PEER-IMPLEMENTED SCRIPT FADING TO PROMOTE PLAY-BASED STATEMENTS IN CHILDREN WITH AUTISM

by

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ABSTRACT

Peer-Implemented Script Fading to Promote Play-Based Statements in Children with Autism

by

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In this study, we examined the effect of peer-implemented script fading procedures on the frequency of independent statements of play by children with autism spectrum disorder (ASD) in a classroom setting. The target children included five 5-year-old individuals with ASD with the ability to speak in three- to five-word phrases but did not initiate play with peers. We trained typically developing peers, ages 5 to 6, on how to implement procedures, prompt correct responses, systematically fade scripts, and interact with the target children. We used a script-fading intervention, including auditory scripts that prompted initiation of play with peers. We conducted sessions in an open area of a classroom using a preferred toy set and two additional toy sets for generalization. Following training, we found that peers implemented procedures with fidelity and target participants showed an increase in independent statements of play, both scripted and unscripted.

(43 pages)

PUBLIC ABSTRACT

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Teaching communication and social skills to children with autism spectrum disorder (ASD) requires systematic teaching and instruction. Teachers provide these interventions to multiple students and the efforts can be strenuous. In order to help relieve teachers, as well as provide a more efficient way to teach social skills, this study was conducted to assess the benefits of using peers as implementers and communication exchange partners for children with ASD. In this study, we used an intervention called script fading, a prompt procedure that provides children with ASD with an appropriate audio phrase, which they then repeat during play. This study also evaluated the effectiveness of peers to implement scripts during play. The results showed an increase in play-based statements in children with ASD effectively during play with a peer and that peers could implement the script fading procedure effectively with proper training and support.

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Jessie Rosdahl

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CHAPTER I

INTRODUCTION

Social interaction and communication deficits are among the commonly identified characteristics of children with autism spectrum disorder (ASD; American Psychiatric Association [APA], 2013, Gibbs, Aldridge, Chandler, Witzlsperger, & Smith, 2012). Typical deficits in these areas include repetitive and stereotyped patterns of behavior, inability to keep eye contact, and difficulty initiating social exchanges with adults and peers in various settings (e.g., play, conversation, and joint attention; Committee on Educational Interventions for Children with Autism, National Research Council, 2001). Systematically teaching these skills to children with ASD has been found to be effective in increasing social and communication skills (Bellini, Benner, & Peters-Myszak, 2009, Camargo et al., 2014). Studies have investigated peers as the implementers of these interventions (Dart, Collins, Klingbeil, McKinley, & VanDerHeyden, 2014) and have shown an associated increase in social skills for children with ASD (Katz & Girolametto, 2013). However, the benefits of peer implementation have not yet been extended to many other successful procedures and interventions, including script fading.

One of the benefits observed in peer-implemented interventions is the ability to remove the ongoing presence and prompting of an adult from the interactions (Krantz & McClannahan, 1993). These interventions utilize the population of peers already available in communities and schools, which allows more opportunities to implement the interventions and removes some of the demand from teachers and other professionals (Chan et al., 2009). Another benefit of direct interaction with peers is that children with

ASD may feel more included and form relationships with those peers. Peer implemented interventions involve training typically developing peers to implement an intervention protocol that addresses social skills, disruptive behaviors, or communication. In these studies, peers have been trained to provide invitations to play, offer assistance, share, or give affection to children with ASD. According to a meta-analytic review of peer management implementations, the research on using peers to implement interventions is minimal (Dart et al., 2014). Thus, there is need for further studies and research to determine the effectiveness of peers implementing procedures.

Script fading is a procedure that has been shown to be effective in helping children with ASD increase social interaction and communication. Scripts are defined as "an audiotaped or written word, phrase, or sentence that enables young people with autism to start or continue conversations" (McClannahan & Krantz, 2005, p. 5). Scripts have been used effectively to teach an array of language skills, including initiations, approaching peers or adults about events or activities, and sharing with peers or adults about recently completed activities (Krantz & MacClannahan, 1993, 1998). Research demonstrates that children with ASD can learn appropriate social interactions using scripts (Krantz & McClannahan, 1993, 1998; McClannahan & Krantz, 2005; Sarokoff & Poulson, 2001). As scripts are designed to encourage social interactions, it would be appropriate for those interactions to be directed towards and supported by peers. Further research to determine the effectiveness of peers implementing scripts to encourage social initiations may combine the already seen benefits of script fading procedures and peer implemented interventions.

CHAPTER II

LITERATURE REVIEW

A literature search was conducted using EBSCO-HOST-*Education Full-Text. ERIC, and Education Source,* and 58 articles were found on the use of script fading procedures in early childhood development. According to the articles, script fading was used to increase reading, communication, or social skills. The majority of this research utilized professionals to implement the script fading procedures. Although some studies used peers as the receiver of social initiations, there were no studies found that used peers as the implementers. There were, however, three studies found that investigated the use of parents and siblings as implementers of the intervention in place of professionals. As these studies are most similar to my experimental questions, I selected them for detailed review.

In an early study on script-fading procedures (Krantz & McClannahan, 1998), three participants with ASD (ages 5, 4, and 3) with limited reading skills were taught to use written scripts to initiate social exchanges with adults. Performed in a classroom, a teacher was used as the implementer, and another teacher, rather than a peer, was used as the recipient of the interaction. Prior to the intervention, each of the students learned how to follow picture activity schedules (point to a photograph of an activity, obtain and complete activity, and return the materials back to the original location) and how to read and say the scripts, “look” and “watch me.”

A session began when the student stood in front of the activity schedule, and was given the instructions, “Have fun. Play with your toys. Do your schedule.” The recipient

of interaction was present throughout the schedule, and was instructed not to ask any questions or give directions but only to respond to the student reading the script aloud or interacting. During the teaching phase, the teacher standing behind the participant would manually guide the student to point to a script and approach the recipient of interaction. If the student did not say the script, the teacher would provide a verbal model. Verbal models were only provided when the student was pointing to the script. Manual guidance was replaced with spatial fading, shadowing, and then decreases in teacher proximity.

Results showed an increase in the number of scripted interactions and elaborations. During baseline, none of the students initiated any interactions with the familiar teacher. After the teaching condition, the number of scripted and unscripted interactions increased as prompting procedures decreased. The reported success of professionals implementing script fading procedures in educational and clinical settings led to further interest in the potential success of these procedures in different settings or when implemented by nonprofessionals.

Reagon and Higbee (2009) examined the effectiveness of parent-implemented script fading in the home setting. Three children (2, 3, and 6 years old) with a diagnosis of ASD and their parent participated. Researchers taught parents how to develop, implement, and fade auditory scripts during play. Audio scripts were created using a button activated voice recorder, and the parents developed and recorded three separate scripts for a target play set. The frequency of unscripted initiations (contextually appropriate [e.g., “Let’s race” for cars but not books] statements or questions that differed from the scripts by more than a name or minor grammatical feature) and scripted verbal

initiations (entire script being imitated by the child) were measured. The parent taught the child how to use the audio-recorder and imitate the script. The scripts consisted of initiating play phrases or words that corresponded with the toy or item (e.g., “mom, let’s go play cars!” in the presence of the toy cars). After the child was able to say the scripts correctly, the script-fading procedure began, and the last word of the script was omitted, and it continued until the entire script was omitted.

The results showed that all three children acquired the scripted initiations and scripts were completely faded after 14 sessions of intervention. Unscripted initiations increased for all three children and initiating generalized to other toys not used in the study. The results showed that children with ASD could be taught to use scripts to increase the frequency of verbal initiations. The study also showed the use of nonprofessionals (parents) as successful implementers of script-fading procedures.

A replication of the Reagon and Higbee study (2009) was conducted, replacing parents with siblings as the implementers of script fading procedures (Akers, Higbee, Pollard, & Reinert, 2015). In this study, siblings of three children with ASD were instructed and trained to use scripts. Parents served as the primary data collectors on the behaviors being measured: independent statements (scripted or unscripted) and prompted statements. Parents also trained the sibling to (a) orient to the participant during play, (b) refrain from asking questions or giving directions, (c) respond to all participant verbalizations, and (d) prompt the participant to make a verbal statement using the auditory scripts.

During the 3-min sessions, siblings played with the participant by responding to

participant statements and refraining from asking questions or giving directions. The sibling began the session by saying, “let’s play.” Audio scripts were present throughout the session, and the sibling wore a vibrating timer that was set to 30-s intervals. When the 30 s elapsed, the sibling prompted the participant by presenting the script to the participant and waited for them to press the button. If they did not repeat the scripted phrase, the sibling would provide a manual prompt to press the button again and then give a verbal prompt (e.g., “Say, here comes the car”).

Results showed general increases in the number of contextually appropriate play statements and all three participants were able to follow the scripts. They continued to have increased levels of statements when scripts were faded. The intervention was effective in extending the findings from the previous study (Reagon & Higbee, 2009) that nonprofessionals, to increase social initiations, can accurately implement script fading procedures.

The studies reviewed provide evidence for the effectiveness of script fading procedures on improving social initiation skills. They move the research forward in observing and determining the appropriate implementer and recipients of the social initiations and interactions. From familiar adults, to parents, to siblings, the research addresses a variety of implementers and recipients of initiations. However, little focus has been given to the effectiveness of unfamiliar peers in a school setting as the implementers.

Concerns in utilizing peer implementation interventions include lack of treatment fidelity and training cost, which is the amount of time needed to effectively train peers to

implement interventions accurately (Dart et al., 2014). However, these concerns have already been addressed for script fading procedures. In association with the research performed by Reagon and Higbee (2009), as well as the subsequent replication of their research by Akers et al. (2015), simplified procedures were developed that parents and siblings could implement with fidelity. They designed an intervention that is easily implemented and provides an appropriate amount of training to those implementing. These same procedures were replicated with the use of peers in a school setting in this study. It should be mentioned that siblings can be considered peers, as many of those participating in Akers study were only a year or two older than their sibling with ASD. Siblings may be considered peers, however a child with ASD may have acquired a history of reinforcement with their sibling, and have similar background knowledge that peers in the school setting will not have. The importance of this study will be utilizing peers not related to the target child, in hopes to show that these skills can be implemented by less familiar peers in settings where target children will have higher frequency of interactions with those less familiar to them than siblings.

As mentioned, peer-implemented procedures allow for less adult direction and prompting. Social interactions become much more naturalistic and generalized when the peer encourages the social interactions, and the adult does not direct the interaction. The previous two studies were limited to a home setting, and those with a sibling, that would be considered a familiar peer. The purpose of this study was to extend the findings of Reagan and Higbee (2009) and Akers et al. (2015) to provide an intervention for increasing statements during play that would be suitable for the school setting, where

many children with ASD receive the majority of their opportunities for peer social interactions.

Understanding the benefits of peer-implemented script fading procedures in a school setting would provide another tool to help children with ASD decrease social deficits. Therefore, the purpose of this study was to investigate the use of peer implemented script procedure to increase play statements in young children with ASD. Questions under investigation for kindergarten-aged children with autism included the following.

1. To what extent will peer-implemented script procedures increase play-based statements, as measured by frequency of statements?
2. To what extent will peer-implemented script procedures increase scripted and unscripted interactions with peers?
3. To what extent will play-based statements generalize to other toys sets where scripts were never used?

CHAPTER III

METHODS

Participants and Setting

Five children (Matthew, Ben, Hank, Benson, and Cash), all age 5, with a medical diagnosis of ASD, were chosen to participate in this study (hereafter also called "target child/children"). Each of the target children were students from the diagnostic kindergarten (DK) classroom. The DK provides specialized instruction to students with a disability that significantly impacts their ability to receive instruction in a general education classroom. Target children were chosen based upon consent given by parent or guardian, and the following criteria: (a) the ability to speak using three or four word phrases or sentences, and (b) the inability to initiate play independently, determined by a pre-experimental observation. We began this study with five target children, who all met criterion specified to participate in the study. After presession training, preference assessments, and baseline (described below), it was determined that Hank and Benson would not be appropriate for this study (see Discussion). Ben, Matthew, and Cash completed the study.

Peer participants were selected for each of the target child participants from the general education classroom, ages 5 to 6. Peer participants were chosen based upon informed consent provided by parent or guardian, and the following criteria: (a) shows interest or effort in interacting with students from the DK classroom, (b) demonstrates high skill level in following directions, performing tasks accurately, and (c) stays on task

based upon teacher nomination. To determine which peers nominated by their teacher met the criteria and would be used in the study, the researcher conducted an assessment to determine their ability and interest. The assessment first required permission from the peers' parent or guardian. With consent, the researcher met with each potential peer and asked them to complete simple directions while playing and commenting with a random toy for 3 min (hand me the car, describe what you are doing, etc.), and then asked if they would be willing to participate in the study. If the peer showed inability to perform the tasks with 80% proficiency, or exhibited disinterest or hesitation behaviors, they were not asked to participate in this study.

Research sessions were conducted in a classroom at the participants' public school. To increase environmental control, the training and intervention procedures occurred in an unoccupied classroom, used as a storage space for computer labs, tables, chairs, and P.E. equipment, in an area free from distractions of other activities or individuals. The equipment being stored in the room were pushed to the sides of the room and covered by partitions, and the sessions took place in the open area of the room. The target child and peer sat on the floor with the toy set to be used in the session.

Materials

Three toy sets were used during the sessions, chosen based on results from a multiple stimulus without replacement preference assessment (see Figure 1). One toy set was randomly selected for the script-fading intervention, and the other two sets were used to assess generalization. Matthew's toy sets included Thomas the Train Pack-n-Go track

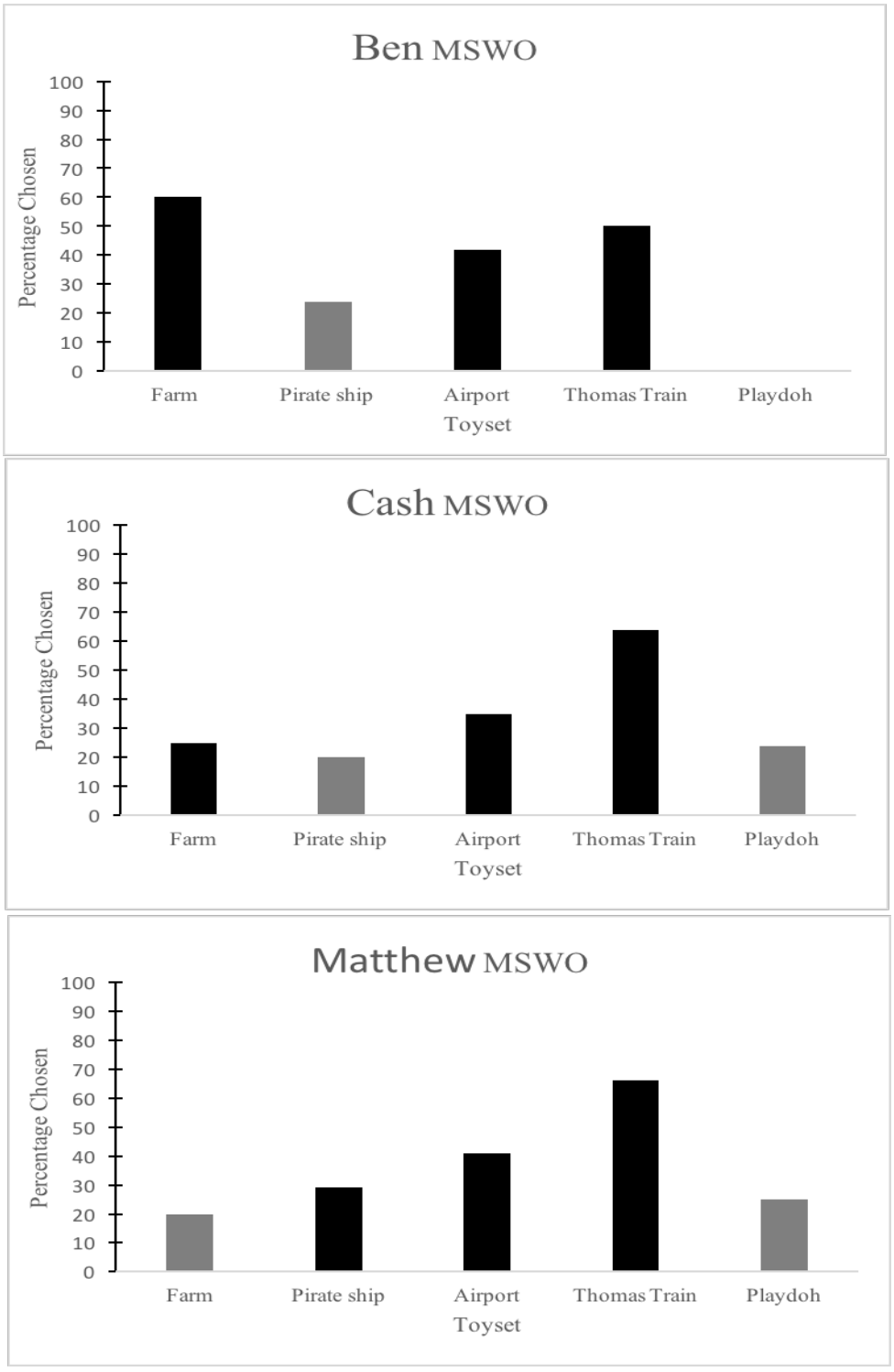

Figure 1. Percentages of toy sets chosen over opportunities to choose item, to determine highest three preferred toy sets for Ben (top), Cash (middle), and Matthew (bottom). High preferred items indicated in black.

(target toy), Fisher-Price Little People Airport (generalization toy 1), and an Imaginext Pirate Ship (generalization toy 2). Cash's toy sets included Thomas the Train Pack-n-Go track (generalization toy 1), Fisher-Price Little People Airport (generalization toy 2), and Fisher-Price Farm and Tractor (target toy). Ben's toy sets included Thomas the Train Pack-n-Go track (target toy), Fisher-Price Little People Airport (generalization toy 1), and Fisher Price Little People Farm and Tractor (generalization toy 2). The toy sets selected were not available to the target children outside of the sessions. Voice recorders, which are approximately 5 cm in diameter with a small button in the center, were used to record and deliver the scripts. A script was recorded onto the device by pressing a different button, hidden inside the recorder, and saying the script. When the external button (centered on the recorder) is pushed, the recorded script played back. Peers recorded three separate scripts (created and determined by the researcher) for the target toy set on three voice recorders, and placed near the toy set at the beginning of the session.

Pre-Assessment

To identify preferred toys, a multiple-stimulus without replacement preference assessment was conducted for each target child (Carr, Nicolson, & Higbee, 2000). In this assessment, the target child was presented with an array of five to seven toy sets. The target child was instructed to "pick one." Immediately after the selection, the remaining items were removed and the selection recorded. After the target child was given 10 seconds to engage with the item, selected items were then set aside, and the remaining

items were re-presented to the target child. The instruction “pick one” was repeated, and the items not chosen were removed. This procedure continued until all items were chosen and ranked. All of the items were presented again, and the procedure of selecting and removing the items was repeated. This was completed three times, as shown in Figure 1. The rank from all three arrays were calculated, and the top three preferred toy sets were used during intervention. The three toy sets were then randomly assigned to be the target toy or generalized toy sets.

Dependent Variables and Response Measurement

The researcher was the primary data collector and was present to collect data and observe the peer and target child throughout the sessions. Data were recorded on independent statements (including scripted and unscripted statements) and prompted statements (see Appendix A). Independent statements were defined as the target child pushing the voice recorder button and saying the script without any verbal or manual prompts. Independent statements were further coded into scripted and unscripted statements. Scripted verbal statements were defined as statements that were specifically trained or statements that only differed from the original script by a minor grammatical feature (e.g., plural, tense, articles). Unscripted verbal statements were contextually appropriate statements that deviated from the original trained script by more than a minor grammatical feature (e.g., addition of words, new words, prepositions, etc.). Statements were not scored if they were: (a) not contextually appropriate, (b) a one-word statement, (c) an immediate repetition of a previously made statement (made by the participant or

the peer), (d) excessive use of the same statement, defined as using the statement more than four times during a given session, (f) stereotypic phrase individually identified for each participant (e.g., "good job"), or (g) if the entire phrase was unintelligible. Prompted statements were also recorded, and were defined as the peer manually guiding the target child to press the button on the voice recorder or giving a verbal prompt (e.g., say "let's play cars"). A frequency measure was used to measure the number of statements from the target child. The researcher used a data sheet to transcribe each statement that met the requirements above.

Interobserver Agreement

The researcher recorded all sessions using a camcorder for the purpose of interobserver agreement (IOA) and treatment fidelity. IOA was calculated for 40% of the sessions and evenly dispersed across baseline and treatment sessions (see Appendix B). An independent second observer, who reviewed the sessions and took IOA data, calculated IOA. The data taken by the researcher and independent second observer were compared to determine percent of agreement. IOA was calculated by dividing the total number of agreements by the number of agreements plus disagreements and multiplying by 100. An agreement was defined as both coders counting the same comment as a contextually appropriate comment. An example of an agreement included both coders writing "Head to the lava" when the target child said the statement to the peer while playing with the volcano. A nonagreement included one coder transcribing "I pledge allegiance" as a contextually appropriate comment, when the other coder did not count it

as a contextually appropriate comment during play with the airplane toy set. The mean agreement was 92.75% (range from 75-100%) for Matthew, 89.1% (range from 57-100%) for Cash, and 98.6% (range from 92-100%) for Ben.

Treatment Integrity

An independent observer recorded data on the proper implementation of prompting procedures by the peer. Treatment fidelity was also collected for 40% of the sessions across all conditions. Treatment fidelity for the peer's performance assessed their ability to accurately implement the procedures by determining if the peer (a) oriented and prompted the target child to the script after 30 s, within 3 s after the timer vibrated, (b) provided verbal responses to the target child's statements, (c) used the correct prompting procedures and (d) avoided asking questions or providing directions. We calculated the percentage score by dividing the number of correctly implemented components by the total number of components and multiplying by 100. The mean was 99% (with a range from 90-100%) for Matthew, 89% (range from 50-100%) for Cash, and 98.6% (range from 92-100%) for Ben.

Experimental Design

We used a multiple baseline design across participants in the study (Cooper, Heron, & Heward, 2007). This design is most widely used for a study with multiple participants and one target behavior where the target behavior is not likely to reverse when the treatment is withdrawn. This design was used to evaluate the increase of

statements of each target child.

Procedures

General Procedures

One session with each toy set was conducted per day, with 1-2 min separating each of the sessions. Each session was 3 min in duration and the order of sessions was randomized. The room had an open area in the middle of the floor. The peer began the experimental session by saying, “Let’s play” to the target child. The peer sat next to the target child and oriented toward them throughout the session.

Peer Training

Training consisted of instruction and role-playing with feedback. Peers were trained to (a) orient to the target child during play, (b) refrain from asking questions or giving directions, (c) respond to all verbalizations, and (d) prompt the target child to make a verbal statement using the auditory scripts. Peers were also trained to wear a timer set to 30 s intervals, which prompted presentation of the scripts. Prompting procedures include presenting the script to the target child, within 3 sec of the timer, and waiting for them to press the button. If the target child did not repeat the scripted phrase, the peer provided a manual prompt, and if the target child did not repeat the script after the manual prompt, the peer prompted them to press the button again and gave a verbal prompt (e.g., “say, here comes the car!”). Peers trained with the researcher acting as the target child, and completed components with 95% accuracy across two sessions. During this training, the researcher and peer also practiced contextually appropriate statements

while playing with a toy set, which were 3-5 words in length, and were appropriate statements for the peer to model during sessions. The peer was prompted to talk about all of the actions and ideas that they have while playing with the toys. An example includes a peer saying “I’m flying to California!” or “Don’t forget your suitcase!” as he was playing with the airplane toy set.

Preteaching

Prior to sessions, the researcher taught the target children how to independently use the voice recorder (independently push the button, and repeat the script) with an unrelated script that were similar in length and complexity to the ones used in the intervention (e.g., “The sky is blue”). If the target child did not repeat the script after being manually guided to push the button, the researcher prompted, “say” and guided the target child to push the button again. If the target child still did not respond, the researcher provided a complete verbal model of the script before repeating manual guidance. Preteaching ended when the target child was able to independently follow the script with the last word faded (see Appendix C for data sheet). Scripts were faded from back to front (e.g., “play with me,” “play with,” “play”) until there were no words recorded on the voice recorder.

Baseline

Peers played with the target child, and modeled appropriate statements as practiced during peer training. Peers responded to target child statements but refrained from asking questions. No scripts or prompts were used or present during baseline.

Intervention

The peer began each session saying, “Let’s play” to the target child. The two general toy set sessions continued to follow baseline procedures, and the researcher recorded each appropriate statement made by the target child. The intervention occurred during the target toy set, and script presenting began. When the first 30 s elapsed, signaled by the timer, the peer presented one of the three scripts recorded to the target child using the prompting procedures described above (peer training) and re-presented a different button each time the 30 s timer vibrated. The peer responded to all verbalizations made by the target child and used appropriate comments during all three of the toy sets. Script fading included recording the scripts on the audio device with the last word omitted (e.g., “Let’s play cars” to “Let’s play,” to “Let’s”) until no words were remaining on the recorder. Script fading began once the target child independently followed all three scripts for 90% of the session for two consecutive sessions. The next word was omitted when the target child was able to again follow the script with 90% accuracy across two sessions.

Generalization and Maintenance

Generalization to novel toys was assessed through all phases of the study, and the same procedures used during baseline were used for generalization probes. The two other toy sets identified as preferred through the preference assessment were used for generalization probes. Maintenance of the skill was not assessed, as the school year completed before the two and six weeks after intervention date occurred.

CHAPTER IV

RESULTS

All three participants were able to follow script procedures during presession trainings. Figure 2 shows all data for the three participants. The data path denoted by the open shape represents the target toy for each participant, which is the only data path that includes scripted statements. The data paths denoted by the closed shapes represent the generalization toy sets for each participant (set 1 [GS1] and set 2 [GS2]). The arrows indicate at which session the scripts were faded, omitting one word each occurrence until there was no longer a script present. We were able to fade the scripts entirely, including the button, for Cash and Matthew. The presence of the button was necessary for Ben to continue making statements during the target toy set.

Shown in the top panel Figure 2, Matthew statements for the three toy sets were varied, however, increased from baseline to treatment. During the target toy set baseline, Matthew had a stable trend of low levels of comments between 0 to 3, and little variability. When intervention was introduced, we saw an immediate increase in comment levels, with a slight increasing trend. However, data show a higher level of variability in comments across sessions than baseline, with comments from 2 to 18. For GS1 and GS2, we again saw low levels of comments during baseline, with little variability across sessions. We implemented the intervention, and a sudden increase in comments occurred through session 27. Similar to the target toy, the data show moderate variability across session, with an increasing trend. Scripts were completely faded for Matthew by session 64. At session 69, During GS2, Matthew made 22 comments, which

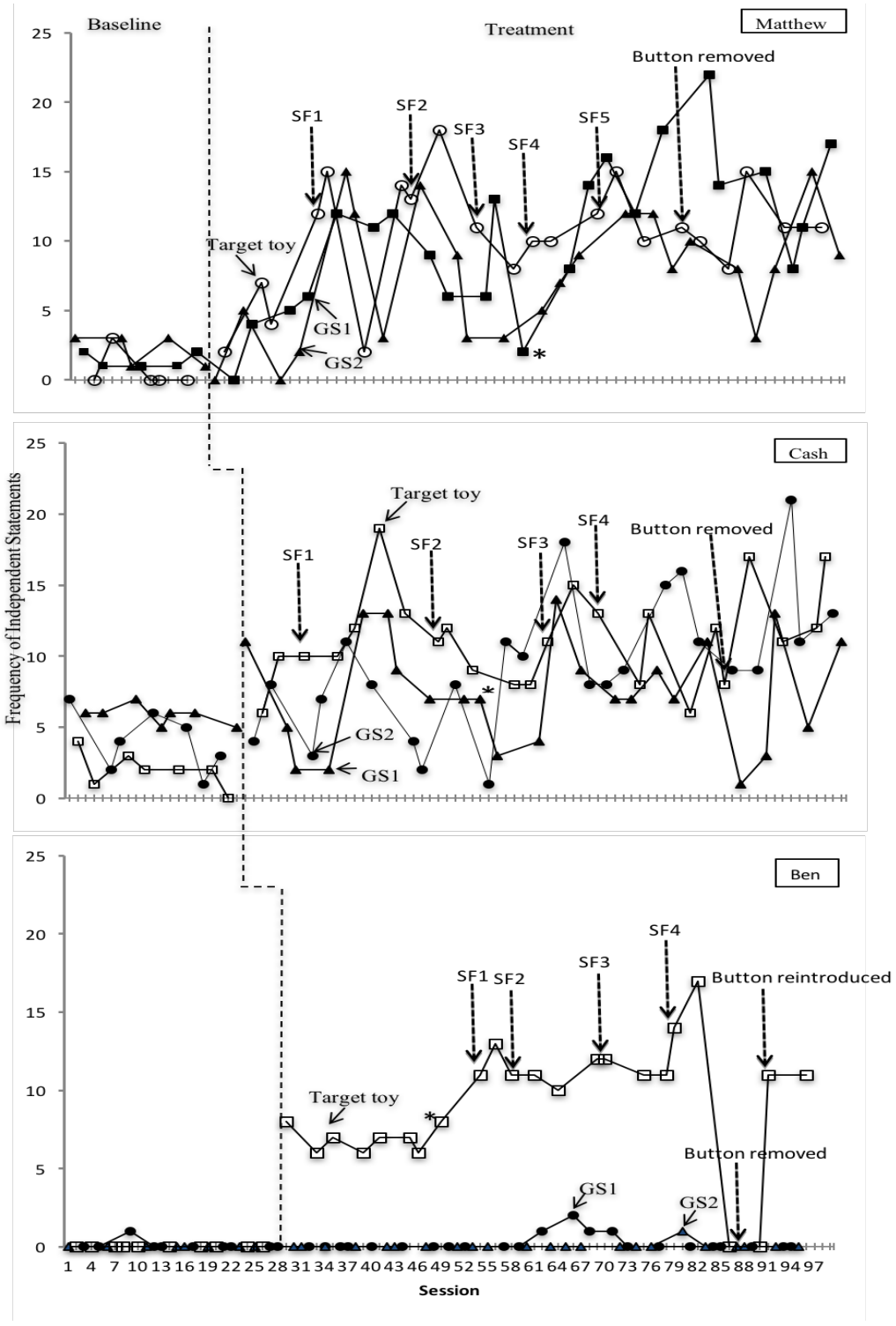

Figure 2. Frequency of independent statements made during 3-min sessions for Matthew (top), Cash (middle), and Ben (bottom). Sessions with the target toy set are shown as an open shape. Arrows denote a script fading step (SF), the omitting of one word from the script until the button was removed and no scripts were present.

was his highest level of comments made during a session. At session 49, Matthew was showing decreasing levels of comments across all toy sets, and we added extra toy figurines and parts to all toy sets in hopes to decrease satiation. We saw an immediate increasing trend, with moderate levels of variability across each session for commenting.

Shown in the middle panel of Figure 2, Cash's statements for the three toy sets increased from baseline to treatment at variable levels, with an increasing trend. During baseline, the target toy set had the lowest levels of comments, with a slight decreasing trend occurring. When intervention began, the data show a sudden increasing trend of comments, with low variability to session 38. We then saw a dramatic decrease of comments that then leveled to a steady trend, with moderate variability across sessions. At session 50, a booster training session occurred for the peer, as many of his comments became sound effects and throwing of toy pieces, which Cash also began to engage in. Before each session after the booster training session, the researcher would review expectations with the peer. For GS1 and GS2, the data show more comments made during baseline than the target toy set, still at low levels with a slight decreasing trend. During intervention, comments had high variability across sessions, however with a slight increasing trend.

In the bottom panel of Figure 2, data show Ben was able to follow the presession script fading procedures, and would repeat the script independently after pressing the button. During baseline *(*target $M = 0$, GS1 $M = .1$, GS2 $M = 0$), Ben made zero comments that were contextually appropriate, and would engage in stereotypic phrases, singing songs and reciting the pledge of allegiance during the sessions. During

intervention (target $M = 8.4$, GS1 $M = 0.2$, GS2 $M = 0.04$), Ben would only say a contextually appropriate phrase when the buttons were presented to him, and at session 49, to decrease the competing responses that were not contextually appropriate, we presented the scripts every 15 seconds, rather than the 30 second intervals. We did not see any generalization to the other toy sets, excluding session 63-72 for GS1 and session 80 for GS2, when he independently said contextually appropriate statements that he had previously heard from his peer. When we removed the button at session 86, we saw an immediate decrease in comments made, and at session 91, we reintroduced the button, with all words omitted from the script, and saw the same levels of commenting as before.

For Matthew and Cash, similar frequency of statements occurred during generalization toy sets as the target toy set. It should be noted that the complexity of statements made during generalization toy sets were varied and differentiating than the target toy set. Table 1 shows a sample comparison of types of statements made during the target toy set and one generalization toy sets.

Table 1

Sample Independent Statements Comparing Target and Generalization Toy Sets

Matthew		Case	
Target	GS	Target	GS
I'm headed to the lava.	There are clouds in the sky.	The animals need hay.	Something just happened to the plane.
We need the treasure.	Mayday! Mayday! Everyone jump out!	I'll drive the tractor.	Let's get this part fixed.
I'll go down the Zip line.	It wants to stay right back in there.	Look at the hen.	This one is the passenger.

CHAPTER V

DISCUSSION

Data show that the script fading procedures increased the amount of comments made by all three target children. These findings were similar to those found by Akers et al. (2015) and Reagan and Higbee (2009). Given these results, I conclude that script fading procedures can be implemented by an unfamiliar peer in a school setting with fidelity.

In the Akers et al. (2015) study, the target children showed higher levels of comments during baseline, and less variability with a higher increasing trend across intervention. Accounting for the different setting may explain the difference in results. Though we planned to minimize distractions, there were unpreventable distractions that arose during sessions, including announcements made over the intercom after the session had started, or other students and staff members ignoring the signs to not enter while sessions were conducted, and coming into the room. These distractions would interfere with the peer commenting, and as a result would decrease the level of commenting made by the target child during the distraction. Data show that level of commenting for all target children were all at an increasing trend, however the variability levels may have been in result to distractions in the environment. The nature of conducting research in school settings provides an opportunity to see how effective interventions will be in natural settings. The distractions experienced would be typical for this intervention if used in a school setting, and show more accurately what kind of results would occur if utilized by teachers.

Generalization occurred for Matthew and Cash across all sessions and followed the similar level of statements made during the target toy set. During the generalization toy sets, Ben would continue to engage in stereotypic statements and songs, and we saw no contextually appropriate statements, excluding sessions 63-72. During these sessions, Cash would imitate statements that had been previously said by his peer. I hypothesize that these statements were not due to generalization of the scripts, but rather an emerging skill of verbal imitation of peers. The diagnostic kindergarten classroom provides services to students across the school district, and each target child will be attending a different school location than the peers next school year. In result, follow-up sessions will not be possible with the same peer, and generalizations of these skills will need to account for new setting, peer, and toy sets.

It should also be noted that further prerequisite skills may be appropriate for future studies, including ensuring that the target child has the ability (a) to attend to a toy for 3 minutes and (b) to play in parallel fashion next to a peer. Hank, a participant that was withdrawn from the study, was able to attend to the toy for 3 minutes alone, however in the presence of a peer, only sat and attended to the toy set for no longer than 30 seconds. In contrast, the second participant withdrawn from the study, Benson, showed increasing numbers of statements made during baseline, and proved that the exposure to a peer increased his level of statements without implementing script procedures. We never reached a steady level for baseline, and we discontinued running sessions.

Future research could study the effects of using different peers during intervention, and if it would change level of commenting based upon which peer was

implementing the procedure. In our study, each peer provided appropriate statements, however each presented different statements and ideas to the toy set. One peer might be more animated, have a higher vocabulary level than another, and it would be interesting to see if that would make a difference in the level of commenting from the target child.

In conclusion, this intervention was effective for all three participants. When the script fading procedures were implemented the number of statements made by participants that were contextually appropriate increased. With the exception of Ben, the statements also increased for the generalized toy sets. These results support the findings of Akers, et al. (2015) and Reagan and Higbee (2009). With proper training and continual support from the researcher, it was also found that peers were able to accurately implement the script fading procedures with fidelity.

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APPENDICES

Appendix A

Baseline and Treatment Data Collection Sheets

Peer Implemented Scripts
Baseline

Date:_____ Session Number:_____ Initials:_____Toy Set:_____

Statements made to Peers

Peer Implemented Script Fading Treatment

Date: _____

Session Number: _____

Initials: _____

Fading Level of Scripts:

_____

_____

_____

Repeat Script	Statement
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	
Y N PP VP NA	

Appendix B

Interobserver Agreement and Treatment Integrity Data Sheets

Date:_____ Target child:_____

Data collector checklist

Session:			
The play area is clear of distractions? (toys, chairs, individuals not part of study, etc.)			
Toys were presented in the appropriate order			
Scripts were present only for target toy			
Data were collected by observer throughout session.			
Session was 3 min. in duration			
Performance feedback was provided to peer.			

Peer performance checklist:

Oriented the target child when playing			
Prompted the target child to use the script after 30 s elapsed			
Provided verbal responses to the participant's initiations			
Used correct prompting procedures			
Did not ask questions or provide directions			
Only made comments about their own behavior.			

Appendix C

Peer Training and Preteaching Data Sheets

Target child_____ Peer_____

Toy set 1_____ Toy set 2_____ Toy set 3_____

Step	**Date**	**Date**	**Date**	**Date**
Preference assessment				
Peer training	%_____ component(s):	%_____ component(s):	%_____ component(s):	%_____ component(s):
Pre-teaching	Script level:	Script level:	Script level:	Script level:
	Script level:	Script level:	Script level:	Script level:
	Script level:	Script level:	Script level:	Script level:

Peer training components

	Master date
Teach orientation to child	
Teach how to comment during play	
Teach prompting after 30 s elapses	
Teach providing responses to participants initiations	
Teach to not ask questions or provide directions	
Teach to only make comments about own behavior	

Script levels	
1	Full script
2	Last word omitted
3	Last two words omitted
4	Last three words omitted