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Effect of Simultaneous Prompting Delivered by Peers in the General Education Setting

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Whitney S. Barnes, Student

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Dr. Ralph Crystal, Director of Graduate Studies

Effects of Simultaneous Prompting Delivered by Peers in the General Education Setting

THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in the
College of Education
at the University of Kentucky

By
Whitney Barnes
Winchester, KY
Director: Dr. Melinda Ault, Professor of Special Education

Winchester, KY
2016
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ABSTRACT OF THESIS

Effects of Simultaneous Prompting Delivered by Peers in the General Education Setting

The purpose of this research study was to provide training for peer tutors to use simultaneous prompting to increase the percentage of correct responses of sight words by students with moderate and severe disabilities. The study included four students with moderate and severe disabilities in an elementary school setting. A multiple probe (days) design across behaviors replicated across students was used to evaluate the effectiveness of the simultaneous prompting procedure used by peer tutors to teach students with moderate and severe disabilities in the general education setting. The results indicated the peers were able to reliably implement the procedures, but a functional relation was demonstrated with only one participant.

KEYWORDS: moderate and severe disabilities, simultaneous prompting procedure, peer tutors

Whitney Barnes

June 2016

Effect of Simultaneous Prompting Delivered by Peers in the General Education Setting

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Section 1: Introduction

Current recommendations stress the importance of using evidence-based, systematic instruction with students with moderate and severe disabilities. (Spooner, Knight, Browder, & Smith, 2012). A number of systematic instructional procedures are available in the literature, including procedures that have a well-established research history for teaching academic and adaptive skills to students with moderate and severe disabilities. Response prompting strategies are evidence-based and include procedures such as constant time delay (CTD) and simultaneous prompting (SP; Brandt, Weinkauf, Zeug, & Klatt, 2016).

The SP procedure has been effective in teaching students with developmental disabilities how to master both discrete and chained skills. Collins (2012) stated, the "SP is a simple procedure in which instructors conduct daily test or probe trials to assess learning followed by daily instructional or training trials to teach the target behavior. This sequence continues until the learner meets criterion during probe trials" (p. 58). This procedure involves presenting a prompt immediately following the discriminative stimulus on all trials. There is no opportunity to respond independently, and therefore, probe trials are conducted each day of instruction to determine whether stimulus control has been transferred (Brandt, Weinkauf, Zeug, & Klatt, 2016). The SP procedure has been used to teach a variety of skills across a variety of ages, diagnoses (e.g. mild to moderate disabilities), and settings. For example, Tekin-Iftar, Acar, and Kurt (2003) used the SP procedure to teach 13 and 14-year-old students with attention disorders and mild intellectual disabilities the names of first aid materials while in a 1:1 instructional format

in the first aid room. All participants learned and maintained the skill across various sessions. Parrott, Schuster, Collins, and Gassaway (2000) taught primary-aged students with moderate and severe disabilities students to wash their hands in a self-contained bathroom setting. Three of the five students maintained and generalized the skills across people. In a study conducted by Smith, Schuster, Collins, and Kleinert (2011), the researcher used the SP procedure to teacher students in high school with various disabilities including a functional mental disability (FMD), mild to moderate disability, and attention deficit hyperactivity disorder (ADHD), to identify restaurant words and the correct classification of each food. The students learned to order food once asked. For example, when asked, "What appetizer would you like?," students were able to identify what was being asked and then identify the food that he/she would like to order. The students were able to maintain and generalize the information taught to use these skills while out in the community.

The SP procedure also has been used to teach students with disabilities in general education classrooms. For example, Collins, Evans, Creech-Galloway, Karl, and Miller, (2007) taught elementary, middle, and secondary students with moderate and severe disabilities to read functional and core content sight words while included in the general education setting. The sight words were embedded in instruction in the general education class as the content may have been presented in various ways such as worksheets, activities such as cooking, or filling job applications. The general education teacher taught the sight words within lessons presented to all of the students in the general education classroom. Riesen, McDonnell, Johnson, Polychronis, and Jameson (2003) used SP to teach 13 and 14-year-old students with autism and intellectual disabilities to

read or verbally define key vocabulary words through embedded instruction and massed trials. The researchers found the SP procedure to be effective while the paraeducators embedded instruction in the general education classroom and collected data using a one-to-one massed trial instruction in the special education classroom.

In addition to mandating the use of current evidence-based procedures, federal legislation also requires that individuals with disabilities receive services, to the fullest extent possible with students without disabilities (Parent Center Hub, 2015). Thus, when possible, students with moderate and severe disabilities should be included in the general education setting with their same age peers. Inclusion in the general education setting allows students to gain access to core content and provides opportunities to engage in social interactions with same-age peers. Ledford and Wolery (2013) explained that this lack of exposure to peers with typical development may result in peer rejection, which would result in few opportunities to improve already delayed social skills and exacerbate the lack of social skill development. The authors go on to say that small-group instruction provides multiple opportunities to observe social and other behaviors performed by peers, which may increase the saliency of discriminative stimuli for these behaviors, making the discrimination easier for the children with disabilities, and priming them to learn observationally. Despite the need for inclusive education, the intensive instruction and student to staff ratio can make it challenging for students with moderate and severe disabilities to acquire information in the general education settings.

To assist with these challenges, schools and researchers have used peer-mediated instruction to provide assistance with tasks and increase peer interactions that can

increase socialization and academic responding. If students can gain access to core content while in the general education classroom with the assistance from a peer tutor, students may acquire new information while increasing socializations with same age peers. To ensure that student progress is being made while in the general education classroom, performance data should be monitored which can be done by while using a response prompting strategy such as SP. Because SP requires the instructor to provide the controlling prompt immediately following the discriminative stimulus on every instructional trial, the procedures are relatively simple to implement, making it ideal for use by both peer tutors and participants since procedural fidelity can be established and participant errors are low (Smith et al., 2011). For example, McDonnell, Mathot-Buckner, Thorson, and Fister (2001) used a class wide peer tutoring program and found that combined with a multi-element curriculum and accommodations, improved levels of academic responding and decreased levels of competing behaviors occurred for students with moderate and severe disabilities. Other researchers have studied the effects of instruction delivered by peer tutors using various systematic instructional procedures such as CTD and SP to teach functional and core content skills. In a study done by Tekin-Iftar (2003), a multiple probe design across training sets was used to show that peer tutors were able to use SP to teach students three sets of community signs. Researchers have also demonstrated that CTD can be used by peer tutors to acquire core content skills. Jimenez, Browder, Spooner, and Dibiase (2012) examined the effects of peer-mediated embedded instruction using the CTD procedure on the number of correct science responses by target students with intellectual disabilities. All of the students increased their number of independent correct responses for the eight science vocabulary words,

pictures, word/picture match, and concept statements. Also, two of the peer tutors demonstrated higher science letter-grade averages after the intervention.

Section 2: Research Question

The purpose of this research study is to answer the following research questions:

1. Is there a functional relation between a peer tutor using simultaneous prompting and an increase in level and trend of sight word reading for elementary-aged student with moderate and severe disabilities in an inclusive setting?

2. Following direct training from a teacher, can elementary aged peers reliably deliver simultaneous prompting instruction to students with moderate and severe disabilities in an inclusive setting?

Section 3: Method

Participants and Setting

Inclusion criteria. Participants who acted as peer tutors and those with disabilities were chosen for the study based on prerequisite skills observed by the special education and general education teacher. Peer tutors could be selected if they were a member of the same general education classroom in which the students with disabilities participated. Peer tutors were nominated to participate by the teachers and paraeducator if they had age appropriate and positive social interactions with students with disabilities, had regular attendance, could follow multiple step directions, were able to work with other peers and remain on-task for a minimum of 10 minutes, and had good communication skills. Additionally, each student participant with a disability was asked if there was a specific student with whom they would like to work. The peer tutors selected were then asked if they were interested in teaching sight words to the students with disabilities and the study was explained to them. If they wanted to participate, their parents were asked to provide consent, and their assent was obtained.

Students with disabilities were included in this study if they were a member of the investigator's special education resource classroom, were able to sit and attend while working with a peer in the general education classroom for a minimum of 10 min., had adequate vision to see the stimuli, had adequate auditory skills to hear the directions and prompts, were able to verbally imitate the words to be taught, and had sight word reading as an objective on their individualized education program. The special education and

general education teacher assessed each of the prerequisite skills prior to implementation of the study using direct observation.

Six students were chosen to participate in the study: three students without disabilities that acted as peer tutors and three students with FMD (i.e., the state's classification for students with moderate and severe intellectual disabilities). All students attended the same elementary school. One peer tutor and one student with FMD were in second grade. Two peer tutors and two students with FMD were in third grade.

Peer tutors. Three students were chosen to participate in the study as peer tutors. Each peer tutor was paired with one student with a disability that was in their same general education homeroom.

Thomas was selected to work with Norman. Thomas was a 9 year 6 month old male student in the 3rd grade general education class. Thomas had a diagnosis of oppositional defiant disorder and ADHD. Thomas received services from the help of a collaboration teacher within the general education classroom. Thomas was able to stay on task and did not display any challenging behaviors while observed by the paraeducator and investigator. Thomas participated in Boy Scouts and was in the same troop with Norman. Norman had identified Thomas as a student with whom he would like to work.

Lyle was selected to work with Sabrina. Sabrina chose to work with Lyle. Lyle was a 9 year 7 month old male student in the 3rd grade general education class. Lyle did not have any identified disabilities and was functioning at a 3rd grade level in all academic areas.

Haden was paired to work with Henry while in the 2nd grade classroom. Haden was an 8 year 6 month old male. Haden had a speech language impairment. He exhibited a delay in area of speech sound production for which he received speech services weekly. Haden was functioning at a 2nd grade level in academic areas.

Students with disabilities. All students had a primary disability of FMD which is the state's classification for those students who have an intellectual disability that is at least three or more standard deviations below the mean, and adaptive behavior deficits are at least three or more standard deviations below the mean. The classroom setting for all students was in the resource room for students with moderate and severe disabilities with time spent in the general education classroom with the specified time indicated on each student's individual education plan.

Norman was a 9 year 6 month old male who had a diagnosis of multiple disabilities with a primary disability of a FMD. Norman had a visual impairment due to brain damage, but was not recommended to wear glasses. He did not require enlarged text or pictures. Norman was in 3rd grade. Norman obtained a full scale IQ score of 48 on the Wechsler Nonverbal Scale of Ability (Wechsler, 2006). Norman's overall adaptive score was compared to a 3 year 8 month old as measured by the Scales of Independent Behavior, Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996). Norman was an outgoing, happy, and self motivated student. He enjoyed helping his peers and teachers with tasks and jobs within the school. If Norman did not understand a direction or task, he refused to continue to work. He was encouraged to use his words or gestures to ask a question or request help when confused. Norman's speech was difficult to understand for unfamiliar adults which is why Norman was encouraged to use gestures if his speech was

unrecognizable. Norman communicated using single word utterances, vocalizations, and gestures. He spontaneously gained others' attention by verbalizing, leading them, or gesturing to indicate his wants and needs. Some of Norman's IEP objectives included: survival sign identification, sight word identification, listening comprehension, and verbal and nonverbal choice makings. Norman received physical therapy, occupational therapy, and speech language therapy services.

Sabrina was an 8 year 1 month old female student. Sabrina had a primary disability of a FMD. Sabrina was in 3rd grade and obtained a full scale IQ score of 52 on the Wechsler Nonverbal Scale of Ability (Wechsler, 2006). Her overall adaptive behavior skills were a composite score of 43, which placed her in the low range of functioning as measured by the Adaptive Behavior Assessment System-II (ABAS-II; Harrison & Oakland, 2003). Sabrina exhibited deficits in the areas of cognition, communication, and adaptive skills as compared to her same age peers. She presented with a severe receptive/expressive language delay and a moderate speech sound production delay. Sabrina's communication delays in language and speech sound production adversely affected her success in sharing her thoughts and ideas across educational settings. Sabrina enjoyed helping her peers with tasks and following directions. Sabrina had some difficulty staying on task if she did not understand the content and would refuse to participate. Her IEP objectives included survival sign identification, sight word identification, and listening comprehension. Sabrina received occupational therapy and speech language therapy services.

Henry was an 8 year 4 month old male student. Henry had a primary disability of a FMD and was in 2nd grade. Henry's overall adaptive behavior skills were rated as below average, with a composite score of 21 as measured by the Scales of Independent Behavior, Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996). The impact of these deficits on his educational performance within the classroom included limitations in cognition (thinking/reasoning/memory skills), delayed cognitive ability, and delayed thinking/reasoning skills. Henry had a moderate speech sound production delay and a severe expressive/receptive language delay. Henry had a difficult time when directions contained concept words or unfamiliar vocabulary, and due to impulsivity and eagerness to begin directions, he consistently did not allow himself enough listening time prior to beginning carrying out directions. He enjoyed volunteering to help his teachers and peers to complete tasks in and out of the classroom and was eager to participate in group activities. Henry had difficulty following multiple task directions. His IEP objectives included sight word identification, reading accuracy, and listening comprehension. Henry received occupational therapy and speech language therapy services.

Staff. The special education teacher, who served as the investigator, collected data on full probe, daily probe, maintenance, and some of the generalization probe sessions while in the resource room. The investigator had 4 years of experience working with students with moderate and severe disabilities. The investigator had taught Norman, Sabrina, and Henry for the current school year. The investigator received her undergraduate degree in special education working with students with moderate and severe disabilities and was currently working toward a teacher leader master's degree in special education.

The paraeducator collected generalization and reliability data throughout the study. The paraeducator worked with students with disabilities for 17 years. The paraeducator had worked with Norman, Sabrina, and Henry for 2 years.

Setting. The study was conducted at a rural elementary school. The school contained students in the Kindergarten-fourth grades.

Screening, full probe, daily probe, generalization, and maintenance sessions occurred in the special education resource room 8.4 m x 5.7 m, at the public elementary school. This classroom was staffed by one teacher and two paraeducators. The investigator collected these data in a one-to-one setting with each student at a large table. A diagram of the setting in the resource room can be found in Figure 1. The investigator collected all daily probe sessions before the students left to join their general education class.

Training sessions were conducted in the general education classrooms. Norman and Sabrina attended the same third grade general education classroom and the intervention was conducted during the language arts/center period that occurred before lunch. Henry attended his 2nd grade class during reading group after lunch. During instructional sessions, one peer tutor worked with one student with disabilities. All students sat beside their peer tutor at two desks in the second and third grade classroom. Both classrooms were split into small reading groups and centers.

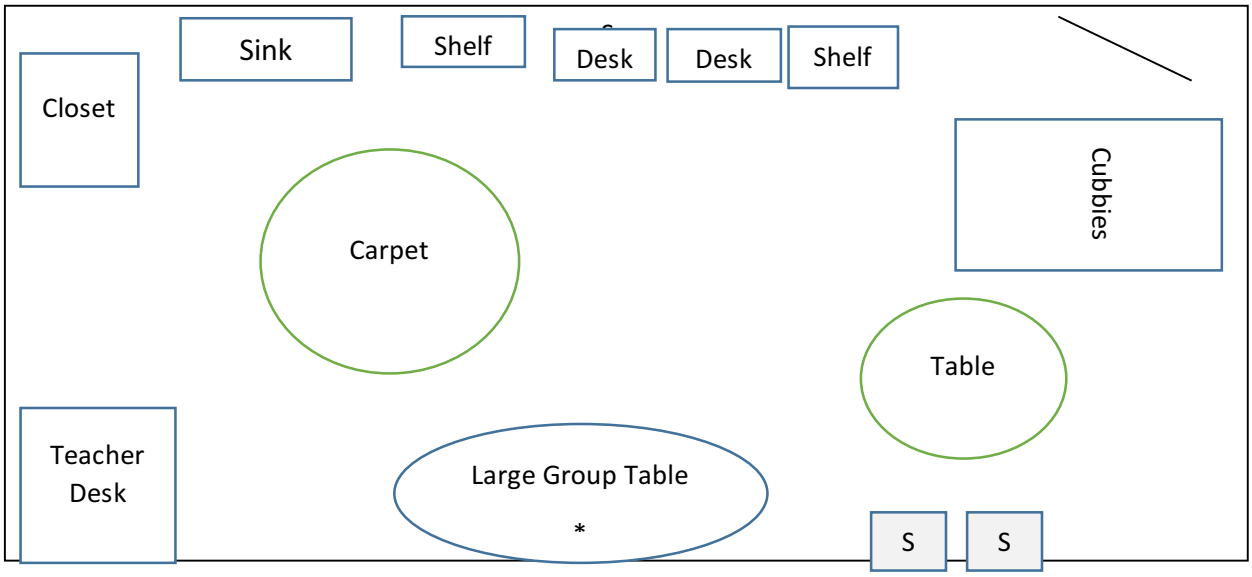

Figure 1. Resource Room. This figure illustrates the layout of the special education resource room. The * indicates the area in which probe sessions occurred.

Figures 2 and 3 show the layout for the second and third grade classrooms respectively. In the second grade general education classroom, the students worked independently at desks while a small reading group met at the large group table in the back of the classroom with the general education teacher. There were 24 students in the classroom. The peer tutor and student worked at the peer's individual desk.

The third grade general education classroom had 22 students working in small reading groups and individual centers that included reading and language arts activities. The general education teacher led a small reading group in the back of the room at the large group table. Centers were set up on student desks and the floor. Students rotated between centers every 5-7 min. During the investigation, peer tutors worked with the students with disabilities in a one-on-one setting at the peer tutor's desk. The

paraeducator supervised student centers in both classrooms while students worked on sight word identification.

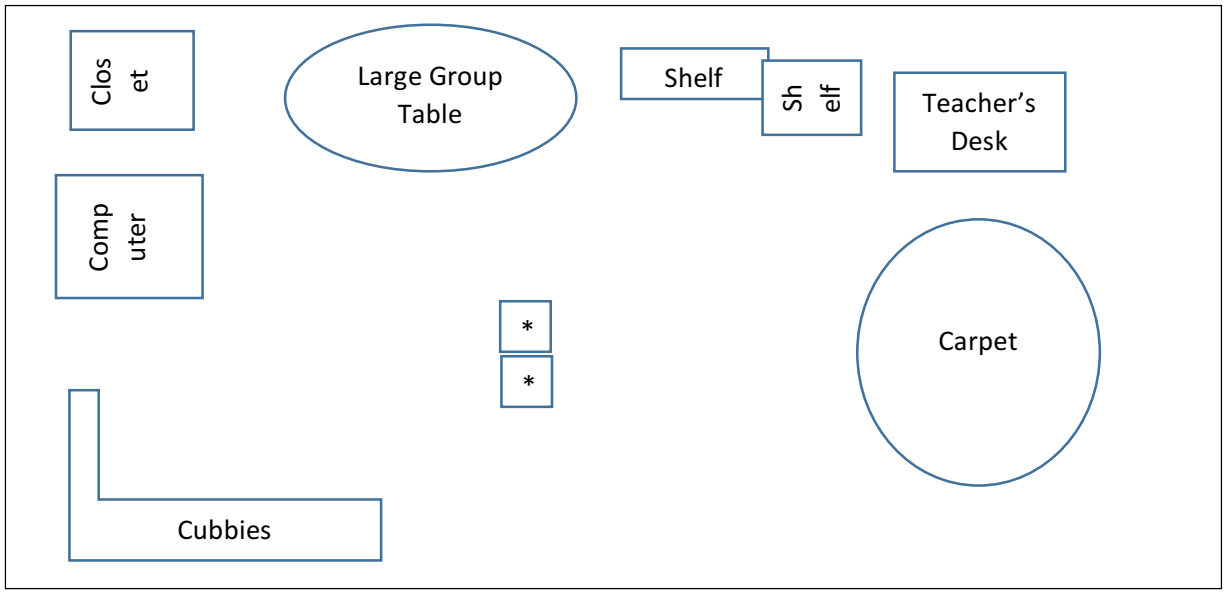

Figure 2. Second Grade Classroom. This figure illustrates the layout of the second grade classroom. The asterisks show the where the participants sat during the study.

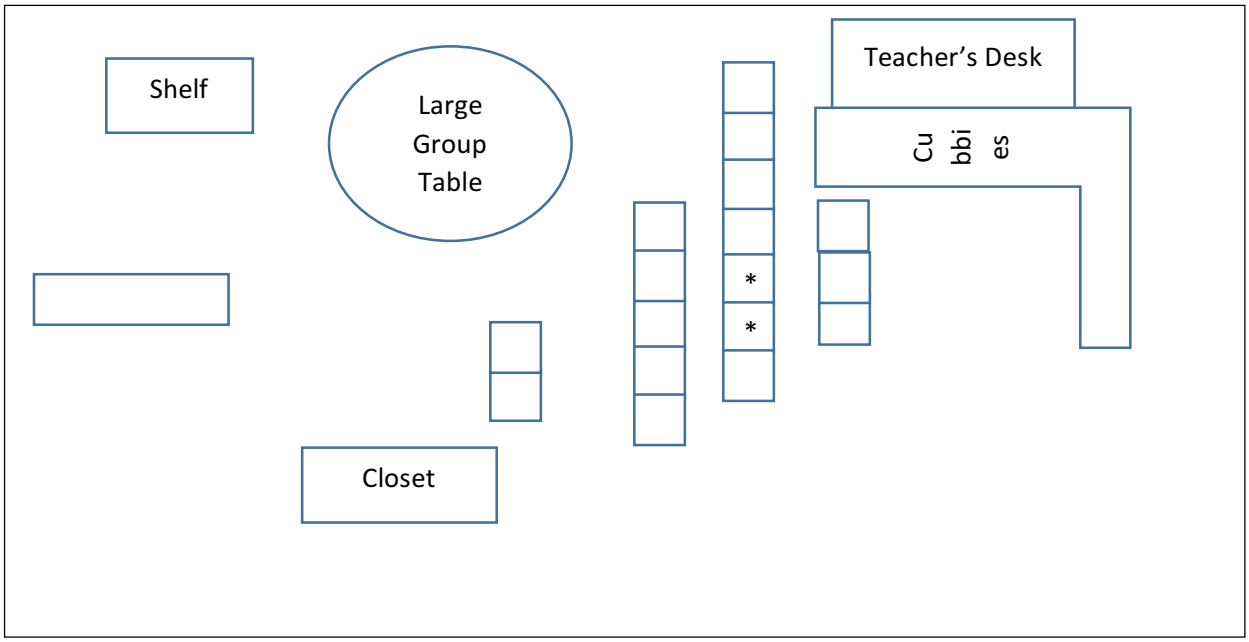

Figure 3. Third Grade Classroom. This figure illustrates the layout of the third grade classroom. The asterisks show where the participants sat during the study.

Materials and Equipment

The materials and equipment used included data sheets used during full probe, daily probe, intermittent probe, and maintenance sessions. Each sight word was on 12.7 cm x 20.3 cm index cards. The words were typed using multiple fonts: Arial, Arial Black, and Comic Sans at a font size of 72. During the pre and posttest for generalization, the Comic Sans font was used. Arial Black font was used during all other generalization probes. During full probe, daily probe, intermittent probes, maintenance sessions, and daily instructional sessions, the sight words identified were typed using Arial font. All words were selected from the Edmark Level 1 series. The words were selected from the beginning of the list. The investigator ensured the words began with different letters. An

Apple iMac was used to create all data sheets. Worksheets were created that targeted generalization skills of each sight word such as focusing on identifying the sight word once combined with other similar words, matching the sight word with the correct picture, and/or simply tracing and writing the sight word. The worksheets were completed while in the general and special education classrooms. The worksheets were completed on a variable schedule based on the amount of free time the students had in the both classrooms.

Dependent Variable/Target Skill/Instructional Objective

The dependent variable for the study was the percent of correct responses of identification of sight words. The instructional objective was as follows for all participants: When shown a collection of sight words, presented individually, the student will orally state each sight word within 5 s of seeing the word, with 100% accuracy for 3 consecutive sessions. The list of words that was taught to each student is shown in Table 1.

Table 1

Target Stimuli by Participant and Tier

Tier	Participants		
	Henry	Norman	Sabrina
1	Horse Car Yellow	Car Yellow Ball	Horse Car Yellow
2	Ball And Fish	And Fish Boy	Little Ball And
3	Airplane Boy The	Girl Airplane The	Boy Airplane Girl
4	N/A	N/A	Elephant Saw Window

Discrete trial data collection was used to measure student responding during full probe, daily probe, and maintenance sessions. The possible student responses included correct, incorrect, and no response. A correct response was defined as the student saying the correct word within 5 s of the task direction. An incorrect response was defined as the student saying a word other than the correct one within 5 s of the task direction. A no response was defined as the student not saying anything within 5 s of the presentation of the word. The investigator verbally praised correct responses (e.g., “Great job, Sabrina. The word is am.”). If no response or incorrect responses occurred, the teacher did not

comment, marked the appropriate mark and moved to the next trial. The student responses were only recorded during full probe and daily probe sessions that were conducted by the investigator. The peer tutors provided instructional trials, but did not collect data.

Rationale

The list of sight words selected for each student were selected to increase independence while reading or completing reading tasks. The students will become more independent while participating in the general education classroom and resource room. The sight words were chosen from the Edmark Level 1 list because the words are designed to teach beginning reading and language development to non readers.

Screening Procedures

Prior to instruction, the investigator gathered the list for the Edmark level 1 series sight words. Due to the students' difficulties with speech, the teacher wanted to confirm that each spoken word was easily discriminable by the teacher. She also selected words that sounded different from one another to eliminate confusion once pronounced. The teacher asked the student to repeat the words after her, without showing the student the index card and conducting a probe session. Once the teacher was able to select words that the students were able to verbally imitate, the teacher conducted screening probe sessions to ensure the students could not identify the sight words.

The teacher conducted screening probe sessions to ensure the students could not identify the sight words. During the screening session, all of the Edmark level 1 words were presented to each student. There was one trial per stimulus during each session. The

teacher ran massed trials with each student. At least two screening sessions were conducted or until nine words were identified that the student could not identify during two screening sessions.

The investigator delivered the attending cue: “Okay, we are going to read some words now.” The teacher ensured an attending response by the student nodding their head, making eye contact, or verbally indicating they were ready. The investigator presented the student with the index card. The investigator delivered the task direction: “What word?” and waited 5 s for a student response. The teacher marked the student response as correct, incorrect, or no response. The investigator verbally praised correct responses (e.g., “Great job, Sabrina. The word is am.”). If no response or incorrect responses occurred, the teacher did not comment, marked the appropriate mark and moved to the next trial.

Experimental Design

A multiple probe (conditions) design across behaviors replicated across students was used in the study (Gast & Ledford, 2014). Experimental control was demonstrated when the percentage of accurate student responses increased when and only when the independent variable was introduced. Procedural fidelity and interobserver reliability data were collected to control for threats to the internal validity. Intermittent full probe sessions were conducted every Friday to report progress on all tiers and to demonstrate independence between the conditions.

Three full probe sessions, or until data were stable, were conducted before the daily probe sessions occurred. First, they had full probe sessions in which they were

assessed on all of the words in the study. Nine words were presented twice during the session which totaled 18 trials. Then, peers taught the first set of words while the teacher conducted daily probe sessions. During daily probe and instructional sessions, the students were presented with three words that were presented twice during one session. The criterion was 100% accuracy over 3 consecutive sessions. Once criterion was met on the first tier of words, the investigator conducted full probe sessions again. The investigator began daily probe sessions on the second tier of words and repeated the same procedures until all words were learned to criterion. Intermittent full probe sessions were conducted every Friday across all tiers. Once all words were met to criterion, the posttest and maintenance sessions were conducted.

General Procedures

The purpose of this study was to use SP procedure and peer tutors to teach three sets of sight words to three elementary school students with disabilities. The investigator used the SP procedure as the independent variable and a multiple probe across conditions experimental design. Peer tutors instructed the students to identify the sight words while in the general education classroom. The peer tutors delivered three words during one instructional session daily. Each tier consisted of three words. Three tiers were assigned to each student that totaled nine words presented to each student throughout the study. The paraeducator collected generalization data in the form of a posttest and the remaining generalization sessions. The investigator collected data for the maintenance sessions.

Peer Training

The investigator taught all peer tutors how to reliably conduct SP instructional trials. Training sessions occurred in the general education classroom before they began working with the students. To teach the peers to conduct the trials, the investigator first modeled one full session with the peer tutor. The investigator conducted one full session with the peer tutor by having the peer tutor play the role of the student and the investigator modeled the role of the peer tutor using the SP procedure. The peer was shown how to present the words, deliver an appropriate response for each student response, and use response times. Once the investigator modeled one full session, the investigator asked the peer tutor to take the role of the teacher and model the steps of the procedure. The peer tutor modeled one full session with the investigator as she played the role of the student. The investigator prompted the peer tutor after an incorrect step and gave descriptive verbal praise once the session had ended. The investigator continued these sessions with the peers until they reliably implemented each procedural step at 90% accuracy or greater.

Haden implemented the steps of the procedure with 100% reliability during his first attempt. Lyle did not positively reinforce after each trial but did verbally praise the investigator at the end of the session. Lyle completed the procedure with 100% reliability during the second session. Thomas forgot to verbally praise the teacher after one trial and did not read the word aloud. He followed the steps of the procedure with 100% reliability during the second session. The behaviors on which the peer tutors were assessed included (a) delivering a general attentional cue, (b) ensuring an attentional response, which

included eye contact and either shaking the head to indicate yes or saying yes (c) presenting the task direction, “Look at these sight words, say (word)”, while showing the index card (d) immediately delivering the controlling prompt within the correct time interval, and (e) delivering appropriate consequences. Correct responses were verbally praised. For no responses or incorrect responses, the student was verbally prompted again. The peer tutors were not trained on data collection as they were not required to collect data during the instructional trials.

The following investigator behaviors were assessed by the paraeducator to ensure a high percentage of procedural fidelity: (a) delivering a general attentional cue, (b) ensuring an attentional response, (c) presenting the task direction while showing the index card (d) immediately delivering the controlling prompt within the correct time interval, and (e) delivering appropriate consequences. The investigator trained the paraeducator to reliably collect procedural fidelity data. A list of steps was provided along with a demonstration of possible responses and appropriate marks for each. The paraeducator collected reliability data on the investigator while collecting data on Haden. Both staff members had 100% of agreement on data collection.

The investigator trained the paraeducator how to reliably collect data using the SP procedure. The procedure was modeled once for the paraeducator. The paraeducator modeled the procedure once with receiving 100% reliability. The training procedures are as follows: attentional cue was delivered, “Are you ready to work? Waited for the student response which was a verbal response stating yes and eye contact or the child displayed eye contact with a nod of the head shaking yes. After the student responded that he/she

was ready to work, the paraeducator delivered the task direction as she showed the index card, “what word?” The paraeducator waited for a student response for 5 seconds. The paraeducator delivered a response based on the student’s response. The paraeducator verbally praised correct responses and for incorrect or no responses, the paraeducator ignored the response and moved on to the next trial.

Probe Procedures

Full probe procedures. The investigator conducted full probe sessions in a one-to-one instructional arrangement for a minimum of three consecutive probe sessions and continued until all data were stable across three tiers. Each student learned three words in each of three tiers during the study. In full probe sessions, all words were presented twice. There was a total of 18 trials presented to each student per session. The data sheet that was used to collect data during full probe sessions is in Appendix A. All full probe sessions occurred in the resource room immediately before the students left for the general education classroom daily and intermittently every Friday.

The investigator conducted the probe sessions by delivering the attending cue of “Okay, we are going to read some words now.” She then ensured the student made a verbal (i.e., stating they were ready) or non verbal attentional response (i.e., eye contact, head nod). The investigator showed the student the index card. The investigator delivered the task direction: “What word?” and waited 5 s for a student response. The investigator provided descriptive verbal praise for correct responses (e.g., “Great job, Sabrina. The word is am.”). If the student responded with an incorrect or no response, the teacher did not comment, marked the appropriate mark and moved to the next trial within 3 to 5 s.

Daily probe procedures. During the daily probe condition, data were collected until the student mastered the selected sight words. The investigator conducted daily probes only on the word set that was receiving instruction during instructional trials. Daily probe sessions occurred daily and before the students left for the general education class. Each session consisted of three trials on each stimulus. Nine trials were presented during each session. One session was conducted daily. Sessions followed the same procedures as during the full probe sessions. The procedure was as follows: The investigator delivered the attending cue: "Okay, we are going to read some words now." Ensured an attending response by receiving a verbal response from the student indicating they were ready to work or if the student made eye contact and shook his/her head. The investigator showed the student the index card. The investigator delivered the task direction: "What word?" and waited 5 seconds for a student response. Three student responses were possible. These included correct, incorrect, and no response. A correct response was defined as the student saying the correct word. An incorrect response was defined as the student saying the incorrect word. A no response was defined as the student not verbally responding once the stimulus was presented. The investigator verbally praised correct responses (e.g., "Great job, Sabrina. The word is am."). If no response or incorrect responses occurred, the teacher did not comment, marked the appropriate mark and moved to the next trial.

Data were recorded as follows: + = Correct response, - = Incorrect response, NR = No response. The investigator would verbally praise the student throughout the sessions if he/she was displaying appropriate behavior such as sitting in their seat, sitting quietly, participating by looking at the card once shown and making an effort to respond to the

card. In Appendix B, the data sheet is included that was used during daily probe conditions.

Instructional Procedures

Instructional sessions were implemented once full probe sessions were complete. The peer delivered instructional trials on one word set at a time until criterion was met on that word set. When the peer delivered instructional sessions in the general education classroom, the investigator conducted daily probe sessions and intermittent probe sessions in the resource classroom. The peer conducted instructional sessions daily.

During instructional sessions, the peer delivered an attentional cue, "Are you ready to work? Waited for the student response to give an affirmative response (e.g., stating yes, looking at the peer, nodding head)., said "What word?" While showing the index card, and then immediately provided a verbal model. The peer tutor then delivered a consequence based on the student's response. Say (word)". The peer tutor verbally praised every correct response (e.g., "Good job, Sabrina. The word is am.). During the instructional sessions, the peer tutor delivered a verbal prompt to the student for every trial. The verbal prompt was the sight word being said aloud by the peer. The peer tutors verbally praised the correct responses. If the student did not respond or responded incorrectly then the peer tutor delivered another verbal prompt and moved on to the next trial.

The peer tutor presented three sight words to the student during the session. Each sight word was presented twice during one session. There were six trials per session: two trials per stimulus. The peer tutor did not collect data during the instructional trials. The

student was expected to conduct the instructional session within a 5-10 min period. Once the session had completed, the students would complete worksheets in the classroom. Each worksheet focused on the current set of sight words to help generalize the skill across materials. The students completed the worksheets independently and if needed help then asked the paraeducator. Data were not collected on student responses on the worksheets but the paraeducator did check the accuracy of student responses on each worksheet. The paraeducator was in the general education class every day and observed the students while she circulated and scanned the entire classroom.

Maintenance Procedures

Maintenance checks were conducted during intermittent and full probe sessions on the stimuli that had reached criterion in previous instruction. Once students met criterion on all tiers, maintenance data were collected during subsequent full probe conditions. Once all words had been taught to criterion, maintenance sessions began to occur after one week of mastery and continued once per week until the end of the school year. Maintenance sessions were conducted using the same procedures as the full probe sessions. The investigator collected data during maintenance sessions in the resource room. All maintenance sessions were conducted in a one-to-one setting. If the student fell below criterion levels, instructional sessions were to be reintroduced and continue until that student met criterion for mastery. The data sheet used for the full probe sessions were used during maintenance sessions.

Generalization Procedures

During this study, generalization sessions across persons, materials, and settings were conducted by the paraeducator. The paraeducator conducted a pre and posttest with each student using index cards with the words printed in the font, Comic Sans size 72 in italics. Both tests were conducted in a one-on-one setting at a small table in the resource room. The paraeducator ran probe sessions, once per week, once the student met criterion for all tiers. All probe sessions were conducted in the resource room in a one-on-one setting at a small table. The procedures demonstrated generalization across persons, materials, and settings. Generalization sessions were conducted with the same procedures as full probe sessions. The pretest was conducted before instruction occurred on any words and posttest was conducted after criterion was met on all words.

Reliability

Procedural fidelity and interobserver reliability data were collected at least once per condition per student. Reliability data were collected for at least 20% of sessions during each condition. The paraeducator was trained to collect these data and collected the data while working with the teacher in the study until a minimum of 80% reliability was obtained. The paraeducator was trained by the investigator before the study began with a student with disabilities that was not in the study. If reliability checks dropped below 80%, the observer was retrained before conducting reliability observation.

Procedural fidelity of investigator delivery of full, daily probe, intermittent probe, and maintenance procedures. The following investigator behaviors were assessed: (a) delivered a general attentional cue, (b) ensuring an atttentional response, (c)

presenting the task direction while showing the index card (d) waiting for a student response within the correct time interval (e) delivering appropriate consequences. The independent variable reliability was collected by the paraeducator that was trained to collect during all sessions. The observer collected reliability data on 26% of the sessions. Procedural fidelity was calculated by dividing the number of peer tutor behaviors observed by the number of behaviors planned and multiplying by 100. Procedural reliability data indicated 100% accuracy during all conditions. The same procedures were used while the investigator trained the peer tutors. The paraeducator observed two sessions while one peer tutor was being trained. The procedural reliability data indicated 100% accuracy.

Interobserver agreement on investigator's probe procedures.. The paraeducator collected interobserver agreement data in the resource room. The paraeducator collected data for 26% of sessions. Interobserver reliability data were calculated using the point-by-point method using the following formula: The number of agreements divided by the number of agreements plus disagreements and multiplied by 100 (Gast & Ledford, 2014). Interobserver agreement was 100% accuracy during all sessions.

Procedural fidelity of peers' delivery of instructional procedures. The paraeducator assessed the peer's use of the independent variable for 23% of the sessions. She measured the occurrence of the peer tutor behaviors of: (a) delivering a general attentional cue, (b) ensuring an attentional response, (c) presenting the task direction while showing the index card (d) immediately delivering the controlling prompt within

the correct time interval, and (e) delivering appropriate consequences. Procedural fidelity was calculated by dividing the number of peer tutor behaviors observed by the number of behaviors planned and multiplying by 100.Two of the peer tutors remained at 100% reliability during all sessions however one peer tutor had a mean of 94% (range= 75%-100%) for the peer-conducted sessions.

Section 4: Results

Henry

The effectiveness data for Henry, Norman, and Sabrina are shown in Figures 4, 5, and 6 respectively. The data indicate that the SP procedure delivered by peer tutors was effective in teaching elementary-aged students to read sight words. Two students (i.e., Sabrina and Henry) learned all sight words to criterion levels. One student reached criterion for one set of set words by the end of the school year.

Henry's data indicated that in Full Probe I, he was unable to read any of the stimuli and was at 0% levels of responding. When the intervention was introduced, he had a flat, stable trend for five sessions, but then had a rapidly accelerating trend for three sessions to reach criterion levels. In intermittent full probes, he had low levels of responding except for one day in which he read one of his Tier 2 words. During Full probe II, Henry decreased below criterion for Tier 1 words, responding from 60-80% accuracy. Tier 2 words returned to 0% responding levels and tier 3 words remained at 0% levels. When instruction occurred on Tier 2 words, he had a flat, stable trend for eight sessions and then had an acceleration in trend and remained stable for four sessions. Henry had a rapidly accelerating trend and mastered tier 2 words after five more sessions.

During Full probe III, Henry decreased below criterion for Tier 1 words, responding from 80-100% accuracy. He decreased below criterion for one session for Tier 2 words for 60% but then reached criterion levels for 100% accuracy. Tier 3 words remained at 0% levels. Once intervention was introduced for Tier 3 words, he had a flat, stable trend for three sessions before had a rapidly accelerating trend for six sessions to reach criterion. During Full probe IV, Henry remained at criterion levels for Tier 1 and 3 words but decreased below criterion for Tier 2 words, responding at 33% accuracy.

Due to end of the school year coming near, a modification was introduced once intervention began for Tier 3 words. The investigator delivered two instructional sessions per day to ensure mastery for Henry. Therefore, after 26 instructional sessions, he worked with his peer tutor twice daily.

Henry maintained 100% accuracy for the first tier of words during intermittent full probes that served as maintenance sessions. He maintained 50% accuracy for the second tier of words and did not receive intermittent full probes for the third set of words due to the end of the school year. He did not reach maintenance sessions that occurred after all sets of words were met to criterion. The pretest conducted on Henry, showed 0% accuracy. No data were collected through a posttest on Henry due to the end of the school year.

Norman

Norman did not identify any of the stimuli during Full Probe I and was at 0% levels of responding. Once the intervention was introduced, he had a flat, stable trend for six sessions. He had a slow accelerating trend for nine sessions and then the first

modification was implemented. He displayed a stable trend for four sessions that introduced the second modification to the study. After the second modification, he had a slow accelerating trend for 17 sessions until criterion was met. During Full probe II, Norman decreased below criterion for Tier 1 words, responding from 80-100% accuracy. Tier 2 and Tier 3 words remained at 0% responding levels. When instruction occurred on Tier 2 words, he had a flat, stable trend for six sessions before the study was stopped due to the end of the school year. Norman only had one demonstration of effect and untreated tiers remained unchanged, but 3 demonstrations of effect within the context of the design are needed to have a functional relation.

For Norman, after 15 instructional sessions, his percentage of correct responses had not shown steady progress. Therefore, the investigator directed the peer to provide two instructional sessions per day in the general education setting. After four instructional sessions, no progress was noted, therefore, the investigator delivered one instructional session in the special education classroom and the peer tutor in the general education classroom each day. This modification resulted in Norman meeting criterion for the first tier of words.

Norman maintained 88% accuracy for the first set of words during full probe sessions. He maintained the first set of words with 50% accuracy during intermittent full probe sessions. He did not reach maintenance sessions that occurred after all words sets were taught, due to the end of the school year and the lack of student progression. He responded with 0% accuracy during a pretest for generalization data. No data were collected through a posttest on Norman.

Sabrina

Sabrina's data indicated that in Full Probe I, she was unable to identify any of the stimuli and was at 0% levels of responding. When the intervention was introduced, she had a flat, stable trend for one session, but then had a rapidly accelerating trend for six sessions to reach criterion levels. During Full probe II, Sabrina remained at criterion levels for Tier 1 words. Tier 2 words remained at 0% responding except for one session and two intermittent full probe sessions. Intervention was introduced before data was stable and she responded with 33% accuracy for one session before the investigator replaced the identified word. The investigator immediately stopped instruction. Tier 3 words remained at 0% levels. During Full probe III, she remained at criterion levels for Tier 1 words. Tier 3 words remained at 0% levels. Tier 4 words were added to the study and Sabrina responded at 0% levels. Once intervention was introduced for Tier 3 words, she had a rapidly accelerating trend for four sessions to reach criterion. During Full probe IV, she remained at criterion levels for Tier 1 and 3 words. She remained at 0% responding for Tier 4 words. Once intervention was introduced, she had a flat, stable trend for one session before she had a rapidly accelerating trend for four sessions before she met criterion levels. For Full probe V, she remained at criterion levels for Tier 1, 3, and 4 words. Sabrina maintained 100% accuracy for the first tier of words, but due to her progress, she did not receive intermittent full probes for tier three and four to assess maintenance. The investigator collected maintenance data for Sabrina, she met criterion at 1, 2, and 3 weeks after criterion was reached on all words. She responded with 100% accuracy on each maintenance probe. Generalization data, across two different trainers and three different fonts typed on the index cards, indicated that prior to training on the

pretest, all students identified the sight words with 0% accuracy. After instructional sessions were completed, the posttest and other generalization data indicated that Sabrina responded with 100% accuracy across people, materials, and settings. No procedural modifications were needed for Sabrina. These results have to be interpreted with caution for Sabrina because there is no demonstration of effect within the context of the design. The SP procedure was effective in teaching at least some sight words to all students, but a functional relation was demonstrated with an adequate number of replications with 1 student.

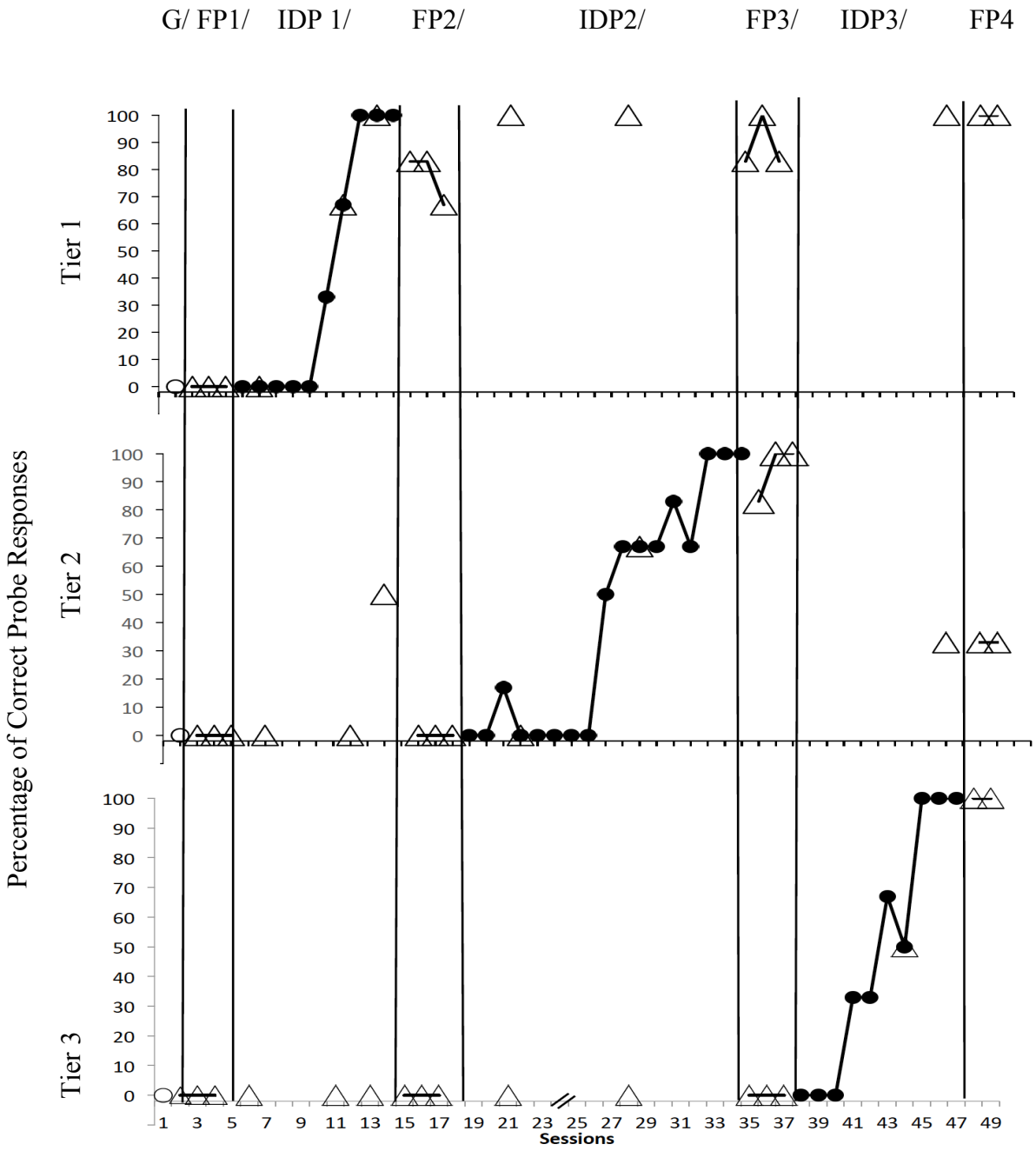

Figure 4. Percent of correct responses for Henry. The open circles show generalization sessions, open triangles show full probe sessions, and closed circles show intervention sessions. G = generalization, FP1= Full probe 1, IDP1= Intervention daily probe 1, FP2= Full probe 2, IDP2=Intervention daily probe 2, FP3= Full probe 3, IDP3= Intervention daily probe 3, FP4= Full probe 4

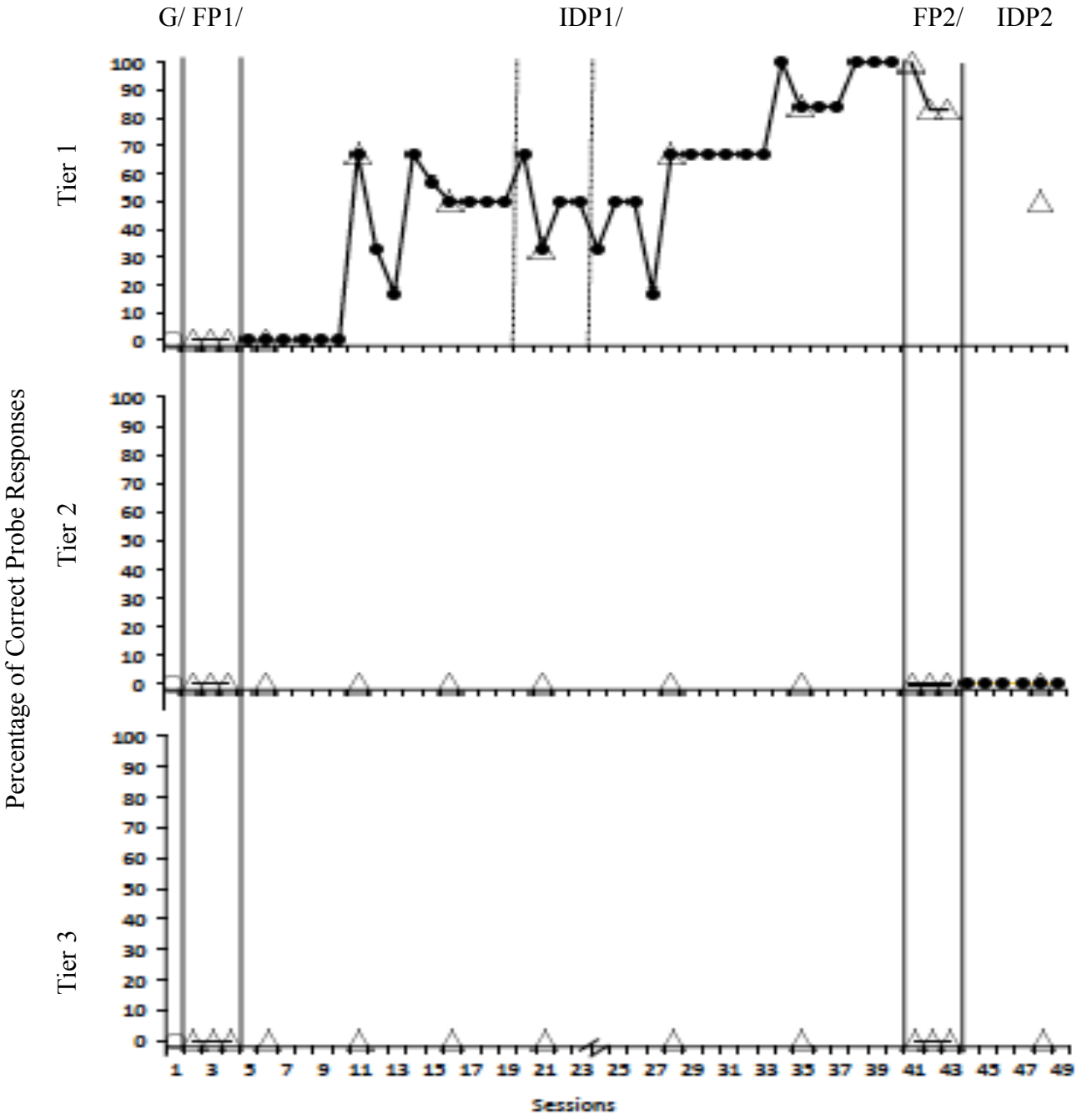

Figure 5. Percent of correct responses for Norman. The open circles show generalization sessions, open triangles show full probe sessions, and closed circles show intervention sessions. G = generalization, FP1= Full probe 1, IDPI= Intervention daily probe I, FPII= Full probe II, IDPII=Intervention daily probe II

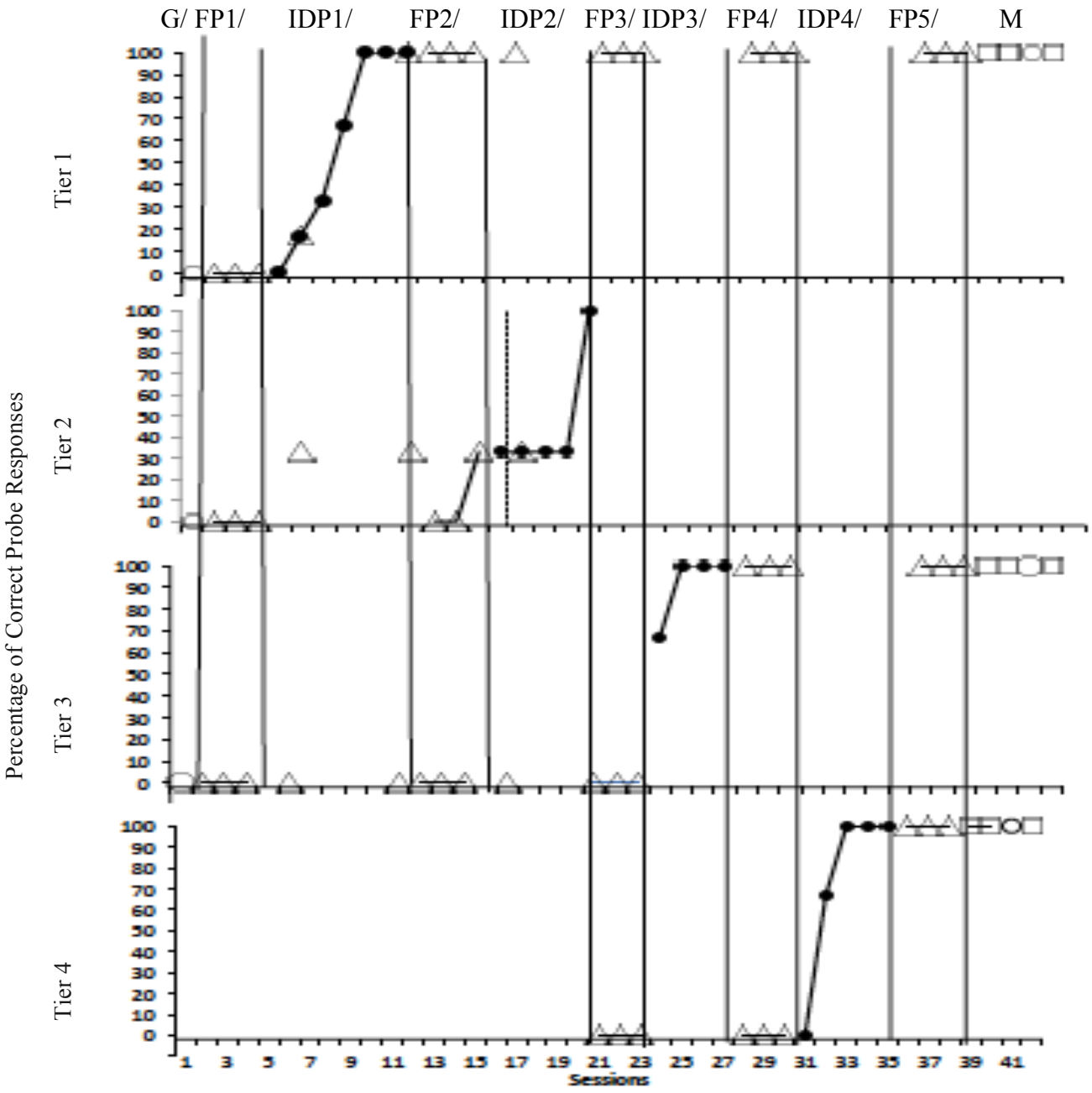

Figure 6. Percent of correct responses for Sabrina. The open circles show generalization sessions, open triangles show full probe sessions, and closed circles show intervention sessions. G = generalization, FP1= Full probe 1, IDPI= Intervention daily probe I, FPII= Full probe II, IDPII=Intervention daily probe II, FPIII= Full probe III, IDPIII= Intervention daily probe III, FPIV= Full probe IV, FPV= Full probe V, M=Maintenance

Efficiency Measures

Sabrina required seven instructional sessions to meet criterion for the first tier of words. She also required four instructional sessions to master the third tier of words and five instructional sessions to meet mastery for the fourth set of sight words. Henry required 10 instructional sessions to reach criterion for the first tier of sight words. He also required 16 instructional sessions to reach criterion for the second tier of words and 10 sessions for the third tier of words. Norman required 36 instructional sessions to reach criterion for the first tier of words. He was responding with 0% accuracy for the second tier of words for the first six sessions when the study ended due to the end of the school year.

Investigator Procedural Errors

Sabrina had four tiers of words included in the study due to procedural errors made by the investigator. In tier two, the teacher moved to the intervention condition before data were stable. Sabrina identified one word during the full probe condition and again during the first intervention probe session. The teacher replaced the word with another sight word from the list, that the student was unable to identify accurately, without conducting a full probe session to ensure data were stable. Tier two was stopped immediately once the procedural error was identified and a fourth tier was added to the study to ensure three replications of the effect of the independent variable.

Section 5: Discussion

The purpose of this study was to examine (a) if there is a functional relation between a peer tutor using SP and an increase in level and trend of reading sight words,

and (b) following direct training from a teacher, can elementary aged peers reliably deliver SP instruction to students with moderate and severe disabilities? Based on the data collected, both questions were answered.

First, the SP procedure was effective in teaching the three elementary-aged students to identify sight words by working with peer tutors while in the general education setting. The peer tutors conducted the instructional sessions while in the general education classrooms. Two of the students identified sight words to criterion levels for all tiers. One student did not reach criterion levels for all tiers by the end of the school year but did acquire three words. Experimental control was strengthened by the replication of the independent variable (i.e., SP) across two students because both students' accuracy of responses only increased once the independent variable was introduced.

Second, the elementary-aged peer tutors reliably delivered SP instruction to the students while in the general education classroom. Lyle did not make errors while delivering instruction. Lyle accurately completed the steps of the instructional prompting session with 100% accuracy for all sessions with Sabrina. Thomas delivered instruction with 100% accuracy for all sessions while working with Norman. Haden did drop below 100% criterion twice as he delivered one session with 75% accuracy and one with 83% accuracy of steps delivered during the instructional sessions. The remaining five sessions where procedural fidelity was collected, he delivered 100% of the steps during instructional sessions. Although Haden did fall below 100% criterion, he did remain at 94% average during instructional sessions during the study. These data indicate that

elementary-aged peers were able to deliver SP trials with a high level of procedural fidelity indicating the SP procedure was easy enough for young children to implement. None of the students, including the student with disabilities, had history with the use of the SP procedure prior to this study.

The investigator took anecdotal notes to capture the thoughts and reactions from the general education teachers, peer tutors, and the student participants. The third grade teacher commented on the peer tutors in her room, "I really thought the peer tutoring was good for my kids. I think they took real ownership of helping your students learn. I'd love to do it again!" The peer tutors' and student participants' thoughts were observed in multiple occurrences throughout the study. On several occasions, two of the peer tutors would come to the investigator in the morning and ask if they were going to get to work with the student they were assigned to work with and then give me a high five or smile and continue to walk to class. The student participants were excited to go to class everyday as evidenced by their inquiries about their participation during that day. The students and peer tutors would greet one another in the hallways and other areas within the school. Participation in the study provided opportunities for the participants to form relationships and increase social interactions.

Limitations

Despite the positive results from the study, there were multiple limitations presented. First, the end of the school year limited the collection of maintenance data with Henry and Norman. Generalization data were ended early due to the end of the

school year as well. Also, the teacher had to make modifications in the study due to the end of the school year.

Implications for Practice

Due to the challenges with student to staff ratio and meeting all needs for every student, peer-mediated instruction can alleviate some pressure put on the teachers. Teachers can reliably train peers that were elementary aged and can create change in student responses. However, some students may need modifications if the peer tutoring alone is not effective. Allowing peer tutors to deliver instruction can free up time for a teacher. Teachers could have more time to work one-on-one with students that need additional help, conduct small groups, and/or deliver instruction to various groups within the classroom while addressing different academic tasks.

Peers can help meet the needs of students and ensure that everyone has a chance to receive instruction in an inclusive setting. This could allow more opportunities for students with disabilities to be included in various activities in the general education setting. The study proved that elementary aged peers can deliver instruction using the SP procedure so peers can meet the needs of students who need systematic instruction.

Future Research

Future research is needed to assess peer tutoring delivering of instructional sessions for various skills such as social skills, academic skills, and possible chained tasks. Also, it should be examined if peer tutors could effectively collect data while using the SP procedure as well as reliably implement other response prompting strategies such as constant time delay and system of least prompts.

In summary, the SP procedure utilized resulted in an increase of student accuracy of sight word identification. More importantly, elementary aged peer tutors reliably delivered instruction to students with disabilities while in the general education classroom. These results can attribute to the literature focusing on peer tutors using systematic instruction to change a student, with disabilities, behavior while in the general education setting.

Appendix A: Full Probe, Intermittent Probe, Maintenance, and Generalization Data Sheets

Student: _____ Instructor: ____ Date: _____ Task: _____

Trial	Stimulus	Trial Type	Correct	Incorrect	No Response
1		Test Prompt			
2		Test Prompt			
3		Test Prompt			
4		Test Prompt			
5		Test Prompt			
6		Test Prompt			
7		Test Prompt			
8		Test Prompt			
9		Test Prompt			
10		Test Prompt			
11		Test Prompt			
12		Test Prompt			
13		Test Prompt			
14		Test Prompt			
15		Test Prompt			
16		Test Prompt			
17		Test Prompt			
18		Test Prompt			
Number/% of Test Trial Responses					
Number/% Prompt Trial Responses					

Appendix B: Daily Probe Data Sheet

Simultaneous Prompting Data Sheet

Name: _____ Date: _____ Instructor:

_____

Objective: _____ Response interval: _____

Circle One: Probe Prompt

Stimuli/Date	/	/	/	/	/	/	/	/	/	/
1										
2										
3										
4										
5										
6										
%/# NR										
%/# Errors										
%/# Correct										

Comments

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