The Effects of Mass Trials versus Distributed Trials During a Shared Story Reading for Students with Moderate to Severe Disabilities

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Abstract

This study used a single-subject alternating treatment design across students to compare mass discrete trials and distributed mass trials distributed in a shared story reading on the acquisition of functional skills for students with Autism. The results of this study examined a functional relationship between the interventions on the acquisition of skills and decrease in interfering behaviors. Two early childhood students in a self-contained classroom were the participants for the study. The results of the study indicated that both instructional strategies were effective in supporting the acquisition of the target skills. However, the interfering behaviors of the two students were different in both instructional settings. The results suggest that students were able to generalize better using the distributed trials. Also, using the shared story reading allowed the students to access the general education literacy curriculum and exposed the students to emergent literacy skills that are typically taught to their peers in the general education classes. Results and conclusions are discussed in terms of future research and implications for including children with moderate and severe disabilities in general education classes.
Keywords: Mass Trials, Embedded Instruction, Distributed Trials, Shared Story Reading, Autism.

Literature Review

Improving literacy skills for students with autism and significant cognitive disability (SCD) has received increased attention in recent years (Individuals with Disabilities Education Improvement Act, 2004; No Child Left Behind, 2001). Yet providing quality instruction for students with autism can be a challenge. Researchers have identified several evidence-based practices for teaching students with autism academic skills (Wheeler, Mayton, & Carter, 2015). One such intervention used to enhance the literacy skills for students with autism and SCD is the use of shared stories (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008; Hudson & Test, 2011; Mims, Hudson, & Browder, 2012). Specifically, shared stories have been utilized to

improve listening comprehension skills in students with autism and SCD (Mims et al., 2012; Browder et al., 2008).

Shared Stories
One benefits of utilizing a shared story intervention is that it allows students who may not otherwise be able to access the general curriculum to participate in an inclusive setting (Browder et al., 2008). Shared stories have been successfully used in literacy, science, and math instruction. Courtade, Lingo, and Whitney, (2013) examined adapted, grade-level read-alouds to increase academic engagement for students with intellectual disabilities, autism and fragile X syndrome in the general education classroom. The results suggest that both special education and general education teachers were able to reliably create adapted read-alouds and implement them successfully in the general education classroom. Additionally, using read-alouds increased the academic engagement time of students from baseline to intervention in the general education classroom. Hudson, Zambone, and Brickhouse, (2015) successfully utilized individually adapted scripted lessons, math story read-alouds, and manipulatives to increase the acquisition of early numeracy skills for three participants with severe multiple disabilities. Shared stories were also used to study the effects of an adapted book on the reading comprehension in a fourth-grade science curricula. Hudson, Browder, & Jimenez (2014) used peer tutoring. The student participants returned to the general education classroom for science instruction later in the day. There, the students received the science instruction. The results indicate that all students showed an increase in level from baseline to intervention. This study contributes to the research on peer-delivered instruction. It also adds to the literature of shared stories, adapted grade level readings, and using a system of lest prompt to enhance learning and comprehension.

Shared stories often have repeated story lines, phrases, words, and pictures that are paired with words. These strategies have been effective in supporting and fostering emergent literacy skills for typically developing students, at-risk students, students with mild and profound disabilities, and English language learners (Hudson & Test, 2011). To implement shared readings, teachers read a story aloud to a student while delivering support for the student to interact with the reader about the story. Then, students are given opportunity to develop a variety of literacy skills, from basic text understanding to determining important details in a text (Browder et al., 2008; Mims et al., 2012).

Systematic Instruction/ Embedded Instruction
Another evidence-based practice that has been employed for students with students with ID is systematic instruction. As shared stories have gained an evidence base, especially for students with intellectual disabilities, incidental and naturalistic teaching methods have been utilized more frequently with students with autism. These naturalistic teaching methods have the added benefits of promoting the generalization of newly learned skills as well as increasing opportunities to maintain these same skills (Bryson, 2007; Koegel, Bimbela & Scheribman, 1996). While these strategies have been used in early childhood classrooms for years, many argue that they can also effectively learn skills using systemic instruction.

Systematic instruction (SI) has been effectively used with students with SCD to teach literacy, science, and math (Jimenez & Kamei, 2015) and SI can be implemented using mass discrete trials (i.e., the same learning trials are presented quickly and immediately following each other);

or distributed trials (i.e., the learning trial is given randomly throughout the lesson or day). Conducting distributed trials in an inclusive setting is referred to as embedded instruction (Jimenez & Kamei, 2015). Jameson, McDonnell, Johnson, Reisen, and Polychronis (2007) described embedded instructions as "a strategy that can be used to provide students with developmental disabilities systematic instruction within the typical routines of general education classrooms". Embedded Instruction allows the teacher to "systematically control all the instructional procedures" (p. 24). Similar to embedded instruction, distributed trials are when instruction is presented to students in the form of discrete trial training distributed along the duration of a lesson, book, or day. When trials are presented in the general education setting they are referred to as embedded instruction. However, when trials are presented in the special education setting, they are referred to as distributed trials (Jimenez & Kamei, 2015).

Sigafoos et al. (2006) used a single subject alternating treatment design (i.e., ABABA) across behaviors to compare the effects of embedded instruction and discrete trial training on the self-injurious behaviors, correct responding, and mood levels of a 12-year-old boy with autism. During phase one, discrete trials, consisting of imitation trial and receptive labeling trials, were implemented in the self-contained classroom. Throughout the imitation trials the teacher would say "Brendan, look at me" to get his attention, then "do this." Then when engaged in the receptive labeling phase, the teacher would get his attention, show him two objects, and then ask him to point to one object. The teacher would prompt the student until he got the response, using least to most prompt sequence. While in the embedded instruction phase opportunities to respond were integrated into each of the three activities during a music activity in the corner of the classroom. The results of the study suggest that the embedded instruction intervention was more effective with less self-injurious behaviors, more correct responses, and higher mood levels for the student.

In a related study Geiger et al., (2012) used an alternating treatment design to compare the effects of traditional discrete trials and embedded discrete trials to teach receptive skills to two 4-year old students with autism. For the traditional discrete trial intervention, students receive instruction at a desk in their self-contained classroom. During this instructional phase the student was asked to point to the discriminative stimulus (SD). When switching to the distributed instruction phase (DT), the two students had different settings, for Sawyer, the DT phase was conducted in the exact same setting as the MT phase, (i.e., at his desk), whereas the other student received instruction at a table in a different area of the classroom. When considering duration of intervention, the students' acquisition among both interventions varied and did not show a specific model to be a better fit for both. However, when reviewing the results of the negative affect during the intervention, the students had higher negative affect behaviors during the MT phase than during DT. The results of the study show that both participants made gains during the intervention, thus suggesting that Embedded Instruction is an effective hybrid of MT and naturalistic teaching.

Parallel to the previous studies, Majdalani, Wilder, Greif, Mathisen, and Saini (2014) compared the effects and usefulness of mass trials, distributed trials, and interspersals to teach expressive labeling on five children, ages 4 to 5 years, who have autism spectrum disorder in a therapy center and bedrooms of the participating students. The researchers used an alternating treatment design embedded in two multiple baselines across participants to examine a functional

relationship between the independent and dependent variables. Mass trials, distributed trials, and task interspersal were three independent variables (IV) that were compared together. The results of the study indicate that five of the six students reached mastery using the Mass Trial intervention, and one student reached mastery using distributed trials. During the maintenance probes, the results varied for the intervention or condition that produced the best results among the students. The results suggest that mass trials were the most successful intervention for teaching tacting skills for students with moderate to severe disabilities.

Purpose/ Research Questions

The aforementioned studies are highlights of the research to date that compares both discrete trial and embedded or distributed instruction strategies for students with Autism and ID. This study aimed to replicate the idea of comparing both distributed trials and discrete trial teaching as methods for intervention for students who have Autism and ID. This study also aimed to examine the effects of both instructional phases on the behavior of the students. Therefore, the purpose of this study was to compare the effects of mass discrete trials (MT) and distributed discrete trials in instruction (DT) on functional skills for students with Autism and ID. The study investigated the difference between the independent variables and their effect on the dependent variables. More specifically, the following research questions were examined.
1. Was there a difference in the acquisition of a skill when using trials presented in mass format (MT) versus using trials distributed in instruction (DT), to teach skills to students with Autism and ID?
2. What was the effect of using MT and DT on the possible interfering behavior of the students?

Method

Description of Participants
To be included in the study, students needed to (a) have autism and an IQ of 55 or less, (b) be attending an elementary school in a self-contained classroom that uses MT, (c) have limited verbal skills, and (d) have a history of interfering behaviors during instructional settings as described by the teacher and/ or in the IEP. The participants were chosen using non-probability convenience sampling. The first participant, Mark, was a 4-year-old boy in the early childhood autism program in a local public school. Exhibiting verbal skills that were behind his age level, Mark would often cry if he did not get an object of desire. The second participant, Kevin, was also 4 years old with autism and in the same classroom as the first participant. Kevin had no verbal skills and would try to escape when asked to complete a less desired task.

The classroom teacher was an early childhood autism teacher, who had over 10 years of experience in the classroom. Throughout the school day, the teacher used mass discrete trials (MT) with her students. This study did not consider gender, race, or social economic status of students in the education classrooms. However, the school was an urban school with diverse student demographics. The students at the school came from different cultural, linguistic, and socio-economic backgrounds.

Description of Setting
The study was conducted in the students' special education classroom. An area was designated in the classroom for the study. This setting was chosen due to its familiarity to the students and the teacher in the study to avoid confounding variables. To avoid disruption to the students' instructional time, study took place during the time allotted by the classroom teacher to work on the MT instruction. However, due to some of the challenges the teacher had with administering the intervention with the two participating students during instruction time, she chose to conduct it during afternoon recess, which often ran into afternoon snack and free play time.

The materials needed for this study included (a) shared story books created by the author specific to each participants' needs, (b) MT pictures, (c) reinforcements, (d) frequency chart, (e) procedural check list chart, and (f) a timer. The stories were built within a PowerPoint program and included approximately 10-20 words per page, a picture that corresponded to the topic on the page, and the picture used for the MT (see Figure 1). The PowerPoint was printed out, bound, and presented as a reading book.

He saw that his friend Mary didn't didn't know what to do with her empty bag of chips.

He said: "Throw it in the trash."

"Show me in the trash"
student points. If not in 5 seconds,
Teacher uses least to most prompting;
Point, model, and hand over hand.
"Good job"

Figure 1. Sample of book page.

Research Design

A single subject alternating treatment across skills design (Barlow & Hayes, 1979) was used with the participants selected. A pre-test was conducted with the participants, asking them to demonstrate different skills, (e.g., sit down, pick up, point to, etc.). Then, based on the needs of each of the students, the teacher selected targeted vocabulary words. Once the dependent variables were established, the students were randomly assigned to determine the order in which each student was to begin the intervention, alternating both instructional methods: discrete trial training (MT) and distributed trials (DT) starting with the distributed trials.

Dependent Variables/ Measurement

The dependent variables measured in this study included (a) the number of correct responses occurring of the words taught, and (b) the frequency of the interfering behaviors occurring within a session. Frequency data were collected every time the student emitted a correct response that was not prompted as well as each time the participants displayed interfering behaviors during the intervention. Correct responses were counted when the student emitted the response, unprompted, within 3 seconds of the discriminative stimulus. If a student did not respond within 3 seconds, the teacher prompted the student using least-to-most prompting. The student was given verbal praise and social reinforcement following every trial. Behaviors were considered interfering if the student tried to escape, pushed the book or card away, tried to get up, moaned, cried, hit, or scratched. The researcher and the teacher kept a research log noting events that occurred during the intervention phase. This research log provides context for some of the data results that is discussed later in this manuscript.

Research Procedure

Pre-intervention phase. Once the participants were selected, the author asked the teacher how MT was done in her classroom, to make sure that it correlated with the procedural checklist proposed by the researcher. The researcher also trained the teacher on conducting the DT. The teacher and the author met for three sessions and discussed the study, practiced the procedures of the intervention and data collection, to ensure reliability and fidelity of both. The classroom teacher has worked with the students every school day since the beginning of the school year. Because of the rapport already established between the teacher and the participants, the teacher was the one who delivered the intervention.

After this, the researcher worked with the teacher to determine target behaviors. An informal observation of three skills that the student had not been previously introduced was observed and determined. Once the specific skills were determined for each student, the author wrote three shared storybooks (one story per target behavior) that the teacher used to read with the students. The mass trials were distributed within the shared story. These books were also used to assist the teacher in planning for antecedent strategies to make sure the student had 10 opportunities to respond to each skill addressed during the DT phase. It was important for the internal validity of the study that the MT and DT instruction in this study mirror each other (Ledford & Gast, 2018).

Mass trial phase. When conducting MT training, the teacher included all four of the following components in order: (a) the antecedent (what the researcher says at the start of a new trial), (b) the response, (c) the consequence (the delivery of the verbal praise immediately after the learner

responds), and (d) the intertrial interval (closing the trial; Ghezzi, 2007) utilizing the following steps:

1. The teacher first presented the student with a picture, on a notecard, of desired item. The teacher probed the student by saying, "point to juice". Only one notecard was provided in the acquisition stage. After three consecutive days on of 100% per that skill, the teacher added another notecard and ask the student to "point to juice".
2. When the student pointed to the picture, the teacher said "good job" or any other form of verbal praise.
3. If the student did not respond within 3 seconds or emitted an incorrect response, the researcher prompted the student using least-to-most prompts until a correct response was emitted.
4. Student received social reinforcement following each trial.
5. The teacher repeated this process for 10 trials and recorded the frequency data on the recording sheet.
6. At the end of 10 trials, the student received the reinforcement that he was working toward, (e.g., spinning toy, noise maker, bubbles, or kitchen center).

Distributed trial phase. The following steps were used in the DT phase: (a) the teacher used the shared storybooks prepared to conduct the training; each of the books included the same picture used on the notecard for the MT phase, however, this picture was embedded within a text and in the form of a story. There were 10 pages, each of that particular picture, to have the same number of response opportunities as in the MT phase. (b) the teacher delivered the DT intervention skills to the students using a shared storybook with distributed trials; (c) the student had the opportunity to respond to each skill 10 times during an instructional setting, but the trials were random and distributed in the instruction; d) the student received social praise after every correct response; and (e) the student received the reinforcement he was working for after 10 trials.

During the intervention stage, the teacher alternated the use of both treatments. During both treatment conditions, all correct responses were reinforced with social praise (i.e., pats on the back, high fives, smiles, and verbal praise). In both conditions, the DT and MT, if the student emitted an incorrect response, or did not respond within 3 seconds of the discriminative stimulus or directive, the teacher used least-to-most prompting to teach the student the correct response. The researcher was an observer and collected data along with the teacher. Both data from the author and the teacher were measured for inter-rater reliability. Notes were make anecdotally by the teacher and the author about the behaviors that were observed during the intervention. These behaviors were recorded in a journal.

Generalization assessment procedures. Generalization occurred when the target behavior was emitted in the presence of new stimulus conditions; different from the stimulus condition under which the student was trained (Cooper, Heward, & Heron, 2007). When the student can generalize a behavior, then the behavior is emitted more frequently and can therefore be maintained with greater success. In alternating treatment designs, generalization can be assessed by changing the treatment to other condition (Cooper, et al, 2007).

The researcher tested for generalization once the student mastered the skill taught during the acquisition phase. To do so, the student was given a generalization probe to examine if he could generalize the learned skill to other settings (e.g., in the classroom). Generalization was assessed after the student reached mastery criterion for three consecutive days. Only Mark met the criterion and was assessed for generality.

Reliability
This study assessed the reliability of the measurement of the dependent variables using the following procedure: (a) the teacher recorded the students' correct and incorrect responses; (b) if incorrect, the teacher recorded substitutions and/or number and type of prompt given ; (c) inter-observer data was collected simultaneously by the researcher; and (d) frequency data taken by the teacher and the experimenter was compared at a later time and an inter-observer agreement (IOA) and calculated by using this formula: smaller number/ larger number x 100 = percent of agreement. The researcher, who also served as an interrater observer for both the reliability of the data and the fidelity of the procedure observed 33.3% of the intervention. A score of minimum 97.2% reliability was obtained. To ensure reliability the first author operationally defined the behaviors measured (i.e., correct response). This allowed the teacher and the observer to assess the same behaviors more accurately.

Procedural Fidelity
Procedural fidelity data were collected across all experimental conditions. A checklist was provided to the teacher for the procedures for both the DT and the MT instructional phases. The teacher was trained on the procedures with 100% accuracy during practice sessions before implementing the intervention. To maintain procedural fidelity, the first author and the teacher utilized a check list ensuring each step of the research process was followed in the same manner each day. The researcher observed 33.3% of the sessions. At the end of each session, the researcher compared the checklist with the teacher and used the formula to calculate the percentage of interrater agreement, (i.e., the number of observed behaviors divided by number of planned behaviors and multiplied by 100; (Ledford & Gast, 2018). If agreement on one session fell below 100%, the researcher and the teacher went over the procedures together. The teacher and the interobserver agreed 100% of the time on the fidelity of the procedure.

Results

Data Analysis
Frequency data for all the dependent variables were charted on graphs to show results (see Figures 2-3). Descriptive statistics included the mean of the percentage of the correct responses. Kevin had higher percentages during the mass trial for all three targeted skills (e.g., 60/80; 57.5/63.75; 64.3/70). Mark had higher means during the Mass trials, (i.e., "in the trash" and "juice") in two of the three targeted skills (e.g., 97.5/100; 97.5/ 100; 96.7/ 93.3). However, for the "on the table" skill, Mark had a higher mean of correct responses using the distributed trial intervention (i.e., 96.7/ 93.3). Both students made gains with both interventions and the percentages of the correct responses using both instructional strategies went up (see figures 2-3). The mean duration of the DT ranged from an average of 2 minutes to 4 minutes for each instructional concept while the mean duration to complete the MT ranged from 30 seconds to 1 minute. Therefore, total time to complete the DT each day, ranged from 6 minutes to 12 minutes. Total time to complete the MT ranged from 1 1/2 to 3 minutes. These times have been calculated

by taking the range of times each instructional strategy took to complete, multiplied by the number of instructional concepts being taught during each intervention time. The use of the mass trials took less time however, the distributed trials took longer because the teacher was reading a book to the student and distributing those discrete trials within the text of the story. Reading the story took more time, not the actual trials.
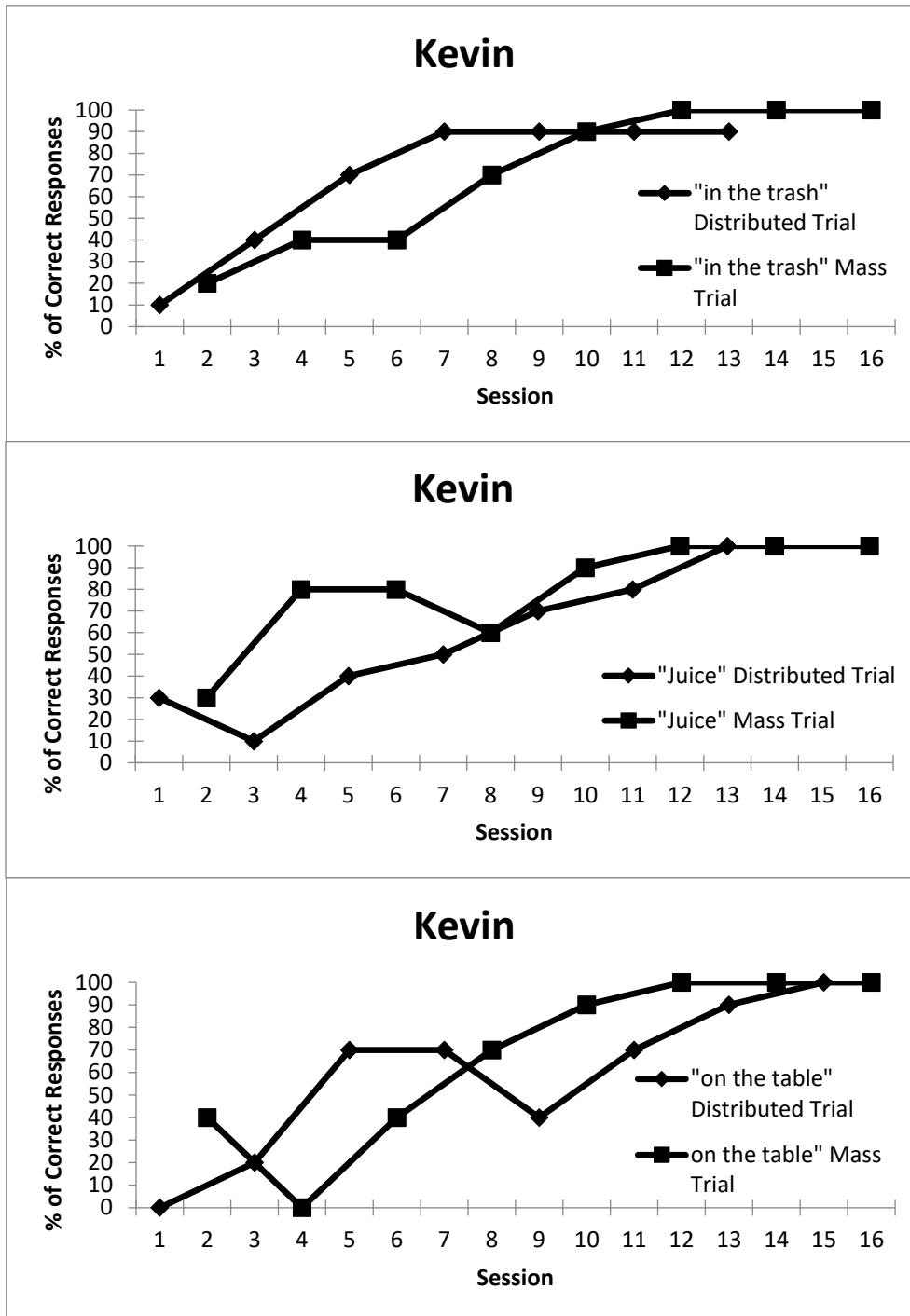

Figure 2. Mass Trial vs. Distributed Trial for Mark for "in the trash," "juice," and "on the table."
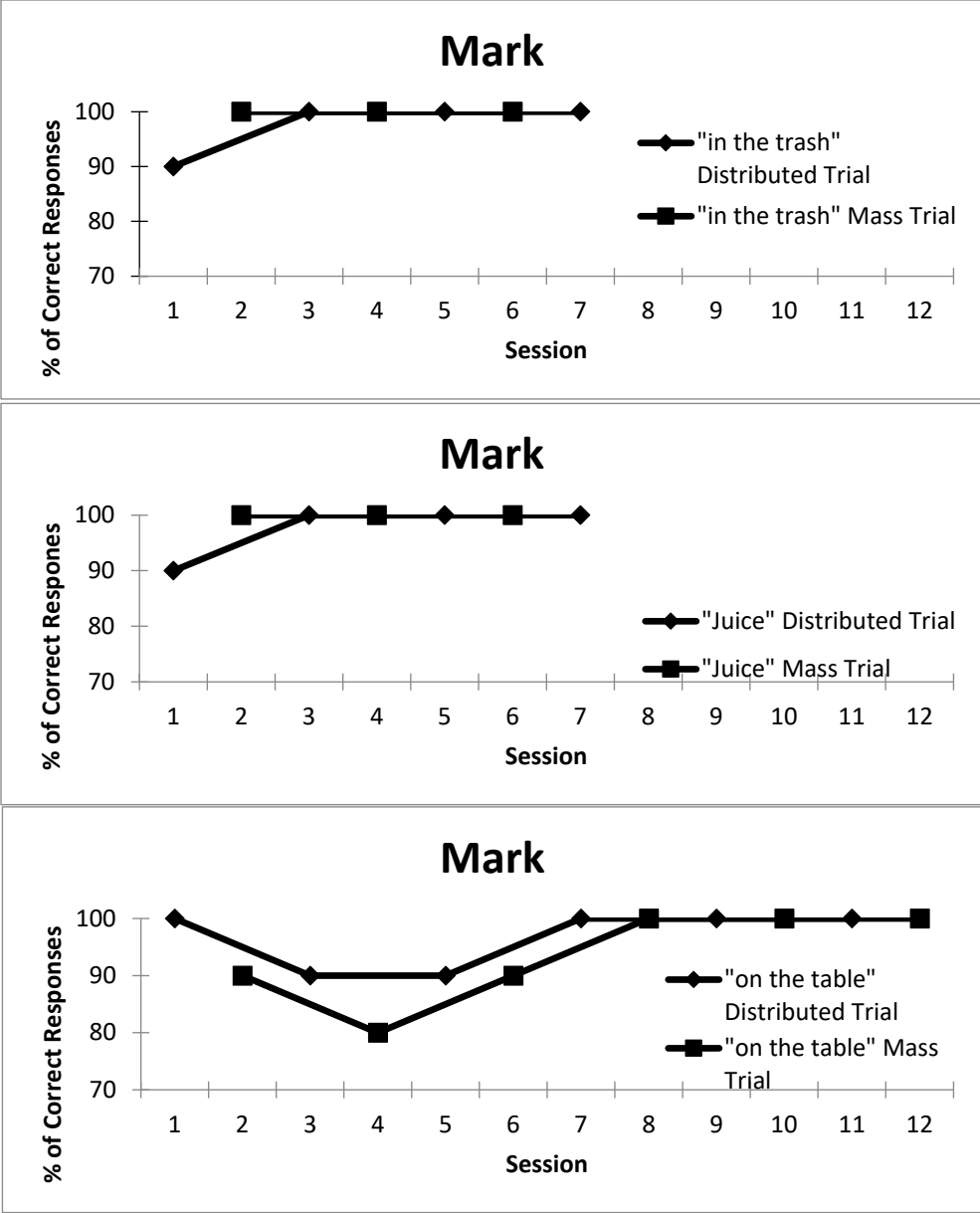
Figure 3. Mass Trial vs. Distributed Trial for Mark for "in the trash," "juice," and "on the table."

Social Validity
Social validity was assessed following the completion of the study in the form of a survey (i.e., Likert scale) that determined the level of satisfaction in the intervention of the special education teacher. The survey included questions for the teacher with regards to the two interventions and addressed the following social validity criteria: (a) whether the dependent variables were socially significant for the participants, (b) if the procedures were practical and cost effective, and (c) if the dependent variable could be maintained over time (Horner et.al., 2005; Storey & Horner, 1991). Moreover, social validity data indicated that the teacher enjoyed implementing the distributed trials. She indicated that while it took more time to prepare and administer the distributed trials intervention, she preferred using that intervention because it included many skills that allowed the students to access the preschool curriculum; such as emergent literary skills. She indicated that she will continue to use the distributed trials in a shared story format in her classroom and with all her students.

Discussion

In this study, the students made gains with both instructional strategies. Although, both students overall had higher correct percentages during the MT, the interfering behaviors were more frequent during the MT phase. Based on researcher field observations, Kevin was less responsive to the directives during the MT phase. He attempted to flop the floor and cried, began to demonstrate vocal angry and escape behaviors, was kicking his feet, spun around in his chair and acted silly (i.e., laughing), and exhibited interfering behaviors such as crying, kicking, and attempting to elope. Interestingly, the researcher's research journal captured an instance when the teacher presented MT to Kevin and he verbalized no to the teacher and pointed to the DT story books and stated "this one." Additionally, he pushed the MT materials away and reached for the DT book.

Although Mark had higher percentages in MT, in two out of three skills, his scores were very close on both strategies. Mark seemed to master the skill right away, but the results varied for the intervention condition that produced the best results among the students. With time being a possible deterring factor for the use of distributed trials Instruction, additional benefits for its use should be considered. The use of shared story readings is a strategy that could easily be linked to content area and academic content standards. Additionally, distributed discrete trials instruction could be further expanded to encompass additional Pre-K academic areas of Effective Writing (PK Content Standard 5.0), Types of Writing (PK Content Standard 6.0), Listening (PK Content Standard 7.0) and Speaking (PK Content Standard 8.0), allowing the students more access to the general education curriculum.

Limitations and Future Recommendations
As with all research done in the natural environment, there are limitations that should be noted. The first is the small number of participants. In order to establish external validity, the study will need to be replicated among other participants and settings. A second limitation is that both instructional strategies may have contributed to the overall acquisition of the skills. The targeted skills were identical in both interventions, and by alternating both strategies, acquisition may have carried over from one day to the next and built on preceding sessions. Next, the intervention was planned to take place during the typical instructional time, however, when the teacher was

delayed, she would pull the students at alternate times. Finally, the DT had more variables and more distractions on the page for the student; whereas, during the MT, there was only one picture for the student to choose. This could possibly be why the students had higher correct responses mean during MT than during DT.

Despite the limitations, this research shows promise for future years. The data suggest that the use of a distributed trials in a shared story reading is effective either alone or as a hybrid with Mass trials. This instructional strategy allows students to access the general curriculum and may be generalized into the general education classroom. As teachers consider more naturalistic interventions that may be able to promote the generalization of skills, they may want to consider distributing trials throughout learning activities rather than isolating the skill in a discrete trial format. Finally, the students and teacher involved in this study indicated they preferred the distributed trial format. Future recommendations include study replication while trying to minimize the variables mentioned as limitations and using the shared stories with DT in a general education inclusive setting for the class, as a whole.

References

Barlow D. H. & Hayes, S. C. (1979). Alternating treatment design: One strategy for comparing the effects of two treatments in a single subject. *Journal of Applied Behavior Analysis*, *12*, 199-210.

Browder, D. M., Mims, P. J., Spooner, F., Ahlgrim-Delzell, L., & Lee, A. (2008). Teaching elementary students with multiple disabilities to participate in shared stories. *Research and Practice for Persons with Severe Disabilities*, *33*, 3-12.

Bryson, S. E., Koegel, L. K., Koegel, R. L., Openden, D., Smith, I. M., & Nefdt, N. (2007). Large scale dissemination and community implementation of pivotal response treatment: Program description and preliminary data. *Research and Practice for Persons with Severe Disabilities*, *32*, 142-153.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearsons.

Coutrade, G.R., Lingo, A.S., & Whitney, T., (2013) Using story-based lessons to increase academic engaged time in general education classes for students with moderate intellectual disability and autism. *Rural Special Education Quarterly, 32*, 3-14

Ledford, J. R., & Gast, D. L. (2018). *Single case research methodology: Applications in special education and behavioral sciences*. New York: Routledge.

Geiger, K. B., Carr, J. E., LeBlanc, L. A., Hanney, N. M., Polick, A. S., & Heinicke, M. R. (2012). Teaching receptive discriminations to children with autism: A comparison of traditional and embedded discrete trial training. *Behavior Analysis in Practice, 5*(2), 49

Ghezzi, P.M. (2007). Discrete Trial Teaching. *Psychology in the Schools*, Vol. 44(7), 667-679 doi: 10.1002/pits.20256

Holcombe, A., Wolery, M., & Gast, D. L. (1994). Comparative single-subject research: Description of designs and discussion of problems. *Topics in Early Childhood Special Education*, *14*, 119-145.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single subject research to identify evidence-based practice in special education. *Council of Exceptional Children*, *71*, 165-171.

Hudson, M.E., Browder, D.M., & Jimenez, B.A. (2014). Effects of a peer-delivered system of least prompts intervention and adapted science read-alouds on listening comprehension for participants with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities*, *49*, 60–77

Hudson, M.E., Zambone, A., & Brickhouse, J. (2015) Teaching early numeracy skills using Single voice-output devices to students with severe multiple disabilities. *Journal of Developmental and Physical Disabilities, 28*, 153-175

Hudson, M. E., & Test, D. W. (2011). Evaluating the evidence base of shared story reading to promote literacy for students with extensive support needs. *Research & Practice for Persons with Severe Disabilities, 36*, 34.

Jameson, J. M., McDonnell, J., Johnson, J. W., Rieson, T., & Polychronis, S. (2007). A comparison of one-to-one embedded instruction in the general education classroom and one-to-one massed practice instruction in the special education classroom. *Education and Treatment of Children*, *30*, 23-44.

Jimenez, B.A, & Kamei, A. (2015). Embedded instruction: An evaluation of evidence to inform inclusive practice. *Inclusion, 3*, 132-144.

Koegel, R. L., Bimbela, A., & Schreibman, L. (1996). Collateral effects of parent training on family interactions. *Journal of Autism and Developmental Disorders*, *26*, 347-359. doi:10.1007/BF02172479

Majdalani, L.M., Wilder, D.A., Greif, A., Mathisen, D., & Saini, V. (2014). Comparing massed-trial instruction, distributed-trial instruction, and task interspersal to teach tacts to children with autism spectrum disorders. *Journal of Applied Behavior Analysis, 47*, 657-662. doi:10.1002/jaba.149

Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism & Other Developmental Disabilities, 27*(2), 67. doi:10.1177/1088357612446859

Rivera, C. J., Spooner, F., Wood, C. L., & Hicks, S. C. (2013). Multimedia shared stories for diverse learners with moderate intellectual disability. *Journal of Special Education Technology*, *28*, 53-66.

Sigafoos, J., O'Reilly, M., Ma, C. H., Edrisinha, C., Cannella, H., & Lancioni, G. (2006). Effects of embedded instruction versus discrete-trial training on self-injury, correct responding, and mood in a child with Autism. *Journal of Intellectual and Developmental Disability*, *31*, 196-203.

Storey, K., & Horner, R. (1991). An evaluative review of social validation research involving persons with handicaps. *Journal of Special Education*, *25*, 352-401.

Wheeler, J., Mayton, M, & Carter, S., (2015). *Methods for teaching students with autism spectrum disorders: Evidence-based practices.* Upper Saddle River, NJ: Pearsons.

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