An Investigation of the Effects of Differential Reinforcement of Alternative Behavior

On Students with Mild/Moderate Disabilities

In a School Classroom

Katrina Spangenberg
Utah State University
Masters Thesis
Introduction

The number of students within the educational system exhibiting problem behavior has increased dramatically in recent years. With this increase in problematic behaviors, the ability for many of these students to progress socially and academically is impacted. The treatment of problem behavior maintained by positive and negative reinforcement continues to be at the forefront of applied behavioral research (Alberto & Troutman, 2006). The purpose of the research is to ascertain the effectiveness of approaches in decreasing problem behaviors and increasing alternatives that are exhibited in order to provide the best educational setting for the student.

Several studies have been conducted regarding effectiveness of interventions for problem behavior (e.g., Goh et al. 2002; Lerman et al. 2002; Ringdahl et al. 2002; Volmer et al. 1999). One approach, differential reinforcement of an alternative behavior (DRA) is defined as reinforcement of an alternative behavior while withholding reinforcement for the inappropriate behavior (LRBI, 2001). Using DRA, problem behavior can be reduced by programming reinforcement contingent on the occurrence of an alternative, socially appropriate behavior. Therefore, DRA becomes an acceptable alternative to punishment procedures in decreasing problem behavior (Goh et al. 2002; Lerman et al. 2002; Ringdahl et al. 2002; Volmer et al. 1999). Research on DRA has demonstrated a reduction in the intensity and duration of problem behavior (Volmer et al. 1999). However, most of the research focuses on severe and potentially dangerous behavior, i.e., self-injurious behavior exhibited by students with severe intellectual disabilities. There is limited research on the effects of DRA in reducing problem behaviors of groups of students who have mild/moderate cognitive disabilities or more common problem behaviors (e.g., disruptiveness).
A similar procedure, Differential Reinforcement of Incompatible Behavior (DRI), involves reinforcement of an incompatible alternative behavior while ignoring the inappropriate behavior (Friman, 1990; Jones & Baker, 1989). When programming DRI, participants cannot engage in the incompatible behavior at the same time as the problem behavior. DRI was not a part of this literature review because the behaviors that are being exhibited by the proposed participants do not have corresponding incompatible behaviors. For example, if a student’s problematic behavior is turning off classroom lights to seek peer and/or adult attention, there is not a behavior that is incompatible. However, there are alternative behaviors that may be introduced that will provide the student with the desired consequence.

**Literature Review**

Research on DRA was identified using online ERIC databases and GOOGLE internet search engines. A secondary search involved reviewing references from the initial article and by reviewing all issues of Journal of Applied Behavior Analysis and Behavior Disorders from 1980 - 2007 to allow for a more thorough and complete search of DRA. Due to the limited research on DRA, various descriptors were used in order to obtain the most information as possible. Descriptors in the search included Differential Reinforcement (DRA), Differential Reinforcement of Alternative Behavior(s) and Reinforcement plus Extinction. Ten studies were found researching the effects of DRA with participants who had significant cognitive disabilities, severe/dangerous behavior and/or were studied in a treatment setting. Five representative studies from the literature are described below.

**Study 1: Differential Reinforcement with and without Instructional Fading**

A study conducted by Ringdahl et al. (2002), utilized a differential-reinforcement-based treatment package for the reduction of problem behaviors during an instructional setting with an
8-year old girl diagnosed with autism functioning in the moderate range of mental retardation. Through the completion of a functional analysis, it was determined that her problem behavior was maintained by escape from instruction. Differential reinforcement of alternative behavior (DRA) was utilized across two conditions with the alternative behavior being compliance. The researchers intended to compare the use of a DRA package with and without instructional fading in the treatment of a young girl’s task-related problem behavior.

Through all sessions involving DRA with instructional fading were conducted in a separate therapy room with each session lasting 45 minutes. Each session was conducted with the behavior specialist. The same instructional material and positive reinforcement materials remained consistent throughout both conditions. The contingencies related to the condition were identical under both conditions so that if problem behavior occurred during the break, the break was halted, the student was required to clean up the room and was then presented with an academic instruction.

Researchers found DRA without instructional fading resulted in an initial increase in problem behavior, but it decreased across sessions. Conversely, DRA with instructional fading resulted in problem behavior in only two out of 13 sessions. Researchers indicated the key component of using DRA with instructional fading was the schedule of instruction altering the value of escape as a reinforcer (Ringdahl et al., 2002).

Ringdahl et al. (2002) noted two limitations of the study. The first limitation was that only one subject was observed, therefore generalizations were not possible. The second limitation was associated with the research being conducted in a “unique setting”, a hospital day treatment program with the study being conducted in a therapy room or classroom located in the
facility, resulting in the possibility of the behaviors being unique to the setting. (Ringdahl, et al. 2002).

**Study 2: DRA and Demand Fading in the Treatment of Escape-Maintained Behavior:**

A study similar to Study 1 was conducted by Piazza, Moes, and Fisher (1996). In this study, researchers discuss the use of physical guidance during instruction and how it is difficult to use this procedure. As a result, combinations of using demand fading and an increase in rate of reinforcement for compliance were implemented.

Piazza et al. (1996) studied an 11 year old boy, Jon, with autism and mild retardation who was hospitalized for treatment of destructive behaviors, self-injury and disruption (property destruction, throwing objects, and kicking and banging surfaces). The sessions were conducted in a clinic room with a one way mirror. Treatment sessions continued until Jon completed a specified number of academic trials while seated at a table with session durations ranging from 30 s to 68.6 min.

Throughout this study, Piazza et al (1996) found that the results they obtained support those of an earlier study conducted by Pace et al. in 1994 indicating that it may not be necessary to physically guide clients to complete a task in order to decrease escape-maintained destructive behavior and increase compliance. The results of the current study indicate destructive behaviors were highest in escape extinction with physical guidance and lowest during DRA plus demand fading.

Piazza et al. (1996) stated that several factors may have contributed to the success of DRA plus demand fading. First, when compliance was gained, it resulted in access to highly preferred items. Second, when latency to compliance was long, Jon did not have access to attention and the tangible items which might have established the effectiveness the reinforcers
used, and demand fading may have increased the possibility that Jon contacted reinforcement for compliance because the response requirement was initially low. Finally, the response-reinforcer relationship for destructive behavior was discontinued by not allowing Jon to escape a task by engaging in noncompliant behavior.

Study 3: Reinforcement Magnitude and Responding during Treatment with Differential Reinforcement

Lerman et al. (2002) reviewed research on DRA and found problem behavior was often maintained by social reinforcement. For example, a subject would engage in a problem behavior such as self-injurious or destructive behavior to gain social attention from others. The researchers stated that as part of treatment with DRA, the functional reinforcer for problem behavior is used to shape and maintain appropriate behavior. As a result, the effectiveness of utilizing DRA is ideal in that, if done correctly, it will no longer produce the inappropriate behavior, especially if it is not receiving reinforcement.

This study (Lerman et al. 2002) consisted of two experiments studying the relation between reinforcement magnitude and adaptive behavior across three subjects. Each session was conducted in unused rooms containing tables, chairs and any materials needed for the experiment in the participant’s school. The first experiment of communication response was shaped and maintained by the same reinforcement found to maintain the inappropriate behavior. Two reinforcement magnitudes of 20 s to 60 s were used with access to toys or escape from demands. The two reinforcement magnitudes were compared and found to be associated with similar levels of resistance to extinction (Lerman et al. 2002).

The three subjects were very similar in that all exhibited aggressive behaviors whether self-injurious or directed at others or property. The first subject, Timmy, was a 4-year-old boy
Diagnosed with moderate mental retardation who had been referred for assessment and treatment of disruption. The second subject, Rachel, was a 20-year-old woman diagnosed with profound mental retardation had been referred for assessment and treatment of self-injury and aggressive behavior. The third subject, Gary, was a 10-year-old boy diagnosed with autism and severe mental retardation who had been referred for aggression.

Touching a communication card was chosen as the alternative behavior for all subjects. A subject was required to touch the card without verbal, model or physical prompts from the therapist. Definitions of problem behaviors were different for each subject. Timmy’s problem behavior was defined as disruption as evidenced by throwing objects more than 0.3 m from the placement on the table. Rachel and Gary engaged in aggression defined as hitting, kicking, biting or pinching the therapist. Additionally, Rachel engaged in self injurious behavior consisting of audible contact between her hand and head.

The reinforcement selection was escape from instruction for Timmy and Gary and access to toys for Rachel. The reinforcement was initiated to maintain alternative behavior during experiments 1 and 2. However, Gary was taught a second alternative behavior, touching a different communication to obtain access to tangible reinforcers. As a result of an additional alternative behavior being introduced with Gary, experiments 1 and 2 were conducted again with a tangible reinforcer.

The overall finding of the relation between reinforcement magnitudes and responding during DRA indicated that this variable may only minimally influence resistance to extinction or overall response rates within the context of a single free operant arrangement (Lerman et al. 2002). Using a reversal design, researchers found that, with the exception of post reinforcement pause (PRP), the characteristics of behavior exposed to different duration of social reinforcement
are similar prior to and during extinction. Additionally, researchers found relatively short duration reinforcement maintained appropriate behavior as well as longer periods of reinforcement. With this, the shorter the reinforcement, the longer the academic session may be (Lerman et al. 2002).

Study 4: Evaluating Treatment Challenges with Differential Reinforcement of Alternative Behavior

Vollmer et al. (1999) conducted a study reviewing DRA at less than optimal parameters. The participants in the study were three individuals who had been referred by their parents and teachers for treatment of their problem behaviors and were functioning at profound mental retardation level (Vollmer et al. 1999). The study was conducted in a therapy room of the participants’ school. The researchers would reinforce a problem behavior after some of the occurrences, and would not at other times. Findings indicated that when exposed to DRA at full implementation, the participants showed an inclination toward appropriate behavior in subsequent conditions during which “mistakes” were intentionally introduced (Vollmer et al. 1999).

Vollmer et al. (1999) state that if the reinforcement schedule caters to the DRA, responding should be allocated toward appropriate behavior and away from the problem behavior, thus ensuring the problem behavior should extinguish. One of the main concerns discussed regarding DRA was that, to date, no studies have evaluated methods for examining the integrity or the reliability of DRA. The purpose of the research would be to ensure that perfect or near-perfect integrity of treatment was conducted.

The results of the study (Vollmer et al. 1999) indicate that at full implementation, DRA virtually replaced inappropriate behavior for all participants. During partial reinforcement of
alternative behavior, if the reinforcement favored the inappropriate behavior, the efficacy of the treatment was questioned, regardless of the fact that there was a bias toward appropriate behaviors.

The overall usage of full and partial implementation of differential reinforcement is acceptable from a clinical perspective. However, if partial implementation is utilized it should be used with fading of the implementation levels prior to generalizing a treatment plan. Future research should also evaluate the manipulation of other variables that constitute full or partial treatment implementation (Vollmer et al. 1999)

Study 5: Competition between Noncontingent and Contingent Reinforcement Schedules during Response Acquisition

Goh et al. (2000) examined non-contingent and contingent reinforcement schedules during response acquisition. Two participants engaged in self-injurious behavior. Two different experiments were conducted with the first utilizing non-contingent reinforcement (NCR) and differential reinforcement of an alternative behavior and the second utilizing a thinning of NCR and differential reinforcement of an alternative behavior. In both experiments, researchers sought a decrease in self-injurious behavior and an increase in appropriate mands (replacement behavior).

Unlike the previous studies, the participants in this study were adults. The study involved two participants who both lived in a residential facility for persons with developmental disabilities and had been referred to a day treatment program for assessment and treatment of self-injurious behavior (Goh et al. 2000).

The dependent variable in the study for both participants was self-injurious behavior (slapping, biting, etc). Data were collected on the frequency of the self-injurious behavior and
mands (replacement behavior) by trained observers. Phase 1 consisted of the functional analysis to determine what reinforcers, both tangible and non-tangible, would work best. Phase 2 consisted of noncontingent reinforcement (NCR) plus DRA then thinning the schedule of NCR while DRA was continued. In order to gain adequate data, both treatments, NCR and DRA, began simultaneously. The alternative behavior, mand training, was provided to the participants by verbal and physical prompts to engage the alternative response at 30-s intervals (Goh et al. 2000).

The overall conclusions of the study show that NCR plus DRA were associated with a decrease in self-injurious behavior but resulted in little or no increase in appropriate mands. In the subsequent phase when the NCR schedule was thinned while the DRA continued, a decrease was observed in the self-injurious behavior while an increase in appropriate mands was noticed. The overwhelming findings of the Goh et al. (2000) study indicate that the strengthening of socially appropriate behavior as replacement for problem behavior during NCR might best be achieved if the NCR schedule is first thinned.

Summary

Each investigation utilized differential reinforcement of an alternative behavior in order to decrease a problem behavior, typically self-injurious or destructive. The first study by Ringdahl et al. (2002), utilized DRA in a treatment package in order to increase compliance during an instructional setting. The second study conducted by Lerman et al. (2002) was seeking extinction of the problem behavior through reinforcing the alternative behavior of utilizing a communication card to seek reinforcement. The third study conducted by Vollmer et al. (1999) did not perform DRA under optimal circumstances in that reinforcement was not utilized regularly. The alternate behavior being sought was to complete a task independently. The last
study reviewed, by Goh et al. (2000), sought replacement behaviors (mands); the behavior being sought was not clearly defined over self-injurious behavior.

All studies reported the similar cognitive functioning level of the participants with the exception of Kyle (Vollmer et al. (1999) who had not been diagnosed. The use of DRA appeared to be appropriate in that in experiment found the use of DRA decreased problem behavior. Three of the articles reported significant decreases in problem behavior.

Throughout the review, with the exception of one study, problem behaviors were ignored while the alternate behaviors were reinforced. The duration of reinforcement for the alternative behavior was surprisingly short, anywhere from 20-s to 300-s; however, it appeared that regardless of the duration, the reinforcement proved to be enough to decrease the problem behavior in order to increase the alternative behavior. This occurred whether the alternative behavior was task completion, touching a communication card or engaging in an appropriate behavior. In the study by Vollmer et al. (1999), DRA with NCR proved to increase the desired alternative behavior.

DRA is appropriate to educational settings because reinforcement (particularly social attention) is used as a contingent consequence for alternative behavior while problem behavior simply remains on extinction (Alberto & Troutman, 2006). Although researchers recommend that future research should be conducted under the same or similar conditions in order to make further determinations on the effectiveness of DRA, one is not able to generalize effects of DRA to multiple functioning levels of students. In order to create a skill that is able to be generalized to multiple settings, the study setting needs to be conducted in an environment more natural and functional for students.
While appropriate for implementation in educational settings, existing research on DRA provides no evidence of its effectiveness in special education classrooms. Existing research on DRA exposes three omissions: research on students with mild/moderate disabilities, research in school classrooms, not clinical settings, and research conducted by a teacher. With the experiments reviewed being conducted in clinical settings, the research does not inform educational practitioners with information needed in order to provide teachers with evidence-based approaches necessary to change behaviors.

Although it was found that DRA was successful with most study participants with severe disabilities in clinical settings, or with students in settings inconsistent with normal day to day schooling, further research needs to be conducted. In particular, research needs to be conducted with students who have mild/moderate disabilities in the normal classroom settings. Many of the studies reviewed consisted of one participant and the researchers in a one on one session. Studies need to be conducted with students who are not only on a school setting but have multiple distracters such as other students and adults that are always present in a classroom.

Purpose Statement

This study will include participants who have mild/moderate disabilities and will be conducted in a resource classroom. The purpose of the proposed study is to examine the effects of DRA in decreasing problem behavior exhibited by students in a typical educational classroom and in increasing alternative behaviors. The proposed study is to determine whether the use of DRA will decrease problem behaviors in intensity and duration across students and increase compliant behaviors.

The proposed study will determine whether appropriate alternative behaviors will generalize from small group settings to large group settings that require the same behavior.
expected in the small group setting but include additional uncontrolled stimuli. By increasing appropriate behaviors, the participants may have the opportunity to move to a less restricted environment.

Research Questions

1. To what extent is problem behavior decreased with DRA for students with mild to moderate disabilities during structured small group instruction between baseline and intervention?

2. To what extent is the alternative behavior increased during with the implementation of DRA for students with mild to moderate disabilities during structured small group instruction between baseline and intervention?

3. To what extent will teachers identify the effects of the treatment used in this study as socially significant?

Participants and Settings

The study will involve three participants who are classified as having mild to moderate disabilities consisting of autism or developmental delays. Three participants, Annie, Mark and Billy have been placed in a mild/moderate self-contained class specializing in academic and behavior management. Annie, a six year old girl diagnosed with autism, exhibits delays in academics, social interactions with peers and behavior problems limiting access to the regular education classroom. Mark, also six years old with autism, excels academically but exhibits social and obsessive behaviors inhibiting his access to the regular education setting. Annie and Mark are able to access the regular education setting with teacher or para-professional assistance but Annie requires accommodated academics to ensure progress in reading and writing.
Billy is seven years old and has developmental delays. He is able to access the regular education setting for all academic instruction independently but due to social behavioral delays requires monitoring by the special education classroom or to ensure continued access to the regular education setting.

The setting for Annie and Mark will be in a self-contained special education learning center with a maximum enrollment of twelve students, a special education teacher and a para-professional. Billy will be in the regular education classroom with one teacher and twenty to twenty-five students enrolled in the class. The proposed study will be conducted at Hill Field Elementary School in Clearfield, Utah, a school in the Davis School District.

Target Behaviors: Participant 1 (Annie)

Problem Behavior: Whining/Tantrumming.

Definition: When she seeks teacher attention but does not get an immediate response, Annie will begin to whine and/or tantrum in order to get the response or attention she is seeking from the teacher. This behavior occurs across all school settings.

Alternative Behavior: Hand Raising.

Definition: Raising her hand quietly, refraining from verbal remarks or sounds, and waiting for a teacher to respond to her.

Target Behaviors: Participant 2 (Mark)

Problem Behavior: Flipping Switches.

Definition: Flipping switches (overhead lights, computer monitor switches, overhead projector switches) in order to get a reaction from the class. Flipping switches occurs across all school settings.

Alternative Behavior: On-task behavior.
Definition: Remaining physically oriented to the task at hand by manipulating materials related to the task in a purposeful way leading to completion of the task.

Target Behaviors: Participant 3 (Billy)

Problem Behavior: Talking Out.

Billy’s problem behavior consists of talking out to gain teacher and/or peer attention. The behavior typically occurs during academic instruction but is not limited to instruction settings only. Definition: Verbalizing at low volume (e.g., whisper) or higher (e.g., conversational level) without first receiving teacher permission.

Alternative Behavior: Seeking teacher or peer attention appropriately.

Definition: Making appropriate verbalizations with conversational volume by using people’s names, saying excuse me or when necessary, raising his hand to seek teacher attention in order to talk.

Dependent Measures

Prior to the beginning of the study, dependent variables will be determined after conducting functional behavioral assessments on each participant. The researcher anticipates that dependent variables will be problem behaviors to be decreased and alternative behaviors to be increased using DRA as treatment. The anticipated function of the problem behaviors for all the participants is getting teacher and/or peer attention. If the functional behavior assessment reveals different functions, the dependent variables may change. The problem behaviors for each participant will be measured as follows:

Participant 1 (Annie): Frequency data will be obtained by recording the number of times whining or tantrums occur during the observation period
Participant 2 (Mark): Frequency data will be obtained recording the number of episodes flipping switches occurs during the observation period.

Participant 3 (Billy): Frequency data will be obtained recording the number of times talk-outs occur during the observation period. Interval recording will also be conducted simultaneously in order to ascertain the rate of off-task behavior occurs in order to determine if the alternative behavior being sought is increasing or decreasing.

**Independent Variable**

The independent variable will be the effect of DRA (reinforcement for the alternative behavior plus extinction for the problem behavior). For each participant, the presumed function of the problem behavior is gaining attention. Possible intervention would include individual teacher attention when the alternative behavior is exhibited by the student. Tokens may also be provided that are used in the classes token economy system for additional reinforcement for exhibiting the alternative behaviors being sought. Students will be able to turn in their tokens for desired items from the classroom on a daily basis. Occurrences of problem behavior will result in extinction procedures, i.e., the teacher, para-professional, and students will direct their attention away from the target student and resume attention only after the problem behavior ceases.

**Research Design**

During baseline and intervention phases, class and schoolwide rules will be in force. Rules will consist of following directions the first time given, keeping hands feet, mouth and objects to oneself, always using an inside voice, raising one's hand before talking, and walking in the halls and asking permission before leaving the classroom. The class and school rules are
enforced with positive reinforcement given through gold star tickets and positive praise with edible reinforcers depending upon the given task and student.

The proposed research design will be a multiple baseline across three participants (Alberto & Troutman, 2006). Baseline data will be obtained during 30 min periods using event recording for both the problem behaviors of tantrumming and flipping switches and the proposed replacement behaviors of hand raising and seeking attention. Time sampling will be used for recording both the problem behavior of off-task and the proposed replacement behavior of on-task.

Baseline data will be obtained until a steady representation of problem behaviors is achieved. At this point, the participant who has exhibited steady frequencies of problem behavior will then begin the intervention. When criterion levels have been attained by the initial participant, the next student will participate in the intervention. This process will continue with each participant until all participants have received intervention procedures. Data will be kept regarding both the problem behavior and the replacement behavior throughout the study in order to accurately determine if the effects of DRA.

**Intervention Procedures**

The treatment will consist of DRA with components targeting social behaviors to increase (e.g. hand raising or on-behavior depending upon the participant) and problem behaviors to decrease (e.g. talk outs, whining/tantrum and flipping switches). The same treatment will occur for each additional participant; however, the specific skill taught for the alternative behavior will be ascertained through the functional behavioral assessment. The DRA procedures will be functionally equivalent to the problem behavior. That is, reinforcement procedures will be consistent with the function of the problem behavior. For example, if the
student is seeking teacher attention, the student will receive teacher attention for exhibiting the appropriate behaviors each time they occur. If the student is avoiding a high demand academic task, the teacher’s attention for the participant’s alternative behavior will be associated with reduced assignment length or complexity.

The proposed alternative behaviors for all the participants are readily observable. Given this, it should be easy for all the participants to receive reinforcement for exhibiting the desired alternative behaviors. Reinforcement in the form of tokens will be given daily, at the end of the day. The daily, fixed interval schedule of reinforcement will be maintained until a pattern of decreased problem behavior and increased alternative behavior is observed for a participant. At this point, contingent on high rates of desired behavior, the rate for turning in tokens may be decreased to every-other-day and continue until token reinforcement can be provided on a weekly basis. Conversely, if the participant exhibits increased rates of problem behavior, daily reinforcement will be reinstated.

The alternative behavior for each participant will be taught in individualized teaching sessions. The participants will participate by reciting and role playing the actions involved in their specific alternative behavior. After individual training sessions, the alternative behaviors will be reviewed and role played again with each participant in various school settings to increase the probability of occurrence. Participants will be encouraged to perform their respective alternative behavior through positive verbal statements and teacher modeling of the appropriate behavior as needed.

Data and Instrumentation

Data will be collected at the beginning of the school year prior to any teaching of specific alternative behaviors. Event recording will be used during the thirty-minute time period. Each
time the problem behavior occurs during baseline and after presentation of the intervention, problem behavior and the alternative behavior will be represented by a tally mark. The data will then be graphed to show trends in the baseline and intervention treatments within a multiple baseline design.

Social Validity

According to Cooper et al. (2007), social validity should be assessed in three areas: social significance of the target behavior, appropriateness of the procedures and social importance of the results. The significance of decreasing the described problem behaviors will improve student success in day to day schooling. This will allow more access to the regular education setting for students with disabilities.

The social validity of the intervention will be assessed through a pre and post survey questioning the acceptability of the proposed intervention procedures for the teacher specifically involved with the participant to determine if they find that the study is beneficial and could be used for other participants.

For other teachers, five to ten teachers, a video sampling of the baseline and end of intervention behaviors will be used in order to determine if the teachers are able to correctly identify which sampling shows the intervention procedures. Teachers that interact with the students will be included in the video sampling in addition to other teachers who are in the school. After observing 1 min of baseline and intervention video segments for each participant, teachers will be asked to identify “before” and “after” segments. The order of “before” and “after” video segments will be counterbalanced across participants. Multiple before and after samples will be used in order to better determine whether or not teachers are able to see a difference in the participants behavior.
Inter-Observable Agreement Procedures

Inter-observer agreements will be conducted to ensure consistent measurement of the dependent variable. Each participant will have data collected at different times and possibly in different settings. With this, multiple observers will be necessary. At this time, the observers will be Katrina Spangenberg, special education teacher, and a special education para-professional. The second observer will be trained by the special education teacher in sessions prior to starting baseline. The teacher and second observer will begin by working together to observe behaviors of the three participants while another teacher conducts a lesson. The purpose of the initial session will be to confirm or modify the definitions of problem and replacement behaviors. In a second session, the teacher and second observer will independently collect data on a sample of problem and alternative behaviors, then compare frequencies or time sampling data. Interobserver agreement will be calculated on two ways. First, on frequency counts, a formula of “small count/large count x 100” will provide an index of interobserver agreement. Second, on time samples, a formula of “agreements/agreements plus disagreements x 100” will provide an index of interobserver agreement. The teacher and second observer will continue training until frequency and time sample agreements are both 80% or higher. At this point, baseline data collection will commence. Interobserver agreement data will be collected in at least 25% of all baseline and intervention sessions for both problem and alternative behaviors.

Data Analysis

Baseline and the intervention data will be visually inspected for each participant in the context of multiple-baseline design to determine the effectiveness of DRA. After the data have been collected and graphed, a decreasing trend in problem behaviors is anticipated with each participant. Effects of DRA will be visually analyzed based on a decrease in problem behaviors
and an increase in the alternative behavior. The researcher anticipates that both decreases in problem behavior and increases in alternative behaviors will be replicated across three participants. Further review of the data will be conducted to determine if additional interventions should have taken place during the study. Proposals and recommendation for further research may also be made at this time.

**Anticipated Results**

*Dependent measures: problem behavior.* The researcher anticipates that high frequencies of problem behavior will occur during baseline, despite the classroom and schoolwide behavior management systems in effect at the school. With training in alternative behaviors and implementation of the DRA contingencies in intervention, frequencies are anticipated to decrease, remaining at low rates throughout intervention.

*Dependent measures: alternative behaviors.* The researcher anticipates that low frequencies of the alternative behaviors will occur throughout baseline. It is anticipated that with the implementation of DRA, the alternative behaviors will increase gradually and continue to increase throughout the intervention period.

*Social validity results.* Teachers who observe the video sampling should be able to accurately identify “before” and “after” videos for all three participants. The researcher anticipates through this study the positive effects of using DRA may be substantial enough to justify implementing DRA with other students exhibiting the same or similar behaviors.
References


