (Krantz & McClannahan).

PURPOSE

The purpose of this study was to examine the effects of social stories on social initiations and responses with three secondary students with disabilities in their educational environment. The independent variable, social stories, was applied to behaviors of initiating social interactions and responding to non-disabled peers. This study did not examine the effect of social stories with persons with ASD, exclusively, but did use social stories for children with varying disabilities who exhibited limitations in responding and initiating social exchanges with peers.

Given the relative ineffectiveness of social stories (see below), the research examined a second treatment: script fading. Therefore, a second purpose of this study was to compare effects of social stories to script fading with the same three participants. Additionally, this study performed generalization probes during the second treatment phase to determine whether script fading generalized into other social situations.

Research questions are as follows:

1. What is the effect of social stories in comparison to script fading on initiated interactions of participant's ages 13 to 14 years who have intellectual and multiple disabilities?
2. To what extent will the effects of script fading generalize to initiated interactions in a non-treatment setting (such as a self-contained classroom, general education classroom, or resource classroom with one to two peer tutors in attendance)?

METHOD

Introduction

The method section presents information about participants, setting, the target behaviors (initiations and response interactions) and response measurement, the research design, the experimental procedures, generalization, and maintenance procedures, interobserver agreement and treatment integrity.

Participants

Eight students participated in this study. The participants were junior high students between the ages of 12 and 14. Five of the students, two boys and three girls, were peers without disabilities for whom data were used as benchmarks for comparing percentage of social interactions of participants with disabilities. Male peers and female peers without disabilities were selected randomly from the population of students within the school. Peers without disabilities were selected based on appropriate social skills and signed, informed consent from their parents. The researcher and a student counselor with knowledge of students whose characteristics matched the above selection criteria nominated peers without disabilities.

Students with disabilities were nominated by the researcher based on observations of limited social interactions. The participants with disabilities had varying cognitive levels but all had been classified as exhibiting Severe Intellectually Disabilities according to Utah State Office of Education rules. These students received services based on goals and objectives from Individualized Education Programs and who also attended regular

education classes in a junior high school. To participate in this study, the students were observed to display low levels of initiating verbalizations or lack of responding to and acknowledging peers. Participants had high rates of attendance, and signed informed consent from their parents and were available throughout the social story/script fading study. To facilitate comprehension of social stories/script fading, participants had visual and auditory acuity in the normal range. Participants were those who could most benefit from social intervention practices and were not currently receiving social story or social script interventions. The participants are described below:

Gabby is a 13-year-old Caucasian female attending a self-contained classroom, resource classes and some regular education classes at a junior high school in a small Intermountain West town. According to the most recent psychological assessment, Gabby obtained a Full Scale Intellectual Quotient (FSIQ) score of 63 on the Wechsler Intelligence Scale for Children III and an Adaptive Behavior Composite Score of 53 on the Vineland-II Adaptive Behavior Scale. Gabby verbalizes in complete sentences in response to teacher cues, but rarely has been observed to initiate verbal interaction or make eye contact with non-disabled peers. Her teacher and staff report that Gabby does not trust or find peer interactions rewarding. She will twirl and talk to herself when faced with groups of non-disabled peers.

Mary is a 14-year-old Caucasian female attending a self-contained classroom, resource classes and some regular education classes at a junior high school in a small Intermountain West town. According to the most recent psychological assessment, Mary obtained an FSIQ score of 60 on the Wechsler Intelligence Scale for Children III and an Adaptive Behavior Composite Score of 63 on the Vineland-II Adaptive Behavior Scale.

Mary verbalizes in single words and simple sentences in response to teacher cues. She rarely initiates verbal interaction with her peers. With her brother, who attended the same school, Mary was observed to initiate verbal interaction and occasionally with other students with disabilities. Mary makes eye contact with teachers or peers but does not sustain it for more than 1-3 s. When presented with high demand tasks or non-preferred activities, Mary attempts to leave the classroom but does not verbalize her needs.

Gage is a 13-year-old Caucasian male attending a self-contained classroom and regular education classes with paraeducator support at a junior high school. According to the most recent psychological assessment, Gage obtained an FSIQ score of 44 on the Wechsler Intelligence Scale for Children III and an Adaptive Behavior Composite Score of 35 on the Vineland-II Adaptive Behavior Scale. Gage can verbalize in mostly single words in response to teacher cues. He initiates verbal interaction with adults and disabled students; however he rarely initiates and interacts with non-disabled peers. Gage will use inappropriate measures to gain adult attention. When presented with high demand academic tasks or non-preferred activities, Gage engages in loud vocal protests and will throw objects or physically aggress against others.

Setting

The primary setting was a lunch period in the school cafeteria. There are three scheduled 30 min lunch periods in the school cafeteria per day. Each participant ate lunch at the same time, every day. Social stories were read in a quiet, semi-secluded room immediately prior to lunch. Generalization probe data were collected in a non-

treatment setting, i.e., a self-contained classroom, resource classroom or general education classroom. The self-contained class included 1-2 peer tutors in attendance.

Target Behaviors

Appropriate social interactions will be defined as: physical, verbal, or gestural initiation to a non-disabled peer or response to a non-disabled peer (tapping a shoulder, high-five, peace sign, hand shake, handing object or receiving object from peer).

Appropriate social interaction will be scored according to whether either or both of the following activities is observed.

Initiation

Initiation is any behavior observed in proximity of another peer (non-disabled) that involves one or more of the following: verbal statements, vocal utterances, touching, or gestures. Initiations may also include eye contact. Examples of initiations include contacts, "I like your shirt," questions "What's up?" or a gesture/touch (e.g., tapping shoulder, rolling of eyes, giving peace sign, holding up hand for a hi-five) just to name a few.

Response

Response was defined as social behavior whose purpose is to sustain interaction with a non-disabled peer. Responses were a comment (e.g., "I doubt it," "oh hi"), question ("How do you know that?"), or a gesture/touch (e.g., head nod or shake, hand to mouth, returning a hi-five, smile, eye contact). Additionally, responses included vocal sounds such as laughing, sighing, snorting, or similar sounds. A response was scored if

the participant, during continued engagement with a non-disabled peer, demonstrated head movements, eye contact or verbal responses such as uh-huh, and comments or joint attention on an activity (such as building a puzzle, looking at a magazine).

Responses and initiations were not differentiated in observations and recording. The unit of measure was appropriate social interaction.

Response Measurement

The researcher, Kristi Dudleston, was the primary observer and data collector. There were three paraeducators who served as secondary data collectors for purposes of interobserver agreement.

The observers used partial-interval recording to record appropriate social interaction during baseline, treatment and generalization. Trained observers collected data during a 5-min period for each participant during their 30-min lunch period. Signal timers were used to cue primary and secondary observers and were set for 10-s intervals to observe, separated by a 2-s vibration which cued the observer to stop the observation, followed by 10 s to record the observation. Observer's recorded on the data sheet whether the appropriate social interaction occurred (+) or did not occur (-). If no peer without disabilities was within 5 m of the participant during an entire 10-s interval, the interval was scored Not Applicable (NA).

Data collection on peers without disabilities used partial interval recording. All social interactions of peers without disabilities was collected for 5 min during their 30-min lunch period. Signal timers were used to cue primary and secondary observers and were set for 10-s intervals to observe, separated by a 2-s vibration which cued the

observer to stop the observation, followed by 10 s to record the observation. Observers recorded whether social interaction occurred (+) or did not occur (-). Social interactions of peers without disabilities were any observable interaction as defined under “Target Behaviors.”

Kristi Dudleston, the researcher, analyzed all data. Baseline involved collection of percentage of intervals with appropriate social interaction during cafeteria periods. Treatment involved the same data collection, but with implementation of social stories (independent variable) immediately preceding lunch. Data in both phases were based on percentages of the 10 s intervals with social interaction. Percentage data for participants were compared to the range of appropriate social interaction displayed by participants without disabilities. Generalization probes began for each participant at least three sessions following implementation of script fading.

Research Design

A multiple-baseline design across participants (Kennedy, 2005) was used to assess the effects of social stories and script fading on appropriate social interactions. A baseline condition preceded the introduction of social stories for all participants. The study examined the effects of the intervention to determine the functional relationship between independent and dependent variables. A partial interval recording method was used to collect data on the participants’ behavior of appropriately initiating interactions and responding to non-disabled peers. Generalization probes were collected intermittently during script fading to demonstrate the effects of script fading on

increasing interactions in a non-treatment setting (i.e., the self-contained, resource, and general education classroom).

Experimental Procedures

Baseline

In the initial phase of the study, the observers collected data on social interactions in the lunch line and lunchroom. No formal social story or script-fading treatment was introduced to the participants. Baseline concluded when stable levels and no trends were apparent in data.

Treatment

The independent variable was the participant's individually created social story. The procedures for implementing the social stories were the same for all the participants. The social stories followed the general rules set up by Gray (1994, 2000) and Gray and Garand (1993) described previously. The social stories included descriptive sentences that answer "wh" questions for the participants, such as, "when" a situation occurs, "what" will describe an event, "why" and "who" is included in the situation. The stories included perspective sentences, which state how someone else feels, affirmative sentences which stress the directive in the social story, and directive sentences describing desired response "I will try" (Scattone et al., 2006). The social stories were used to provide information to the student on how to interact; however, they were not used to direct the child's behavior. The stories used the ratio of zero to one directive or control sentence to every two to five descriptive, perspective, or affirmative sentences. The ratio

is set up to assure and describe qualities, not to direct or control the student (Ivey et al., 2004).

The stories were written with a basic scenario for waiting in the lunch line and interacting through out lunch. The social stories were written for each individual based on each participant's reading and social skill levels and individual interests. Participants were tested for social stories comprehension and were guided through three questions regarding information from their individual story. The story was considered complete when the participant comprehended the story at 100%. Three predetermined questions were asked after the story was read one to three times to the participants to assess comprehension (Scattone et al., 2006).

Social Story Procedures

The stories consisted of 11-13 pages of text and were 20-point Arial font size. Each page included 3-6 sentences. The type was black on white background, cut out and glued to 8½ by 5½ black card stock. The stories were spiral bound and appeared in book style with a title page. The student's social story was read on a daily basis in a semi-secluded room with limited distractions 10 -15 min prior to lunchtime. Each story was read at least once. The stories were repeated if deemed necessary for some or all of the participants. Each participant had a story read to him or her with some details pertaining to that individual. Participants with reading skills were encouraged to read their own stories to the teacher or paraeducator. Reading of the story was the same throughout treatment.

The researcher or paraeducator read the story sitting beside and slightly behind the participant. The presenter read the story page by page without additional comments. The reader's voice tone remained consistent for most of the treatment phases. Participants were reinforced with praise for reading their own story and sections in the story were emphasized by increased tone of voice in story areas the student had not demonstrated.

Following baseline, the social stories were implemented sequentially for each participant. The procedures for reading the stories were the same for all phases across participants. Each participant began treatment after baseline appeared low and stable, at least three data points. Data was collected daily with all of the three participants.

The original plan was for treatment to continue until percentage data on appropriate social interactions for participants consistently occurred at a level similar to that of non-disabled peers. Since data using social stories did not increase social interactions script fading was introduced. Changes in treatment were recorded and included in the results.

Script Fading Procedures

The scripts followed suggestions by McClannahan and Krantz (2005). Scripts were 10 sentences, written with current topics, joint attention dialog and typical junior high sentence content. Scripts included sentences such as; (e.g. "I like your shirt," "I will eat _____ for lunch"), questions, ("What's for lunch?", "Do you have a pet?"). The scripts were 14 point, Arial font, black type on white paper, then cut out and glued to cream colored index cards. A hole was punched at the top left corner and secured with a round metal ring.

The participant's script was read on a daily basis during the treatment phase, in a quiet area with limited distractions 5-10 min prior to lunchtime. Each script was read at least once. The scripts were repeated if deemed necessary for some or all of the participants. Participants with reading skills were encouraged to read their own scripts to the teacher or para-educator. Reading of the script was the same throughout treatment.

The researcher or paraeducator read the script sitting beside and slightly behind the participant. The presenter read the story page by page and answered questions and/or addressed comments made by the participant. Participants were reinforced with praise for reading their own story and reminded of reinforcers for interacting with peers. The word "talk" was used to cue participants to use their scripts to talk to peers during lunch. If the participants were observed ignoring peers while waiting to get their food or at the lunch table sitting with peers, observers would cue the participant with the word "talk." The participants had received instruction to begin talking to peers when they heard this cue. The participants held the script in their hand while waiting in the lunch line and while getting their food. The participants then sat at a lunch table with their script.

The scripts were faded first by removing the last words. The second fade was to remove the last two words. Fade three was to remove all but the first two words next fade four removed all but the first word. Fades 5 and 6 were removal of all text, then removal of script, respectively. Procedures for fading were initiated per participant when they demonstrated effective interaction data.

Treatment with script fading began after social story data demonstrated low effects. Treatment continued until percentage data on appropriate social interactions fell within range of non-disabled participants. The script began fading for Gabby first, in

session 19. Mary followed in session 20 and Gage in session 21. Gabby was the only participant to experience all 6 steps of fading during data collection. Data collection ended for Mary and Gage on session 23. Gabby's ended on session 26 (see Figure 1).

Generalization Probe

Generalization probes were taken after script fading began for each participant, in the self-contained classroom, resource classroom and general education classroom. Probes consisted of measures of appropriate social interaction in a non-treatment setting. The purpose of these probes was to determine whether the effects of script fading increased appropriate social interaction in a setting outside the treatment setting. The peers without disabilities, who served as targets of appropriate social interactions, received limited training and were peer tutors who were available to work with participants. Some of the peers were instructed not to initiate social interaction but were told to stand close to the participant and to respond and attempt to sustain interaction. Probes were taken prior to a particular class period during free time or when the opportunity to interact was best presented.

Maintenance Follow-up

A one-month maintenance probe was done on all three participants. The follow-up included partial interval recording in the lunchroom and in other settings (classrooms).

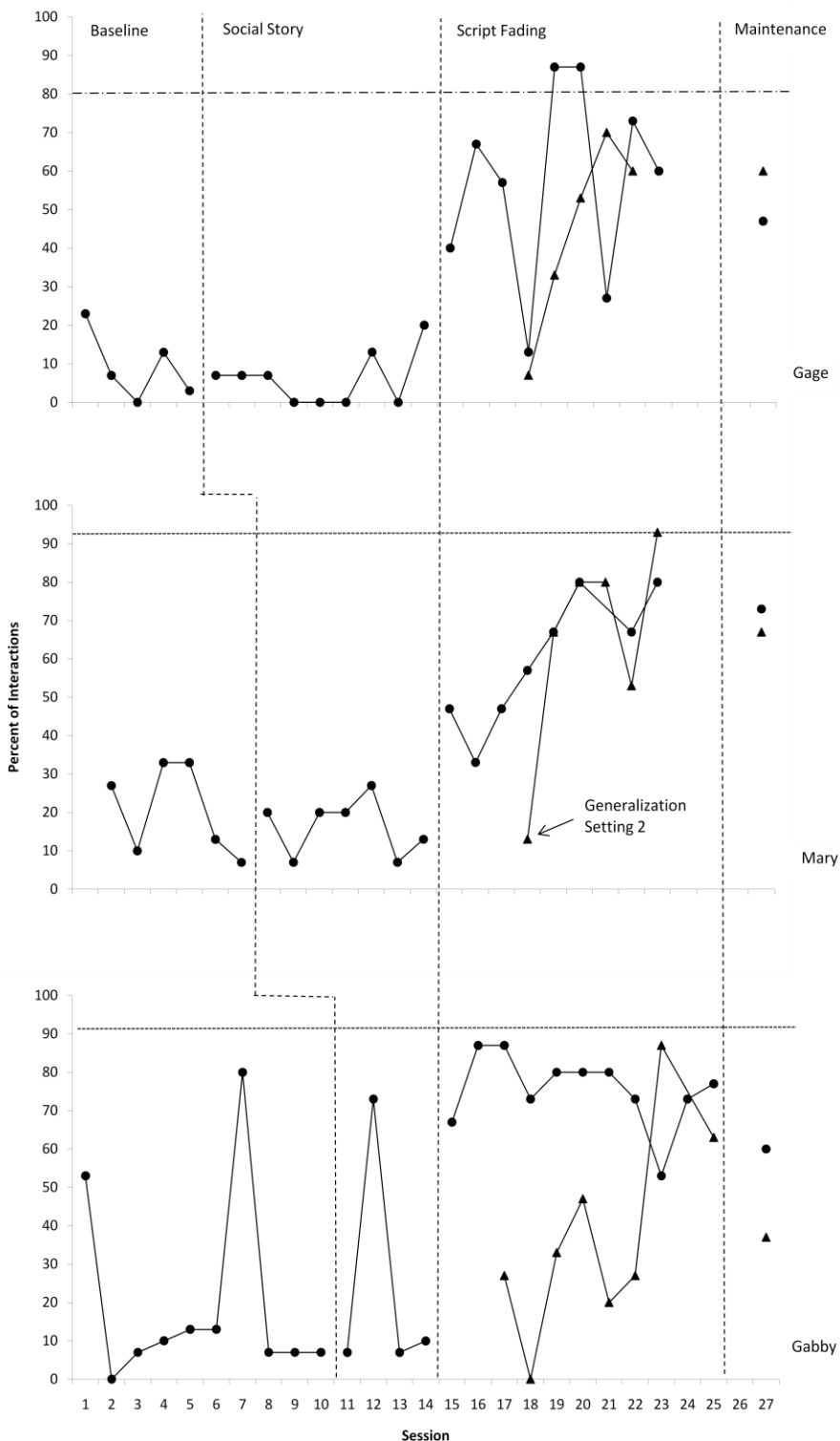


Figure 1. Percentage of interactions across phases for three participants. In the script fading phase, additional data are presented on generalization and maintenance. The horizontal dashed lines represent mean interactions for girls and boys without disabilities.

Interobserver Agreement

Two observers independently observed and recorded appropriate social interactions as a measure of interobserver agreement (IOA) of the dependent measure (Kennedy, 2005). Training of observers began by observing non-disabled peers engaged in appropriate social interaction, during lunchtime in the cafeteria. The observers gathered data on five selected non-disabled peers. The primary and secondary data collectors collected percentage data using the partial interval recording method until IOA maintained at 80% or higher for 30% of the 5-min observations. Interobserver agreement was conducted in 30% of the sessions and was collected across all phases. IOA was calculated by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100%, or agreements divided by agreements plus disagreements x 100% (Kennedy).

IOA data were collected on the implementation of social stories (i.e., treatment integrity). The researcher and paraeducator recorded whether or not (yes or no) the reader of the social story followed procedures described below in reading the social story in 30% of total social stories. All procedures must be followed in a reading session for the observer to score “yes.” IOA for the independent variable was scored at the conclusion of the treatment by dividing procedures scored “yes” by procedures scored “yes” plus “no” x 100 (Kennedy, 2005).

Results indicated a mean overall IOA of 97% with a range of 73% to 100% for appropriate social interactions. Across participants IOA means were 95% for Gabby, 97% for Mary, and 98% for Gage. For typical peer’s, mean overall IOA was 96%, with a range of 80% to 100%. IOA data were collected for 35% of sessions. IOA data collected

for social stories averaged 99% with a range of 97% to 100%. IOA data were collected for 26% of the sessions (social story treatment was suspended when low effects were demonstrated, thus interrupting collection of IOA). IOA data collected for script fading averaged 95% with a range of 73% to 100%. IOA data were collected for 39% of the sessions. IOA data for the generalization probes were collected in at least 30% across sessions for all the participants. Results indicate overall IOA of 95% with a range of 67% to 100% for generalization probes.

Treatment Integrity

Treatment integrity IOA data across social stories overall was 98% with a range of 89% to 100%. IOA data was collected across 37% of sessions during social story treatment. Results indicate that script fading averaged 98%, with a range of 89% to 100%. IOA data was collected across 32% of sessions during script fading treatment.

RESULTS

Interaction data for typical peers are divided according to student gender (see Table 1). The range for girls (columns 1-3) for peer interactions was 91.5% to 96% with a mean of 94%. The range for boys (columns 4-5) for peer interactions was 75% to 85% with a mean of 80%. The overall mean for both boys and girls was 87%.

Gage's Results

In Baseline, Gage demonstrated a mean of 9% interactions with non-disabled peers. Gage's range of interaction was 0% to 23%. During the Social Stories, Gage had performed a mean of 6% interactions. His range during Social Stories was 0% to 20% interactions. Script Fading was introduced in Session 15. The first fade, step one, began

Table 1

Interactions of Students Without Disabilities During Lunch in Cafeteria

Session date	Measure	Girl 1	Girl 2	Girl 3	Boy 1	Boy 2
1/28/2008	Interactions/total	14/15	15/15	15/15	12/15	14/15
	Percentage	93%	100%	100%	80%	93%
1/29/2008	Interactions/total	15/15	14/15	^a 27/30	12/15	10/15
	Percentage	100%	93%	80%	80%	67%
1/30/2008	Interactions/total	11/15	^a 29/30	^a 30/30	11/15	^a 25/30
	Percentage	73%	97%	100%	73%	83%
1/31/2008	Interactions/total	^a 30/30	14/15	^a 30/30	10/15	^a 29/30
	Percentage	100%	93%	100%	67%	97%
	Average Percentage	91.5%	96%	95%	75%	85%

^aIOA data collected on these dates

in session 21. Gage's mean during Script Fading was 57% interactions, ranging from 13% to 87%. Gage demonstrated a 51% average increase in interactions from Social Stories to Script Fading. He averaged 45% interactions for the Generalization Probes.

Mary's Results

In Baseline, Mary demonstrated a mean of 20% interactions, ranging from 7% to 33%. During Social Stories, Mary performed at a mean level of 16% interactions, ranging from 7% to 27% interactions. Script Fading was introduced in Session 14. The first fade, step one, began in session 20. Mean interactions averaged 60%, ranging from 33% to 80%. Mary demonstrated a 40% average increase in interactions from Social Stories to Script Fading. She averaged 64% interactions for the Generalization Probes.

Gabby's Results

In Baseline Gabby demonstrated a mean of 20% interactions, ranging from 0% to 80%. On two occasions in Baseline, Gabby was observed to interact at high levels with peers, each occurring when she stood near familiar peers without disabilities. During Social Stories, Gabby performed at a mean level of 24% interactions, ranging from 7% to 73%. Script Fading was introduced in Session 15. The first fade, step one, began in session 19. Mean interactions were 75%, ranging from 53% to 87%. Gabby demonstrated a 55% average increase in interactions from Social Stories to Script Fading. Gabby averaged 38% interactions for the Generalization Probes.

Talk Data on the “Talking” Prompt

Gage received the cue “talk” when he was observed to be ignoring peers. In script fading sessions, Gage was cued to talk in approximately 13% of observation intervals. This was calculated by taking Gage’s 9 sessions of script fading and multiplying it by 15 observations possibilities. Gage was prompted to “talk” in 8 sessions, or 89% of the total script fading session. Gage had a total of 21 cues to talk across sessions.

Mary also received the cue “talk” when she was observed to be ignoring peers. In 100% of the sessions during script fading, Mary was cued to talk in approximately 8% of observation intervals. Mary received 10 cues to talk in the 8 sessions.

Gabby was cued to talk approximately 3% of observation intervals. Gabby was prompted to talk 5 times in the 11 sessions she was observed.

DISCUSSION

In this study social stories were largely ineffective in increasing interactions in a cafeteria for three participants. In contrast, the second treatment, script fading, was immediately and consistently effective in increasing social interactions. Generalization probes were consistent with intervention results and indicated increased social interactions with script fading.

Although social stories have been found effective in increasing social interactions with students with ASD, this study failed to replicate the effect. Three arguments are provided as potential reasons for failure to replicate. First, current participants may have had limited cognitive levels or relative skill deficits preventing them from associating the social story stimuli with response requirements in the cafeteria. Although the content of the social story compelled the participants to respond in social situations with peers, a conceptual relationship between this content and opportunities for social interaction was necessary, and was perhaps, indiscriminable to participants. Second, contextual information associated with the reading of social stories and the cafeteria stimuli were markedly different. While stories were read in a private room with the researcher, the stimuli in the cafeteria were diverse, varied, and fast paced. The lunchroom was typically very noisy and full of changing activity. Variables affecting data included disciplinary actions taken by the administrators such as requesting absolute silence during lectures of students on cafeteria etiquette, performances by students on a stage in the cafeteria with the request to watch quietly, drawings for candy and awards and charity collections. Additionally the cafeteria had two lunch lines with different menus. The lunch menu had

effects on duration of standing in lunch lines. At times, students stood in line for 10 seconds and other times they were in line for 10 to 15 min. The time variations affected data because the duration of the recording session was 5 min. The researcher selected the lunch line as the setting because it offered the best opportunities to interact. The lunch line usually had fewer interruptions from activities. The challenge was, to get students to select the menu with the longer lunch line and then delay them for a couple of minutes prior to getting in line. This challenge often required that observers collect data as students selected food, obtained their silverware then selected a table where they would eat. Third, the demand characteristics in a lunch line were challenging to students with limited social skills. The expectation was that all students stood facing the same direction therefore, for social interaction to occur, it was necessary for one student to rotate 180 degrees to face another student. Although data on non-disabled peers indicated high levels of social interactions (and presumably high levels of students facing each other), for students with limited social skills, the demands to produce social interaction may have appeared complex. Given the noise and activity in the cafeteria, it is conceivable a student with limited social skill could have initiated social interaction with a student in line and have been unsuccessful in producing conversation. It should also be noted that generalization data collected in classrooms were not directly comparable to data collected in the cafeteria. It is logical to think to assume that social interactions with peer tutors or classmates occur at different levels in comparison to social interactions in a cafeteria line or at a table while eating. However, generalization probe data in the script fading phase show increasing trend from beginning to end and provide further evidence for changes in level of social interaction.

Given the demand characteristics of a school cafeteria, script fading may have been more compatible with social stimuli than social stories and better effects. A script for initiating interaction in a cafeteria may have equipped the participant with the information necessary to be successful and receive reinforcement, whereas social stories offered no statements producing immediate reaction. Data from Mary's script fading show a steady increase in cafeteria interaction, suggesting a functional relationship between statements and reinforcement. However, this trend was exclusive to her interactions and was not apparent with the other participants. During baseline and social story phases, students with disabilities avoided interactions with typical peers, either because initiations had a history of being ignored or because interactions were not often reinforced. The participant's social story suggested that he or she "talk to other kids even if some kids won't talk to you." However, observations suggested that the social stories were ineffective in reminding participants to find another peer they could talk to.

During baseline data collection several observations were noted. Participants with disabilities had a difficult time ignoring observers (their teacher and paraeducators). In the first few sessions, participants were reactive to observation. Participants tried to initiate with nearby adults, even when typical peers made it a point to try and engage participants in greeting or conversation. The observers reminded students to ignore them. Students never fully ignored observers; however, data demonstrates that interacting with peers became more reinforcing.

A variable that affected some data with participants with disabilities was their familiarity with other students from the self-contained classroom. The relationship between students with disabilities has a familiar quality and is easier for those students to

trust and accept. Participants in the study naturally wanted to stand by and interact with other students with disabilities. The researcher and other observers discouraged participants from waiting in line or sitting with other students with disabilities during the research. Since the conclusion of the study, participants with disabilities have been observed interacting more effectively with their fellow peers with disabilities, for example, conversations appear to have more sentence structure and include a few more topics. This observation suggests that interacting with typical peers increases more overall appropriate social skills, including those interactions with other disabled individuals.

Gage appeared comfortable interacting with other students with disabilities. Anecdotal reports from teachers and parents indicated other children with disabilities were his typical playmates. Gage demonstrated little experience for interacting with peers without disabilities. His social story interested him but he did not appear to associate it with his own behavior. Gage did receive reinforcement for interacting and his story was rewritten when he failed to demonstrate effects. With his story in a lower reading level and more basic than Gabby's or Mary's, Gage's overall responses were lower. The introduction of script fading with photos and icons dramatically increased his interactions with peers. The researcher and other observers used the word "talk" as a cue when Gage was in line or seated with peers at a table and not engaged. Gage was encouraged to sit with non-disabled peers and use his script throughout lunch. He reported that he felt he was done after going through his 10-sentence script once. Having the script in his hand prompted Gage to interact with kids in line. He would also use his script when he heard the word "talk." He also used the script at his lunch table. Gage was successful and has

continued to increase interactions with non-disabled peers. Six days after his last treatment session, Gage continued to talk to peers using his script.

Mary had issues with trusting peers. She also had trouble facing or orienting herself to persons addressing her and making eye contact. Mary received a change in medication during the study and as a result had an increased appetite. She would stand in line preoccupied with eating and did not respond to peers or initiate interactions. Mary's preoccupation with hunger and the desire to get food quickly cause missed opportunities to interact. She mostly kept to herself and tried to communicate with observers about how hungry she was. Mary's hunger was her excuse to select the shortest lunch line making observers follow her through the food line, back and forth from her table to obtain silverware and then her milk, before she finally sat to eat. Mary rarely made eye contact or spoke to anyone as she traveled back and forth. Social stories were read to Mary just prior to lunch. Mary's concentration was a problem and if she heard the cleanup bell she could not focus on the story but wanted to wash up for lunch. Mary did act interested in her story and said she wanted to talk to kids, however her attention continued to decline. When she arrived in line she might try to interact at first, then she quickly gave up and resorted to trying to engage staff. Mary's success with script fading may be attributed to the simple act of having something to hold and refer to while interacting. The script may also have acted as a distraction from her hunger. The researcher had reassured Mary that the line would go faster if she kept busy talking to kids. Mary quickly adapted to using her script while waiting in line and while sitting with peers. Her body orientation changed from having her back to peers while she waited in line and sat eating, to standing or sitting comfortably, facing peers to whom she was

interacting. (Mary's social story had described looking at kids while she talked to them.) Mary also increased eye contact while engaged with peers, and subsequently with staff. Reinforcement was offered during the social story phase and script fading (see Appendix A & B). Mary responded to the reinforcement set up with script fading with more enthusiasm. The script was a prompt to talk and possibly acted as a discriminate stimulus for reinforcement. Observers also used the cue "talk" to get Mary talking to peers. Mary's interactions increased dramatically. The act of holding the script and turning pages may have worked as a prompt to keep her focused and reminded her to try new peers if her first attempts were unsuccessful. Mary also reached levels of interaction to within those ranges of typical peers. Mary's change in behavior may be attributed, in part, to suggestions from her social story. Even though the stories demonstrated little or no effects, information from the stories may have influenced subsequent script fading effects because it provided information on body orientation, and who/,what/,where/,when and why questions. Krantz and McClannahan (1993) had to reintroduce the script to students, in their script fading study, as their initiated interactions decreased over time. This might suggest that having a script is a powerful stimulus for students with disabilities. It may suggest that using a social story prior to a script may increase the effects of the script. The study reported that initiated interactions increased with reintroduction of the script within ranges displayed by typical peers (Krantz & McClannahan). Future research should investigate the comparison of social story and script fading effects as well as sequence effects.

More time may be necessary to build and generalize social skills. The social stories may have been the foundation for success when using the scripts. Future

researchers may want to investigate pairing social story information and script fading. Researchers may also want to investigate using, then fading reinforcement during treatment phases. In the five days following Mary's last treatment session, she was observed to continue using her script, and continued interacting including the day she had no script.

Gabby had similar issues trusting peers. Gabby had not been observed socializing with peers while waiting for lunch, but over the course of the school year had found a few peers she trusted enough to engage. On the two days of baseline with high levels of social interactions, Gabby stood by peers she trusted. Gabby complained that kids left when she sat by them to eat her lunch. Social stories did not have an effect on her ability to move around and select new or different peers to sit by. After hearing her social story and getting in the lunch line, Gabby made little or no attempts to interact with typical peers. She stood facing peers for brief periods however she would quickly withdraw and eventually ignored those students standing next to her. With script fading, Gabby initiated interactions and responded to typical peers while waiting in the lunch line, regardless of developing a previous trust. Gabby was observed sitting at new tables and using her script to converse. Peers sitting near Gabby acted unsure with staff observing in line and at lunch tables but eventually ignored observers and followed conversation. Gabby reacted to these successes by increasing her interactions while waiting in line and sitting with peers during her lunch. She also continued to look for a table with new peers who might not move away when she sat down. Gabby was observed interacting with peers following her last session on March 31 without her script. Gabby reached levels of interaction similar to those ranges of typical peers.

It was observed that using the “talk” prompt or seeing observers standing near participants resulted in participants attending to their script (stimuli) to initiate interactions. Unlike social stories, scripts are portable and allow participants to refer to them in different environments. Systematic fading of text was not associated with decreased social interaction, but instead, with generalized initiations and responses. As text was removed from the script, the participant literally was required to “fill in the blanks,” sometimes with novel initiations unrelated to the original script. Social stories did not directly involve or include participants, whereas the act of carrying a script may have directly or indirectly involved participants in using a script to interact with peers.

Script fading procedures included a reinforcement system (i.e., tokens exchanged for preferred items). All three participants earned stickers to purchase preferred items. For initiating or responding to interactions, each participant received a ticket that they could turn in to stickers, which turned into preferred items. The more interactions the quicker students got to “purchase” their preferred item. The effects of reinforcement independent of script fading were not examined in this study but should be the focus of future research.

Future investigators should examine social skill treatments with students with a range of disabilities. The more effective treatment with the three junior high participants with severe intellectual disabilities appears to be script fading, however, additional research is needed comparing this treatment with social stories. Students with disabilities need experience and success in socializing in order to find social engagement rewarding, especially with typical peers. In the ever-changing junior high setting, teachers need access to successful tools in teaching the all-important social skills to students with

disabilities. Finally, students with disabilities require a range of experiences socializing in order to generalize social awareness and appropriate social engagement.

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APPENDICES

Appendix A
Mary's Social Story

Mary Says Hi To Kids

1. There are lots of kids waiting in the lunch line. The kids are waiting to get their food. The kids might get pizza or a hamburger or chicken teriyaki. We all pick what we like to eat.

2. The kids say hi to each other. Sometimes they say hi to me. Sometimes kids high-five. I will earn stickers for talking to kids.

3. Kids talk to each other about food. They talk about teachers and classes. I can talk to the kids waiting with me. I have things to say!

4. There are kids in front of me and behind me. We can all talk to each other. I will try to speak in a regular voice and look at the kids when I talk. The kids will like to hear me and will usually answer me.

5. Kids at lunch will like it if I say hello to them. They will like it if I talk to them. I can give a high five. Some kids will like to talk to me too. I will talk about things I like.

6. There is a lot I can talk about.

I can tell kids I watch movies. I can tell kids which movies I watch. I can tell kids something funny about my favorite movie.

7. The other kids might have something to say. I can ask what they like. I can listen to what they say. I can have another turn to talk. Kids can become my friends.

8. I can try to talk like the kids in line. I will try to say hello and talk. We can talk about food. We can talk about teachers and classes. If they don't talk to me, I can try again with other kids.

9. I can tell kids I take drama and Elvis on Falcon Friday. I can talk about my teachers Mr. Mai or Mrs. Poulson. I can ask kids, "Who are your teachers?"

10. I can ask kids what they will do after school. I can tell them what I will do after school. I can tell kids I take care of pets at home. I can say something about my cat. I can ask if they have pets.

11. We can get our food. We can eat together. I will try to say "See you later!" after we eat.

12. I can say hi to kids in my school! I can work on saying hi in classes. I will try to say hi in the halls.

Appendix B

Mary's Script

Mary's Script

"What is for lunch?"

"I will eat _____ for lunch."

"This line is _____."

"What food do you like?"

"I like your shirt."

"Do you have a pet?"

"I have a cat."

"What are you talking about?"

"I like to talk about _____."

"This _____ is good."