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Noncontingent Reinforcement and Decreasing Problem Behaviors with Students with Special Needs and Its Effect on Teacher Behavior

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NONCONTINGENT REINFORCEMENT AND DECREASING PROBLEM BEHAVIORS WITH STUDENTS WITH SPECIAL NEEDS AND ITS EFFECT ON TEACHER BEHAVIOR

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I dedicate this specialist project to my family. Mom, Dad, Alan, and Sarah, I could not have accomplished any of my goals without your faith in my abilities and your love.

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A pilot study of noncontingent reinforcement (NCR) was conducted using NCR statements to (a) decrease target behaviors, (b) increase unprompted praise statements from the teacher and decrease reprimands, and (c) increase proximity to the participants by the teacher implementing NCR. Data were collected using a single-subject research design on two participants and one teacher. The target behaviors were physical and verbal aggression and inappropriate gestures. Teacher behaviors targeted with this study were praise statements, reprimands, and proximity to students. The participants included were one 16-year-old student with an emotional behavior disability, one 18-year-old student identified with autism spectrum disorder (ASD) and an undergraduate student who was the teacher in this setting. The results were inconclusive regarding the students' behavior due to confounding variables. However, regarding teacher behavior, the results demonstrated an increase in proximity and praise statements and a decrease in reprimands. This single-subject study provided empirical support that the NCR intervention positively altered teacher behavior.

Introduction

Education is currently making important changes to incorporate more interventions in the general education setting. Students are receiving more interventions than in the past, with the inclusion of Response to Intervention (RTI) programs for monitoring academic achievement and modifying student behavior (Myers, Simonsen, & Sugai, 2011). Multiple school districts are progress monitoring students and using RTI for academic program planning, differential grouping of students, and special education referrals. Interventions are being implemented, adjusted and individualized for all students in the school system to better target students' educational needs.

Due to limited fiscal and personnel resources in public schools, empirically supported interventions are more critical than ever. The Individuals with Disabilities Act (IDEA) requires school administrators to select evidence-based interventions with a history of success in educational settings (Fixsen, Blasé, Metz, & Van Dyke, 2013). In addition, time is a valuable and limited resource for public education teachers. Administrators are seeking interventions that are not only empirically supported, but also feasible for teachers to perform in addition to their daily duties in the classroom.

Interventions for problem behavior are of great value to teachers in both general education and special education settings. Problem behavior is both distracting for other students and time-consuming for teachers to rectify. Teachers are expected to both modify negative student behaviors and teach concurrently. In settings that behaviors are more severe and extreme the behavior may be a safety concern for personnel and students (Ladd, Luiselli, & Baker, 2009).

In classrooms with multiple students, it may be difficult for a teacher to observe each behavior of one specific student. Noncontingent reinforcement (NCR) is a feasible intervention choice for the classroom environment because NCR is delivering a neutral reinforcer that is not contingent on the individual participating in a target behavior (Rassmussen & O'Neil, 2006). NCR provides a function-based reinforcer that diminishes the problem behavior because the reinforcer that typically maintains the target behavior is frequently available and therefore, the participant does not have to engage in the problem behavior to receive reinforcement (Cooper, Heron, & Heward, 2007). The NCR serves as an abolishing operation that lessens the motivation of the participant to engage in the target behavior (Cooper et al., 2007). With using NCR, the teacher does not need to monitor a student and reinforce him or her every time the target behavior is engaged in.

This may be an especially important intervention for teachers who work with students with emotional behavior disorders. This population often engages in distracting and disruptive behaviors, which can make the classroom a negative experience (Rassmussen & O'Neil, 2006). A teacher may only be interacting with a student to reprimand him or her, which does not promote a positive relationship and can lead to a conflict-relationship between the teacher and child (Skalicka, Belsky, Stenseng, & Wichstrom, 2015). Additionally, the student who is engaging in the negative behavior may only be in the proximity of the teacher when he or she is being punished. If a student is seeking attention with the negative behavior, he or she may engage in it more to obtain verbal attention and proximity from the teacher. NCR provides an opportunity for a teacher to interact with a student in a way that is separated from the problem behavior (Richman, Barnard-Brak, Grubb, Bosch, & Abby, 2015). Therefore, it is possible that NCR can not

only modify behavior, but also promote a more positive relationship between the teacher and student.

Literature Review

Reinforcement and Punishment Procedures

When seeking to change a student's behavior, teachers can use either punishment or reinforcement techniques. Each of these techniques has a different effect on the behavior being shaped and either may be appropriate in different circumstances. Punishment results in a decrease in the target behavior and reinforcement results in an increase in the target behavior (Cooper et al., 2007). Two types of punishment can be used—positive or negative punishment. Negative punishment is the removal of a stimulus to decrease future frequency of the target behavior. A child losing his recess because he lied would be an example of negative punishment because the removal of a desired stimulus, recess, would result in a decrease in the likelihood of the child lying in the future. Positive punishment is another form of punishment, which is the addition of a stimulus to decrease a behavior. A teacher telling a student no when she yelled in class would be an example of positive punishment. This is an example of positive punishment because the teacher saying no is the added stimulus and the yelling in class is the target behavior that is desired to decrease in the future. While punishment may seem an effective method to decrease a problem behavior, it is often a temporary solution (Cooper et al., 2007). Punishment only modifies a behavior if the behavior is actively being punished because eventually the association with the behavior and the punishment subsides for the individual.

Although punishment can be effective in decreasing certain behaviors in the immediate context, it is likely these behaviors will quickly reemerge, if not paired with reinforcing desired alternative behaviors (Cooper et al., 2007). In order to obtain

sustainable behavior change, reinforcement strategies are necessary. Previous research demonstrates that the use of reinforcement leads to a long-lasting change in behavior; therefore, it is more sustainable than punishment (Rapp, Cook, McHugh, & Mann, 2017; Richman et al., 2015). There are two types of reinforcement that can be used – positive reinforcement and negative reinforcement. Positive reinforcement is the addition of a stimulus to increase behavior. An example of positive reinforcement would be giving a student a piece of candy every time he or she answered a question in class, with the added stimulus being the candy and the desired behavior being answering questions. The other form of reinforcement is negative reinforcement, which is removing an aversive stimulus to increase a behavior. An example of negative reinforcement would be a student yelling whenever he views a particular cartoon and then the cartoon being removed; thus, the student does not have to view the cartoon. The target behavior would be yelling and the aversive stimulus would be the cartoon. One traditional and common method of delivering reinforcement is through the use of contingent reinforcement.

Contingent Reinforcement

Contingent describes a reinforcer that is delivered only after the target behavior has occurred (Cooper et al., 2007). An example of contingent reinforcement would be an individual immediately responding to the behavior that he or she wants to encourage continuing.

Contingent attention can be part of contingent reinforcement. Contingent attention is when the teacher's attention is a reinforcer for the behavior and the teacher uses attention after a behavior to increase the likelihood of the behavior occurring again.

For contingent attention to be effective, it needs to be implemented immediately after the behavior. A delay in reinforcement decreases the effectiveness because other behaviors have occurred between the target behavior and the reinforcement (Cooper et al., 2007). In a classroom setting, implementing reinforcement immediately after the behavior occurs may be difficult to do while teaching a classroom of other students.

Contingent reinforcement is implemented through different procedures, including differential reinforcement procedures. Differential reinforcement is the reinforcing of only responses within a response class and placing all of other responses on extinction (Cooper et al., 2007).

Differential Reinforcement

One way researchers conceptualize contingent reinforcement is through the use of differential reinforcement procedures. Differential reinforcement is the reinforcement of only the behavior one wants to increase and the extinction of all other behaviors (Watts, Wilder, Gregory, Leon, & Ditzian, 2013). Differential reinforcement has been used with a variety of topographies of behavior, such as to decrease pica (Goh, Iwata, & Kahing, 1999) and increase on task behavior (Watts et al., 2013). Differential reinforcement has also been used to change behaviors that serve different functions. For example, differential reinforcement has been used to modify escape-maintained behaviors (Ingvarsson, Hanley, & Welter, 2009), attention-seeking behaviors (Rasmussen et al., 2006), and sensory function behaviors (Kerth, Progar, & Morales, 2009).

Interventions such as differential reinforcement are most appropriate when used with behaviors that are not severe, because of the need to incorporate extinction to

diminish negative behaviors. Extinction has possible negative side effects that could make it an inappropriate choice for intervention of severe behaviors (Cooper et al., 2007).

Extinction

Extinction is no longer reinforcing a behavior that has a history of being reinforced (Cooper et al., 2007). When using extinction to change behaviors, an extinction burst is a possible negative effect. An extinction burst is the temporary increase in the target behavior once reinforcement has been removed (Cooper et al., 2007). A student displaying higher rates of aggression after the beginning of the implementation of the intervention than in baseline would be an example of an extinction burst. Lerman, Iwata, and Wallace (1999) operationally defined extinction burst as an "increase in responding during any of the first three treatment sessions above that observed during all of the last five baseline sessions or all of baseline" (p. 3), which provides a measurable definition of extinction for the literature. Extinction can lead to an increase in the behavior due to its inability to enact the desired response.

An example of an extinction burst was demonstrated in a study conducted in a clinical setting by Goh and Iwata (1994). In this study, a 40-year-old man with an intellectual disability that engaged in self-injury had two extinction bursts during the intervention that occurred at the beginning and the end of the intervention session. These two extinction bursts could have resulted in the injury of the participant, however did not, that could keep this from being an appropriate intervention in a different setting. In extinction, problem behaviors can worsen before any improvement. The Goh and Iwata (1994) study is relevant because it provides an example of the negative effect of

extinction burst – the increase in the target behavior – and the possibility of harm to the participant.

Self-injurious behavior can be too extreme to use extinction because it can lead to harm of the participants (Ingvarsson et al., 2009; Roscoe, Iwata, & Goh, 1998). Another reason that it may be inadvisable to allow an extinction burst is that many people are not trained in how to completely restrict access to the reinforcer and if they are unable to carry out the extinction burst, the student is likely to engage in more extreme behaviors the next time the reinforcer is denied (Cooper et al., 2007). Once extinction has occurred, the extinction procedure needs to stay in effect permanently to continue to modify the target behavior (Cooper et al., 2007).

Extinction, differential reinforcement, and contingent reinforcement all have effects that may make each an inappropriate option for certain behaviors and individuals. If differential reinforcement and contingent reinforcement have failed at increasing the frequency of the target behavior, another method should be considered. NCR may be an appropriate option for behavior modification because it provides a different method of decreasing the likelihood of a target behavior and increasing the likelihood of an appropriate behavior. Instead of a reinforcer being contingent on a behavior, NCR provides practitioners with the ability to provide reinforcement without being dependent on a specific behavior occurring. For these reasons, NCR is another option for reinforcing a behavior that has fewer possible negative effects and may be preferable.

Noncontingent Reinforcement

Noncontingent Reinforcement is a procedure during which stimuli with known reinforcing qualities are presented independent of a behavior on a fixed-time or variable-

time schedule (Cooper et al., 2007). NCR may be a preferred intervention for a number of reasons, including its versatility in different settings, with different topographies of behavior, with different functions of behavior, and with different participants.

Versatility of NCR

First, NCR is a versatile intervention that practitioners can use with a number of different topographies of behavior. It can be used to modify less extreme behaviors and effectively decrease problem behaviors, like inappropriate verbal outbursts in classroom settings (Gouboth, Wilder, & Booher, 2007) and instances of verbal and physical stereotypy in students with autism (Rapp et al., 2017; Wang, Parrila, & Cui, 2013). NCR can also be a valuable intervention for practitioners to employ for more extreme behaviors, like instances of mania in children diagnosed with bipolar disorder (Rasmussen & O'Neil, 2006), aggression (Gouboth et al., 2007), and self-injury (Kerth et al., 2009). Studies have been conducted using NCR to increase desired behaviors, such as improving hygiene for children with autism (Piazza, Contrucci, Hanley, & Fisher, 1997), decreasing food selectivity (Allison et al., 2012) or increasing general food consumption (Reed et al., 2004).

NCR with Different Topographies of Behavior

NCR can be used by practitioners with many topographies of behavior and has successfully reduced severe behaviors, such as self-injurious behaviors (Lalli, Casey, & Kates, 1997). Lalli et al. (1997) used NCR for three participants hospitalized due to severe problem behavior, ranging from aggression towards others to SIB. Researchers conducted a functional analysis of the participants' behaviors and determined a fixed-time schedule for each participant. The fixed-time interval was determined based on the

frequency of occurrence of the target behavior for each individual during baseline. A timer signaled when it was time to provide a noncontingent reinforcer, which was either a prompted walk or desired toy, since the behaviors were escape-maintained or tangible in function. For one participant, the timer was set for 90 seconds and for the other two participants, the timer was set for 120 seconds. During this time, the therapist, who was delivering the NCR, did not respond to any aggressive or self-injurious behaviors. The results indicated lower rates of problem behavior during the NCR conditions when compared to the baseline for two of the participants.

As Ingvarsson et al. (2009) demonstrated, NCR can be used to decrease problem behaviors and to increase desired behavior. Ideally, if a student is not engaging in negative behaviors, such as aggression, he or she will be able to engage in more positive behaviors, such as time on task. In a study conducted Virues-Ortega, Iwata, Fahmie, and Harper (2013), the researchers sought to increase alternative behaviors in two participants with an intellectual disability through the use of NCR. The study aimed to increase the alternative behaviors once the negative behavior decreased. To determine if NCR could be used to increase assigned behavior, the researchers sought to increase the pressing of a red button on the desks of the two participants. Researchers provided the participants with candy every 2-minutes as the NCR intervention, which led to an increase in the desired behavior and a decrease in the negative behavior.

NCR with Different Functions of Behavior

NCR procedures are effective regardless of the function of the behavior. Ingvarsson et al. (2009) used NCR to decrease escape-maintained negative behaviors, such as aggression and vocal outbursts in preschool children. In the study, the

experimenters sought to make the environment more desirable to the participants by providing them with preferable items to attempt to decrease escape behaviors and increase compliance. The NCR was delivered by providing the three participants something edible on a fixed-time schedule. The children were presented with an edible prior to receiving a verbal instruction. The results indicated an increase in compliance for all three children.

Overall, NCR can be employed by practitioners for multiple functions of behavior and the literature demonstrated its use with escape-maintained behavior. NCR is also an intervention that can be easily implemented in a classroom setting and feasible for a teacher to accomplish. Much research has been conducted to support its use for a variety of behaviors and in different circumstances. Besides being effective with different types of behaviors, NCR is also effective in different settings.

Use of NCR in Different Settings

NCR can be implemented in different settings, such as a clinical or educational setting. Vollmer, Iwata, Zarcone, Smith, and Mazaleski (1993) conducted a study using NCR in a clinical setting with three participants exhibiting SIB at a residential facility. In this study, a functional analysis was conducted and baseline data were obtained during 10 to 15 minute sessions over a period of five days. The experimenter delivered NCR over a fixed-time schedule, with each interaction between the experimenter and the participant lasting 10 seconds. The experimenter provided verbal attention to the participant during the NCR, which was prompted with a timer. The study was an AB design, with baseline obtained before the intervention (NCR) was introduced. The results demonstrated a reduced rate of SIB with the introduction of NCR.

NCR can also be utilized in the school setting. One example of NCR being used in schools is supported in the Rasmussen and O'Neil (2006) study, which sought to decrease inappropriate verbal disruptions in a classroom setting. There were three participants in this study, two with medical diagnoses of bi-polar disorder and one with an anxiety disorder. Four 10-minute sessions were conducted over a five-day period to obtain baseline data for the students. This study used ABAB design to observe the effects on the target behaviors once the NCR intervention was removed. A functional analysis was conducted for all three participants, which demonstrated that the students' behaviors were attention-seeking. Verbal disruption was the target behavior for all participants, which was defined as singing out loud, talking to a peer while the teacher was talking, or talking out without raising his or her hand. The teacher wore a timer to prompt him to provide NCR on the fixed-time schedule. If the student was engaged in the problem behavior at the scheduled intervention time, the teacher delayed the comments for 10 seconds, so the NCR would not be associated with the problem behavior. The results indicated that the target behavior occurred at a relatively high rate during baseline; however, with the implementation of the fixed-time schedule, the target behavior immediately decreased. With the reversal and return to baseline, the target behavior increased again and once the intervention stage was introduced again, the behavior immediately decreased.

NCR with Different Participants

As the previously cited studies have illustrated, NCR is effective in clinical and school settings with varied demographics, which has been demonstrated by previous studies including participants ranging in age from infants to adults. NCR has been used in

research with elderly dementia patients to decrease disruptive vocalizations (Buchanan & Fisher, 2002). This study involved two participants, one who was 82 and one who was 89, who were diagnosed with Alzheimer's and dementia. The target behavior was frequent disruptive vocalizations and a functional analysis demonstrated a sensory function to the participants' behavior. A fixed-time schedule was utilized, in which the experimenter provided preferred music for the participants every 80 seconds. The target behavior decreased with NCR from occurring 67% of the time during baseline to 35% of the time during the intervention phase.

Another study, conducted by Hagopian, Fisher, and Legacy (1994) involved modifying problem behaviors of identical quadruplets, whom had been diagnosed with intellectual disability and pervasive developmental disorder and engaged in property destruction. Once a functional analysis was completed, the NCR was delivered on a fixed-time schedule of 10 seconds during the 20-minute session. The experimenter was prompted to provide attention for 10 seconds every one minute. The introduction of the NCR intervention led to a decrease in the problem behavior for three of the participants, with three of the children demonstrating lower rates of destruction than in the baseline. The effectiveness of NCR in multiple settings and with multiple demographics demonstrates the value of NCR to practitioners as an intervention with great generalizability.

Benefits of Using NCR as an Intervention in Schools

A benefit of NCR for practitioners is it is an easily understood intervention that focuses on positive reinforcement procedures instead of punishment procedures. After instructing the teacher or researcher about what a noncontingent reinforcer, the teacher or

researcher can easily implement the intervention (Richman et al., 2015). There are many benefits to implementing NCR over contingent reinforcement for practitioners, such as high fidelity, low risk, and easy application (Richman et al., 2015).

Another benefit for practitioners is NCR can lead to a more positive relationship between the participant and the individual implementing NCR. Typically, disruptive students do not receive many praise statements in the classroom. Noel, Rubrow, and Wehby (2014) showed that teachers trained on NCR procedures had a corresponding increase in general praise statements toward a student with EBD. Praise statements have been shown to improve student performance and the suggested rate of praise to reprimand statements is 4:1 (Noel et al., 2014), which also leads to an improvement in the relationship between the teacher and student (Skalicka et al., 2015). The literature illustrates that teachers using NCR begin to use more praise statements even when not prompted to do so (Noel et al., 2014).

Present Study

As the literature has demonstrated, NCR is an intervention that is versatile with different topographies of behavior, different functions of behavior, in different settings, and with different participants and can be demonstrated with high fidelity in a classroom setting. This pilot study will attempt to decrease problem behaviors of participants and examine the behavior of the individual implementing the NCR by recording the number of reprimands, praise statements, and proximity pre- and post- implementation of NCR. This study seeks to measure if the teacher will increase proximity and will uphold the same proximity to the student once the intervention is no longer implemented. Currently,

the effect NCR has on the individual implementing the intervention is relatively unstudied and will be focused on in this pilot study.

Therefore, the research questions for this study are as follows:

1. Can NCR decrease target behaviors?
2. Does the use of NCR result in an increase in unprompted praise statements by the teacher implementing NCR?
3. Does NCR result in an increase in the teacher's proximity to students?
4. Does the use of NCR result in a decrease in reprimands by the teacher implementing NCR?

Method

Participants

For this study, data were collected for two high-school aged participants who engaged in high levels of disruptive behavior and an undergraduate after-school teacher working with the participants. The individual implementing the intervention is an undergraduate participant who worked part-time with the high-school students as the teacher of the social skills class.

High school students. The two participants for this study attended an university-based after school program for students with ASD and their siblings. The Program Director nominated these students because their disruptive behaviors occurred at rates higher than the average of the group. Parental consent was obtained by the Program Director. One of the participants is Charlie, a 16-year-old Caucasian male, who is eligible in the state of Kentucky for special education services under the category of emotional-behavioral disability (EBD). The other participant is Danny, who is an 18-year-old Caucasian male with a medical diagnosis of autism. The participants are brothers. Both Charlie and Danny received special education services in their school. Charlie was in regular education classes and at the time of the study and was receiving special education services through inclusion services at his school. Danny is in the EBD room full time due to episodes of extreme aggressive behavior to peers and teachers. Both students are of average cognitive functioning and cognitively performing at a level comparable to their same-aged peers. The behaviors of most concern for both participants are physical and verbal aggression. The Program Director at the after-school program reported that most

episodes of aggression they have witnessed were between with one another and not other individuals.

Teacher participant. Rebecca is a 20 year-old female majoring in speech and language pathology. She works part-time at the after-school program. At the time of the study, Rebecca had been working with the program for a year. The only training she had received for behavioral interventions prior to this study was the implementation of the token economy used at the program. For the token economy, the staff would reward desired behavior with 'Bucks.' The students were allowed to use their Kelly Bucks to buy items in the store or trade them in for a preferred activity.

Setting

All sessions were conducted within an after-school program designed for students with ASD and their siblings. The after-school program is part of the university's campus. Individuals attending the program come after school with sessions starting at 3:30 pm. Children ranging in ages from kindergarten to high school attend the program, with the schedule differing based on the grade of the group. The sessions are intended to promote social skills of the individuals and provide recreational activities. The students receive a snack, play games, listen to music, make art, and attend a social skills class.

For this study, the baseline data and intervention data were collected during the social skills class. The sessions were conducted in a classroom created for small group teaching. The room contained three tables placed in a U-shape and 6 chairs. A room divider was used as one of the walls in the room. There were no decorations in the room. A dry erase board was present as a teaching tool. The space aimed to emulate a classroom

setting in a school. There was the teacher and an assistant present and a total of four students in the group. Also, one observer was present for each of the sessions.

Dependent Variables

The dependent variables are the behaviors the study is attempting to modify. A frequency count was used to measure the following target behaviors for the high school participants: (a) negative talk to others, (b) aggression, and (c) inappropriate gestures. For the teacher's target behaviors, a frequency count was used for praise statements and reprimands. Proximity was measured using duration.

High school participants. The target behaviors for the high school participants were negative talk to others, aggression, and inappropriate gestures. *Negative talk to others* was defined as cursing or insulting phrases to oneself or to another. *Aggression* was defined as using feet or hands to strike or shove. *Inappropriate gestures* were defined as anytime the participant engaged in a disrespectful gesture directed towards a peer or teacher such as showing one's middle finger to insult someone.

Teacher participant. The other dependent variables of this study were the behaviors of the teacher, Rebecca. The study measured changes in the teacher's proximity to the participants, number of reprimands and number of praise statements to the participants. *Proximity* was defined as moving to be within two feet of a participant. *Reprimand statement* was defined as a negative statement specifically directed to a participant to stop his behavior. *Praise statement* was defined as a positive statement specifically directed to a participant that can be behavior specific.

Independent Variable

The independent variable of this study was an NCR statement on a fixed-time schedule. An NCR statement was operationally defined as a neutral statement directed specifically at a participant that is not contingent on a behavior. These NCR statements were to provide attention without being contingent on a behavior of a participant and should not be encouraging or discouraging for the individual. Examples of NCR statements used are located in Appendix A.

Instrument. The teacher was given a timer that was set to vibrate every 1 minute on a fixed-time schedule (FT-1). An FT-1 schedule was determined from the frequency of the participants' behaviors during baseline to best provide a reinforcement schedule similar to the occurrence of the target behaviors. The timer was silent and worn discretely, so that the participants could not view it.

Experimental Design

The study was conducted as a single-subject design in the ABA reversal format (Cooper et al., 2007). ABA reversal means that baseline data (A) was conducted initially, then the intervention (B) was introduced, and finally return to baseline (A). At least three sessions were recorded for each phase. Three sessions per phase allowed for the pattern of the behaviors to be regularly observed and helps to eliminate outlier occurrences of behavior. This study sought to conduct a ABA reversal to allow for more data to be obtained to ensure a static pattern of participant behavior.

Procedure

Functional behavior assessment. A functional behavior assessment was completed prior to this study by a Board Certified Behavior Analyst for both high school

participants. The results of the FBA indicated that Charlie and Danny both exhibit disruptive behaviors for adult attention, which made the application of teacher-delivered NCR statements appropriate for this study.

Intervention training. The first author used a PowerPoint presentation to train the teacher on the procedures of NCR, (e.g., what it is, when to use it, and examples of how to use it.) The first author then explained that the noncontingent verbal statement could be about anything, except to praise a certain behavior. After viewing the PowerPoint presentation, the researcher modeled the intervention for the teacher to observe. Then, the teacher had an opportunity to ask any questions she had and practiced using the statements before the intervention began. The teacher was also given a noncontingent verbal statement bank that she could reference (see Appendix). Examples of the statements included are "it is sunny today" or "your shirt is blue."

Data analysis. Each session was recorded and later coded by the researcher. Each session was ten minutes in length, with a break between sessions of 5-minutes, with two sessions being recorded a day. Participants' behaviors were recorded with the frequency recording method, which used a tally mark each time one of the behaviors occurred. Two of the teacher's behaviors, praise and reprimand statements, were recorded with the frequency recording method, with a tally mark each time one of the behaviors occurred. Proximity was recorded in duration of seconds, which the researcher timed with a stopwatch and recorded. During the intervention phase, the researcher also recorded procedural fidelity of NCR. If the teacher missed delivering a NCR statement or made a statement contingent on the participants' behavior, fidelity reflected the deviation. If the teacher provided a NCR statement every minute for the 10-minute session, the session

received 100 percent fidelity, however, if the teacher missed one NCR statement in the 10-minute session, the session received 90% fidelity.

Results

Baseline 1

Due to unexpected closures of the university and the participants' attendance, only one phase of the intervention was implemented. The means of the behaviors were calculated by totaling the collective times the specific behavior occurred and dividing that sum by the total number of sessions.

The baseline data for Danny indicated high rates of negative talk to others (M = 8.6), aggression (M = 2), and inappropriate gestures (M = 2.2). Danny's data for negative talk to others are located in Figure 1, his data for aggression are located in Figure 2, and his data for inappropriate gestures are located in Figure 3. For Charlie, the baseline data indicated high rates of negative talk to others (M = 7.2), aggression (M = 1.2), and inappropriate gestures (M = 0.2). Charlie's data for negative talk to others are located in Figure 4, his data for aggression are located in Figure 5, and his data for inappropriate gestures are located in Figure 6.

Regarding teacher behavior during the first baseline phase, reprimands occurred at a higher frequency rate than praise statements, with (M = 6.4) for reprimands and (M = 0.5) for praise statements. These data are represented in Figures 7 and 8, respectively. For proximity, represented in Figure 9, the (M = 30 s), meaning the teacher was only within close proximity to the participants for an average of 30 seconds for each of the five sessions that composed the first baseline phase.

NCR Intervention 1

Four sessions were conducted implementing NCR. The intervention phase of this study was terminated earlier than scheduled due to an unexpected snowstorm that led to a

university closure for two weeks. Also, once programing began again at the after-school program, the high school participants were absent. The last day of data collected in the intervention phase, session nine, depicts an increase in all target behaviors for both participants. The only reason that session nine was the last day of the intervention phase was because the unexpected closures and the absences of the participants limited the amount of time to collect sessions before the program closed for the summer.

The intervention data for Danny indicated decreased rates of negative talk to others (M = 2.5), aggression (M = 0.75), and inappropriate gestures (M = 0.75). Danny's results are located in Figure 1 for negative talk to others, in Figure 2 for aggression, and in Figure 3 for inappropriate gestures. For Charlie, the intervention data indicated decreased rates of negative talk to others (M = 3.5), and aggression to others (M = 0). The data for negative talk to others are located in Figure 4 and the data for aggression are located in Figure 5. Charlie did engage in an increased rate of inappropriate gestures than he did in baseline (M = 1), which data are located in Figure 6.

Rebecca demonstrated a decreased rate in reprimands (M = 1.25) and an increased rate of praise statements (M = 1.25). Data for reprimands are located in Figure 7 and for praise statements are located in Figure 8. Also, Rebecca increased proximity with the participants to an average of 307.50 seconds per session, which is 5.13 minutes (M = 307.50 *s*). Figure 9 depicts data for proximity for Rebecca during intervention.

Fidelity was conducted at an average of 90% during the four intervention sessions. The average fidelity was calculated by averaging the fidelity rates of each of the four sessions.

Baseline 2

After a series of unexpected university closures because of snow and participants being absent, two sessions were conducted that returned to the baseline. Only two sessions were conducted because the lack of time left in the schedule before the program closed for the summer. Also, it was reported that during the period of closures and absences of the participants that Danny had a medication change and was hospitalized within that time frame. The parents never reported the exact date of the medication change to the observer or to the staff at the program. All return to baseline data was obtained after Danny had returned from being hospitalized. Due to the confounding variables, all of Danny's data should be viewed with caution and all figures depicting his data reflect this information.

During these two sessions, no NCR was implemented. During this phase, Danny exhibited negative behaviors at an increased rate from intervention, negative talk to others (M = 4.5), aggression (M = 2), and inappropriate gestures (M = 1). Data for Danny for negative talk to others are located in Figure 1, data for aggression are located in Figure 2, and data for inappropriate gestures are located in Figure 3. For Charlie the target behaviors remained lower than the first baseline phase. Charlie's rates of behavior were: negative talk to others (M = 2.5), aggression (M = 1.5), and inappropriate gestures (M = 0.5). Data for Charlie for negative talk to others are located in Figure 4, data for aggression are located in Figure 5, and data for inappropriate gestures are located in Figure 6.

Rebecca's behavior during the return to baseline also demonstrated with a decrease in proximity (M = 0 s), which data are located in Figure 9. Praise statements (M

= 2) still occurred at a higher rate than the first baseline phase, which data for are located in Figure 8. Reprimands occurred at a lower rate still during this phase to an average of 1.5 per session (M = 1.5) and data are located in Figure 7.

Danny

For Danny, the results indicate that NCR successfully decreased negative talk to others in terms of overall level and variability. Although there are overlapping data points between the two baseline conditions and the intervention condition, negative talk did not occur at such elevated rates as it did during baseline and the frequency of negative talk statements were consistent between 0-3 statements per session.

In terms of Danny's aggression, visual analysis does not support NCR as an effective intervention. Danny's overall level of aggression during baseline and intervention conditions was consistently at near zero levels. There was one outlier data point at session 2 that was much higher, but then three consecutive sessions with no aggression. This behavior occurred at such low rates throughout the study, it is unclear whether this intervention decreased rates of aggression.

Regarding inappropriate gestures, the visual analysis does support NCR as an effective intervention. During baseline, Danny's overall level of inappropriate gestures was static, with 1-4 occurrences per session, besides one outlier data point at session 5 that was much lower than the previous four data points. During the intervention phase, Danny's inappropriate gestures decreased to 0 occurrences for three data points. Danny did have an increase in occurrences of inappropriate gestures at session 9, but all target behaviors had an increase that session. During the return to baseline, Danny's

inappropriate gestures dramatically increased without the intervention, with 2-8 occurrences per session.

Charlie

For Charlie, the results indicate that NCR successfully decreased negative talk to others in terms of overall level and variability. During baseline, this target behavior occurred between 3-15 times per session. Negative talk did not occur at such elevated rates as it did during baseline and the frequency of negative talk statements were consistent between 0-3 statements per session.

In terms of Charlie's aggression, visual analysis does not support NCR as an effective intervention. Charlie's overall level of aggression during baseline and intervention conditions was consistently at near zero levels. There was one outlier data point at session 2 that was much higher, but then three consecutive sessions with no aggression. In addition, in the return to baseline phase, Charlie's aggression actually increased to 1-2 occurrences per session. This behavior occurred at such low rates throughout the study, it is unclear whether this intervention decreased rates of aggression.

Regarding inappropriate gestures, the visual analysis does not support NCR as an effective intervention. During baseline, Charlie's overall level of inappropriate gestures was static, with 0-1 occurrences per session. During the intervention phase, Charlie's inappropriate gestures remained low, besides one outlier data point at session 9 that was much higher. During the return to baseline, Charlie's occurrences of inappropriate behavior remained similar to before, with 0-1 occurrences per session. This behavior occurred at such low rates throughout the study, it is unclear whether this intervention decreased rates of inappropriate gesture.

Rebecca

For Rebecca, the results indicate that NCR successfully decreased reprimands in terms of overall level and variability. During baseline, this target behavior occurred frequently, besides one outlier data point at session 3 that was much lower. Reprimands did not occur at such elevated rates for the intervention and return to baseline phase.

In terms of praise statements, visual analysis does support NCR as an effective intervention. The teacher's number of praise statements during baseline was low, occurring between 0-2 praise statements per session. Session four does reflect an outlier data point, with 3 praise statements occurring that session. Praise statements increased during the intervention and return to baseline. During intervention, the teacher delivered between 0-3 praise statements per session and during the return to baseline, the teacher delivered 0-4 praise statements per session.

Regarding proximity, the visual analysis does support NCR as an effective intervention to increase proximity of the teacher to the student. During the baseline, the teacher spent little time in proximity of students. During the intervention phase, the teacher's proximity to the students drastically increased. However, once the intervention phase was complete, the teacher returned to baseline levels of proximity to the students.

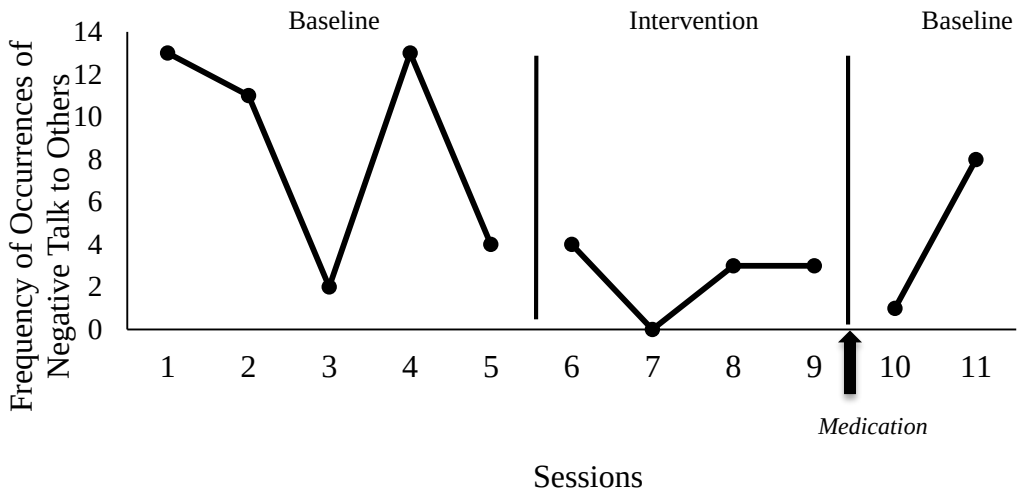

Figure 1. Danny's negative talk to others.

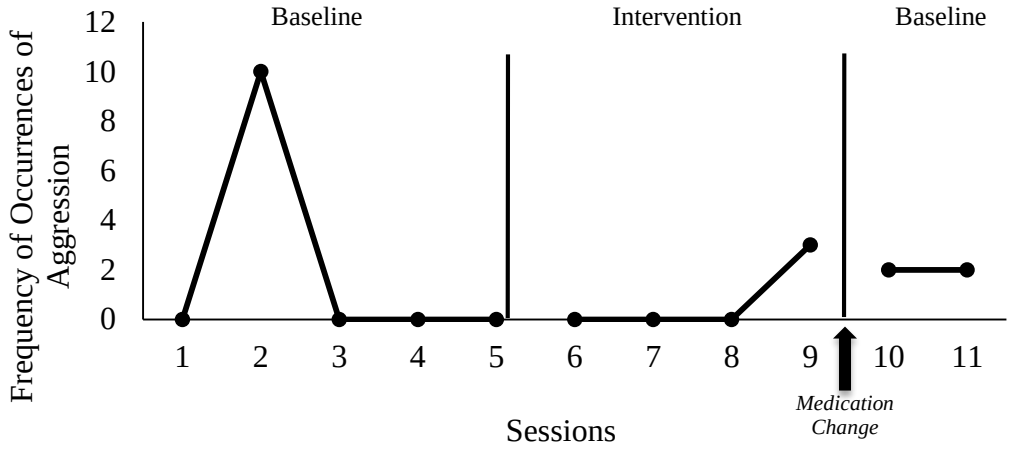

Figure 2. Danny's aggression.

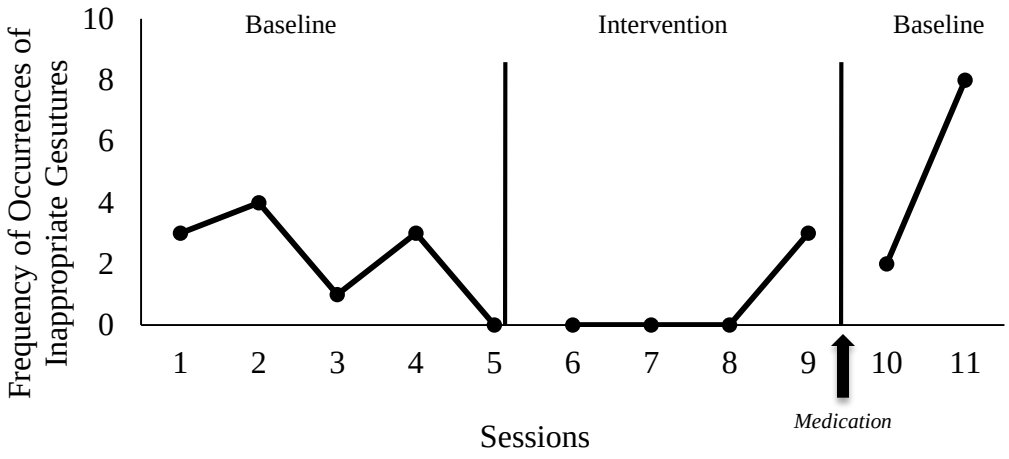

Figure 3. Danny's inappropriate gestures.

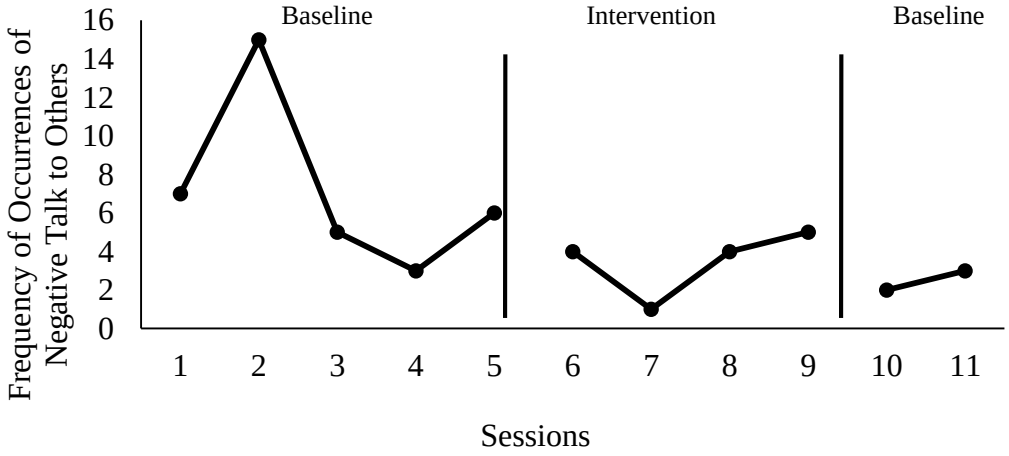

Figure 4. Charlie's negative talk to others.

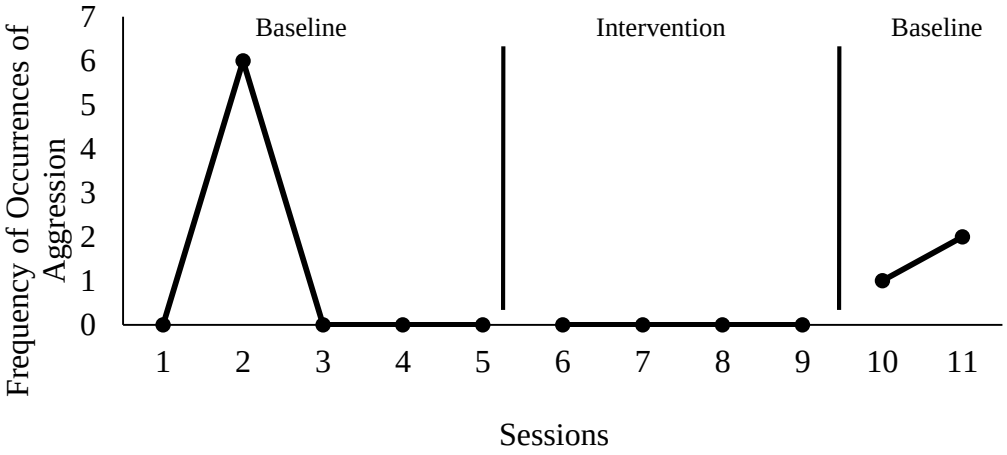

Figure 5. Charlie's aggression.

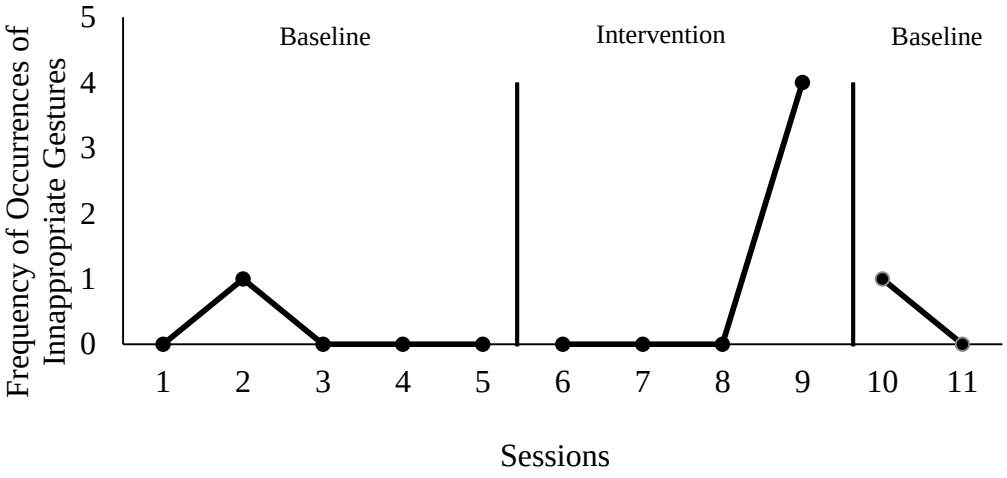

Figure 6. Charlie's inappropriate gestures.

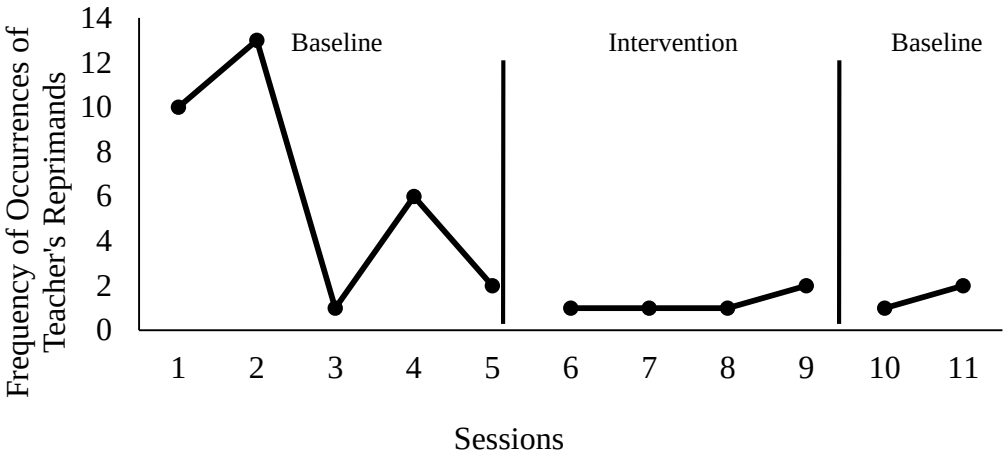

Figure 7. Teacher's reprimands.

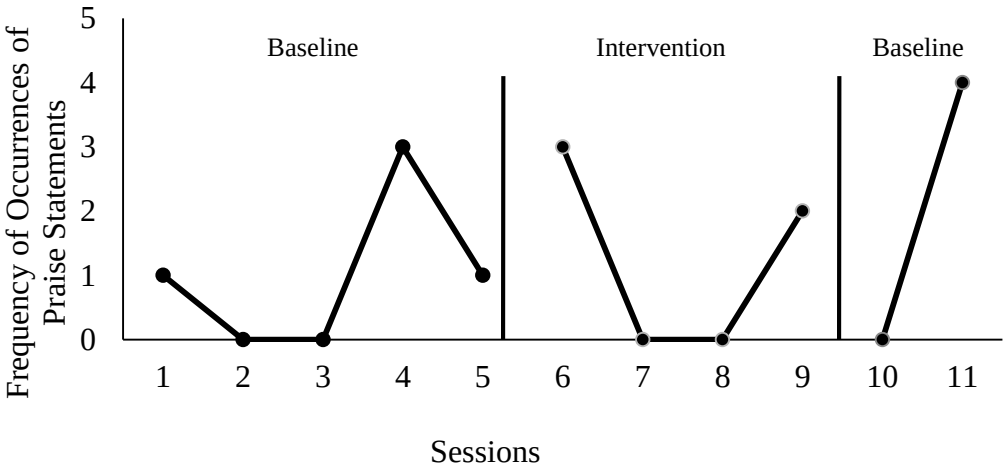

Figure 8. Teacher's praise statements.

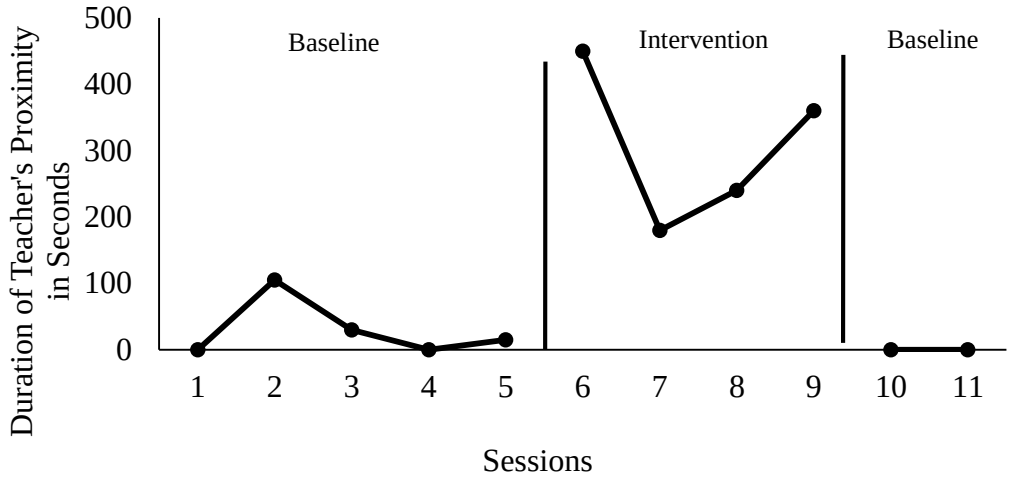

Figure 9. Teacher's proximity.

Discussion

The current pilot study sought to use NCR to decrease problem behaviors in students and increase positive behaviors in teachers. This study contained two high school participants – one with EBD and one with ASD – in a classroom setting, and one undergraduate student, with no previous training in NCR, who was the teacher for the study.

By decreasing problem behaviors and increasing teacher interaction with the participants, this study also aspired to determine if NCR was a versatile and effective intervention that could be employed in educational settings to generate a more positive relationship between teacher and child. Previous literature determined that NCR is applicable to different participants, settings, topographies, and functions of behavior (Richman et al, 2015). The literature also depicted children who are disruptive in class, like the participants in this study, can have more negative relationships with their teachers (Skalicka et al., 2015). By decreasing problem behaviors and increasing positive interaction between student and teacher, this study attempted to use NCR to create a classroom that was more inductive to learning.

While this study was conducted in an after-school program and not a traditional classroom setting, the study's purpose was to decrease problem behaviors of different topographies and for participants with different diagnoses that would be applicable in any educational setting. Research question 1 was to determine if NCR resulted in a decrease in target behaviors. While there were many confounding variables, some target behaviors did demonstrate a decrease with intervention. Negative talk to others was demonstrated in high frequency by both participants in baseline. This behavior was highly disruptive to all

and interrupted class time. Both participants exhibited in negative talk to others at a much lower rate during the intervention phase. The decrease in negative talk to others was meaningful for both participants and the other members of the class because it created a more positive environment.

Unlike previous literature, this study differed because it measured the behavior of the individual implementing the NCR. Rebecca's behavior was measured to determine whether her behavior changed after implementing NCR. Research question 2 was to determine whether NCR resulted in an increase of unprompted praise statements by the teacher implementing NCR. The results of this study indicated that praise statements did increase during the NCR intervention phase. Additionally, once the teacher was not implementing NCR, she still continued to use a higher rate of praise statements. During the first baseline, the teacher had an average of 0.5 praise statements per session. For the first intervention phase, the teacher had an average of 1.25 praise statements per session and for the final baseline phase; the teacher had an average of 2 praise statements per session. Therefore, the teacher demonstrated a higher rate of unprompted praise statements after the implementation of NCR. For students with attention-maintained problem behavior, a subsequent increase in praise statements for appropriate behavior by the teacher is a positive outcome. This is especially relevant, because the teacher was not instructed to increase praise statements, however, increased praise statements was a positive side effect of the use of NCR.

This study added to the literature for utilization of NCR by measuring teacher proximity to participants. Research question 3 was to determine if NCR resulted in an increase in teacher proximity to students. The results of this study indicated that NCR did

cause a higher duration of proximity to students during its implementation. During baseline, the average duration the teacher spent within the proximity of the participants was 30 seconds. During the intervention phase, the teacher spent an average of 5 minutes and 13 seconds within the proximity of the students. In the return to baseline, the teacher spent an average of 0 seconds within the proximity of the students. Therefore, the results indicate that implementation of NCR did lead to an increase in the teacher's proximity during the intervention; however, proximity did not increase once NCR is no longer being implemented. The increase in proximity during intervention could have been caused by the teacher moving towards the student to deliver the NCR.

NCR also led to a decrease in reprimands provided by the teacher during the intervention phase and the return to baseline. Research question 4 was to determine whether NCR resulted in a decrease in reprimands by the teacher implementing NCR. During the initial baseline, the teacher performed a high number of reprimands, with an average of 6.4 reprimands per session. However, this number greatly decreased with the implementation of the intervention, which may be because she was having a positive dialogue with the participants because of delivering the NCR statements. The number of reprimands remained lower than the initial baseline after the intervention was no longer being implemented.

Limitations

There were a number of unexpected events that negatively impacted the reliability and validity of the data collected in the study. The setting for this study was determined to be an after-school program rather than a clinical setting in an attempt to extend the literature of NCR to a variety of settings; however, the applied nature of this study

allowed for the introduction of a number of confounding variables. Originally, the pilot study was to be conducted with two phases of baseline and two intervention phases to collect as much data as possible to establish patterns of behavior. However, due to unexpected absences of the participants and closures of the university for snow, only one intervention phase was collected and that intervention phase was terminated earlier than planned. The last day of data collection during the intervention phase, session nine, indicated an increase in the target behaviors. Ideally, the researcher would have collected additional data in the intervention phase to determine a pattern of behavior. However, after session nine, the program was unexpectedly closed for weather and then the participants were absent. The return to baseline occurred because the after-school program was closing for the summer and there was not any time to collect any additional data. The two sessions for return to baseline phase were determined for the last day the program was open.

Another problem that arose was that Danny was hospitalized due to extreme behavior at home during the study resulting in a month and a half absence. Per the Program Director, the participants were chosen because prior to this study they had attended the program regularly. There were times Charlie only attended, and for data collection, both participants had to be present. The researcher was not made aware that Danny had been hospitalized and was having such severe behavior at home until after many weeks into the study. Therefore, the entire design of this pilot study had to be adapted to accommodate the unplanned change in schedule.

A third problem with the results of this study is that Danny had a change in medication in the middle of the data collection that the researcher was not made aware of

until after several weeks. During the return to baseline, Danny was absent and the researcher was eventually informed he had been hospitalized and his medication was altered due to severe behavior at home. At the point that Danny's change in medication became known, it was too late in the study to terminate and select new participants because the after-school program only had a few weeks left before it closed for the summer. Also, the parents never provided the exact date of the medication change to the observer or the staff at the after-school program. Due to the lack of knowledge of the exact date of when Danny's medication, the data should be viewed with caution.

The researcher also faced another problem with the change in schedule at the after-school program. Reward days would interrupt the regular schedule, which meant that no social skills class would be taught that day. Without the social skills class, the researcher was not able to collect data. During reward days, the students were able to choose amongst preferred activities and problem behaviors were not as present. Unlike the other issues, the change in schedule could be modified in another study by conducting the study in a school setting with a more formal schedule. The researcher realized that this could be a more effective study in a school setting, with a certified teacher conducting the NCR.

Finally, the fact that the high school participants were brothers is another limitation of this study. The frequency of the behaviors could have been because the siblings were with one another almost constantly. Additionally, changes in Charlie's behaviors could have been because he was witnessing the extreme behavior of his brother Danny's behavior at home and school that led to his hospitalization. Therefore, the study needs to be replicated without the participants being siblings.

Due to many limitations, it is impossible to determine the functional relation between NCR and decreased problem behaviors in this study. Due to change in medication, lack of attendance, and unexpected change in the program schedule, any change in the participants' behavior cannot claim to be exclusively caused by the implementation of NCR. While there was a decrease in the target negative behaviors, it cannot be considered caused by NCR due to these limitations. Also, the disruption in attendance and schedule caused an unstable condition for the setting, such as changes in programming for birthday parties, holiday parties, and reward days.

The results did indicate a change in the teacher's behavior after implementing NCR. There was an increase in proximity while implementing NCR and an increase in praise statements during and after the intervention. Like the participants, the teacher was subject to many of the limitations, like the change in scheduling, program closures, and the unexpected absences of the participants.

Implications

This current study demonstrated that NCR is an intervention that is applicable in different settings, with different participants who had different topographies of behavior. The study also demonstrated that NCR may be an effective intervention for adult attention-seeking behaviors. The most important implication from this current study is the possible use of NCR as an intervention in an educational setting. Due to lack of resources – personnel and financial – teachers need interventions that are effective and easily understood to implement. NCR provides that needed versatility. Also, with the results of this study, NCR can also improve the relationship between teacher and child that can make school a more positive place for the child. Additionally, by lowering

reprimands and increasing praise statements, the entire class is going to benefit by a teacher providing less negative attention to one specific student. The results of this study regarding teacher behavior provided can be a useful tool in improving classroom environments. If teacher behavior positively changes with the use of NCR, the classroom may possibly become a more desired environment for individuals who exhibit problem behaviors. If NCR can increase praise statements and proximity, students may foster better opinions of their classrooms and teachers.

The current study measured the effects of NCR on problem behaviors of two high-school aged males attending an after-school program that targeted social skills. Since an after-school program is not mandatory, the attendance of the participants was lacking in this study. If this study was replicated in a more formal setting, like a classroom, attendance of the participants would be more regulated. This study added to the literature by demonstrating that NCR can be employed in after-school programs as well as educational or clinical settings.

Future Research

For future research, the limitations of the current study need to be addressed. Although it is still recommended that future researchers implement NCR in applied settings, planning for longer data collection (an academic year rather than three months) could allow for more flexibility with participant and schedule changes. Once these limitations are addressed, more reliable data can be obtained to determine the true effect of NCR on target behavior. Additionally, by rectifying the limitations of the current study, more reliable data will ensure that the change in teacher behavior was due to the implementation of NCR.

Another possible extension is a change in the individual implementing the intervention. For this study, an undergraduate student without a teaching certificate was used. Future studies need to use different individuals as the implementers of the intervention and measure any change in behavior. If NCR changes the behavior of the individual implementing the intervention, then the change should be similar for anyone, such as a certified teacher, counselor, experimenter, or parent.

Additionally, future research could focus on replication in different settings should be completed, such as different classes, after-school settings, home or a homeschool environment would be beneficial for the literature on NCR. The literature demonstrates the versatility of NCR in multiple settings; however, the number of NCR studies conducted in homes were limited. Pertaining to child development and possible behavior interventions for children, the home is a definite setting in which research should be conducted. Like teachers, parents are seeking effective interventions to employ and if NCR has been so effective in clinical and educational settings, it should be effective in the home. For example, a study could employ NCR in an educational setting and then extend that intervention into the home.

A final area that can be addressed in replication of this study is the possibility that different functions of behaviors affect the change in teacher behavior differently. This study examined different topographies of behavior, however, it only examined one function of behavior, attention-seeking. To determine if implementing NCR truly changes the behavior of the implementer, different functions of behavior need to be included. A study needs to include participants with different functions, such as escape-maintained, tangible, or sensory, to determine if the teacher behavior continues to change. The

literature demonstrates that NCR is effective when working with all functions of behavior; however, the literature is lacking in measuring the behavior of the implementer when working with different functions.

Overall, this study added to the NCR literature by providing additional empirical evidence that NCR is a versatile intervention that is employable in multiple settings, including an after-school program. It additionally added to the literature by demonstrating that it is applicable with different topographies and with different types of participants. However, additional research needs to be conducted and this study replicated to address its limitations before any conclusions can be made.

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Appendix: Teacher Noncontingent Statement Bank

1) The weather is nice today.
2) I like it when it is sunny.
3) Fridays are always good days.
4) My favorite color is _____.
5) My favorite kind of music is _____.
6) I like (whatever kind of food.)
7) This weekend will be fun.
8) My favorite holiday is _____.
9) I like to do _____.
10) Those shoes are (whatever color).