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Effects of Preprinted Response Cards on Disruptive Behavior of Students in an Inclusive Education Setting

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Effects of Preprinted Response Cards on Disruptive Behavior of Students in an Inclusive
Education Setting

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Applied Behavior Analysis
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ABSTRACT

This study examined the effects of preprinted response cards on disruptive behavior and rates and accuracy of responding of elementary-aged students in an inclusive education setting with or at risk for Individualized Education Plans (IEPs). An alternating treatments design with an additional baseline phase was used across three teacher recommended students. During baseline, the teacher conducted a group language arts routine as normal, posing questions to the class and prompting them to raise their hands to answer. During the intervention phase, preprinted response cards (two sets: one true/false and one A/B) were passed out to the class to utilize during the group language arts routine to answer questions. The response card intervention was alternated with the baseline phase in each observation session. The results showed that disruptive behavior decreased substantially across all three students during the response card condition. Additionally, rates of responding and accuracy of responding increased across all three participants during the response card condition. Results indicate that the preprinted choice cards could serve as an effective classroom management strategy in inclusive education settings.

CHAPTER ONE:

INTRODUCTION

Since the passage of the Individuals with Disabilities Education Act (IDEA) in 1975, the educational rights of children with disabilities have been mandated in the public education system. IDEA requires that students who are eligible for special education programs are given an Individualized Education Plan (IEP) that outlines their specific goals and needs that are to be met in the classroom. In addition to the specific services, students with disabilities are guaranteed to have under IDEA, IDEA also mandates that those same students are receiving that same core education as their general education counterparts. For teachers, trying to provide individualized education supports to students with disabilities while also maintaining a commitment to inclusion is a difficult balancing act. The supports that are necessary for teachers to maintain an effective learning environment are not often available and the behavioral needs of students in the classroom are often not met (Rhodes, Neville, & Allen, 2004). As such, finding solutions to manage the problem behaviors of students in classrooms that are easy to implement by teachers is necessary in order to increase effective classroom management.

Active responding methods have been well documented in the literature as an effective method for increasing student participation and academic engagement across a wide array of classroom environments (Clarke, Haydon, Bauer, & Epperly, 2015; Haydon, MacSuga-Gage, Simonsen, & Hawkins, 2012; Wolery & Ault, 1992). Active responding is an instructional management method that promotes the individual student's involvement in their own learning by engaging them directly with course content. Active responding methods are considered a class wide intervention in the School-Wide Positive Behavior Interventions and Supports (SWPBIS) model and are often utilized as a classroom intervention strategy in schools implementing SWPBIS (Reinke, Herman, & Stormont, 2013). SWPBIS is a comprehensive framework rooted in the principles of applied behavior analysis that is designed to

support the implementation of evidence-based practices targeted at shaping the behavior repertoires of individuals by reducing problematic behavior and increasing academic engagement (Horner & Sugai, 2000; Carr et al., 2002). The main purpose of SWPBIS is to provide an environment that allows individuals to change their behavior in a positive way while also providing “relevant stakeholders” (e.g., teachers, parents, peers) the opportunity to be positively impacted as well (McIntosh, Ty, Horner, & Segai, 2012). By increasing student participation during instructional time, research on class wide interventions within SWPBIS has shown increases in on-task behavior and decreases in disruptive behavior (Horn, Schuster, & Collins, 2006; Wood, Mabry, Kretlow, Lo, & Galloway, 2009). A number of class wide intervention strategies designed to increase active participation and student responding during instructional time have been evaluated. These methods include choral responding, peer tutoring, guided notes and response cards (Bowman-Perrott et al., 2013; Haydon, Mancil, Kroeger, McLeskey, & Lin, 2011; Haydon, Mariscano, & Scott, 2014; Randolph, 2007).

Response cards are an evidence-based intervention strategy that has been demonstrated to facilitate active student responding during instructional periods. Response cards are preprinted answer cards, write-on dry erase boards, or computer applications that allow students to display their answers to questions asked by the teacher during instructional activities. Response cards are an intervention strategy that is highly adaptable to units of learning, student abilities, and teacher desires (e.g., Christle & Schuster, 2003; Horn, Schuster, & Collins, 2006; Marmolejo, Wilder, & Lucas, 2004). As such, there exists a diverse body of research outlining the success of response cards as an intervention across a number of environments. The efficacy of response cards has been evaluated as a classroom management strategy across general education classrooms (Clarke et al., 2015; Christle & Schuster, 2003; Wood et al., 2009), special education classrooms (Berrong, Schuster, Morse, & Collins, 2006; Horn, Schuster, & Collins, 2006) and in university settings (Kellum, Carr, & Dozier, 2001; Marmolejo, Wilder, & Lucas, 2004). Response card interventions are typically compared to the more widely used instructional method

of hand raising. Hand-raising, while frequently used in classroom settings, is problematic because it is a passive method of instructional management. Only students who raise their hand are provided an opportunity to respond, and teachers may not select students equally to respond to questions (Haydon et al., 2012).

There are numerous studies that have shown the positive results of response card use in classrooms (e.g., Christle & Schuster, 2003; Wood et al., 2009). In the general education setting, both preprinted and write-on laminated boards have been evaluated (Christle & Schuster, 2003; Wood et al., 2009; Clarke et al., 2016) with typically developing students (Wood et al., 2009; Clarke et al., 2016). The literature has provided substantial evidence to support the use of response cards to reduce disruptive behavior and increase appropriate behaviors (e.g., academic engagement, rates of responding, and accuracy of responding) across ages and ability levels in general education settings.

The current body of research that exists on the efficacy of response cards in the classroom solidifies response cards as an evidence-based intervention that can be utilized to increase academic engagement across a wide array of ages and intellectual abilities in general education classrooms. The studies in general education classrooms evaluate important academic behaviors, such as on-task behavior and off-task (e.g. Christle & Schuster, 2003; Wood et al., 2009). Academic engagement is particularly important for special education students, as these students often require more intensive instructional support (McLeskey & Waldron, 2011). As such, effective classroom management strategies are vital to the success of special education students (Horner & Sugai, 2000; McLeskey & Waldron, 2011).

While there is a growing body of research evaluating the effectiveness of response cards on the social behaviors of both typical and disabled students in the general education setting, few studies have evaluated the effectiveness of response cards on social behaviors in special education settings. A small subset of the existing literature examines the effects of preprinted response cards on both social and academic behaviors in children with developmental disabilities (e.g. Berrong et al., 2007; Cakiroglu,

2014; Horn et al., 2009). Much of this research examines response cards that are specific to an area of learning (Berrong et al., 2007; Horn et al., 2009) and most has demonstrated success for only a small age range, around 10-15 years of age (e.g., Berrong et al., 2007; Horn et al., 2009; George, 2010). The literature among special education populations demonstrates a decrease in off-task and inappropriate behaviors (Berrong et al., 2007; Horn et al., 2009) as well as increases in active participation, rates of responding, and accurate responding (Cakiroglu, 2014; Horn et al., 2009).

Despite the demonstrated benefits, limitations in the current research on response cards within special education contexts exist, particularly regarding the types of cards being used. The current research has evaluated types of preprinted cards that are specific to units of learning, such as telling time (Horn et al., 2009) and weather, months, and seasons (Berrong et al., 2007). Utilizing a more open-ended method, such as multiple choice and true/false preprinted cards allows teachers more flexibility and less preparation time.

Response card research within special education settings is limited. The few studies that do exist include both specific target populations and activities, so extensions and replications of the research are necessary to solidify the efficacy of response card use in special education classrooms. Little research documents the efficacy of response cards as an intervention strategy specifically with children who have disabilities and IEPs. As such, additional research is necessary to evaluate the use of response cards within the SWPBIS model in increasing on-task behavior, reducing disruptive behavior, and increasing both rates of responding and academic accuracy in special education classrooms.

To address some of these gaps that exist in the literature, this particular study aimed to further examine the effects of preprinted response cards (multiple choice and true/false cards) on disruptive behavior and rates and accuracy of responding in an inclusive elementary classroom. This research project set out to address the following questions:

1. To what extent do preprinted response cards impact levels of disruptive behavior?
2. To what extent do preprinted response cards impact the rates of responding and accuracy of responding in an instructional setting?

CHAPTER TWO:

METHOD

Participants and Setting

This study evaluated the effectiveness of pre-printed response cards on reducing students' disruptive behavior during teacher-selected problematic classroom routines. The intervention in question was evaluated in the natural classroom environment during normal instructional routines. The study was conducted in an inclusive, contained 2nd grade classroom at a model PBIS public school in central Florida. According to the National Center for Education Statistics (NCES), the school serves approximately 700 students in pre-k to fifth-grade. At the time of this study, approximately 70% of the students enrolled were eligible for free lunch services, suggesting the school served a high population of economically disadvantaged students. For the 2015-2016 school year, 65% of students were white, 5% were black, 21% were Hispanic, 8% were mixed race, and less than 1% were Native American, Asian, or Pacific Islander. According to the Florida Department of Education (FDOE), the school received an overall letter grade of C for the 2016-2017 when evaluated for overall FCAT standardized scores.

A participant teacher was recruited for this study based on a demonstrated need for increased instructional management support. The participant teacher had a total of three years of teaching experience in elementary level classrooms, including one year in a contained classroom for students with intellectual disabilities. She had been teaching in the 2nd grade classroom that participated in this study for a little over a year. The instructional routine chosen for this study was a group language arts routine. The group language arts routine consisted of several different activities, including group reading and comprehension activities and language arts worksheets. The chosen classroom had a total of 20 students who all participated in the study; however, only three teacher-recommended students were selected for

data collection purposes. The primary investigator provided the teacher with a flyer outlining inclusion criteria for the study, and the teacher made participant recommendations based on the information outlined in the flyer. All three teacher-recommended students were between the ages of 7 and 8, and all recommended students either had or were at risk for a 504 plan or IEP.

The three student participants included in this study were Aaron, Drake, and Alexis. Aaron was a 7-year-old white male who was in the process of being recommended for an IEP at the time of this study. He had progress monitoring plans in math, reading, and writing. Aaron also had a 504 plan that included preferential seating, visual and verbal instructional aids, verbal testing, and small group instruction. Aaron's teacher indicated that Aaron's primary disruptive behaviors included out of seat behaviors, calling out during instruction, and talking with peers. Drake was an 8-year-old white male who was in the process of being recommended for gifted instruction at the time of this study but was denied. Drake received enrichment curriculum in his general education placement. Though Drake was academically successful, he had 504 accommodations including preferential seating and additional teacher support to remain on task. Drake struggled with staying focused on his work, and his primary behavior of concern was unsanctioned play with objects during instructional activities. Alexis was a 7-year-old Hispanic female who had been struggling academically. She had a progress-monitoring plan for writing and was being recommended for additional support. Alexis had a 504 plan that included preferential seating to address behavioral disruptions during instructional routines. Alexis' primary disruptive behaviors included talking to peers, calling out during instructional activities, and unsanctioned play with objects.

Informed Consent

In order for this study to be conducted, informed consent was obtained from the teacher and the parents of the recommended students. In addition to informed consent, verbal assent was obtained from the student participants.

Teacher informed consent. After a classroom had been identified for inclusion in the study, the primary investigator (PI) had a brief informational briefing with the teacher. The PI provided the teacher with a packet that outlined the purpose of the study and the procedures involved. The PI reviewed all of the information in the packet with the teacher during the briefing and allowed the teacher to review the packet for one week following the date of the initial meeting. An informed consent form was included in the packet for the teacher to sign and return to the PI within a weeklong time frame.

Parental informed consent. After teacher informed consent had been received, an informed consent form was sent home with all students in the classroom for parents to review and sign. The form informed the parents that the class was going to be participating in a graduate level research project looking at academic engagement during a teacher-selected routine. The form outlined that the study would be comparing the currently used instructional methods with an active responding instructional method in the form of pre-printed response cards. The consent form gave the parents the option to request additional information about the study. Parents had a one-week timeframe to review the form and send it back to the PI. If parents chose not to let their children participate in the study, the child in question would not be used for data collection.

Student assent. After the PI received signed parental consent forms, the PI obtained verbal assent from the students in the classroom. The teacher allowed the PI to explain to the students the nature of the intervention activity, and then asked the participants if they would like to participate. The assent script outlined the procedures in simple yet understandable terms.

Materials

The intervention evaluated in this study was preprinted response cards that could be used to answer either multiple choice or true/false questions. The PI provided all necessary materials for the study to the teacher prior to the start of intervention. Materials included 20 sets of four laminated cards (approximately 4”X6” in size). Each set of four cards was hole-punched and stored on a key ring to ensure they did not get lost. Two of the cards had “A” and “B” printed on them in a bold, color-coded font. The other two cards had “TRUE” and “FALSE” printed on them in the same bold, color-coded font. All cards had their respective responses printed on both sides of the card, so data collectors could view the answer selections made by the students. The teacher, PI, or a research assistant passed the cards out at the start of the instructional period, and the cards were passed back in at the completion of the instructional period. All cards were kept in the classroom.

Data Collection

The PI served as the principal observer of the classroom throughout the duration of this study. Three target behaviors served as the dependent variables: 1) disruptive behavior, 2) rate of responding, and 3) accuracy of responding. All three target behaviors were observed simultaneously throughout the course of the observational period. Observations took place between 2 and 5 times per week, during the target academic session which ranged between 12 and 32 min in duration with an average length of 21 min. Data were collected using data sheets, a pencil and an iPhone to use to signal interval periods during observation.

Disruptive Behavior

The primary dependent variable included in this study was disruptive behavior. Disruptive behaviors included verbal disruptions defined as unsanctioned talking to peers during instructional time and calling out without permission, as well as motor behaviors defined as getting out of seat, unsanctioned play with objects, touching peers, and throwing objects.

Data on disruptive behavior were collected by using a 10 s partial interval recording system (Appendix A). Disruptive behavior was measured as the percentage of intervals during which the behavior occurred across the observation period. The PI used an audio-file on an iPhone that played a beep at the end of every 10 s interval. Each of the target students were observed for a 2 min period before the PI moved on to observing the next target student. Each participant in the study was observed for a minimum of 4 min per observation. The order of observation of the students was rotated during each observation session to ensure accurate data collection. Disruptive behaviors were recorded on a data sheet with intervals (Appendix A). Plus/minus marks were used to distinguish intervals with disruptive behavior from intervals without disruptive behaviors. The total number of intervals with disruptive behavior were divided by the total number of intervals and multiplied by 100 to get a percentage of intervals with disruptive behavior across the entirety of the observation period.

Percentage of Responding and Accuracy of Responding

The percentage and accuracy of student responding were recorded in order to identify changes in responding between baseline and intervention phases. In the baseline phase, the responses recorded were the number of times the participant raised his or her hand and the number of times the participant was called on and emitted a vocal response. In the intervention phase, the responses recorded were a motor response (i.e., holding up a pre-printed response card). The observer(s) also recorded accuracy of

responding in conjunction with percentage of responding. A checklist sheet was used to record responding data (Appendix B). In each interval, the observer(s) circled a letter H for hand-raise, a letter V for vocal response, and a letter M for motor response, as well as a plus (+) or minus (-) to indicate if the response given was accurate. The total number of responses were summed up and divided by the total number of questions asked and then multiplied by 100 to get a percentage of responding across the observational period. The total number of accurate responses were divided by the total number of responses and multiplied by 100 to get a percentage of accurate responding across the observational period.

Inter-Observer Agreement

A minimum of two additional research assistants with a background in Applied Behavior Analysis were trained in order to work as observers under the PI. Training included a brief (i.e., 30 min) presentation that provided the assistants with operational definitions of the target behaviors and the data collection methods. The PI also modeled target behaviors for the research assistants to observe and provided the research assistants the opportunity to practice data collection with some short video segments of the target behaviors. Research assistants had to reach 100% agreement in training prior to starting data collection for the study. A second observer collected data across 45% of all phases, including baseline and intervention. In order to assess IOA, research assistants needed to both independently and simultaneously collect data on target behaviors and treatment integrity.

IOA for target behaviors was calculated by summing the intervals with agreement, dividing it by the total number of intervals with agreements and disagreements, and multiplying by 100 to get a percentage. Agreement was scored if both observers used the same or similar codes (i.e., a check mark or

plus sign for occurrence of behavior) for corresponding intervals. Any intervals in which coding did not match up were scored as disagreements.

During the initial baseline, IOA was assessed across 50% of sessions (n = 4 sessions). IOA scores ranged from 90%-100%, with an average of 94%. For the baseline sessions during the alternating treatments phase, IOA was calculated 50% of the time (n = 4 sessions). IOA scores ranged from 84%-100%, with an average of 92%. During the response card phase of the treatment condition, IOA was calculated across 50% of sessions (n = 4 sessions). IOA scores ranged from 91%-100%, with an average of 95%.

Experimental Design and Procedures

An alternating treatments design with an initial baseline phase was used to compare the use of hand raising to the use of preprinted response cards on disruptive behavior, percentage of responding and accuracy of responding. An alternating treatments design ensured that any potential extraneous variables were affecting the independent variables similarly, and therefore controlling possible sequencing effects (Cooper, Heron, & Heward, 2007). The conditions that were alternated in this study were the baseline condition and a response cards (RC) condition. Participants were able to easily distinguish between conditions as response cards were either present or not.

Baseline

After a group language arts routine was established as a time where disruptive behavior was most likely to occur, all phases of the study were conducted during this routine. This routine consisted of activities such as group reading and comprehension, as well as language arts worksheets and review activities. In the initial baseline condition, the teacher continued to use the same hand-raising instructional

methods that were used prior to the research investigation. Question and answer sessions took place throughout the class and the teacher called on students who raised their hands to answer when a question was presented. During this phase, the PI monitored the number of questions asked by the teacher in order to ensure enough questions were asked for data collection purposes. teacher was instructed to “teach as she normally would” in the classroom. Between 11 and 20 questions were asked during each initial baseline session. Questions were generally open ended (e.g., what is an example of a multiple meaning word?)

Response Cards

The teacher generated content-based questions to utilize during each lecture that were a part of the response card intervention phase. The questions were generated dependent upon the teacher-selected language arts routine (the same routine from the baseline conditions) and were similar to questions that she asked in the baseline condition. Examples of questions asked were “Show me ‘A’ if you think this passage was about Teddy Roosevelt, show me ‘B’ if you think it was about Johnny Appleseed” and “True or False: ‘match’ is a multiple meaning word.” Questions were delivered vocally and/or textually (i.e., written on the board).

Questions were a combination of true/false and multiple-choice questions. Response cards in the form of flashcards were administered to students prior to the start of lecture. Once the teacher posed a question, the students had an opportunity to respond by holding up either a true/false flashcard or an A/B flashcard, depending on the question posed. A brief interval (i.e., 5 s) was provided between the posing of the question and the presentation of student responses. Once the class held up their answers, the teacher scanned the answers and decided upon the appropriate feedback to provide to the entire class (e.g. “everybody answered the question correctly,” “we need to spend some time reviewing this material”).

Several steps for each instructional unit during the RC phases were utilized. These steps included: (1) vocally or textually presenting the question to the entire class (e.g., “The current month is October, hold up true or false” or writing “What month of the year is it? A. October B. December” on the board), (2) providing an appropriate time frame for the students to provide a response (e.g. between 15 and 30 s), (3) providing a cue for the students to present their selected cards, 4) vocally providing the correct response to the class (e.g., “The correct answer is True, it is October” or “The correct answer is A for October”), and (5) providing praise for utilizing the response cards and for correct responses while also providing corrective feedback if needed. If inappropriate behavior occurred with the response cards during the RC phase, the teacher provided the students with a warning (e.g., “You need to use your response card to answer the question”). If the inappropriate behavior continued, the RC would have been removed for a brief period of time (e.g., 10 s). The teacher gave warnings to students twice during intervention phase when the response cards were being used inappropriately. The cards were never removed from students for any length of time.

Teacher training for using response cards. Behavioral skills training (BST) was provided to the teacher following the conclusion of the baseline phase. BST consisted of an instructional period, modeling done by the primary investigator, an opportunity for the teacher to rehearse the intervention and feedback from the primary investigator on how to appropriately implement the intervention. Training took less than 20 min outside of instructional time (e.g., during morning setup or lunch breaks), and was conducted until the teacher demonstrated 100% fidelity across all steps of the procedure.

Student training for using response cards. Behavioral skills training was also implemented with the students to instruct them on how to use the response cards. The training occurred during an instructional routine that was different from the one targeted during the study (a daily spelling and grammar activity). The PI first provided the students with verbal instructions on how to properly utilize the preprinted response cards they were given. The teacher then provided a question, and the PI modeled

the behavior of holding up the appropriate card to respond to the question. This behavior was modeled for both multiple choice and true/false questions, as each had their own set of response cards. After the modeling session, students had the opportunity to rehearse using the sets of cards when the teacher asks questions and the primary investigator provided immediate feedback. Once students reached 100% proficiency without additional verbal prompting, training was completed.

Treatment Integrity

Treatment integrity checks were conducted across 50% of sessions to ensure the teacher was implementing the response-card intervention with high fidelity (Appendix D). If treatment integrity fell below 100%, the PI would have provided both positive and corrective feedback at the end of the conclusion of the observation session. The teacher never required corrective feedback for her implementation of the response cards, so the PI provided praise to the teacher for following the integrity checklist so well. Treatment integrity was calculated by dividing the number of steps completed correctly by the total number of steps, and then by multiplying 100 to get a percentage. Treatment integrity was at 100% during the entire intervention phase of the study.

Social Validity

Both the teacher and the students rated the acceptability of the intervention. The teacher was given a Modified Intervention Rating Profile (IRP-15; Martens, Witt, Elliot, & Darveaux, 1985) immediately following the conclusion of intervention (Appendix E). This 15-item questionnaire used a 6-point Likert-type scale to identify teacher satisfaction with the intervention, as well as their perception of efficacy and ease of use. An adapted version of this rating developed by the PI was administered to the

students (Appendix F). The student survey contained questions on a 3-point Likert-type scale that addressed their satisfaction with the intervention, and their perceptions of how effective the intervention was and how they felt it impacted their classroom experience.

The IRP-15 was administered to the teacher following the conclusion of data collection. The average rating across all IRP-15 questions was a 5.9 (range= 5-6). Overall, the teacher strongly agreed that the use of the response cards was a useful intervention to reduce disruptive behaviors and keep her students on task. She found them very easy to incorporate into her language arts routine and planned to try and incorporate their use into more areas of instruction.

Surveys were sent out with all students in the classroom, but for the purposes of this study only the responses of the students who turned in parental consent were included (n = 10). Nine out of ten students thought that the response cards helped them understand their work and pay attention to the teacher. Nine out of ten students also thought the cards were fun to use, and eight of the ten students wanted to continue to use the cards. One student was unsure if they wanted to continue using the cards, and another did not want to continue using the cards despite saying the cards were fun and helped them stay focused. Social validity was collected for two of the three participants used for data collection in this study. Aaron reported that he thought the cards were a fun activity that helped him learn and stay focused, and he wanted to continue to use them during class. Drake reported that he thought the cards were fun and helped him understand his work, but he was unsure if they helped him pay attention in class and if he wanted to continue using them.

CHAPTER THREE:

RESULTS

Figure 1 displays data on disruptive behavior across all three participants during the target instructional period. During the baseline phase, disruptive behaviors of all three students were variable but high across most intervals (range = 43%-94%). The mean percentage of intervals in which disruptive behavior was 64% (range = 60%-66%). During the alternating treatments phase of the study, baseline levels were comparable to what was observed during the initial baseline phase (range = 42%-77%) with a mean percentage of 65% (range = 63%-67%). The response card intervention resulted in a substantial decrease in disruptive behaviors across all three participants (range = 6%-55%). Drake, the second participant in the study, had one intervention point (disruption during 55% of intervals) that overlapped with three of his baseline points. Despite the one outlier, the mean percentage of intervals with disruptive behaviors was much lower at 24% (range = 18%-29%) during the response card condition.

Figure 2 displays data on rates of responding across all three participants. During baseline, all three participants responded to teacher posed questions at low rates (range = 0%-27%). The mean percentage of responding across opportunities to respond was 14% (range = 11%-16%). During the alternating treatments phase, rates of responding in the baseline condition were comparable to those during the initial baseline phase (range = 0%-60%) with a mean percentage of 12%. The response card intervention resulted in a substantial increase in rates of responding across all three participants (range = 80%-100%) with an average rate of responding of 98% (range = 96%-100%).

Figure 3 displays data on the accuracy of responding across all three participants. During baseline, all three participants accurately responded to teacher posed questions at low rates (range = 0%-50%). The mean percentage of accurate responding across attempted responses during baseline was 22%

(range = 8%-29%). During the alternating treatments phase, rates of accurate responding in the baseline condition remained similar to those during the initial baseline phase (range = 0%-100%) with a mean percentage of 30% (range = 25%-33%). The response card intervention resulted in a substantial increase in accurate responding, with rates ranging from 60%-100% across all three participants, with a mean accurate response rate of 90% (range = 86%-95%).

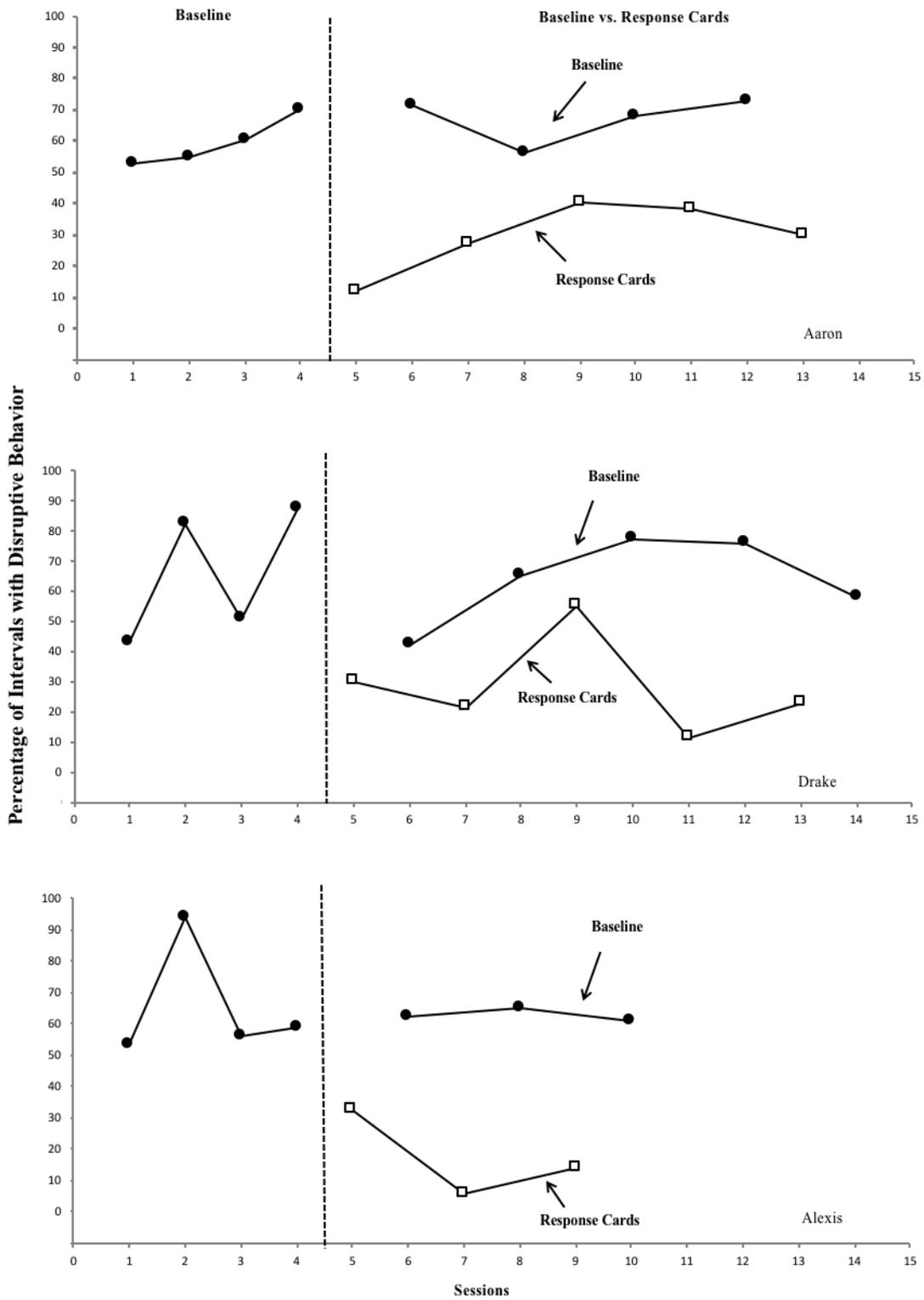


Figure 1. The percentage of intervals during instructional time that disruptive behaviors were observed are recorded and displayed in the above graphs.

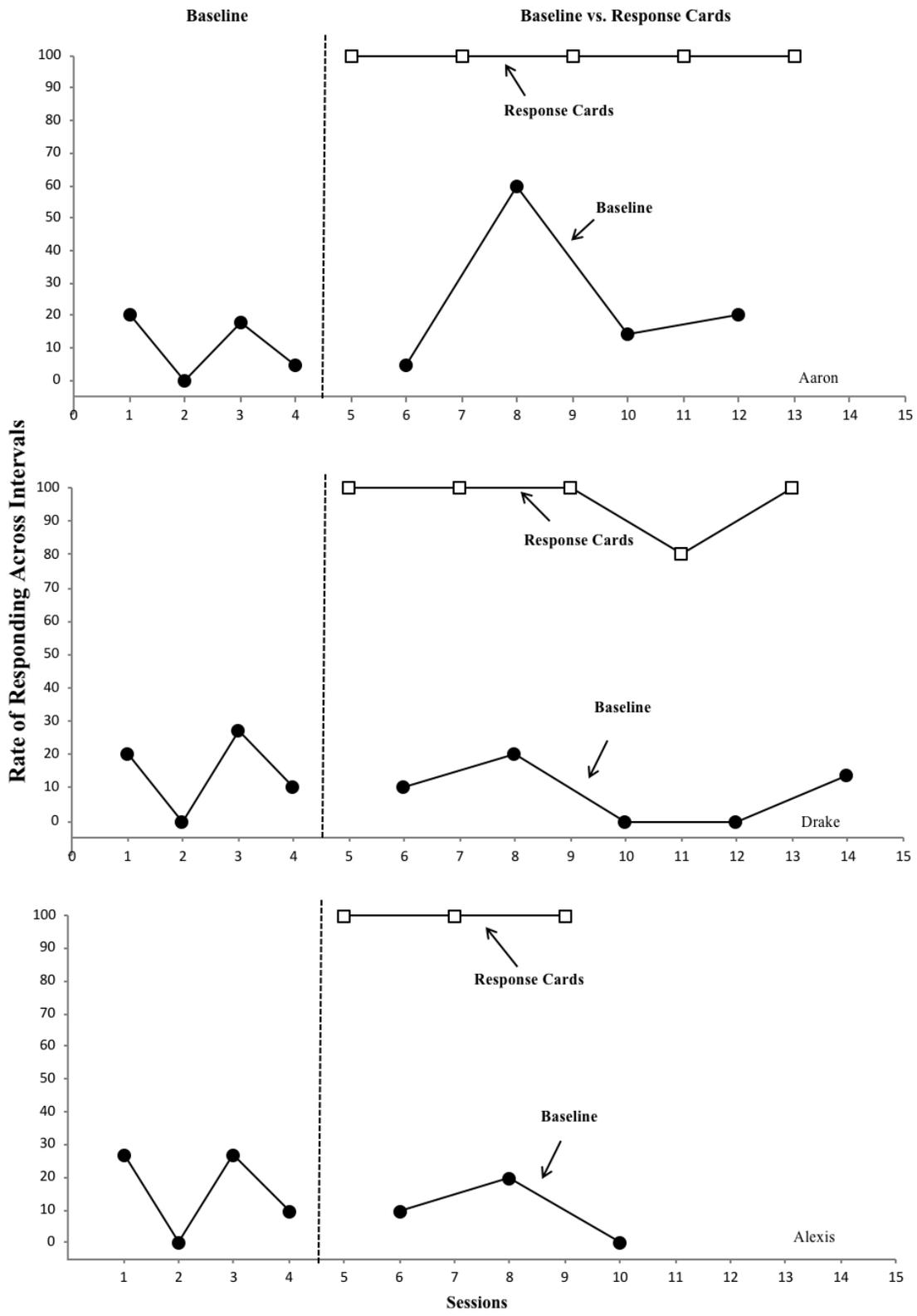


Figure 2. The percentage of total responding across students is displayed in the above graphs.

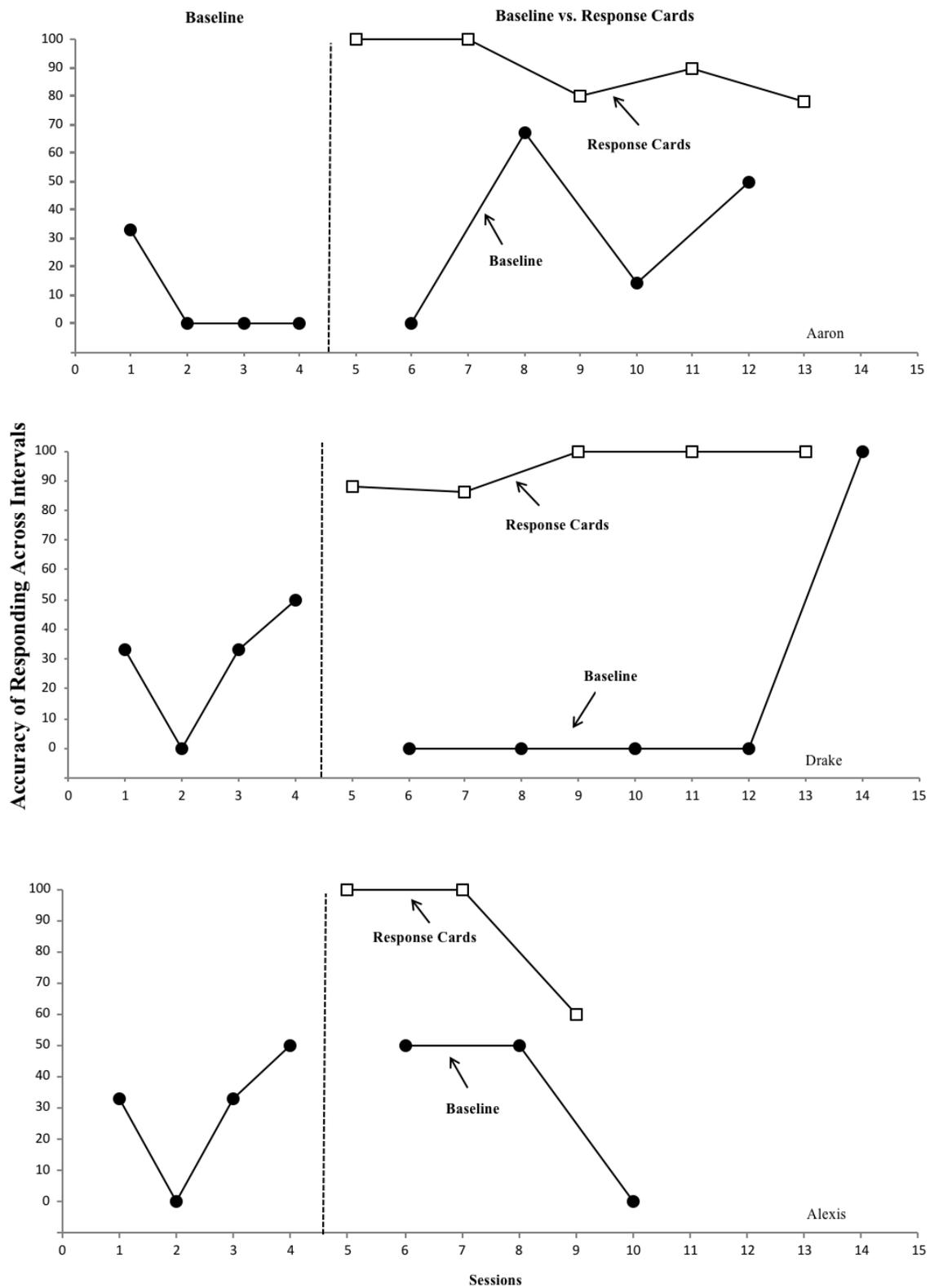


Figure 3. The percentage of accurate responding across students is displayed in the above graphs.

CHAPTER FOUR:

DISCUSSION

The purpose of this study was to examine whether preprinted choice response cards would help (a) reduce rates of disruptive behavior, (b) increase rates of responding, and (c) increase accuracy of responding during instructional routines. The results demonstrated that the use of the response cards did reduce disruptive behaviors and increase rates and accuracy of responding across all three student participants.

During the initial baseline phase, all three target students exhibited moderate to high levels of disruptive behaviors and low levels of responding and accuracy of responding. During intervention conditions during the alternating treatments phase, all three students were less disruptive across nearly all observations and more likely to respond and respond accurately to teacher posed questions. Drake, participant 2 in the study, had one data point during intervention where the rate of his disruptive behaviors (55%) overlapped with the rate of his disruptive behaviors during baseline. Despite this, Drake was still responding at much higher rates (100%) and responding with much higher accuracy (100%) in the response card condition than he was averaging during baseline. The remaining two participants saw no overlapping data points between baseline and the response card intervention for any of the three target behaviors observed during this study.

The results of this study highlight the benefits of using response cards as a measure to decrease disruptive behavior, as their utilization may serve as a competing response. Active responding methods such as the cards require students to remain focused on the instructional routine, thus likely providing fewer opportunities for disruptive behavior to occur. When using traditional hand raising methods or calling on students at random, students were less likely to be engaged in the instructional material

throughout the activity, and only participated when specifically called on by the teacher. The results demonstrated in this study were similar to findings in previous studies. Wood et al. (2009) and Clarke et al. (2016) also utilized preprinted response cards in inclusive classroom settings and demonstrated a decrease in disruptive behavior and an increase in active participation. However, the modality of response cards they used only allowed for their use during specific instructional routines (i.e., days of the week, stages in the water cycle). This study further extends the literature by demonstrating the efficacy of open-ended response cards on disruptive behavior and academic engagement.

The increase in rates and accuracy of responding demonstrated in this study may be a result of a change in content requirement between baseline and intervention. During baseline, questions posed frequently required a more complex response than a “True/False” or “A/B” (e.g., requiring a full sentence response). The nature of the response cards meant that students always had a set of two answers to choose from and subsequently had a 50% chance of answering the question correctly. The lower content requirement of the response cards may serve as an explanation for why there was such a drastic increase in rates of responding and accuracy.

While baseline levels of accuracy remained relatively low, some of the participants had data points that indicated high rates of accuracy during baseline, such as Drake. While Drake did respond with 100% accuracy during one baseline session, his corresponding rate of responding was quite low at 14%. This demonstrates that while Drake was answering questions correctly, he was not answering them frequently. The use of the response cards increased rates and accuracy of responding concurrently, which helped to establish their effectiveness.

All three students engaged in separate topographies of disruptive behavior. Aaron primarily engaged in out-of-seat behaviors and talked out of turn, Drake would mainly doodle or rock his desk chair back and forth, and Alexis would talk to peers and aggressively tap her pencil. The teacher noticed that the addition of the response cards seemed to make the lesson more fun for the students, which may have

resulted in them engaging in less disruptive behaviors. She also commented that she did not need to reprimand students as much since they were engaging in less disruptive behaviors when they were using the response cards. She was surprised that the students actually seemed to enjoy participating in academic routines with the use of the response cards as well.

While the results of the study support the use of response cards, there are several limitations that need to be highlighted when looking at the data. First, follow up data were not collected. This was primarily due to time constraints that made it impossible to collect (i.e., quarterly assessment, spring break, the end of the year). Follow-up data would have allowed the researcher to see if the teacher continued to utilize the intervention following the conclusion of the study, and what the long-term behavioral effects of the intervention might be for students. Future research should evaluate the use of response cards longitudinally, and how their use might affect other important classroom behaviors, such as social behaviors and academic performance.

Data collection procedures were another limitation of this study. The group reading routine that was evaluated in this study was relatively short and varied in length, ranging between 12-32 min long. This provided each student with an average of about 8 min of observation time. Unfortunately, videotaping was not allowed in the public classroom, which could have allowed for more data with each student. Despite the short observation windows per student, experimental control was demonstrated through the replication of the results across all three participants.

Future research should address several areas that this study was unable to evaluate. First, using the same modality of cards used in this study that provided choice options to students should be examined in other learning routines. This study only examined the efficacy of the activity during a group reading routine, but the open-ended nature of the cards could also be evaluated across other instructional routines in which the teacher asks content-based questions. The cards should also be evaluated in different settings. While this study examined the response cards efficacy in an inclusive general education setting,

the use of response cards in self-contained special education and/or classrooms for students with emotional and behavioral challenges should also be evaluated.

The use of response cards in conjunction with a rewards system might also be assessed in future studies. This study only examined the effectiveness of response cards in comparison to a baseline condition of hand raising but conducting a component analysis where the response cards are used with a rewards system and without a rewards system might help to further identify the overall efficacy of response cards as an intervention used to reduce disruptive behaviors. It may be the case that adding a reward system might improve the long-term use of response cards in the classroom.

The findings of this study demonstrated that open-ended response cards could decrease disruptive behaviors and increase rates and accuracy of responding in inclusive classroom settings. The results indicate that open-ended response cards could be used as an effective classroom management strategy in classrooms that need additional supports to increase on task behaviors.

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APPENDICES

Appendix A: Disruptive Behavior Data Sheet

Observer Initials: _____

Start Time: _____

Date: _____

End Time: _____

Instructions: Within each 10-s interval, please mark a plus sign (i.e., +) if disruptive behavior is observed or a minus sign (i.e., -) if disruptive behavior is not observed for each of the target students.

| Seconds | 0-10s | 10-20s | 20-30s | 30-40s | 40-50s | 50-60s | 60-70s | 70-80s | 80-90s | 90-100s | 100-110s | 110-120s |
|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|----------|----------|
| Student | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |

| Seconds | 0-10s | 10-20s | 20-30s | 30-40s | 40-50s | 50-60s | 60-70s | 70-80s | 80-90s | 90-100s | 100-110s | 110-120s |
|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|----------|----------|
| Student | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |

| Seconds | 0-10s | 10-20s | 20-30s | 30-40s | 40-50s | 50-60s | 60-70s | 70-80s | 80-90s | 90-100s | 100-110s | 110-120s |
|---------|-------|--------|--------|--------|--------|--------|--------|--------|--------|---------|----------|----------|
| Student | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |

Appendix B: Student Responding and Accuracy Recording

Observer Initials: _____

Start Time: _____

Date: _____

End Time: _____

Instructions: For each teacher-posed question, circle a H for hand raises, a V for verbal responses, or an M for motor responses. For each correct response, circle a plus sign (i.e., +). For each incorrect response, circle a minus sign (i.e., -).

| Student | 1 | 2 | 3 |
|----------|--------------|--------------|--------------|
| Question | | | |
| 1 | H V M + - | H V M + - | H V M + - |
| 2 | H V M + - | H V M + - | H V M + - |
| 3 | H V M + - | H V M + - | H V M + - |
| 4 | H V M + - | H V M + - | H V M + - |
| 5 | H V M + - | H V M + - | H V M + - |
| 6 | H V M + - | H V M + - | H V M + - |
| 7 | H V M + - | H V M + - | H V M + - |
| 8 | H V M + - | H V M + - | H V M + - |
| 9 | H V M + - | H V M + - | H V M + - |
| 10 | H V M + - | H V M + - | H V M + - |
| 11 | H V M + - | H V M + - | H V M + - |
| 12 | H V M + - | H V M + - | H V M + - |
| 13 | H V M + - | H V M + - | H V M + - |
| 14 | H V M + - | H V M + - | H V M + - |
| 15 | H V M + - | H V M + - | H V M + - |

Appendix C: Teacher Self-Monitoring Form

Instructions: Use the following steps to pose a question to the students in the class when utilizing the response cards. Please check off underneath each successive number as questions are posed to the class to monitor how many questions have been asked.

Step 1: A question is posed by the teacher to the class, either verbally or textually (e.g., on the board).

Step 2: The teacher provides an appropriate amount of time for the students to read the question and provide a response (approximately 20-30 s).

Step 3: The teacher provides a cue to the students to hold up their cards (e.g., “Cards up everyone!”).

Step 4: The teacher provides the class with the correct answer.

Step 5: The teacher provides the whole class with praise for responding (e.g., “Everyone did great using their response cards!”).

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 15 |
| Date: _____ | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 15 |
| Date: _____ | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 15 |
| Date: _____ | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 15 |
| Date: _____ | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | |
|-------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| Question: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 15 |
| Date: _____ | | | | | | | | | | | | | | |

Appendix D: Treatment Integrity Recording Sheet

Date: _____ Time: _____

Instructions: During each trial, indicate whether or not teacher performed the steps outlined below. Place a plus sign (e.g., +) to indicate a completed step and a minus sign (e.g., -) to indicate an incomplete step. Each trial begins when the teacher poses a question to the class, and finishes when the teacher reveals the answer and provides praise.

Step 1: A question is posed by the teacher to the class, either verbally or textually (e.g., on the board).

Step 2: The teacher provides an appropriate amount of time for the students to read the question and provide a response (approximately 20-30 s).

Step 3: The teacher provides a cue to the students to hold up their cards (e.g., “Cards up everyone!”).

Step 4: The teacher provides the class with the correct answer.

Step 5: The teacher provides the whole class with praise for responding (e.g., “Everyone did great using their response cards!”).

| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|----------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| Step | | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | |

Appendix E: Social Validity Checklist: Modified Intervention Rating Profile-15 (IRP 15)

Adapted from the IRP-15 Copyright, 1982. Brian K. Martens & Joseph C. Witt

Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1= Strongly disagree 2= Disagree 3= Slightly disagree 4= Slightly agree 5= Agree 6= Strongly agree

1. This was an acceptable intervention for the problem behavior engaged in by targeted students in my class.
1 2 3 4 5 6
2. Most teachers would find this intervention appropriate for behavior problems in addition to those described.
1 2 3 4 5 6
3. This intervention proved effective in changing the overall problem behavior for targeted students in my class.
1 2 3 4 5 6
4. I would suggest the use of this intervention to other teachers.
1 2 3 4 5 6
5. The problem behavior was severe enough to warrant use of this intervention.
1 2 3 4 5 6
6. Most teachers would find this intervention suitable for the behavior problems in their class.
1 2 3 4 5 6
7. I would be willing to use this intervention in the classroom setting with other students.
1 2 3 4 5 6
8. This intervention did *not* result in negative side effects for children in my class.
1 2 3 4 5 6
9. This intervention would be appropriate for a variety of children and classrooms.

1 2 3 4 5 6

10. This intervention was consistent with those I have used in classroom settings.

1 2 3 4 5 6

11. This intervention was a fair way to handle the problem behavior in my classroom.

1 2 3 4 5 6

12. This intervention was reasonable for the behavior problems in my classroom.

1 2 3 4 5 6

13. I liked the procedures used in this intervention.

1 2 3 4 5 6

14. This intervention was a good way to handle the problem behaviors in my classroom.

1 2 3 4 5 6

15. Overall, this intervention was beneficial for the students in my classroom.

1 2 3 4 5 6

Appendix F: Student Social Validity Checklist

NAME _____

Social Validity- Student Version

Please score each item by circling the answer that describes how you feel about the picture cards

1. Did the answer cards help you understand your work?

NO

I DON'T KNOW

YES

2. Did the answer cards help you pay attention to your teacher?

NO

I DON'T KNOW

YES

3. Did you have fun using the answer cards?

NO

I DON'T KNOW

YES

4. Would you like to keep using the answer cards?

NO

I DON'T KNOW

YES

Appendix G: USF IRB Approval Letter



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799
(813) 974-5638 • FAX (813) 974-7091

10/11/2017

Haley Paulish
ABA-Applied Behavior Analysis
4202 E Fowler Ave., MHC 2113A
Tampa, FL 33612

RE: Expedited Approval for Initial Review

IRB#: Pro00032034

Title: The Effects of Preprinted Response Cards on Disruptive Behavior of Students with Disabilities

Study Approval Period: 10/10/2017 to 10/10/2018

Dear H. Paulish:

On 10/10/2017, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):

Protocol Document(s):

[Protocol_V3_9/12/2017](#)

Consent/Assent Document(s)*:

[Parental Consent_V4.pdf](#)

[Student Written Assent.docx.pdf](#)

[Teacher Consent_V2.docx.pdf](#)

***[Student Verbal Assent_V1.docx](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent documents are valid until the consent document is amended and approved. ***Child verbal assent is not a stamped form.

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR

56.110. The research proposed in this study is categorized under the following expedited review category:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

This study involving child participants falls under the minimal risk category 45 CFR 46.404: Research not involving greater than minimal risk.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,



John Schinka, Ph.D., Chairperson
USF Institutional Review Board