Summer 8-2009

The Effects of Differential Negative Reinforcement of Task Engagement on Escape from Academic Tasks

Brett Vivian Mehrtens Prince
University of Southern Mississippi

The University of Southern Mississippi

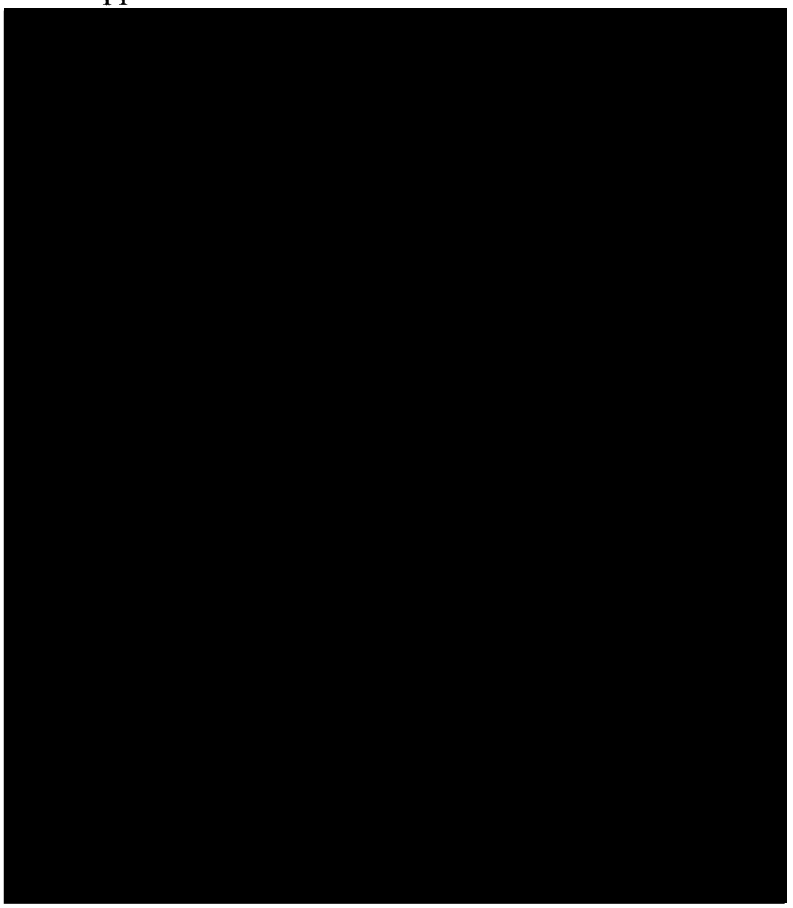
THE EFFECTS OF DIFFERENTIAL NEGATIVE REINFORCEMENT OF TASK ENGAGEMENT ON ESCAPE FROM ACADEMIC TASKS

by

Brett Vivian Mehrtens Prince

A Dissertation
Submitted to the Graduate Studies Office
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Approved:



August 2009

The University of Southern Mississippi

THE EFFECTS OF DIFFERENTIAL NEGATIVE REINFORCEMENT OF TASK ENGAGEMENT ON ESCAPE FROM ACADEMIC TASKS

by

Brett Vivian Mehrtens Prince

Abstract of a Dissertation
Submitted to the Graduate Studies Office
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

August 2009

ABSTRACT

THE EFFECTS OF DIFFERENTIAL NEGATIVE REINFORCEMENT OF TASK ENGAGEMENT ON ESCAPE FROM ACADEMIC TASKS

by Brett Vivian Mehrtens Prince

August 2009

The effects of differential negative reinforcement of alternative behavior (DNRA) were examined on the escape behavior of four 1st and 2nd grade general education students. The alternative behavior that was negatively reinforced was task engagement during reading or math periods. The DNRA treatment was evaluated for its effects on task engagement in either a DNRA with access to a preferred activity condition or a DNRA without access to a preferred activity condition. In the preferred activity condition, the participants were allowed to engage in a high preferred activity when they had been engaged with an academic task for a certain period of time. In the without access condition, participants were allowed to sit quietly or put their head down when they had been engaged with an academic task for a certain period of time.

Following a screening procedure using the FAIR-T interview, conditional probability observations, and a direct assessment of instructional performance to ensure that participants were on grade level in the academic period of concern, the effects of the intervention were analyzed using an alternating treatments design (ATD). Three conditions (DNRA with access, DNRA without access, control) were randomized, and on and off task behavior in the three conditions were compared to on and off task behavior during the baseline period. Data for all four participants indicated that the DNRA with access to a preferred activity and DNRA without access to a preferred activity conditions

were equally effective in decreasing off task behavior and increasing on task behavior. The results suggest that the participants were equally as likely to stay on task to earn a break when the break was combined with an activity as when the break was not combined with an activity. Limitations of this study are discussed as well as suggestions for future directions in research involving DNRA procedures with general education students.

ACKNOWLEDGEMENTS

First and foremost I would like to extend thanks and gratitude to the members of my dissertation committee: Drs. D. Joe Olmi, Dan Tingstrom, Heather Sterling-Turner, Brad Dufrene, and Chris Barry. I am extremely grateful to all of you for your constant guidance and support throughout this dissertation process, as well as throughout graduate school in general. I have learned a lot from all of you, and I will always appreciate your expertise both in and out of the graduate school context. To my dissertation chair, Dr. D. Joe Olmi, I cannot thank you enough for guiding me through first a thesis and now a dissertation. It has been a pleasure and an honor working with you, and I take pride in all that you have taught me during my graduate career.

I also wish to thank my graduate colleagues for all of their help and support in collecting data for this project. I wish to thank Britney Burton and Laura Needelman for helping me find participants and helping to collect data. I also wish to thank Lauren Harpole, Kim Zoder Martell, Dana Swartzwelder, Qi Zhou, Katy Menousek, and Veena Poole for helping me collect data, and especially for coming out to the school with me during their summer vacation.

I, of course, want to thank my parents, Roy Mehrtens and Leslie Richardson. Without your ongoing support through every part of my life, I would not have ever made it this far. You have both always supported me throughout every step of my education toward my career, and if it were not for your love and wisdom, I probably would not have finished graduate school. You both had to sacrifice time spent with me so that I could work on things for school, but you never failed to come visit me when I could not make it home to see you. I have the utmost respect for you because you have sacrificed your time

and supported me financially. I could not ask for better or more loving parents.

To my husband, Andy, you have also put up with me throughout the majority of my graduate career. I know I was not always the best person to be around when things got stressful, but you stuck by me and never let me down. You are my best friend, and this life is so much more enjoyable because I share it with you. You have sacrificed so much so that I could finish my degree. I can never thank you enough for putting me ahead of your own goals and aspirations. I can't wait to do the same for you.

And last but not least, to my best furry friends, Punky and Brewster. You have burned the midnight oil with me on numerous occasions and sacrificed my attention for a spot under the kitchen table while I worked on this project. There is never a dull moment with the two of you around, and I enjoy laughing at your crazy antics. You provided the comic relief that I needed to get through this task. A dog is truly a woman's best friend, and I am lucky enough to have two of you.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

Figure

LIST OF TABLES

Table

CHAPTER I

INTRODUCTION

Current regulations through the No Child Left Behind Act (NCLB, 2001) and its alignment with the Individuals with Disabilities Education Act (IDEA, 2004) call for "scientifically-based research," which includes empirically-sound research investigations (IDEA, 2004; NCLB, 2001). Another initiative that stems from current government regulations is response-to-intervention (RTI). In this initiative, students at-risk for behavioral or academic problems are identified early, given additional instruction or a prescribed intervention, their progress under the intervention is monitored, and their progress is then evaluated to determine if the intervention or additional instruction produced the desired effect (Fletcher, Coulter, Reschly, & Vaughn, 2004).

Despite mandates for "scientifically-based research," however, many interventions for general education students are recommended by intervention agents that have not been clarified in the literature. One such recommendation is for a teacher or caregiver to give his/her student a period of free time or a break after the student engages in a desirable behavior (Piazza et al., 1997). This recommendation is typically used for students who exhibit hypothesized escape-maintained behaviors during academic tasks. In theory, the break received after a period of engagement functions as a negative reinforcer designed to increase the on-task behavior (Kodak, Miltenberger, & Romaniuk, 2003b). Therefore, the removal of an academic task following task engagement would strengthen task engagement if the student's off task or problematic behavior functioned to escape task demands.

In behavioral terms, negative reinforcement is defined as the occurrence of a behavior, followed by the removal of a stimulus, which then increases the frequency of the behavior (Miltenberger, 2001). One type of intervention that involves a procedure to increase a desirable behavior and decrease an undesirable behavior is differential reinforcement of alternative behavior (DRA). In this procedure, the targeted desirable behavior is positively reinforced, and the undesirable behavior is not (Miltenberger). In differential negative reinforcement of alternative behavior (DNRA), the same procedure is used except a stimulus is removed, rather than presented, for the occurrence of a desirable behavior.

Several DNRA procedures have been documented in the literature. Most of these research studies have examined the effects of DNRA on compliance (DeLeon, Neidert, Anders, & Rodriguez-Catter, 2001; Lalli & Casey, 1996; Lalli et al., 1999; Marcus & Vollmer, 1995; Piazza, Moes, & Fisher, 1996; Roberts, Mace, & Daggett, 1995; Steege et al., 1990). Other researchers have investigated the effects of DNRA on engagement with academic tasks (Aaron & Bostow, 1978; McComas, Goddard, & Hoch, 2002; Mozzoni & Hartnedy, 2000; Mueller, Edwards, & Trahant, 2003; Peterson, Caniglia, & Royster, 2001; Peterson et al., 2005; Piazza et al., 1997; Reed, Ringdahl, Wacker, Barretto, & Andelman, 2004; Zarcone, Fisher, & Piazza, 1996). Two other studies focused on the use of DNRA procedures with pediatric dental patients who displayed disruptive behaviors while in the dentist's chair (Allen, Loiben, Allen, & Stanley, 1992; O'Callaghan, Allen, Powell, & Salama, 2006).

On the other hand, other studies have investigated the effects of noncontingent escape on behaviors such as self-injury, unauthorized breaks, and disruption (Coleman &

Holmes, 1998; Kodak, Miltenberger, & Romaniuk, 2003a; Kodak, Miltenberger, & Romaniuk, 2003b; Vollmer, Marcus, & Ringdahl, 1995; Wesolowski, Zencius, & Rodriguez, 1999). Although a noncontingent procedure may prove useful in some settings and for some behaviors with its ease of use, Tucker, Sigafoos, and Bushell (1998) noted that noncontingent negative reinforcement in a classroom does not encourage the reinforcement of appropriate behaviors. Noncontingent escape is likely to be an effective strategy for certain populations and for individuals with limited cognitive abilities. However, this strategy may not be appropriate for general education students and is also not likely to be well received by general education teachers, in that escape may be given on a time schedule, rather than contingent on task engagement. This would likely be seen as a method of reinforcing whatever behavior the student happened to be engaged in during the specified time interval, even if that behavior was disruptive or inappropriate.

In 2003, Mueller et al. investigated the effects of several procedures on the escape- maintained problem behavior of students. Participants included a 7-year old female with developmental delay, a 7-year old male in a general education classroom with no diagnoses, and a 7-year old male diagnosed with severe hearing impairment. Problem behaviors included tantrumming (e.g., whining, crying, hitting objects, aggression), inappropriate vocalizations, and head shaking, respectively. The Mueller study first examined the effects of DNRA of task engagement, non-contingent reinforcement (NCR), and differential reinforcement of incompatible behavior (DRI) in an intervention component analysis using an alternating treatments design. One intervention was then chosen for each participant and examined using an ABAB design.

During the Mueller et al. (2003) study, the function of the participants' problem behaviors was determined through teacher interviews and functional analyses. Both methods revealed that the function of each participant's problem behavior was escape from academic tasks. Once function was determined, an intervention component analysis was conducted for each participant using DNRA, NCR, and DRI procedures.

During the DNRA procedure, participants received a break from an academic task when their teacher checked their behavior every 30s using a momentary time sampling observation and task engagement was present. The participants were allowed to engage in activities during the 20 s DNRA break. When NCR was in place, participants received tokens on a fixed interval (FI) 30s schedule. The tokens were exchanged for highly preferred items or activities. During the DRI component, participants received tokens when their teachers checked on them every 30s, and they were engaged in a behavior that was incompatible with their target behavior (e.g., tantrumming, inappropriate vocalizations, head shaking).

Once each participant experienced each intervention condition at least three times, a decision was made as to which intervention was most effective in reducing problem behavior. If the interventions were undifferentiated, teachers completed an Intervention Rating Profile (IRP-15), and the most acceptable intervention was chosen for the intervention analysis. For the participant with tantrums, the NCR intervention appeared most effective at reducing tantrum behaviors. For the participant with inappropriate vocalizations, the DRI intervention was chosen because it was rated the most acceptable by the teacher, and the intervention conditions were undifferentiated in the intervention analysis. For the participant with head shaking, NCR and DRI were more effective than

DNRA at reducing problem behavior, and DRI was chosen because it was rated the most acceptable by the teacher (Mueller et al., 2003).

The results of the intervention analyses for each participant revealed that the chosen interventions were effective at reducing their problem behaviors. Problem behaviors increased for each participant when treatments were withdrawn, and subsequently decreased once interventions were reinstated. In addition, the DRI schedule was successfully thinned from 30 s to 60 s for the participant with inappropriate vocalizations.

Although the Mueller et al. (2003) study demonstrated reductions in problem behaviors maintained by escape from task demands, the reductions were due to NCR and DRI interventions. Both NCR and DRI were not functionally-based interventions for behaviors maintained by escape. It is not known to what extent the DNRA procedure would be able to reduce simple off task behaviors maintained by escape. It is likely that NCR and DRI were more effective because the target problem behaviors involved more overt topographies of behavior. It is interesting to note that the three interventions were undifferentiated for the student in the general education classroom, while interventions were more differentiated for the student with disabilities and the student with a severe hearing impairment.

While there appears to be a paucity of research that has investigated DNRA procedures with academic tasks, research investigations have their basis in the developmental disabilities literature. In the one study (Piazza et al., 1997) that did involve a general education student, the DNRA sessions were not conducted in the classroom. There are no research investigations to suggest that these same procedures would work

with children of typical development who are experiencing academic difficulties in a general education setting.

The proposed study will first include a review of studies that have used negative reinforcement procedures for escape-maintained behavior. For example, Aaron and Bostow (1978) analyzed the use of contingent breaks for a percentage of work completion. The authors questioned if contingent breaks would lead to increased time on-task and increased academic productivity. The review will then be followed by a review of literature that involved negative reinforcement, or breaks from demands, with access to attention or preferred activities. All but one of these investigations involved participants with developmental disabilities. One example of this literature base involved a study conducted by McComas, Goddard, and Hoch (2002). They investigated whether breaks from task demands with and without access to preferred activities would increase task engagement and decrease inappropriate behavior.

Negative Reinforcement in the Treatment of Escape-Maintained Behaviors

Aaron and Bostow (1978) examined the effects of contingent free time on academic productivity. Participants included 3 students from a special education classroom. The authors evaluated both time on task and academic productivity as targeted behaviors. Academic productivity was analyzed through various tasks, such as answer completion, task completion, comprehension, handwriting, matching, and following directions. Initially, students were given access to free time from tasks on a noncontingent basis; however, no changes in their on task behavior or academic completion occurred. Aaron and Bostow then made free time contingent upon a percentage of work completed for each of the above specified tasks. Following this

modification, on task behavior and academic completion increased for all 3 participants. When noncontingent free time was reinstated, time on task and work completion decreased and again increased when free time was made contingent upon a percentage of completed work. This investigation demonstrates that breaks that are given contingent on academic work may be effective as negative reinforcers for on task behavior.

In an attempt to decrease disruptive behavior with an escape period, Marcus and Vollmer (1995) examined differential negative reinforcement (DNR) of communication and differential negative reinforcement of compliance with an ABAC experimental design. Communication was defined as the participant stating the word "Finished," and compliance was defined as the participant initiating a request within 5 s without further requests or physical guidance from the therapist. The participant was a 5-year-old female with Down syndrome who was referred for aggression, self-injurious behavior (SIB), and disruptions.

A functional analysis was conducted that included conditions for escape, access to tangibles, attention, no interaction, and play. Results of the analysis revealed that the participant's inappropriate behaviors were most likely maintained by escape from task demands. During baseline, the participant received praise when she followed instructions without being physically guided, and she was allowed to escape when she exhibited problem behaviors.

When the first condition, DNR (communication), was implemented, the participant received a 20-s break from demands if she stated the word "Finished." If she engaged in inappropriate behavior, she was physically guided to perform the appropriate behavior. During the second condition, DNR (compliance), compliance with an

instruction resulted in a 20-s break, and inappropriate behaviors were followed by physical guidance to perform the appropriate behavior. During DNR (compliance), escape breaks were increased from a fixed-ratio (FR) 1 to a FR 3 schedule.

Results of the DNR (communication) condition indicated that the participant's inappropriate behavior decreased from baseline levels, but she escaped all possible demands by constantly stating, "Finished." Results of the DNR (compliance) condition indicated that compliance increased compared to baseline, and inappropriate behavior increased slightly from the DNR (communication) condition. Although the communication condition was more effective for reducing inappropriate behavior, Marcus and Vollmer (1995) noted that this may have been due to the fact that the participant was escaping all task demands, consequently, there was no longer the presentation of something aversive from which to escape by engaging in problematic behavior.

In the Marcus and Vollmer (1995) study, increases in compliance and decreases in inappropriate behavior did not occur until breaks were given for compliance, and inappropriate behaviors were extinguished. One limitation of this study was that the authors did not provide any information on what the 20-s breaks involved. Therefore, it is not known if the participant's behavior improved because of her ability to escape from instruction or because of what she had access to during the breaks (e.g., attention, tangibles, activities).

It is also possible that inappropriate behavior decreased because it was extinguished through physically guided completion of task demands, and not due to direct effects of the DNR interventions. In addition, the change in reinforcement from a

FR 1 to a FR 3 schedule is another possible limitation of this research investigation. It is possible that the participant's reduction in inappropriate behavior during the DNR (compliance) condition was not as great as the reduction in DNR (communication) because she was only receiving escape breaks after every third occurrence of compliance.

A 2003 study by Kodak, Miltenberger, and Romaniuk examined both noncontingent escape (NCE) and differential negative reinforcement of other behavior (DNRO) on compliance with an alternating treatments design within a nonconcurrent multiple baseline across participants. Participants were 2 four-year-old males who had been diagnosed with autism. Their inappropriate behavior included disruption, which was defined as throwing materials, pounding the table, defiance, and resisting the therapist's physical guidance. Compliance was defined as the number of sessions in which the participants initiated a demand without needing an additional prompt to complete the task, divided by the total number of sessions.

During the NCE condition, participants received a 10-s break every 10 s, regardless of behavior. When participants' inappropriate behavior fell below 85% of the baseline mean for two consecutive sessions, the time between breaks increased by 10 s until 2 min passed between breaks. During the DNRO condition, the participants' absence of inappropriate behavior for a 10-s interval allowed them to receive a 10-s break. If inappropriate behaviors occurred, the time clock for the 10-s interval was re-started. Like the NCE condition, time intervals increased by 10 s until the interval reached 2 min.

Results of both intervention conditions demonstrated that problem behavior decreased and compliance increased for both participants. Unlike the Marcus and

Vollmer (1995) investigation, compliance increased even though breaks were not given in response to compliant behavior. It is possible that increases in compliance were observed because breaks were given frequently at the beginning of the intervention conditions. Additionally, frequent breaks may have made the task demands less aversive to the participants, thus reducing the establishing operation for escape-maintained disruptive behaviors (Kodak et al., 2003b). In other words, escape from task demands became less potent as a reinforcer once breaks were introduced.

Similar to the Kodak et al. (2003b) investigation, Reed et al. (2004) examined negative reinforcement interventions for altering compliance and problem behaviors with a reversal design. They sought to determine if fixed-time and contingent schedules of DNRA would have the same effects on behavior as positive reinforcement procedures, and to determine if behavior would be affected by dense versus lean schedules of reinforcement. Participants included an 8-year-old male diagnosed with autism and Moderate Mental Retardation, and a 10-year-old male diagnosed with Mild Mental Retardation, Oppositional Defiant Disorder, and Attention-Deficit/Hyperactivity Disorder. They both engaged in noncompliant, aggressive, and disruptive behavior. Compliance was defined as a percentage of the number of tasks completed divided by the number of tasks presented.

Functional analyses were conducted for the participants and included attention, tangible, escape, and free play conditions. Results revealed a greater occurrence of problem behaviors in the escape condition for both participants. The first intervention phase consisted of DNRA for compliance. Compliance resulted in a 30-s break from the task at hand, and inappropriate behaviors resulted in continuous presentation of the task.

In the second phase, DNRA was combined with a lean fixed-time schedule of reinforcement. This was determined by the mean rate of reinforcement that was provided during the DNRA phase. The participants received noncontingent breaks every 150 or 170 s, or a 30-s break for compliance. In the third phase, DNRA was combined with a dense fixed-time schedule of reinforcement. This was determined using the same procedures as in the lean schedule phase. Participants received noncontingent breaks every 85 or 90 s, or a 30-s break for compliance (Reed et al., 2004).

During the DNRA phase, compliance increased and problem behavior decreased for both participants. For the first participant, the dense schedule was associated with an initial increase in problem behavior with a subsequent decrease to zero levels. Compliance decreased and was variable. When the lean schedule was implemented, problem behavior decreased relative to the dense schedule, and compliance was high following a re-implementation of the DNRA phase. For the second participant, the dense schedule resulted in increased problem behavior and decreased compliance. The lean schedule resulted in the suppression of problem behavior and increased compliance relative to baseline and the dense schedule.

Reed et al. (2004) stated that the DNRA phase consistently produced low levels of problem behavior and high levels of compliance. However, the dense schedule of breaks was only effective for reducing problem behavior, and the lean schedule was less effective than DNRA for reducing problem behavior and increasing compliance. Additionally, the investigation always involved the use of escape extinction in that tasks were presented continuously, contingent on problem behavior, until compliance occurred. It is not known to what extent this component had an effect on the participants' behavior.

The Reed et al. investigation does not answer the question of whether breaks without an extinction component are salient enough to result in changes in behavior.

In a different approach to negative reinforcement, Steege et al. (1990) examined a procedure for the treatment of self-injurious behavior (SIB) using an ABAB design for one participant and a multiple baseline across tasks for the other participant. The authors evaluated a negative reinforcement intervention in which participants received a break from an activity by pressing a microswitch. Participants included a 5-year-old female and a 6-year-old male diagnosed with Profound Mental Retardation who were referred for self-injurious behaviors that occurred primarily during their grooming activities. Steege et al. defined appropriate behavior as participation in grooming tasks by grasping grooming materials. Pressing the microswitch was defined as either independent (without the use of physical prompts) or prompted.

The authors conducted an analysis of self-injurious behavior that included alone, demand, attention, and DRA. Results indicated that both participants' SIB was maintained by negative reinforcement. The intervention phase consisted of providing a 10-s break contingent on the pressing of the microswitch that played the word "stop" when pressed. If participants did not initiate pressing the switch when they were engaged in appropriate behavior, the therapist prompted them to press it. Based on the occurrence of SIB, the therapist provided hand-over-hand physical guidance for completion of the grooming task.

Results of the intervention demonstrated that, for the female participant, the intervention resulted in an immediate decrease in SIB. When a withdrawal phase was introduced, her SIB increased to baseline levels and immediately decreased again when

the intervention was implemented. For the male participant, SIB also decreased with implementation of the intervention. The male participant initiated several instances of microswitch pressing whereas the female participant initiated only one instance.

Although SIB decreased for both participants during grooming activities, Steege et al. (1990) noted that it was impossible to know which component of the intervention was responsible for the decreases in SIB. It is not known whether the decreases occurred based on contingent breaks for appropriate behavior or if the hand-over-hand physical guidance was aversive enough to decrease instances of SIB, without the addition of the contingent breaks.

Roberts, Mace, and Daggett (1995) also examined the effects of a negative reinforcement procedure on SIB while comparing DNRA and DNRO in a combined ABAB and alternating treatments design. The participant was a 4-year-old female with Severe Mental Retardation who was hospitalized for the treatment of SIB. A functional analysis with escape, attention, tangible, and play conditions revealed that SIB occurred most often during the escape condition.

During the DNRA and DNRO interventions, SIB was recorded during bathing and tooth brushing sessions. The DNRA intervention consisted of a 15-s break for compliance with an instruction within 3 s. Noncompliance resulted in physical guidance to complete the task. During the DNRO procedure, compliance with an instruction resulted in praise, and a 15-s break occurred contingent on the absence of SIB for a 20-s interval. When breaks were given to the participant, she had access to only her grooming task materials.

Results of the Roberts et al. (1995) investigation revealed that the DNRA procedure was more effective than the DNRO procedure at reducing SIB and increasing compliance during bathing and tooth brushing grooming sessions. The authors stated that results may have been due to the fact that the schedule of reinforcement was denser in the DNRA procedure. In this study, it is likely that the participant's SIB decreased because it was negatively reinforced, and she received a break when she was compliant. Additionally, the breaks did not allow her access to preferred items or activities, thus strengthening the effects of the DNRA procedure. The results suggest that more research is needed to determine whether a break alone is sufficient for changes in behavior to occur.

DeLeon, Neidert, Anders, and Rodriguez-Catter (2001) analyzed the effects of both positive and negative reinforcement on compliance with a 10-year-old female diagnosed with autism who engaged in SIB, aggression, and disruption in the form of throwing objects and destroying items. The treatment analysis was evaluated using a combined ABABC and alternating treatments design. A functional analysis was conducted that included attention, demand, tangible, alone, and play conditions. The results suggested that the participant's inappropriate behaviors were maintained by escape from task demands and access to tangibles. Compliance was defined as completion of a task following a verbal or gestural prompt.

The first intervention phase consisted of comparing reinforcement with an edible to negative reinforcement with a break for compliant behavior. The participant received either a potato chip or a 30-s break when she complied with a demand. If she engaged in inappropriate behavior, she also received a 30-s break from task demands. She was

reinforced on a continuous schedule. The second intervention phase consisted of allowing the participant to choose which reinforcer she wanted and also included extinction and fading. When she was compliant, she could choose either the edible or the 30-s break. In addition, inappropriate behavior no longer produced a break, and the number of tasks to be completed gradually increased from one to three or more.

Results of the DeLeon et al. (2001) investigation demonstrated that the participant's inappropriate behavior decreased and compliance increased when she received an edible reinforcer but not when she received a break. During the choice plus extinction and fading procedure, the participant chose positive reinforcement (edible), and inappropriate behavior was low in frequency when she only had to complete one task. When the compliance requirements increased, problem behaviors increased slightly, and she chose to receive a break. When only one task was again required, problem behavior decreased, and choices between positive and negative reinforcement were variable. When she was again required to complete a higher number of tasks, both problem behavior and choices were variable.

DeLeon et al. (2001) noted that positive reinforcement was more effective at increasing compliance and decreasing inappropriate behavior when reinforcement was delivered on a dense schedule. When more tasks were required and the reinforcement schedule was thinned, choice making became more variable. This was likely due to the fact that a break from tasks was more salient when the number of required tasks increased. The authors neglected to discuss the possible effects of extinction during the choice making procedure. It is unknown if the extinction component for inappropriate behavior had an effect on its decrease during the second intervention phase.

While comparing reinforcement procedures to noncontingent escape from demands, Lalli et al. (1999) examined the effects of positive versus negative reinforcement on compliance using withdrawal designs for 4 participants and an alternating treatments design for 1 participant. Participants included 4 males and 1 female ranging in age from 3 to 21 years, with diagnoses of autism, Severe Mental Retardation, and developmental delays. All participants had been hospitalized for severe behavior problems. Behaviors included self-injury, disruptions, and flopping. Compliance was defined as initiation of a task within 5 s after a verbal or gestural prompt.

A functional analysis was conducted with all participants and included attention, edibles, escape, alone, and control conditions. Results of the analysis indicated that all participants' behavior was maintained by escape from demands. Intervention phases consisted of positive reinforcement with and without extinction, negative reinforcement with and without extinction, NCE, extinction alone, and varying schedules of reinforcement for 3 of the participants.

During positive reinforcement without extinction, participants received an edible for compliance and a 30-s break when they engaged in problem behavior. When positive reinforcement was combined with extinction, there was no break given for problem behavior. During negative reinforcement without extinction, both compliance and problem behavior resulted in a 30-s break. When combined with extinction, problem behavior did not result in a break. For the NCE phase, one participant participated and received a 30-s break every 10 s. When extinction was implemented alone, one participant participated and received praise for compliance and did not receive a break contingent on problem behavior. When different reinforcement schedules were

implemented for three of the participants, schedules were increased or decreased based on occurrences of problem behavior.

Results of the Lalli et al. (1999) investigation indicated that for one participant, compliance increased and problem behaviors decreased only when she was given an edible for compliance and a break for problem behavior. For one participant, compliance increased and problem behavior decreased in the positive reinforcement without extinction phase, and when reinforcement was thinned, SIB increased but eventually decreased. For the third and fourth participants, the positive reinforcement without extinction condition produced the best results. For the third participant, responding remained stable when reinforcement was thinned. For the fourth participant, problem behavior increased with a thin schedule but was eventually brought under control under a denser schedule. For the fifth participant, compliance was high in frequency and problem behavior low in frequency during the positive reinforcement without extinction phase.

Lalli et al. (1999) stated that compliance was higher and problem behavior lower when compliance produced an edible item rather than a break, and problem behavior resulted in a break. In addition, these results were obtained without the use of extinction for problem behavior. The authors were able to demonstrate that concurrent results were obtained for problem behavior, just by reinforcing compliance with an edible item. It should be noted however, that baseline measures of compliance were obtained while compliance resulted in praise, not in an edible item. Therefore, the results during the positive reinforcement without extinction phase may be inflated for compliance if an edible item was more reinforcing to the participants than praise. These results

demonstrate that a break alone may not be sufficient to result in increases in appropriate behavior, since compliance was higher when it produced an edible rather than a break.

Negative Reinforcement Procedures with Access to Preferred Activities

Although many investigations have examined the use of negative reinforcement-based procedures for individuals whose behaviors are maintained by escape, few have compared the use of negative reinforcement with and without access to a preferred activity. McComas, Goddard, and Hoch (2002) sought to examine the effects of a negative reinforcement-based intervention with and without access to preferred activities on problem behavior and task engagement using a counterbalanced design for intervention conditions. The participant was a 9-year-old male in a special education classroom who exhibited disruptive behavior in the form of talking to peers, destroying task materials, or defacing his desk. Engagement was defined as having eyes and hands directed toward the task or providing written responses related to the task at hand. Because the authors hypothesized that his behavior was maintained by attention and/or escape, they conducted a functional analysis that involved unstructured play, attention, and escape conditions. Results of the functional analysis revealed that his behavior was maintained by escape from academic demands.

Intervention phases for disruptive behavior included escape extinction (EE), a combination of EE with negative reinforcement for work completion (EE/SR^-), and EE with negative reinforcement plus access to a preferred activity (EE/SR^-/PA) contingent on work completion. In the EE condition, the participant was given constant access to an academic task. In EE/SR^-, he was given a 5-min break following completion of a worksheet. He was allowed to sit at his desk but did not have access to any materials. In

the EE/SR⁻/PA condition, the participant was allowed a 5-min break following completion of a two-digit subtraction worksheet. During the break, he was allowed to engage in a preferred activity that he chose from a list of options. At the end of the break in the EE/SR⁻ and EE/SR⁻/PA conditions, he was presented with another academic task (McComas et al., 2002).

Results indicated that the participant's disruptive behavior decreased during EE, but his engagement was 50% of coded intervals. Because engagement levels were unacceptable to the teacher, the EE/SR⁻ condition was implemented. In this condition, the participant's disruptive behavior was stable at over 25% of the intervals, and engagement did not improve. In the EE/SR⁻/PA condition, engagement was approximately 100%, and disruptive behavior was at or below 5% of the intervals.

The McComas et al. (2002) investigation demonstrated that breaks from a task combined with access to preferred activities during the break were able to reduce the disruptive behavior of a student, while also improving his academic engagement. One limitation was that the authors did not gradually reduce the break time or increase the amount of work completion needed to receive a break. This dense schedule may have been responsible for the improvements in engagement and reduction in problematic behavior; however, it is likely not feasible to provide a 5-min break for the completion of one worksheet in a classroom. Additionally, the authors did not state whether the subtraction worksheet was a task that was difficult or easy for the participant. The difficulty level of the subtraction worksheet could have affected the outcome of the study in that an easy task could have inflated time on task when access to preferred activities followed. The McComas et al. study provides evidence that a break combined with

access to preferred activities was effective at reducing problem behavior and improving academically appropriate behavior.

Another study that examined task engagement and problem behavior also incorporated choice making and functional communication training (FCT). Peterson et al. (2005) examined a choice making opportunity for participants with a reversal design by allowing them to choose between engaging in a task and receiving a long break, or requesting a break from the task and receiving a short break. Participants included a 4-year-old male and a 9-year-old male who had a developmental delay and moderate mental disabilities, respectively. The authors recorded engagement, problem behavior, mands (sign, gesture, or vocalization) for a break, and mands for work. Engagement was defined as completion of a task and manipulation of task materials according to the teacher's instructions. Mands were defined as independent requests for a break. Problem behaviors included flopping to the ground and eloping for one participant, and inappropriate vocalizations, throwing objects, and banging objects or parts of his body on a table for the other participant.

A functional analysis was conducted with both participants, and it was determined that the behavior of both participants was maintained by escape from task demands. Problem behavior was also maintained by access to tangibles for one participant. Following the functional analysis, participants were taught to mand for breaks while completing tasks. When they requested a break, they were allowed access to toys and attention for 30 s to 1 min. If they engaged in problematic behavior, they were required to complete a task before they could receive a break. In the next phase, FCT was combined with a "work versus break" phase or a "break versus work" phase. In work versus break,

participants received a longer break when they requested to work first and then receive a break. In break versus work, longer breaks were given when breaks were requested. When breaks followed engagement, the participants had access to toys and attention from adults, but did not have this access when breaks followed mands for breaks.

During the FCT phase, both participants had low levels of problem behavior, but they also had low levels of task engagement because they constantly requested a break from the task. When choice making was added to the participants' ability to request a break, the participants consistently requested the condition that resulted in a longer break. Problem behaviors were low and task engagement was high only when the participants manded for work in the "work versus break" phase.

The results of the Peterson et al. (2005) investigation revealed that individuals may choose to work on a task rather than receive an immediate break if working results in a longer break. However, it is not known if the length of the break itself was as salient as the access to toys and attention that followed a break from task engagement. In addition, the study involved an extinction component for problem behaviors, and it is not known to what extent this had an effect on the results of the study. These results lend support to the advantages of analyzing breaks alone versus breaks combined with access to preferred activities.

An investigation that examined the effects of choice-making with an individual whose behavior was maintained by both attention from the teacher and escape from task demands was conducted by Peterson et al. (2001) using a simultaneous treatment design. The participant included a 10-year-old male who had been diagnosed with autism and Mental Retardation. Based on an indirect functional behavior assessment, it was reported

through teacher interview that problem behaviors included out of seat, work refusal, destroying materials, and putting his head down. It was also determined that he engaged in these behaviors when presented with task demands. Additionally, the participant was reported to laugh and smile when receiving teacher attention in the form of redirection to task demands.

An experimental analysis was conducted to confirm the hypotheses derived from the descriptive analysis. Conditions included play, contingent attention during play, contingent attention during work, and contingent escape during work. Results demonstrated that the participant displayed inappropriate behavior during the contingent attention during work and the contingent escape during work conditions. This confirmed the results of the descriptive analysis that the participant engaged in problem behavior when presented with task demands, and also accessed teacher attention following inappropriate behavior. Based on the results of the analyses, an intervention was developed that included a choice component. One component was termed, "Teacher's Choice" and the other, "Trevor's Plan." If the participant (Trevor) picked the teacher component, his teacher assigned him a task and worked with him throughout the task. If he picked his own plan, independent completion of an assignment resulted in a 5-min break in which he had access to toys. If Trevor engaged in inappropriate behavior or failed to make a choice, the teacher chose "Teacher's Choice" for him and this component was implemented.

Results of the Peterson et al. (2001) study demonstrated that the choice-making intervention produced variable responding from the participant. Of nine sessions, three involved 100% of intervals coded for problem behavior. The participant's behavior did

not decrease until the last three sessions. Trevor chose which intervention he wanted for seven of the nine sessions. Four sessions resulted in the "Teacher's Choice" component, and three sessions resulted in the "Trevor's Plan" component. It was reported by Trevor's teacher that he chose "Trevor's Plan" during other periods of the school day more than he chose "Teacher's Choice."

Although a decreasing trend was exhibited in Trevor's problem behavior at the end of the study, Peterson et al. (2001) stated that it is uncertain that the choice-making intervention influenced the participant's problem behavior. One limitation is the lack of a withdrawal phase following decreases in inappropriate behavior. The investigation would have been strengthened by a withdrawal phase and a re-instatement of the choice-making intervention to demonstrate that problem behavior increased when the intervention was withdrawn and subsequently decreased with its return. In addition, receiving attention from the teacher may have been more salient for Trevor than receiving a break with access to toys. This may have been why he chose "Teacher's Choice" more often than "Trevor's Plan" during the intervention.

In 1996, Zarcone et al. demonstrated that free-time breaks from work may be affected by positive versus negative reinforcement. They examined the effects of positive versus negative reinforcement on stacking cups, the effects of free-time with and without access to preferred activities, and the effects of free-time with access to preferred activities for noncompliant behavior. Results of the investigation were examined with a combination withdrawal and alternating treatments design. Their participant was a 10-year-old male who had diagnoses of Profound Mental Retardation and autism. During the first phase of the study, the authors recorded task engagement for stacking cups. In one

condition, the participant received .5 oz of soda for stacking cups, and received a 20-s break for stacking cups in the other condition. In the second phase of the study, cup stacking was recorded and produced either a 20-s break with no interaction or a 20-s break with access to preferred activities. During the third phase, the participant received a 20-s break with access to preferred activities when he complied with task demands.

Results of the Zarcone et al. (1996) study suggested that the participant stacked cups at an increased rate to receive the break rather than the soda in the first phase. In the second phase, cup stacking increased when the participant had access to preferred activities during the break rather than just the break itself. In the third phase, breaks with access to preferred activities resulted in significant improvements in compliance with three task demands. These results demonstrated that the participant was more likely to engage in task completion and compliance when he received a break with access to preferred activities.

On the other hand, he was more likely to complete a task when he could take a break without access to preferred activities than to gain access to soda as a preferred reinforcer, which likely indicates that the participant's behavior was maintained by escape from demands. The Zarcone study emphasizes that, in order for a break from an academic task to negatively reinforce task engagement, it may be necessary for the break to also include access to preferred activities or items. The Zarcone study sets the stage for the research question posed in the current investigation by analyzing a comparison of breaks from tasks to breaks from tasks with access to preferred activities.

Positive and negative reinforcement for escape-maintained behavior was similarly examined by Piazza et al. (1997) with escape extinction as an added component. The

authors evaluated breaks given for problem behavior, breaks given for compliance, and breaks given for compliance compared to breaks given for compliance with access to a tangible item within a combination of withdrawal and alternating treatments designs. They also evaluated their ability to thin the reinforcement schedule for compliance using just a break or a break with access to tangible items and/or attention. Participants included a 7-year-old male with Mild Mental Retardation and Pervasive Developmental Disorder, an 8-year-old female with Mild Mental Retardation, and a 9-year-old male with Oppositional Defiant Disorder (ODD) and Attention-Deficit/Hyperactivity Disorder (ADHD). Target behaviors included aggression and disruption. Compliance was also targeted and defined as completion of a demand following a prompt.

During the first phase of the study, a functional analysis was conducted that included demand, attention, play, and tangible conditions. Results indicated that escape from demands and access to activities were the maintaining variables for one participant. For the second participant the functional analysis was undifferentiated, and escape from demands and access to tangibles maintained the behavior of the third participant. In the second phase of the study, a demand analysis was conducted to examine the effects of escape-maintained behavior by manipulating the contingencies for compliance and inappropriate behavior. The first condition included differential reinforcement of compliance (DRA) without extinction (praise/break). Compliance resulted in praise and inappropriate behavior resulted in a 30-s break where no attention or access to activities was given.

In the next phase (break/break), both compliance and problem behavior resulted in a 30-s break. In the tangible/break condition, compliance resulted in a 30-s break that

included access to a tangible item. Problem behavior resulted in a 30-s break. In the break/extinction condition, compliance resulted in a break, and no consequence occurred for inappropriate behavior. Lastly, in the tangible/extinction condition, compliance resulted in access to a tangible item for 30 s, and no consequence occurred for problem behavior (Piazza et al., 1997).

Results of the demand analysis for the first participant indicated that compliance was low and problem behavior was stable in the praise/break condition. In the tangible/break condition, compliance increased and inappropriate behavior was near zero. In the break/break condition, problem behavior eventually decreased, and compliance gradually increased. Results for the second participant indicated that in the praise/break and break/break conditions, compliance and inappropriate behavior were similar. In the tangible/break condition, inappropriate behavior was near zero and compliance was highest; this condition demonstrated the greatest change in behavior. For the third participant with ODD and ADHD, praise/break, break/break, and tangible/break all resulted in similar responses. When extinction was added, compliance increased and inappropriate behavior decreased.

The third phase of the investigation involved a fading procedure, whereby demand requirements increased, and access to reinforcement also increased based on a fading criterion (i.e., inappropriate behavior at or below 10% of baseline for two consecutive sessions); (Piazza et al., 1997). If the requirement for fading was not met in a certain condition, a tangible item or attention was added to that condition. For the first participant, fading was unsuccessful in the break/break and tangible/break conditions. Extinction was then added. Compliance increased, and inappropriate behavior decreased

in the tangible/extinction condition. For the second participant, when attention was added to the tangible/break condition, the fading goal was reached, compliance increased, and inappropriate behavior decreased. For the third participant, fading was achieved in the tangible/extinction condition. A tangible item had to be added in the break/extinction condition in order for compliance to remain high and inappropriate behavior low.

Results of the Piazza et al. (1997) investigation revealed that, for one participant, compliance increased, and inappropriate behavior decreased in the break/break condition. The tangible/break condition produced positive effects for two participants, but extinction was necessary once reinforcement was faded in this condition. For the participant with ODD and ADHD, only extinction resulted in decreases in inappropriate behavior. Additionally, the goals of increasing compliance, decreasing inappropriate behavior, and fading reinforcement were only met when extinction was combined with compliance that resulted in a break plus a tangible, access to attention, or both. These results suggest that a break alone may not be sufficient when multiple treatment goals are desired; for example, decreasing problem behaviors, increasing appropriate behaviors, and fading reinforcement.

Lalli and Casey (1996) examined the effects of a break and a break with access to toys and attention with a withdrawal design for a 6-year-old participant whose aggressive behavior was multiply maintained. The authors examined breaks contingent on compliance, which was defined as initiation of the task within 5 s and completion of the task within 120 s of a demand. Problematic behavior included aggression, which was defined as throwing objects at people, hitting, kicking, and biting. A descriptive analysis demonstrated that aggression occurred when a request was made to stop playing and

clean up toys. A functional analysis revealed that aggression was maintained by access to toys, attention, and escape from task demands.

During the escape only condition, aggression resulted in a 30-s break from the task on a variable-ratio (VR) 5 schedule. The break resulted in access to toys. Breaks were given for compliance on a FR 1 schedule in some phases and a FR 2 schedule in other phases. Praise was also given for compliance on a FR 1 schedule. During the escape plus social interaction condition, compliance resulted in a 30-s break on a FR 1 to a FR 10 schedule, and access was given to toys and interactions with the therapist. Again, aggression resulted in a 30-s break from the task.

In the escape only phase, when breaks were given on a FR 1 schedule, aggression did not occur, and compliance was 100%. When breaks were given on a FR 2 schedule, aggression increased, and compliance decreased to 0%. When returned to a FR 1 schedule, aggression decreased, but compliance remained at 0%. When escape was combined with social interaction, aggression was near zero, and compliance was 100% on average in the FR 1 and FR 2 conditions. When there was a return to the escape only FR 2 condition, aggression increased, and compliance decreased to 0%. When social interaction was again added, aggression decreased, and compliance remained at 100% even when the FR schedules were increased (Lalli & Casey, 1996).

Although Lalli and Casey (1996) demonstrated that aggression decreased and compliance increased only when attention was added to the escape condition, the escape only condition did not represent a true escape condition because the participant had access to toys during the break. In addition, compliance resulted in praise as well as breaks with access to toys. It is possible that the social interaction condition resulted in

more significant effects because the social interaction (attention) consisted of modeling and demonstrating appropriate behavior as well as physical contact from the therapist. It cannot be ascertained through the methodology and results of the study if physical contact or corrective attention was more reinforcing than attention in the form of praise. In addition, a comparison of breaks alone versus breaks combined with activities is warranted because the break condition was not truly escape-based.

Another comparison study that involved the use of a participant whose problem behaviors were multiply maintained was performed by Kodak et al. (2003a). They investigated the use of NCR and differential reinforcement of other behavior (DRO) using an alternating treatments design for a 7-year-old female who had been diagnosed with a seizure disorder and a mood disorder. She attended a 2nd grade general education classroom. Her problem behaviors included inappropriate vocalizations, aggression, and destruction. Compliance was recorded to see if NCR and DRO would not only decrease problem behavior, but also increase compliance. Compliance was defined as attempts to perform an academic task before being given an additional prompt to complete the work.

During the first functional analysis, attention, escape, control, and alone conditions were conducted. This analysis demonstrated that the participant's problem behaviors were maintained by escape from academic demands. The first intervention consisted of NCR and DRO. During the NCR condition, a 10-s break was provided following 10 s of work time. In the DRO condition, a 10-s break was given for the absence of problem behaviors in a 10-s period. Because the participant engaged in problem behaviors during the first few sessions of the interventions, a second functional analysis was conducted. This analysis included an "attention during command" condition

whereby a reprimand was given contingent upon inappropriate behavior. This analysis demonstrated that the participant's behavior was maintained by attention and escape.

For the second intervention, DRO and NCR were implemented with attention and escape as reinforcers. In the NCR condition, a 50-s break followed 10 s of work time. During the break, the participant received attention from the therapist. As sessions progressed, the time interval for breaks decreased while the time interval for work increased. In the DRO condition, a 50-s break was given for the absence of problem behaviors over a 10-s interval of time. Attention from the therapist was provided during the breaks. Like the NCR condition, break time decreased, and the time interval for absence of problem behavior increased.

Results indicated that when the intervention included both attention and escape components, the participant's problem behaviors during NCR and DRO were variable until pre-session attention and tangible items were added as part of the treatment. Following this modification, problem behavior steadily decreased. Compliance increased following the second treatment phase and was higher in the DRO condition. After the tenth session in this treatment phase, compliance was high in both the NCR and DRO conditions.

Kodak et al. (2003a) hypothesized that decreases in problem behavior were more likely due to the NCR condition because the rate of behavior was typically lower in this condition. It is impossible to say with any certainty that the DRO and NCR procedures caused the increases in compliance and the decreases in problem behavior. The participant's rate of problem behavior was highly variable until pre-session attention and tangible items were added to the treatment package. Because a tangible condition was not

implemented in the functional analysis, it could be the case that this condition would have produced the highest rates of responding for problem behavior, and this is why problem behavior decreased significantly when tangible items were added.

Piazza et al. (1996) also sought to determine the effects of negative reinforcement procedures on compliant behavior using a combination of reversal and alternating treatments designs. Piazza et al. analyzed the effects of DRA and demand fading with an 11-year-old male who had been diagnosed with autism and Mild Mental Retardation. The participant's problem behaviors included aggression, self-injury, and disruption.

A functional analysis was conducted that included demand, tangible, attention, alone, and play conditions. Results revealed that the participant displayed more inappropriate behavior in the attention, demand, and tangible conditions. The intervention consisted of DRA plus demand fading. The participant received demands every 10 s regardless of his behavior. Once he complied with a certain number of demands, he received a break in which he could receive attention or access to tangible items for 10 min. If he left his seat during the demand presentations, he was allowed to escape the task but was reminded every 2 min that he would have to complete the task to receive access to attention or tangibles.

After two consecutive sessions with problem behavior below 90% of the baseline mean, the criterion for demands changed, and the number of demands increased by one per session. During the intervention, escape extinction with physical guidance was introduced when the participant took too long to complete his demands, and he had to be physically guided through four of the sessions. The escape extinction phase was added to

see if the participant's problem behavior would increase. During this phase, compliance was praised and problem behaviors ignored.

The results demonstrated that inappropriate behaviors decreased with the DRA plus demand fading intervention, in which the participant was allowed an escape break following compliance with a certain number of demands. When escape extinction was introduced, disruptive behaviors were higher than baseline levels. The intervention demonstrated that the participant's compliance improved and disruptions decreased when he received a break for compliance and was prompted to complete tasks without being physically guided to do so.

Piazza et al. (1996) noted that compliance not only resulted in a break from task presentations, it also resulted in access to attention and tangibles. They also noted that problem behaviors were possibly maintained by escape, attention, and access to tangibles. Therefore, it is likely that the participant's inappropriate behaviors decreased because he received a break in addition to receiving access to attention and tangibles. The access to attention and tangibles received during the breaks meant that the participant never experienced a purely escape condition, even though his inappropriate behavior was maintained by escape from demands. It should be further analyzed whether a pure escape break is as salient as a break that is combined with access to preferred activities.

Mozzoni and Hartnedy (2000) used breaks from task demands to demonstrate the effectiveness of escape as a reinforcer. They conducted an analysis of three treatment conditions for a 15-year-old male who had problem behavior hypothesized to be maintained by both attention and escape from task demands. He had a history of cognitive impairments, and his problem behaviors included eloping, getting out of his

seat, aggression, inappropriate vocalizations, inappropriate touching of others, and exposing himself. The three treatments were analyzed using an alternating treatments design (ATD), and one was determined to be the most effective.

For the first treatment condition, a therapist graphed the participant's progress on therapy-related tasks throughout the day and showed the graph to him. The therapist encouraged him to do well the next day and demonstrated his progress from the last treatment session. The second treatment condition involved having a therapist give verbal praise when a tape recorder beeped. The praise was only given if the participant was sitting in his desk and doing his work. In the third condition, a 2-min break was given when the participant engaged in appropriate behaviors for a 2-min period. The participant was allowed to check the therapist's mail boxes when he was on a break, which was an activity he reportedly enjoyed. The time on-task was then gradually increased to 5 min and then to the length of the class period, or 30 min.

Results of the ATD revealed that problem behavior decreased most significantly during the escape condition, although it did decrease from baseline levels in the other conditions. This condition was then continued for the remainder of treatment sessions. One limitation of the Mozzoni and Hartnedy (2000) investigation was that the escape condition was not purely escape. Even though the participant was allowed a break from task demands, the break involved access to a preferred activity. This investigation demonstrates the need to compare pure escape breaks to breaks combined with access to preferred activities. In other words, is a pure escape break salient enough to produce changes in behavior, or is access to preferred activities a necessary component of a break?

Purpose of the Current Investigation

Differential negative reinforcement of alternative behavior (DNRA) is a procedure that is commonly recommended for teachers by behavioral consultants in the general education setting. However, only one of the previously reviewed investigations involved a student from a general education setting. The other investigations that have been conducted have limitations including lack of pure escape conditions and the use of participants primarily from developmentally disabled populations. Most research using DNRA has been focused on compliant behaviors or on task behaviors for students in special education settings or more restrictive settings for individuals with significant cognitive impairments. The lack of evidence for DNRA in general education classrooms with students whose behavior is escape-maintained demonstrates the need for studies investigating this procedure's effectiveness.

Aaron and Bostow (1978) examined the use of contingent free time for students in a special education classroom. The students received a period of free time from academic tasks when they completed a pre-specified amount of correct academic work. Increases were seen in both academic engagement and correctly completed work. Although increases were observed in on task behavior and academic responding, it is unclear of what the students' free time break consisted. It is possible that the students also received access to preferred activities or attention during the break interval. It is important to differentiate if the break itself was negatively reinforcing or if the activity or attention during the break functioned as a positive reinforcer for academic engagement. Additionally, it is possible that the combination of the break and access to an activity or

attention had a greater effect on increasing task engagement than either the break or the activity alone.

One example of the possible interaction between escape from demands and access to attention comes from a 2005 research study by Mueller, Sterling-Turner, and Moore. The authors demonstrated that tantrum behavior from a 6-year old male with autism occurred at higher percentages during an escape-to-attention functional analysis condition than in escape or attention only conditions. In the escape-to-attention condition, task demands were presented to the participant. When the participant engaged in tantrum behavior, task materials were removed and attention was delivered in the form of reprimands. This finding supports the notion that the combination of an escape break plus access to attention during the break may be more reinforcing than either a pure escape break or attention alone. Although the authors demonstrated that tantrum behaviors were higher when escape and attention were combined in a functional analysis, it is difficult to say what effect this combination would have if used in a treatment context.

In contrast to the Mueller et al. (2005) study, McComas et al. (2002) analyzed the effects of DNRA with and without access to preferred activities. The participant received a break following the completion of a worksheet. He was allowed to sit quietly at his desk in the phase without access to activities and was allowed to pick an activity from a list in the phase where he received access to activities during the break. For this participant, inappropriate behaviors decreased and engagement increased when he received a break with access to an activity.

The McComas et al. (2002) study demonstrated that the type of break received following a period of academic engagement had an effect on escape behaviors. The

greatest changes in behavior were obtained when the participant had access to a preferred activity during his break. This study was conducted with one student in a special education classroom. The other studies that investigated breaks with access to preferred activities did so by examining breaks with access to toys versus attention or breaks that were also accompanied by extinction. Therefore, it is not known if the break itself was negatively reinforcing or if the availability of toys, activities, or attention was responsible for the participants' changes in behavior. It is also possible that there was an interaction between the break plus access to activities or attention that affected changes in behavior. Although some of the studies also added extinction to their intervention phases, it is not known how all of these elements would affect the escape-maintained problem behavior of general education students.

It is apparent in the literature that little research has been conducted on DNRA procedures in general education settings, and many conclusions about the effectiveness of DNRA procedures are based on individuals with significant developmental disabilities. After reviewing the literature on DNRA and escape procedures, it is crucial to examine a DNRA procedure in a general education setting where teachers are likely to approve of an intervention that involves negatively reinforcing their student for appropriate engagement in academic tasks. Research in this area is scarce if not absent. However, it continues to be a recommended procedure put forth by intervention agents.

Previous research in this area has several limitations. Most of the research involved breaks from task demands that was conducted with participants who had escape-maintained problem behaviors. However, many of the investigations did not involve pure

escape conditions, but rather conditions that included escape from the demand coupled with access to attention or a tangible item. Additionally, many studies involved only one participant, and all but one participant came from developmentally delayed populations or special education settings. The proposed investigation will include a comparison of breaks with and without access to preferred activities with four participants from general education classrooms who are presenting with escape-maintained problematic behavior in reading or math classes.

Research Question

1. Will a differential negative reinforcement of alternative behavior (DNRA) procedure be more effective in reducing problematic behavior when a break from a task is given alone or when the break is paired with access to a preferred activity?

CHAPTER II

METHOD

Participants and Setting

The participants were 4 teachers, and 4 students who exhibited behavioral problems in academic settings. Five students were initially screened for participation, but one student did not meet all of the inclusion criteria. Services were offered for this student outside the context of the research investigation. The setting was an elementary school located in a southeastern state. Participants were included in the study based on the following criteria: a) teacher referral for problem behaviors during reading or math periods; b) presence of problem behaviors with a hypothesized escape function from academic tasks as evidenced by teacher interview using the Functional Assessment Informant Record for Teachers (FAIR-T) and as evidenced by conditional probability data; c) behaviors that reached 40% or more of all intervals coded on the targeted disruptive behavior and that were at least twice the percentage of intervals coded for that behavior as same gender peers; and d) determination that students were on the instructional level for their grade in reading or math (Good & Kaminski, 2002; Shapiro, 1996).

Participants were chosen from different classrooms so that the potential of observational learning would be minimized. The participants were in first and second grade general education classrooms. Participants were not included in the study if they had an individualized intervention plan (i.e., behavioral interventions, medication management) at the time of the investigation. Parent and teacher consent was obtained

prior to the start of the intervention (Appendix A and B). A Human Subjects Protection Review Committee approved the investigation prior to its onset (Appendix C).

MJ was a 6-year old Caucasian female who attended a first grade general education classroom. She was referred by her teacher for problem behaviors including getting out of her seat, talking to peers, and staring off during academic tasks. These behaviors were reported to occur during all academic tasks, and were reported to decrease if MJ received one-on-one assistance from her teacher or the assistant. MJ's teacher noted that these behaviors were more likely to occur in large group or independent work situations. MJ's teacher reported that she was on grade level in reading and math, and that the academic period she wished to target for intervention was reading.

Mrs. Murray, MJ's teacher, was a 60-year old Caucasian female with 39 years of teaching experience. She had a Master's degree in 1st through 8th grade education. She taught a first grade general education class.

TP was a 7-year old African American female who attended a first grade general education classroom. She was referred by her teacher for problem behaviors including sleeping in class and inattention. TP also had documented hearing problems in her right ear, which was accommodated by the teacher in the classroom through having TP sit at the front of the room. TP's off-task behavior was not observed to be related to her hearing deficit in that when she was called on in class, she was always observed to attend to the teacher. TP's teacher noted that her behavior problems occurred throughout the day and were more likely to occur in large group or independent work situations. TP's teacher reported that she was on grade level in reading and math and that she wished to target reading as the academic period for intervention.

TP's teacher, Mrs. Miller, was a 33-year old Caucasian female. She had 9 years of teaching experience and held a Bachelor's degree in Elementary Education. She taught a first grade general education class.

KD was a 9-year old Caucasian female who attended a second grade general education classroom. She was referred by her teacher for problem behaviors including inattention and poor class participation. Her teacher reported that her inattention occurred throughout the day and was more likely to occur in large group or independent work settings. KD's teacher reported that she was on grade level in math and on the first grade level in reading. KD reportedly attended an inclusion setting to target her reading deficit. KD's teacher noted that she wished to target math as the academic period for intervention.

KD's teacher, Mrs. Montgomery, was a 27-year old Caucasian female. She had 4 years of teaching experience and held a Bachelor's degree in Elementary Education. She taught a second grade general education class.

ZC was a 7-year old Caucasian male who attended a second grade general education classroom. He was referred by his teacher for problem behaviors including inattention and an unorganized work area. His teacher reported that these behaviors occurred throughout the day and were not more likely to occur in certain settings. ZC's teacher noted that he was on grade level in reading and was slightly below grade level in math. ZC's teacher chose reading as the academic period to target for intervention.

ZC's teacher, Mrs. Mauldin, was a 51-year old Caucasian female. She had 30 years of teaching experience and held a Master's degree in 1st through 8th grade Elementary Education. She taught a second grade general education class.

Materials and Measures

FAIR-T

The Functional Assessment Informant Record for Teachers (FAIR-T; Doggett, Edwards, Moore, Tingstrom, & Wilczynski, 2001; Edwards, 2002) (Appendix D) was used to determine each participant's most problematic behaviors, their antecedents and consequences, and when they were most likely to occur. The FAIR-T was conducted by the primary investigator with each student's teacher in an interview format. The FAIR-T (Edwards) is a teacher interview/questionnaire that was designed to identify student target behavior(s) and associated environmental events (i.e., antecedents, consequences).

The FAIR-T provides the following information: (a) demographic information about the student, classroom setting, and schedule; (b) description of the target behaviors of concern; (c) identification of structural and environmental factors predictive of the target behaviors (triggers or antecedents); and (d) identification of factors potentially maintaining the target behaviors (maintaining consequences). Additionally, administration of the FAIR-T was used to identify possible functional relationships between problem behaviors and environmental events (Doggett & Edwards, 2001; Moore, Doggett, Edwards, & Olmi, 1999). These studies have indicated that the FAIR-T is useful for identifying functional relationships between target behaviors and environmental events and developing effective behavioral interventions (Doggett & Edwards; Moore et al.).

Procedure

Screening

Following teacher referral for escape-maintained behavior problems during

academic periods, the primary investigator obtained written informed consent from both the participant's teacher and parent(s). After informed consent was obtained, the primary investigator ensured that each participant exhibited externalizing behavior problems by conducting the FAIR-T interview with the teacher.

Conditional Probability Observations. Conditional probability observations (Appendix E) are observations used in the assessment of functions of behavior. They are useful for analyzing the antecedents and consequences of targeted behaviors. Conditional probability observations were 10 min in length and used a 10-s partial interval recording procedure, for a total of 60 intervals in which to record targeted behaviors. All observers were provided with an audiotape that cued the listener with a beep when it was time to record.

Conditional probability observations were collected by conducting three 10-min observations during academic periods to determine if problem behaviors were followed by escape, and to supplement the findings from the FAIR-T that disruptive behaviors during academic tasks were followed by escape. In addition to the primary investigator, an advanced graduate student skilled in determining the function of behaviors analyzed the FAIR-T and the conditional probability observations to determine that problem behaviors for each participant were followed by escape (Appendix F). All participants met the criteria for escape, as determined through the FAIR-T and the conditional probability observations.

It has been demonstrated that conducting conditional probability observations may lead to a correct hypothesis about the function of a behavior as well as intervention planning based on hypothesized function. Moore et al. (1999) demonstrated that the use

of conditional probability observations led to a match between the hypothesized function of a behavior and a behavioral intervention.

It was hypothesized that there was a relationship between problem behaviors and escape from academic tasks when escape followed problem behaviors equal to or more than 25% of the time. Escape was coded when any action on the part of the student was followed by the removal or avoidance of a task by the student, or the removal of the task by the teacher. Other consequences included in the observations were teacher attention, defined as close physical proximity to the target student (an arm's length away) or any verbal communication or eye contact directed toward the target student; peer attention, defined as any verbal communication, eye contact, or physical contact directed toward the target student by any peer in the classroom; and access to tangibles, defined as any access to a tangible item in the classroom (i.e., book, computer, toys, edibles). Conditional probabilities were determined by calculating the number of intervals where the problem behavior was followed by escape in the same interval or the following two intervals (Doggett et al., 2001).

Behavioral Observations. Behavioral observations (Appendix G) included any behaviors that were disruptive or inappropriate to the academic task at hand and involved the student engaging in behaviors not related to the task. These behaviors included aggression, inappropriate vocalizations, playing with objects, getting out of seat, off task, disruptions, or noncompliance. Observations also included a category for task engagement, or on task behavior.

Observations used a 10-s observe/5-s record partial interval recording procedure. All observers used an audiotape that cued them when to observe and when to record.

Each observation was conducted for a total of 10 minutes, with 5 minutes of data coded for each participant and 5 minutes of data coded for same gender peers. For each observation, 5 same gender peers were randomly selected and rotated throughout the observation (i.e., observer coded data for the participant, then the 1st peer, then the participant again, then the 2nd peer, and etc). There were a total of 20 intervals in which to record the occurrence of each disruptive classroom behavior for the referred student and 20 intervals to record the occurrence of disruptive behaviors for peer comparisons. There were a total of 20 intervals in which to record the occurrence of engagement for the referred student as well as 20 intervals for engagement for peer comparisons. Because off task was the only behavior that was coded consistently for each participant, the number of intervals where participants engaged in off task behavior was divided by a total of 20 intervals.

During the behavioral observation screener, trained graduate students conducted observations in each participant's classroom during the academic period of concern to determine the occurrence of disruptive classroom behaviors and academically engaged behaviors. Graduate students were trained on the occurrences and non-occurrences of problematic behaviors and task engagement. Observations were coded for the presence of targeted disruptive behaviors.

A participant qualified for participation in the study if the percentage of intervals coded on one disruptive behavior met or exceeded 40%. In addition, a participant had to obtain at least twice the percentage of intervals coded for that same disruptive behavior as compared to same gender peers. Observations for participants and same gender peers included the coding of on-task or academically engaged behaviors.

Instructional Performance Assessment. A direct assessment of instructional performance was conducted to determine that students were on the instructional level for their grade in reading or math. The assessment consisted of administering three academic probes (reading or math) for each participant that were scored using either correct words per minute (CWPM) on the reading probes or correct digits per minute (CDPM) on the math probes. For grade 1, low risk for oral reading fluency is considered to be above or equal to 20 CWPM for the middle of the year. For grade 2, low risk for oral reading fluency is considered to be above or equal to 68 CWPM (Good & Kaminski, 2002). In math, for grades 1-3, instructional CDPM is between 10-19 (Deno and Mirkin, 1977).

Activity Preference Assessment. A preference assessment (Morgan, 2006) was used to determine participants' first choice activities for the DNRA with access to a preferred activity condition (Appendix H). The assessment involved the use of a sheet of paper with classroom activities previously listed on it, as well as spaces for the participants to list additional preferred activities, if applicable.

For the activity preference assessment, each participant was given a preference assessment sheet that included the following activities: read a book, color or draw, play with toys, or play on the computer. Each student was asked to list other activities that he/she enjoyed in the classroom that were not already on the assessment sheet. Once this assessment was complete, each participant rank ordered the activities on the preference assessment from most to least preferred, in order to determine their first choice activities for the DNRA with access to a preferred activity condition.

Treatment Integrity Checklist

A treatment integrity intervention checklist (Appendix I) included all of the

necessary steps to implement the intervention as planned. The checklist consisted of spaces for integrity observers to mark "yes," "no," or "not applicable" pertaining to each intervention step. An intervention protocol was available to the teachers throughout implementation of the intervention. This protocol included a list of all of the steps necessary for the teacher to carry out the intervention as planned (Appendix J).

A treatment integrity intervention checklist was completed by trained graduate observers who collected integrity checks for at least 30% of the intervention sessions for each participant. A teacher checklist was provided to the teacher by the primary investigator. The teacher used the checklist during intervention sessions to prompt or assist with proper implementation of the intervention.

No Treatment Control Condition

In the control condition, no intervention was in place for the targeted student. The same classroom procedures that were in place during the behavioral observation screener were in place in the control condition. Data on problematic and engaged behaviors continued to be collected in this phase. During this phase, observers recorded the percentage occurrence of disruptive behaviors and on task behaviors during academic periods for each participant and same gender peers. Observations were conducted in the classroom during normal classroom routines during the no treatment control phase. This condition was randomized with the intervention conditions.

Intervention

The in-class behavioral intervention consisted of two randomized phases. One phase involved the differential negative reinforcement of an alternative behavior (DNRA) without access to a preferred activity. The alternative behavior that was negatively

reinforced was task engagement, defined as the student being engaged or on task with the current academic task. For an observer to code a participant as on task, the student's eyes and head had to be directed toward the task, and engagement also included manipulation of task materials (e.g., pencil, paper, scissors, crayons, ruler) as applicable.

Another phase of the intervention involved DNRA with access to a preferred activity. The alternative behavior that was negatively reinforced was task engagement. Task engagement was defined the same as in the DNRA without access to a preferred activity condition.

In the intervention condition for DNRA without access to a preferred activity, the target student's teacher delivered a break to the student when the student was engaged with the required task. The engagement period was yoked to the mean time for engagement for each participant during the conditional probability screener. The break time was the same as the period of engagement, and was found acceptable by each teacher. MJ's work and break time was 34 s, TP's time was 52 s, KD's time was 65 s, and ZC's time was 1 min and 55 s.

At the start of the academic period, the teacher stated to the student, "You will be given a break after you have completed work. During your break, you may sit quietly at your desk or put your head down." Once these instructions were given by the teacher, the experimenter timed the student's engagement period. If the student reached the set criterion for engagement time, the experimenter signaled the teacher with a "thumbs up" gesture and the student received a break. When the break ended, the teacher stated, "Your break is over. Continue to work on your assignment. When you have worked again, you

may receive another break." This process continued until the assignment was completed by the student.

If the student did not reach the set criterion, the observer signaled the teacher with a "thumbs down" gesture and the teacher stated to the student, "You did not spend enough time working on your assignment; therefore, you will not receive a break. Try again." Problem behavior resulted in the same techniques previously used by the teacher.

In the DNRA with access to a preferred activity intervention condition, the student again received a break following a work period. However, at the start of the academic period, the teacher stated, "You will be given a break after you have completed work. During your break, you may (read quietly, color/draw, play on the computer)." Once these instructions were given by the teacher, the experimenter timed the student's engagement period. If the student reached the set criterion for engagement time, the observer signaled the teacher with a "thumbs up" gesture and the student received a break. When the break ended, the teacher stated, "Your break is over. Continue to work on your assignment. When you have worked again, you may receive another break." This continued until the assignment was completed by the student.

If the student did not reach the set criterion, the observer signaled the teacher with a "thumbs down" gesture and the teacher stated to the student, "You did not spend enough time working on your assignment; therefore, you will not receive a break. Try again." Problem behavior resulted in the same techniques previously used by the teacher. Each student was allowed to perform an activity during the break. First choice activities were always used for each participant.

Dependent Variables, Data Collection, and Inter-Observer Agreement

Two dependent variables were measured for each of the participants. The dependent variables were (a) percentage of intervals of disruptive classroom behaviors and (b) percentage of intervals of academically engaged behavior. Disruptive behaviors included off task for each participant, as this was the only behavior consistently coded at or above 40% of intervals for each student. The following behaviors were also coded; however, the data are not reported because these behaviors were not coded equal to or more than 40% of the intervals.

Aggression was coded if the child engaged in an act that involved an attempt to cause harm to another student, teacher, or other person. This involved hitting, kicking, scratching, pinching, biting, or throwing objects that hit someone. Inappropriate vocalizations were defined as task irrelevant vocalizations (e.g., humming, singing, making unusual vocal noises, speaking, whispering, cursing, or making noises with one's teeth). Playing with objects was defined as touching or manipulating any object in the room except for the table, chair, pencil, or materials needed for the academic task at hand. This included the child's clothing, walls, light switches, toys, curtains, and etcetera.

Out of seat was defined as the child getting completely out of seat. If a child was considered out of seat, no part of his/her legs or buttocks was in contact with the seat. This also included walking around the room. Off task was coded if the child removed his/her eyes from a task for a period of 3 or more seconds, including if the child broke eye contact with the task, and his/her attention was removed from the task. Destruction was coded if the student destroyed task materials or any other item in the classroom. This also included hitting or throwing task materials, table, chairs, or other objects.

Noncompliance was coded if the student did not initiate or complete a task as requested by the teacher or other adult in the classroom (e.g., substitute teacher). This included responding "no" to a teacher's request or shaking one's head from side to side, indicating a response of "no." Academically engaged behaviors were defined as the student being engaged or on task with the current academic task. The student's eyes and head were directed toward the task, and also included manipulation of task materials (e.g., pencil, paper, scissors, crayons, ruler). Behavioral observations were conducted in each participant's classroom during academic periods in order to determine if the intervention was having effects on the percentage of disruptive behaviors and percentage of on task behavior.

Inter-observer agreement (IOA) was defined as the percentage of agreement of occurrences and non-occurrences of the dependent variables between two data collectors. Each data collector was trained to a criterion (≥80%) of the occurrence of disruptive behaviors and task engagement. IOA did not fall below 80% at any time during the study, and no data collectors had to be re-trained. IOA was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100.

IOA was collected for 31% of MJ's sessions. IOA ranged from 95%-99% (M = 98%) for the sessions. IOA was collected for 41% of TP's sessions and ranged from 93%-99% (M = 97%). IOA was collected for 63% of KD's sessions and ranged from 96%-100% (M = 98%). IOA was collected for 43% of ZC's sessions and ranged from 97%-100% (M = 99%).

Treatment Integrity

Prior to intervention implementation, the primary investigator conducted a

procedural training with each classroom teacher to ensure that all steps of the intervention were implemented without confusion and with integrity. The procedural training included written guidelines developed by the primary investigator as well as modeling of correct implementation of the procedures. While training the teachers, the primary investigator provided praise for correct implementation, modeling, and corrective feedback. Training for the teachers was complete when 100% integrity was obtained on one practice session. Treatment integrity remained above 80% at all times for each teacher throughout the intervention. Teachers were provided with a list of the intervention steps, and the intervention protocol was provided to them in hardcopy form prior to the start of the intervention. It was also available to them throughout the intervention in their respective classrooms.

Treatment integrity was collected for 31% of MJ's intervention sessions and ranged from 88%-100% (M = 98%). Integrity was collected for 35% of TP's intervention sessions and remained at 100% throughout the intervention. Integrity was collected for 31% of KD's intervention sessions and remained at 100% throughout all sessions. Integrity was collected for 33% of ZC's intervention sessions and remained at 100% throughout all sessions. None of the participants' teachers had to be retrained to implement the interventions with integrity. Integrity data were calculated by dividing the number of completed integrity steps by the total number of possible integrity steps and multiplying by 100.

Design and Data Analysis

An alternating treatments design (ATD); (Barlow & Hersen, 1984) was utilized in order to determine the effectiveness of the DNRA intervention with and without access

to preferred activities on each participant's disruptive behavior and task engagement. Each participant received a semi-random sequence of the two DNRA procedures and the control condition. Conditions were determined by drawing a number (1, 2, or 3) out of a jar, where 1 represented DNRA without access to an activity, 2 represented DNRA with access to an activity, and 3 represented the control condition. No participant received any one condition more than 3 times consecutively, and each participant received no more than two sessions per day. Participants were exposed to each condition for at least two data points.

The data were analyzed by visual inspection of the percentage of occurrence of task engagement and the percentage of occurrence of off task behaviors during screener, control, and intervention phases, and compared between intervention and control phases. The effectiveness of each intervention condition was determined by analyzing which condition had the most impact on increasing engagement and decreasing problem behaviors. This was determined by calculating the means for the two DNRA conditions. Following completion of the intervention for each participant, it was determined if DNRA without access to a preferred activity or DNRA with access to a preferred activity had more of an impact on increases in academic engagement and decreases in problem behavior. The condition that was determined to be more effective was the one that had a mean that was at least 20% higher than the mean for the other intervention condition with regard to task engagement, and 20% lower than the mean for the other intervention with regard to problem behaviors. If one condition was determined to be more effective, a verification phase was conducted with the more effective intervention.

CHAPTER III

RESULTS

Screening Procedures

Conditional Probability Observations

Conditional probability observations were conducted to determine that participants' problem behaviors during academic tasks were followed by escape. They were also used to determine whether problem behaviors were also followed by teacher or peer attention or access to tangible items. The results were used to determine that problem behaviors were followed by escape for at least 25% of all intervals coded (Table 1). Based on the fact that off task was the most problematic behavior for each participant, only the results of off task behavior are reported. The targeted behavior and the percentage of each following consequence can be seen in Table 1.

Behavioral Observations

Behavioral observations (Table 2) were conducted to determine that each participants' target behavior was occurring for equal to or more than 40% of all intervals coded for that disruptive behavior, and that these behaviors were occurring for at least twice the percentage of intervals coded for same gender peers. Because off task was the only behavior consistently coded for 40% or more of the intervals, only those data are reported.

Instructional Performance Assessment

An instructional performance assessment (Table 3) was conducted to determine that each participant was on grade level for the specified academic period of concern. The assessment was conducted in reading for MJ, TP, and ZC and in math for KD. Each

Table 1

Conditional probability results for each participant.

Participant	Behavior	Consequence	Observation 1	Observation 2	Observation 3
MJ	**Off Task**	% of Intervals	38%	50%	50%
		Escape	100%	100%	57%
		Teacher Attention	22%	20%	0%
		Peer Attention	9%	23%	23%
		Access to Tangibles	0%	0%	7%
TP	**Off Task**	% of Intervals	42%	27%	13%
		Escape	64%	100%	88%
		Teacher Attention	12%	0%	19%
		Peer Attention	12%	38%	67%
		Access to Tangibles	0%	0%	0%
KD	**Off Task**	% of Intervals	20%	25%	30%
		Escape	83%	87%	50%
		Teacher Attention	17%	27%	17%
		Peer Attention	33%	33%	0%
		Access to Tangibles	0%	0%	0%
ZC	**Off Task**	% of Intervals	22%	37%	27%
		Escape	46%	36%	94%
		Teacher Attention	0%	0%	31%
		Peer Attention	0%	0%	0%
		Access to Tangibles	0%	0%	0%

Table 2

Off Task behavioral observation results for each participant and same gender peers.

Participant	Observation 1	Observation 2	Observation 3
MJ	**80%**	**75%**	**75%**
MJ's Peers	15%	30%	15%
TP	**60%**	**60%**	**65%**
TP's Peers	25%	10%	40%
KD	**45%**	**50%**	**45%**
KD's Peers	25%	20%	10%
ZC	**40%**	**80%**	**55%**
ZC's Peers	15%	20%	5%

Table 3

Instructional Performance Assessment Results for Each Participant.

Participant	Assessment	Grade	Probe 1	Probe 2	Probe 3	Median Score	Level
MJ	Reading	1st	20	15	21	20	Low Risk
TP	Reading	1st	51	27	38	38	Low Risk
KD	Math	2nd	7	10	12	10	Instructional
ZC	Reading	2nd	85	107	105	105	Low Risk

participant was given either three reading probes or three math probes and Correct Words Per Minute (CWPM) or Correct Digits Per Minute (CDPM) was determined.

MJ's CWPM scores on first grade reading probes can be seen in Table 2. Her median score of 20 was in the low risk range (Good & Kaminski, 2002). TP's CWPM scores on first grade reading probes can be seen in Table 2. Her median score of 38 was in the low risk range (Good & Kaminski). ZC's CWPM scores on second grade reading probes are depicted in Table 2. His median score of 105 was in the low risk range (Good & Kaminski). KD's CDPM scores on second grade math probes are shown in Table 2. Her median score of 10 was in the instructional range (Deno & Mirkin, 1977).

Activity Preference Assessment

An activity preference assessment was conducted with each participant to determine his/her first choice activity to use during the DNRA with access to a preferred activity condition. Each participant was allowed to rank order four activities (e.g., read a book, color/draw, play with toys, or play on the computer). In addition, each participant was allowed to name additional activities that were highly preferable. MJ's most preferred activity was reading a book. This activity was always used in her DNRA with access condition. She named going out to recess as an additional activity. TP's most preferred activity was playing on the computer. This activity was always used in her DNRA with access condition. She named listening to songs as an additional activity, and she was allowed to listen to songs as they were associated with computer programs.

KD's most preferred activity was to color. She also named show and tell, "Fun Friday" and having a party as additional preferred activities. However, these activities were not feasible to use during academic periods. ZC named playing on the computer as

his most preferred activity; however, his teacher stated that it would not be possible for him to play on the computer every day. The second highest preferred activity was reading a book, and this was used in the DNRA with access condition.

Control and Intervention (Figures 1 and 2)

Throughout the observations where the control condition was in place, MJ was off task for an average of 47% of the intervals. During the DNRA with access to a preferred activity condition, MJ was off task for an average of 16.7% of the intervals. During the DNRA without access to a preferred activity condition, MJ was off task for an average of 11% of the intervals. No verification phase was conducted following the intervention because there was only a difference of 5.7 percentage points between the two DNRA conditions.

The difference between the control percentages of off task and the treatment percentages of off task demonstrates that the changes in MJ's off task behavior were due to the intervention, rather than due to the effects of other variables. When MJ's treatment data were compared to her screener data, there was an immediate decrease in level from screener to treatment sessions. This further demonstrates that the changes in MJ's off task behavior were due to implementation of the intervention conditions. Although MJ's off task behavior did not decrease to zero levels during intervention, the behavior during DNRA without access to an activity represents a decreasing trend.

Throughout the observations where the control condition was in place, TP was off task for an average of 37.5% of the intervals. During the DNRA with access to a preferred activity condition, TP was off task for an average of .83% of the intervals. During the DNRA without access to a preferred activity condition, TP was off task for an

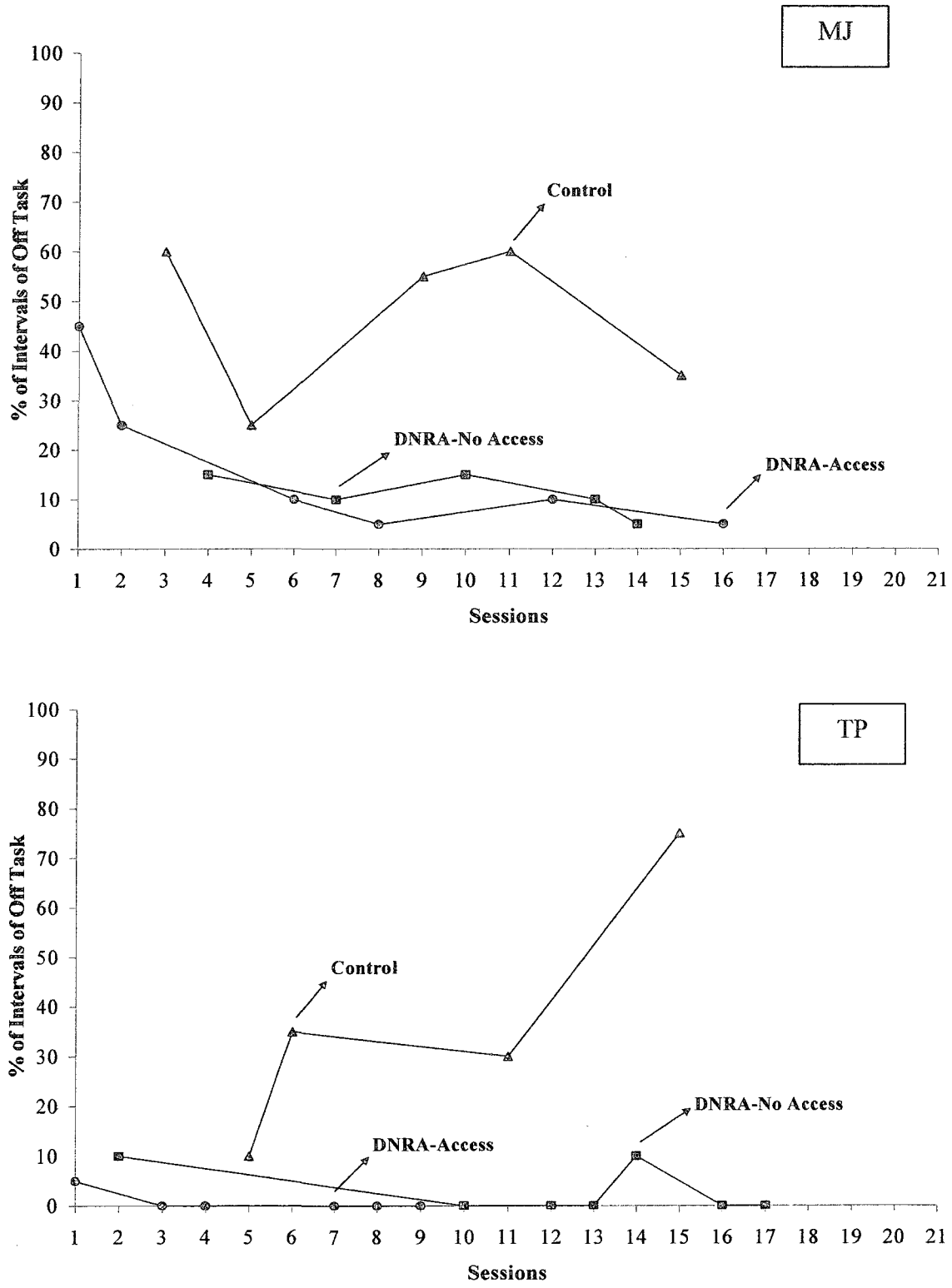


Figure 1. Percentage of intervals of off task for MJ and TP during control and intervention phases.

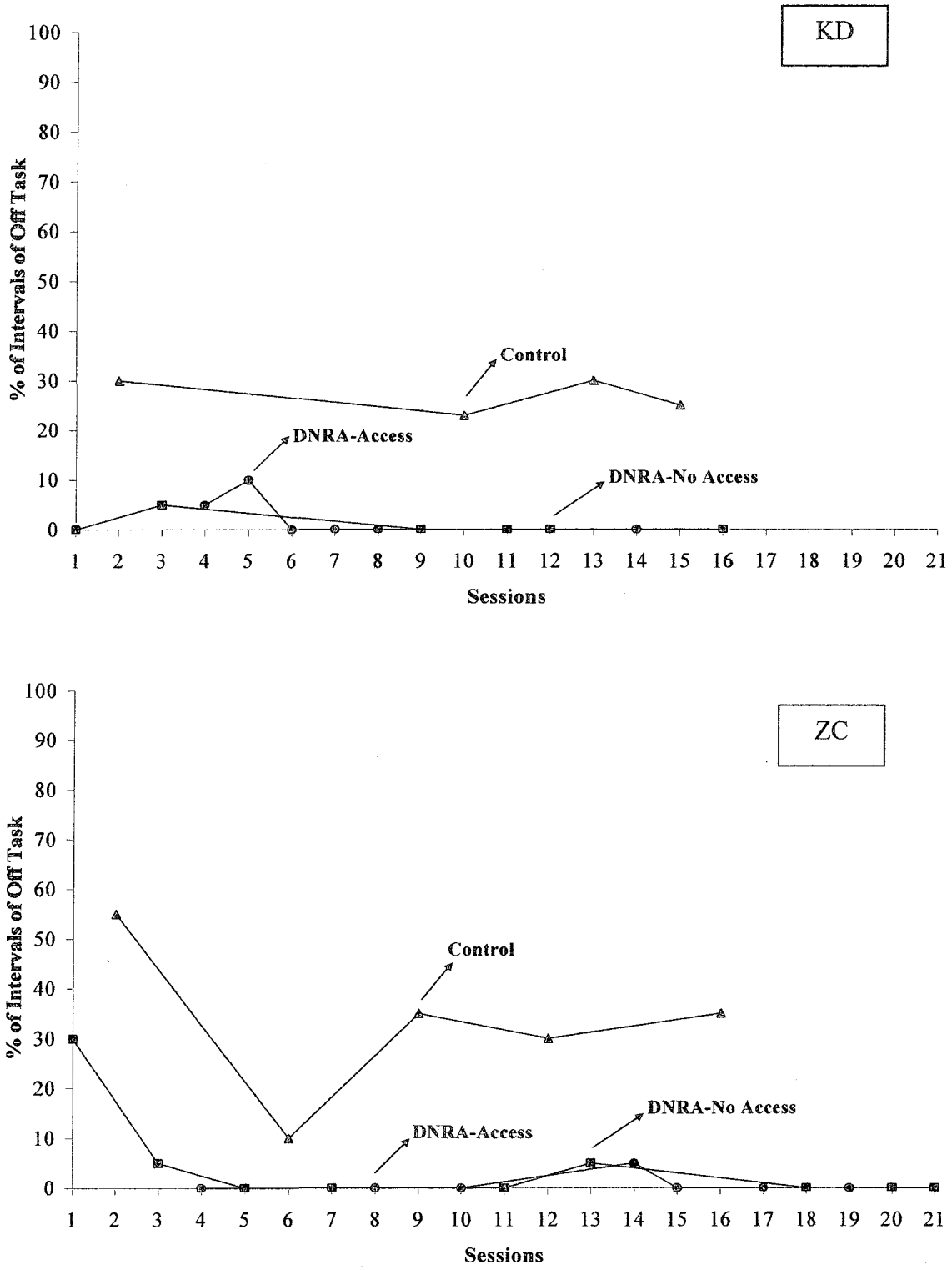


Figure 2. Percentage of intervals of off task for KD and ZC during control and intervention phases.

average of 2.86% of the intervals. No verification phase was conducted following the intervention because there was only a difference of 2 percentage points between the two DNRA conditions.

When TP's off task percentages during the treatment conditions were compared to her off task percentages during the control condition, the off task percentage during the control condition was 36.7% higher than in the DNRA with access condition, representing a difference in level between these conditions. The off task percentage during control was 34.6% higher than in the DNRA without access condition, also representing a decrease in level between the conditions. This difference in off task behavior demonstrates that TP's decrease in off task behavior during the two intervention conditions was due to the interventions, and not other factors. In addition, when TP's off task behavior during intervention was compared to the screener, there was an immediate decrease in level from screener off task to intervention off task behavior. At the end of TP's treatment, both DNRA conditions stabilized at zero levels of off task behavior.

Throughout the observations where the control condition was in place, KD was off task for an average of 27.5% of the intervals. During the DNRA with access to a preferred activity condition, KD was off task for an average of 2.5% of the intervals. During the DNRA without access to a preferred activity condition, KD was off task for an average of .83% of the intervals. No verification phase was conducted following the intervention because there was a difference of less than 2 percentage points between the two DNRA conditions.

When KD's off task behavior was compared from each intervention condition to the control condition, percentages of off task behavior were higher during control. Off

task behavior was 25% higher in the control condition than in the DNRA with access condition. Off task was 26.7% higher in control than in the DNRA without access condition. This difference represents a difference in level between the control condition and each of the intervention conditions. It also demonstrates that decreases in off task behavior were due to the effects of the intervention conditions. When KD's intervention data were compared to her screener data, there was an immediate decrease in level from screener off task to intervention off task percentages. At the completion of the treatment, KD's off task behavior during both DNRA conditions decreased to zero levels and stabilized across intervention conditions.

Throughout the observations where the control condition was in place, ZC was off task for an average of 33% of the intervals. During the DNRA with access to a preferred activity condition, ZC was off task for an average of .71% of the intervals. During the DNRA without access to a preferred activity condition, ZC was off task for an average of 4.4% of the intervals. No verification phase was conducted following the intervention because there was only a difference of 3.7 percentage points between the two DNRA conditions.

When the control condition was compared to each of the intervention conditions, off task behavior was higher during the control condition. ZC's off task behavior was 32.3% higher during control than during DNRA with access. His off task behavior was 28.6% higher during the control condition than during the DNRA without access condition. This information along with an immediate decrease in level from baseline off task to intervention off task demonstrates that the intervention conditions were responsible for the decreases in ZC's off task behavior. It also represents a difference in

level between the control condition and the intervention conditions. At the end of treatment, ZC's off task behavior stabilized and decreased to zero levels in both intervention conditions.

CHAPTER IV

DISCUSSION

The present investigation assessed the effects of two DNRA procedures on the off task behavior of 4 first and second grade participants. Each participant was exposed to the DNRA with access to a preferred activity condition and the DNRA without access to a preferred activity condition. Control observations were also conducted to determine that decreases in participants' off task behavior were due to one of the DNRA interventions rather than other factors such as time, maturation, or history. The results of the investigation demonstrated that both DNRA procedures were effective at reducing participants' off task behavior during either reading or math periods.

All four participants were referred by their teachers for problem behaviors during academic periods. These referrals were further assessed through the FAIR-T interview and conditional probability observations. The results of the FAIR-T interview and conditional probability observations revealed that each participant's problem behavior during academic tasks was maintained by escape from the tasks. The premise that participants' problem behavior was maintained by escape was further assessed by an upper level graduate student who analyzed the FAIR-T and determined that problem behaviors were maintained by escape.

In addition to the FAIR-T and observations, students also completed an activity preference assessment and an instructional performance assessment. The instructional performance assessment revealed that each participant was functioning on grade level for their targeted academic period. This assessment helped demonstrate that the chosen participants were not in need of additional instruction in their academic period due to a

skill deficit. Although the tasks included in the instructional performance assessment did not necessarily match the tasks that were given during the intervention sessions, curriculum-based measures (CBM) like those used in the assessment are general outcomes measures. CBMs are predictors of the general skills (e.g., reading fluency, basic math skills) that are needed to perform well in reading and math classes.

Once the FAIR-T, conditional probability observations, preference assessment, and instructional performance assessment were completed, screener observations were conducted for each participant. Although screener observations included various problem behavior categories (e.g., noncompliance, aggression, destruction, off task, out of seat, inappropriate vocalizations, and playing with objects), the only behavior consistently coded for each participant for 40% or more of intervals was off task. Therefore, off task became the targeted behavior for the intervention conditions. Off task behavior included the student removing his/her eyes from the current task for a period of 3 or more seconds to engage in another behavior. It also included if the participant broke eye contact with the task and removed his/her attention from the task.

Each participant's off task behavior during screener observations was consistently coded at or above 40% of the intervals. In addition, the participants' off task behavior had to be at least twice as high as the off task behavior for same sex peers. During MJ's screener observations, her off task behavior was always more than twice as high as same sex peers. For screener observations for TP, off task behavior was always more than twice as high as same sex peers except in the last session when it was slightly less than twice as high. For screener observations for KD, her off task behavior was more than twice as high as same sex peers except for the first observation, when it was slightly less

than twice as high. For screener observations for ZC, off task behavior was always at least twice as high as off task behavior for same gender peers.

Once the DNRA intervention conditions were introduced, off task behavior immediately decreased to lower levels for all participants than what was seen during the screener observations. This immediate drop in off task behavior from screener levels demonstrates that the DNRA intervention is the most likely cause for decreases in off task behavior. In addition to the immediate decrease in levels of off task behavior for all four participants, off task behavior decreased and stabilized at zero levels for three of the four participants. It is possible that off task behavior would have decreased to zero levels for the fourth participant (MJ) had intervention data been collected for a longer period of time. Data collection ceased before the data stabilized because MJ's teacher was no longer going to be the instructor for her targeted academic period. Instead, a student teacher was coming in to teach the academic period where observations were previously conducted.

It is interesting to note that there were not large differences in off task behavior between the two DNRA procedures for any of the participants. The largest difference in off task behavior for any participant was less than 5.7 percentage points for MJ. This finding demonstrates that participants were just as likely to work for a break when it involved access to a highly preferred activity as when it involved sitting quietly at their desk or putting their head down. It also demonstrates that both DNRA procedures were effective at decreasing levels of off task behavior among general education students.

One possibility for this finding is that the participants were willing to stay on task for either type of break because the break from work was reinforcing whether it was a

pure escape break or a break combined with access to a preferred activity. Also, the work break for each student was relatively short. For example, MJ's work time and break time was 34 seconds. TP's work and break time was 52 seconds, KD's time was 65 seconds, and ZC's time was 1 minute and 55 seconds. The short break times may have limited the salience of the breaks combined with access to preferred activities. It is possible that the students did not have enough time to engage in their preferred activity; therefore, the impact of engaging in the activity was reduced.

Another possibility is that the participants were able to stay on task for their designated time periods because these times were taken from their average time on task during the conditional probability observations. This likely made it relatively easy for each student to remain on task for that period of time with the ability to earn either type of break. Increasing the task engagement period may have made one of the DNRA procedures more effective at reducing off task behavior. Students may have found one of the breaks more reinforcing if they had to work longer to access one of the breaks.

Increasing the task engagement period has implications for the internal validity of the study. The results demonstrate that students' off task behavior decreased in the presence of two DNRA procedures when the engagement period was relatively short. It is not known to what extent the DNRA procedures would have been effective at reducing off task behavior if the engagement period was longer and more realistic for a general education setting (e.g., 5 minutes).

Related to this issue is the length of the break. If the engagement period was increased to 5 minutes, the break period would not also be 5 minutes. Teachers would likely not see that length of a break as realistic or conducive to the learning environment.

The DNRA breaks would have to be short enough to get students back on task once the break was over but long enough for students to be willing to work for the break. The break would have to be long enough to maintain its potency as a reinforcer for on task behavior. It is not known to what extent increasing the engagement period would have effects on off task behavior. It is also not known which DNRA procedure would be more effective at reducing off task behavior if the engagement period was longer.

Piazza et al. (1997) found that fading the number of demands for compliance and subsequently increasing the duration of access to a reinforcer was not sufficient for suppressing inappropriate behavior. The authors added an extinction component for inappropriate behavior in order for the fading process to be effective. These results suggest that, if time on task were to be increased, an extinction component may be necessary to maintain decreases in overt inappropriate behavior and to maintain increases in academic engagement.

Another internal and external validity issue is the presence of the observer in the classroom to signal the teacher with a thumb up or down to either issue a break or tell the student to try again. This issue could have been resolved by using a beeper to signal the teacher when it was appropriate to give the student a break. However, using a more discrete method would not resolve how to let the teacher know if the student earned a break or if the student needed to be told that they did not work hard enough and to try again to earn a break. Related to this is the issue of reactivity in the classroom. During observations in TP's classroom, it was noted that this participant began to give herself a break when she saw the observer give the teacher a "thumbs up." Once TP learned which break she was able to earn in a certain condition, she initiated that type of break (e.g., put

her head down, began walking to the computer) once she noticed the thumbs up signal without having to be told by the teacher whether or not she earned the break.

Observers always sat in the classrooms for several minutes to help eliminate possible effects of reactivity. With the exception of TP's classroom observations, the participants continued their regularly scheduled activities once the observer had been in the room for several minutes. Anecdotally, reactivity must have been limited due to the fact that the participants' peers never questioned why they were not also allowed to take a break from their work. In fact, most peers did not even seem to notice that the participants were receiving a break or being allowed to engage in activities unrelated to the academic task at hand.

With regard to external validity, the current investigation involved 4 participants in first and second grade general education classrooms. It is not known to what extent these DNRA procedures would be effective at reducing problem behaviors for students in different types of classrooms or from different grades. The present study only involved participants whose target behavior was being off task from assignments. It is not known how these procedures would work with more covert behaviors. However, previous studies have demonstrated that DNRA procedures can be effective at increasing compliance and decreasing SIB and other problematic behaviors (Lalli & Casey, 1996; Marcus & Vollmer, 1995; Piazza et al., 1996).

The major limitation with the current investigation is that the DNRA procedures were not entirely realistic for a classroom setting. It would have been advantageous to thin the amount of time that students had to stay on task in order to receive a break. The longest time period for task engagement was 1 minute and 55 seconds for ZC. Teachers

would likely find it useful to thin the period for engagement to 5 minutes or more, depending on the task.

It would be useful to determine a method that teachers could use for knowing whether or not to give their students a break. It is not realistic to have observers sitting in the classroom to let the teachers know whether or not each student earned a break by staying on task. Perhaps teachers could use a momentary time sampling method such as the one used in Mueller et al. (2003). This would allow teachers to continue with their normal classroom routine by observing the target student after a certain period of time elapsed. The teachers would then reward a break based on whether or not the student was engaged with their task at the moment when the teacher observed them.

Another limitation is that the observations were only conducted with each participant during one academic period. It is not known how effective the DNRA procedures would have been in different subject areas or at different times in the students' day. However, the teachers decided which academic periods to target, so it is likely that the periods chosen were the ones that elicited the most severe or the most frequent problem behaviors.

Limitations regarding the observations also included how the observations were conducted. During the 10-s of observation for each interval, it was assumed that the participant was engaging in the target behavior (i.e., off task) for the entire 10-s period. This may have overestimated the real time that was spent engaged in off task behaviors and it may have underestimated the time that was spent engaging in on task behaviors.

An additional limitation is that maintaining functions besides escape may have played a role in participants' off task behavior. For example, MJ's off task behavior was

often followed by teacher and peer attention in addition to escape from tasks. However, escape was more likely to follow this behavior than either teacher or peer attention. TP's off task behavior was sometimes followed by attention from peers. Again, escape from demands was more likely to follow off task behavior than peer attention. Lastly, KD's off task behavior was sometimes followed by teacher and peer attention, albeit to a lesser extent than escape from tasks. This issue of multiple functions of behavior may have been resolved by conducting an in-class functional analysis to further determine the maintaining function of the participants' off task behavior. Although each participant's off task behavior may have been maintained by functions in addition to escape, the data suggest that the DNRA procedures were effective at reducing off task behavior.

Related to this issue is the factor of the teacher attention that was delivered when students were told that they earned one of the DNRA breaks. If students earned a break, the teacher approached them and told them that they earned a break and that they could engage in the appropriate activity or that they could sit quietly or put their head on their desk. Similarly, even if students did not earn a break, the teacher still approached them and told them that they did not earn a break and that they could work hard and try to earn one next time. It is not known how this teacher attention affected the outcomes of the study. It should be noted; however, that once teachers told the students about their break, the participants did not receive any teacher or peer attention until the teacher approached them at the end of the break to guide them back to their task.

Future research involving DNRA procedures with general education students should focus on more realistic time schedules for students' periods of engagement. It will be useful to extend the engagement period not only for the teacher's benefit, but also so

that students will be able to stay on task for longer periods of time. Longer periods of task engagement will lead to more instructional time for the student and his/her peers as well as more time for the teacher to devote to lessons and assisting other students. Future research should also examine whether or not the DNRA procedures used here would benefit students in more than one academic context and in more than one type of classroom. These procedures should also be examined in the context of differing problem behaviors. It would be interesting to observe how the DNRA procedures would affect behaviors that are more overt than off task behaviors (e.g., aggression, inappropriate vocalizations, destruction).

Future research may also wish to examine the effects of type of task with DNRA procedures. The 4 participants in the present study were functioning at grade level for their respective academic subjects. All screener and treatment observations were conducted during independent seatwork activities when students were completing workbook pages and receiving instruction from the teacher. It would be interesting to see if the DNRA procedures would have the same effect on task engagement during small and large group instruction or during activity periods (e.g., music, art, library, computer).

Finally, it would be advantageous to the research literature to examine whether or not DNRA procedures would decrease the off task behavior of students with skill deficits who were also receiving additional instruction in the deficit area. Previous research suggests that implementing an academic intervention with students who exhibit escape-maintained problem behaviors and who also have skill deficits may not have enough of an effect on decreasing off task behavior (Mehrtens, 2007). Examining an academic intervention in addition to DNRA procedures would add to this needed literature base.

Despite the above mentioned limitations, the current investigation demonstrated the effective use of a functionally-based classroom intervention for general education students who exhibited escape-maintained off task behavior. This investigation adds to the literature base by demonstrating that DNRA procedures are effective in the general education setting when they are linked to maintaining functions. Previous research with DNRA procedures was unclear because most procedures combined escape breaks with access to attention, tangibles, or preferred activities. For example, Mozzoni and Hartnedy (2000) combined escape breaks with access to preferred activities. For that reason, it was impossible to tell if the break, the activity, or the combination of the two was responsible for changes in behavior.

Other research investigations also demonstrated that escape breaks that were combined with activities, attention, or tangible items were responsible for desired changes in behavior (Lalli & Casey, 1996; McComas et al., 2002; Piazza et al., 1996; Zarcone et al., 1996). These investigations were all conducted outside of general education settings and did not compare the effects of escape breaks to breaks that also included access to other variables. Interestingly, in the one research investigation that involved a participant without a developmental delay, results were similar to the results of the current investigation (Piazza et al., 1997). The authors in this study found that escape breaks, breaks combined with attention, and breaks combined with tangible items all produced similar decreases in problem behavior.

With regard to the interventions of the study, some might argue that the DNRA procedures were actually differential negative reinforcement of incompatible behavior (DNRI) procedures. The argument for DNRI is relevant in that on task behaviors are

incompatible with off task behaviors. In other words, one cannot be on task and off task at the same time. According to Miltenberger (2001); however, DRI procedures are a variation of DRA procedures, and the alternative behavior to be reinforced is a physically incompatible behavior.

This investigation demonstrated that using breaks with and without access to preferred activities is effective at increasing the on task behavior of students with escape-maintained off task behavior. From an applied standpoint, the current research demonstrates the effectiveness of a simple procedure whereby breaks from tasks can be used to reinforce on task behavior and decrease off task behavior in a classroom setting. Teachers may prefer to use a certain type of break, but it is certainly not detrimental to the classroom environment to use breaks combined with activities.

The investigation further demonstrated that it did not make a difference to the students if the breaks were combined with access to activities or if they were pure escape breaks. From a research standpoint, further investigations are needed to determine if there is a difference between escape only breaks and enhanced breaks. The present study added to the literature in a much needed way that was demonstrated through clear and definable assessment, data collection, analysis, and results.

APPENDIX A

PARENT CONSENT FORM

Dear Parent,

I am a doctoral student at the University of Southern Mississippi working under the direction of Dr. Joe Olmi, Ph.D. I am currently working on my Doctoral dissertation in the area of behavior problems. I will be examining the relationship between problem behaviors and escape from academic tasks. You are receiving this form because your child's teacher referred him/her for behavior problems during academic periods.

With your permission, your child will be participating in my dissertation project. This will involve a classroom-based behavioral intervention. The intervention will involve giving your child a brief break from task demands after they have been on-task for a certain amount of time. Their breaks will involve either the opportunity to sit quietly at their desk or put their head down, or the opportunity to engage in a preferred classroom activity.

As the primary investigator in this project, I will be training your child's teacher on how to implement the intervention following teacher referral and an interview. I will also be training graduate students to observe your child's behavior during the academic period of concern. If you consent to your child's participation in this project, they will be determined to have behavior problems if their problem behaviors exceed the norm of behaviors exhibited by same gender peers.

Your child may benefit from increased time on-task and decreased disruptive behaviors as a result of this project. There are no negative side effects expected to occur in relation to this project. However, it is possible that your child's disruptive behavior may increase at first. It is expected that this will be a temporary increase that will eventually lead to the behavior's decrease. Even if you give your consent for this project, you may withdraw your child's participation at any time, without penalty or loss to yourself or your child.

If you agree to participate in this project, please read and sign the following page. If you have any questions, please contact myself, Brett Mehrtens, or Dr. Olmi at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

_____

Brett V. Mehrtens, M.A.
School Psychologist-in-Training

TO BE COMPLETED BY THE PARENT

Please read the following and sign:

I have read the above statement and consent to my participation in the research project. I have had the purpose and procedures of the study explained to me and have had the opportunity to ask questions. I understand that my consent is voluntary and I may withdraw my participation at any time, without penalty or loss to myself or my child. I understand that my child will be receiving an in-class behavioral intervention. I understand that my child's participation is confidential, as is the participation of my child's teacher.

_____ _____

Signature of Parent Date

APPENDIX B

TEACHER CONSENT FORM

Dear Teacher,

I am a doctoral student at the University of Southern Mississippi working under the direction of Dr. Joe Olmi, Ph.D. I am currently working on my Doctoral dissertation in the area of behavior problems. I will be examining the relationship between problem behaviors and escape from academic tasks. You are receiving this form because you referred your student for behavior problems during academic periods.

With your permission, your student will be participating in my dissertation project. This will involve a classroom-based behavioral intervention. The intervention will involve giving your child a brief break from task demands after they have been on-task for a certain amount of time. Their breaks will involve either the opportunity to sit quietly at their desk or put their head down, or the opportunity to engage in a preferred classroom activity.

As the primary investigator in this project, I will be training you on how to implement the intervention following teacher referral and an interview. I will also be training graduate students to observe your student's behavior during the academic period of concern. If you consent to your student's participation in this project, they will be determined to have behavior problems if their problem behaviors exceed the norm of behaviors exhibited by same gender peers.

Your student may benefit from increased time on-task and decreased disruptive behaviors as a result of this project. There are no negative side effects expected to occur in relation to this project. However, it is possible that your student's disruptive behavior may increase at first. It is expected that this will be a temporary increase that will eventually lead to the behaviors' decrease. Even if you give your consent for this project, you may withdraw your student's participation at any time, without penalty or loss to yourself or your student.

If you agree to participate in this project, please read and sign the following page. If you have any questions, please contact myself, Brett Mehrtens, or Dr. Olmi at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

_____

Brett V. Mehrtens, M.A.
School Psychologist-in-Training

TO BE COMPLETED BY THE TEACHER

Please read the following and sign:

I have read the above statement and consent to my participation in the research project. I have had the purpose and procedures of the study explained to me and have had the opportunity to ask questions. I understand that my consent is voluntary and I may withdraw my participation at any time, without penalty or loss to myself or my student. I understand that I will be implementing an in-class behavioral intervention with my student. I understand that I will be asked to complete an interview as part of this project. In addition, I understand that the primary investigator will be training me on how to correctly implement the intervention. I understand that my student's participation is confidential, as is my own participation.

_____ _____

Signature of Teacher Date

APPENDIX C

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE APPROVAL

HUMAN SUBJECTS REVIEW FORM
UNIVERSITY OF SOUTHERN MISSISSIPPI
(SUBMIT THIS FORM IN DUPLICATE)

Protocol # 27110102
(office use only)

Name Brett Mehrtens Phone 601-209-7952

E-Mail Address Brett.Mehrtens@usm.edu

Mailing Address 40 Windgate Dr. Hattiesburg, MS 39402
(address to receive information regarding this application)

College/Division Education and Psychology Dept Psychology

Department Box # 5025 Phone 601-266-5255

Proposed Project Dates: From 12/01/2007 To 12/01/2008
(specific month, day and year of the beginning and ending dates of full project, not just data collection)

Title The Effects of Differential Negative Reinforcement of Alternative Behavior on Escape from Academic Tasks

Funding Agencies or Research Sponsors

Grant Number (when applicable)

____ New Project

X Dissertation or Thesis

____ Renewal or Continuation: Protocol #

____ Change in Previously Approved Project: Protocol #

Brett V. Mehrtens — Principal Investigator — 10/29/07 Date

Advisor — 10/29/07 Date

Department Chair — 10/29/07 Date

RECOMMENDATION OF HSPRC MEMBER

____ Category I, Exempt under Subpart A, Section 46.101 ( ) ( ), 45CFR46.

X Category II, Expedited Review, Subpart A, Section 46.110 and Subparagraph (B).

____ Category III, Full Committee Review.

HSPRC College/Division Member — 11-8-07 DATE

Lawrence A. Hosman — HSPRC Chair — 11-13-07 DATE

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

Institutional Review Board

118 College Drive #5147
Hattiesburg, MS 39406-0001
Tel: 601.266.6820
Fax: 601.266.5509
www.usm.edu/irb

HUMAN SUBJECTS PROTECTION REVIEW COMMITTEE
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Human Subjects Protection Review Committee in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **27110102**
PROJECT TITLE: **The Effects of Differential Negative Reinforcement of Alternative Behavior on Escape From Academic Tasks**
PROPOSED PROJECT DATES: **12/01/07 to 12/01/08**
PROJECT TYPE: **Dissertation or Thesis**
PRINCIPAL INVESTIGATORS: **Brett Mehrtens**
COLLEGE/DIVISION: **College of Education & Psychology**
DEPARTMENT: **Psychology**
FUNDING AGENCY: **N/A**
HSPRC COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **11/12/07 to 11/11/08**

Lawrence A. Hosman — 11-13-07

Lawrence A. Hosman, Ph.D.
HSPRC Chair

Date

APPENDIX D

FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS

If information is being provided by both the Teacher and the Classroom Aide, indicate both respondents' names. In addition, in instances where divergent information is provided, note the sources of specific information.

Student:_____ Respondent(s):_____

School:_____ Age:_____ Sex: M F Date:_____

1. Describe the referred student. What is he/she like in the classroom? (Write down what you believe is the most important information about the referred student.)

_____
_____
_____
_____
_____

2. Pick a second student of the same sex who is also difficult to teach. What makes the referred student more difficult than the second student?

_____
_____
_____
_____
_____

3. a. On what grade level is the student reading? _____
   b. On what grade level is an average student in the class reading? _____

4. a. On what grade level is the student performing in math? _____
   b. On what grade level is an average student in the class performing in math? _____

5. a. What is the student's classwork completion percentage (0 - 100%)? _____
   b. What is the student's classwork accuracy percentage (0 - 100%)? _____

6. Is the student taking any medications that might affect the student's behavior?
   _____ Yes _____ No If yes, briefly explain:

_____
_____
_____

7. Do you have any specific health concerns regarding this student?
_____ Yes _____ No If yes, briefly explain:

_____
_____
_____

8. What procedures have you tried in the past to deal with this student's problem behavior?

_____
_____
_____

9. Briefly list below the student's typical daily schedule of activities.

Time	Activity	Time	Activity
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

10. When during the day (two academic <u>activities</u> and <u>times</u>) does the student's problem behavior(s) typically occur?

Academic Activity #1_____ Time_____

Academic Activity #2_____ Time_____

11. Please indicate <u>good days</u> and <u>times</u> to observe. (At least two observations are needed.)

<u>Observation #1</u>	<u>Observation #2</u>	<u>Observation #3</u> (Back-up)
Date_____	Date_____	Date_____
Time_____	Time_____	Time_____

Problem Behaviors

Please list one to three problem behaviors in order of severity. Do not use a general description such as "disruptive" but give the actual behavior such as "doesn't stay in his/her seat", or "talks out without permission".

1. _____

_____

_____

2. _____

_____

_____

3. _____

_____

_____

1. Rate how *manageable* the behavior is:
   a. Problem Behavior 1 — 1 2 3 4 5 (Unmanageable … Manageable)
   b. Problem Behavior 2 — 1 2 3 4 5 (Unmanageable … Manageable)
   c. Problem Behavior 3 — 1 2 3 4 5 (Unmanageable … Manageable)

2. Rate how *disruptive* the behavior is:
   a. Problem Behavior 1 — 1 2 3 4 5 (Mildly … Very)
   b. Problem Behavior 2 — 1 2 3 4 5 (Mildly … Very)
   c. Problem Behavior 3 — 1 2 3 4 5 (Mildly … Very)

3. How often does the behavior occur *per day* (please circle)?
   a. Problem Behavior 1 — <1-3 4-6 7-9 10-12 >13
   b. Problem Behavior 2 — <1-3 4-6 7-9 10-12 >13
   c. Problem Behavior 3 — <1-3 4-6 7-9 10-12 >13

4. How many *months* has the behavior been present?

a. Problem Behavior 1	<1	2	3	4	entire school year
b. Problem Behavior 2	<1	2	3	4	entire school year
c. Problem Behavior 3	<1	2	3	4	entire school year

Antecedents: Problem Behavior #_____:_____

		Yes	No
1.	Does the behavior occur more often during a certain *type* of task?	_____	_____
2.	Does the behavior occur more often during *easy* tasks?	_____	_____
3.	Does the behavior occur more often during *difficult* tasks?	_____	_____
4.	Does the behavior occur more often during *certain subject areas*?	_____	_____
5.	Does the behavior occur more often during *new* subject material?	_____	_____
6.	Does the behavior occur more often when a request is made to *stop* an activity?	_____	_____
7.	Does the behavior occur more often when a request is made to *begin a new activity*?	_____	_____
8.	Does the behavior occur more often during *transition* periods?	_____	_____
9.	Does the behavior occur more often when a *disruption* occurs in the student's normal routine?	_____	_____
10.	Does the behavior occur more often when the student's *request has been denied*?	_____	_____
11.	Does the behavior occur more often when a *specific person is in the room*?	_____	_____
12.	Does the behavior occur more often when a *specific person is absent from the room*?	_____	_____
13.	Are there any other behaviors that usually *precede* the problem behavior?	_____	_____
14.	Is there anything you could do that would *ensure* the occurrence of the behavior?	_____	_____

15. Are there any events occurring in the child's *home* that seem to precede occurrence of the behavior at school? _____ _____

16. Does the behavior occur more often in *certain settings*? _____ _____
(circle all that apply)
large group small group independent work one-to-one interaction

bathroom recess cafeteria bus
other:_____

Consequences: Problem Behavior #_____:_____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

Consequence	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?
_____ Yes _____ No

If yes, describe:_____

3. Are there other problem behaviors that often occur after the behavior is exhibited?
_____ Yes _____ No

If yes, describe:_____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?
_____ Yes _____ No

Comments:_____

Antecedents: Problem Behavior #_____:_____	Yes	No
1. Does the behavior occur more often during a certain *type* of task?	_____	_____
2. Does the behavior occur more often during *easy* tasks?	_____	_____
3. Does the behavior occur more often during *difficult* tasks?	_____	_____
4. Does the behavior occur more often during *certain subject areas*?	_____	_____
5. Does the behavior occur more often during *new* subject material?	_____	_____
6. Does the behavior occur more often when a request is made to *stop* an activity?	_____	_____
7. Does the behavior occur more often when a request is made to *begin a new activity*?	_____	_____
8. Does the behavior occur more often during *transition* periods?	_____	_____
9. Does the behavior occur more often when a *disruption* occurs in the student's normal routine?	_____	_____
10. Does the behavior occur more often when the student's *request has been denied*?	_____	_____
11. Does the behavior occur more often when a *specific person is in the room*?	_____	_____
12. Does the behavior occur more often when a *specific person is absent from the room*?	_____	_____
13. Are there any other behaviors that usually *precede* the problem behavior?	_____	_____

14. Is there anything you could do that would *ensure* the occurrence of the behavior? _____ _____

15. Are there any events occurring in the child's *home* that seem to precede occurrence of the behavior at school? _____ _____

16. Does the behavior occur more often in *certain settings*? (circle all that apply) _____ _____

large group small group independent work one-to-one interaction

bathroom recess cafeteria bus

other:_____

Consequences: Problem Behavior #_____:_____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

Consequence	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes _____ No

If yes, describe:_____

3. Are there other problem behaviors that often occur after the behavior is exhibited?
_____ Yes _____ No

If yes, describe:_____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?
_____ Yes _____ No

Comments:_____

Antecedents: Problem Behavior #_____:_____	Yes	No
1. Does the behavior occur more often during a certain *type* of task?	_____	_____
2. Does the behavior occur more often during *easy* tasks?	_____	_____
3. Does the behavior occur more often during *difficult* tasks?	_____	_____
4. Does the behavior occur more often during *certain subject areas*?	_____	_____
5. Does the behavior occur more often during *new* subject material?	_____	_____
6. Does the behavior occur more often when a request is made to *stop* an activity?	_____	_____
7. Does the behavior occur more often when a request is made to *begin a new activity*?	_____	_____
8. Does the behavior occur more often during *transition* periods?	_____	_____
9. Does the behavior occur more often when a *disruption* occurs in the student's normal routine?	_____	_____
10. Does the behavior occur more often when the student's *request has been denied*?	_____	_____
11. Does the behavior occur more often when a *specific person is in the room*?	_____	_____
12. Does the behavior occur more often when a *specific person is absent from the room*?	_____	_____
13. Are there any other behaviors that usually *precede* the problem behavior?	_____	_____

14. Is there anything you could do that would *ensure* the occurrence of the behavior? _____ _____

15. Are there any events occurring in the child's *home* that seem to precede occurrence of the behavior at school? _____ _____

16. Does the behavior occur more often in *certain settings*? (circle all that apply) _____ _____

large group small group independent work one-to-one interaction

bathroom recess cafeteria bus

other:_____

Consequences: Problem Behavior #_____:_____

1. Please indicate whether the following consequences occur after the behavior is exhibited.

Consequence	Yes	No
Access to Preferred Activity	_____	_____
Termination of Task	_____	_____
Rewards	_____	_____
Peer Attention	_____	_____
Teacher Attention	_____	_____
Praise	_____	_____
Ignore	_____	_____
Re-direction	_____	_____
Interrupt	_____	_____
Reprimand	_____	_____

2. Is there any task you have stopped presenting to the student as a result of the problem behavior?

_____ Yes _____ No

If yes, describe:_____

3. Are there other problem behaviors that often occur after the behavior is exhibited?
_____ Yes _____ No

If yes, describe:_____

4. Does the student typically receive praise or any positive consequence when behavior occurs that you would like to see instead of the problem behavior?
_____ Yes _____ No

Comments:_____

APPENDIX E

CONDITIONAL PROBABILITY OBSERVATION

Child: Date: Session: Data Collector:

1.1										6.1										
2										2										
3										3										
4										4										
5										5										
6										6										
2.1										7.1										
2										2										
3										3										
4										4										
5										5										
6										6										
3.1										8.1										
2										2										
3										3										
4										4										
5										5										
6										6										
4.1										9.1										
2										2										
3										3										
4										4										
5										5										
6										6										
5.1										10.1										
2										2										
3										3										
4										4										
5										5										
6										6										

Notes/Totals:

APPENDIX F

FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS CHECKLIST

Instructions: Indicate if the respondent endorsed these specific antecedent or consequent events. The checklist will assist in identifying behavioral function. Mark if the items of the FAIR-T were (yes) or were not (no) endorsed by the respondent.

Antecedent Events Endorsed:_____

Does the behavior occur more often during a certain *type* of task?
Yes_____ No_____

Does the behavior occur more often during *easy* tasks?
Yes_____ No_____

Does the behavior occur more often during *difficult* tasks?
Yes_____ No_____

Does the behavior occur more often during *new subject material*?
Yes_____ No_____

Does the behavior occur more often during *certain subject areas*?
Yes_____ No_____

Does the behavior occur more often when a request is made to begin a new activity?
Yes_____ No_____

Does the behavior occur more often in certain settings?
(circle those that were endorsed)
Large group small group independent work

One-to-one interactions

Consequent Events Endorsed:	YES	NO
Access to preferred activity	_____	_____
Termination of Task	_____	_____

Is there any task you have stopped presenting to the student as a result of the problem behavior?
Yes_____ No_____

Hypothesis of Behavioral Function:

Avoidance/Escape

Yes_____ No_____

Comments

_____

_____

_____

_____

APPENDIX G

OBSERVATION FORM

Disruptive classroom behaviors will be defined as any behaviors that are inappropriate to the task at hand. These behaviors include aggression, inappropriate vocalizations, getting out of seat, playing with objects, noncompliance, disruption, and off-task.

Task engagement will be defined as the student being engaged or on-task with the current academic task. The student's eyes and head will be directed toward the task and engagement may also include manipulation of task materials (e.g., pencil, paper, scissors, crayons, ruler).

A) ***AGGRESSION***: This is coded if the child engages in an act that involves an attempt to cause harm to another student, teacher, or other person. This may involve hitting, kicking, scratching, pinching, biting, or throwing objects that hit someone.

B) ***INAPPROPRIATE VOCALIZATIONS***: Task irrelevant vocalizations (e.g., humming, singing, making unusual vocal noises, speaking, whispering, cursing, or making noises with one's teeth).

C) ***OUT OF SEAT***: Child has to be completely out of seat. If a child is out of seat, no part of their legs or buttocks can be in contact with the seat. This may also include walking around the room.

D) ***PLAYING WITH OBJECTS***: Touching or manipulating any object in the room except the table, chair, pencil, or materials needed for the academic task at hand. This could include the child's clothing, walls, light switches, toys, curtains, etc.

E) ***NONCOMPLIANCE***: This will be coded if the student does not complete a task as requested by the teacher or other adult in the classroom (e.g., substitute teacher). This may also include responding "no" to a teacher's request or shaking one's head from side to side.

F) ***DESTRUCTION***: This will be coded if the student destroys task materials or any other item in the classroom. This may also include hitting or throwing task materials, or the table, chairs, or other objects in the classroom.

F) ***OFF TASK***: Child removes eyes from current task for a period of 3 or more seconds to engage in another behavior. Child breaks eye contact with the task and removes attention from the task.

Interval	0.15	0.30	0.45	1.00	1.15	1.30	1.45	2.00	2.15	2.30
Aggression										
Inappropriate Vocs										
Out of Seat										
PWO										
Noncompliance										
Destruction										
Off Task										
On Task										
Interval	**2.45**	**3.00**	**3.15**	**3.30**	**3.45**	**4.00**	**4.15**	**4.30**	**4.45**	**5.00**
Aggression										
Inappropriate Vocs										
Out of Seat										
PWO										
Noncompliance										
Destruction										
Off Task										
On Task										
Interval	**5.15**	**5.30**	**5.45**	**6.00**	**6.15**	**6.30**	**6.45**	**7.00**	**7.15**	**7.30**
Aggression										
Inappropriate Vocs										
Out of Seat										
PWO										
Noncompliance										
Destruction										
Off Task										
On Task										
Interval	**7.45**	**8.00**	**8.15**	**8.30**	**8.45**	**9.00**	**9.15**	**9.30**	**9.45**	**10.00**
Aggression										
Inappropriate Vocs										
Out of Seat										
PWO										
Noncompliance										
Destruction										
Off Task										
On Task										

Control 1:		Target Total	Control Total
Control 2:	A	/20= %	/20= %
Control 3:	IV	/20= %	/20= %
Control 4:	OOS	/20= %	/20= %
Control 5:	PWO	/20= %	/20= %
Child's Name:	NonC	/20= %	/20= %
Teacher's Name:	Des	/20= %	/20= %
Date:	Off T	/20= %	/20= %
Time:	On T	/20= %	/20= %
	Total Dis.	/140= %	/140= %

APPENDIX H

ACTIVITY PREFERENCE ASSESSMENT

Please order the following activities from most preferred to least preferred

_____ Read a book

_____ Color/Draw

_____ Play with toys

_____ Play on the computer

List any other activities you enjoy in the classroom:

_____

_____

_____

_____

APPENDIX I

TEACHER INTEGRITY CHECKLIST

Teacher: _____ Date: _____ Observer: _____

Directions: Please circle yes if teacher implemented intervention step correctly, no if teacher did not implement step correctly, and na if step implementation is unknown

Step 1. Student receives assignment	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 2. Student is engaged with task	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 3. Experimenter times student's engagement	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 4. If student does not work for set amount of time, teacher says, "You did not spend enough time working on your assignment; therefore, you will not receive a break. Try again."	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 5. Teacher delivers break after engagement without access to activity	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 6. Teacher delivers break after engagement with access to 1st choice activity if applicable	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 7. Experimenter times break	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 8. Teacher re-presents task to student	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA
Step 9. Teacher repeats intervention until assignment is completed by student	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA	Yes No NA

APPENDIX J

TEACHER INTERVENTION CHECKLIST

Teacher: _____ Date: _____

Directions: Please be sure to implement the following steps ***exactly*** as they are written

Step 1) Give assignment to student

Step 2) In the ***DNRA without access*** condition, at the start of the academic period say to the student, "You will be given a break after you have completed work. During your break, you may sit quietly at your desk or put your head down."

Step 3) In the ***DNRA with access to a preferred activity*** condition, at the start of the academic period say, "You will be given a break after you have completed work. During your break, you may (read quietly, play with a toy, color/draw, play on the computer)."

Step 4) Give student a break if he/she has been engaged, as determined by the experimenter

Step 5) Give student a break (i.e., student may put head down or sit quietly at desk) in the ***DNRA without access condition***

Step 6) Give student a break with access to a 1st choice preferred activity in the ***DNRA with access to a preferred activity condition***

Step 7) When the break ends say, "Your break is over. Continue to work on your assignment. When you have worked again, you may receive another break."

Step 8) If student was not engaged for the set amount of time say, "You did not spend enough time working on your assignment; therefore, you will not receive a break. Try again."

Step 9) Re-present task to student

Step 10) Continue with above steps until student's assignment is complete

REFERENCES

Aaron, B.A., & Bostow, D.E. (1978). Indirect facilitation of on-task behavior produced by contingent free-time for academic productivity. *Journal of Applied Behavior Analysis, 11*, 197.

Allen, K.D., Loiben, T., Allen, S.J., & Stanley, R.T. (1992). Dentist-implemented contingent escape for management of disruptive child behavior. *Journal of Applied Behavior Analysis, 25*, 629-636.

Barlow, D.H., & Hersen, M. (1984). *Single case experimental designs: Strategies for studying behavior change*. Elmsford, NY: Pergamon Press.

Coleman, C.L., & Holmes, P.A. (1998). The use of noncontingent escape to reduce disruptive behaviors in children with speech delays. *Journal of Applied Behavior Analysis, 31*, 687-690.

DeLeon, I.G., Neidert, P.L., Anders, B.M., & Rodriguez-Catter, V. (2001). Choices between positive and negative reinforcement during treatment for escape-maintained behavior. *Journal of Applied Behavior Analysis, 34*, 521-525.

Deno, S.L., & Mirkin, P.K. (1977). *Data-based program modification: A manual.* Reston, VA: Council for Exceptional Children.

Doggett, R.A., & Edwards, R.P. (2001). Functional assessment and treatment: Using data from informant assessments to develop functionally-based interventions to reduce problem behavior in general education classrooms. Unpublished manuscript.

Doggett, R.A., Edwards, R.P., Moore, J.W., Tingstrom, D.H., & Wilczynski, S.M. (2001). An approach to functional assessment in general education classroom settings. *School Psychology Review, 30*, 313-328.

Edwards, R.P. (2002). A tutorial for using the functional assessment informant record for teachers (FAIR-T). *Proven Practice, 4*, 31-33.

Fletcher, J.M., Coulter, W.A., Reschly, D.J., & Vaughn, S. (2004). Alternative approaches to the definition and identification of learning disabilities: Some questions and answers. *Annals of Dyslexia, 54*, 304-331.

Good, R.H., & Kaminski, R.A. (Eds.). (2002). *Dynamic indicators of basic early literacy skills* (6th ed.). Eugene, OR: Institute for the Development of Educational Achievement.

Individuals with Disabilities Education Act of 2004, P.L. 108-446.

Kodak, T., Miltenberger, R.G., & Romaniuk, C. (2003a). A comparison of differential reinforcement and noncontingent reinforcement for the treatment of a child's multiply controlled problem behavior. *Behavioral Interventions, 18*, 267-278.

Kodak, T., Miltenberger, R.G., & Romaniuk, C. (2003b). The effects of differential negative reinforcement of other behavior and noncontingent escape on compliance. *Journal of Applied Behavior Analysis, 36*, 379-382.

Lalli, J.S., & Casey, S.D. (1996). Treatment of multiply controlled problem behavior. *Journal of Applied Behavior Analysis, 29*, 391-395.

Lalli, J.S., Vollmer, T.R., Progar, P.R., Wright, C., Borrero, J., Daniel, D. et al. (1999). Competition between positive and negative reinforcement in the treatment of escape behavior. *Journal of Applied Behavior Analysis, 32*, 285-296.

Marcus, B.A., & Vollmer, T.R. (1995). Effects of differential negative reinforcement on disruption and compliance. *Journal of Applied Behavior Analysis, 28*, 229-230.

McComas, J.J., Goddard, C., & Hoch, H. (2002). The effects of preferred activities

during academic work breaks on task engagement and negatively reinforced destructive behavior. *Education and Treatment of Children, 25*, 103-112.

Mehrtens, B.V. (2007). *The collateral effects of improved reading performance on externalizing behaviors in the classroom.* Unpublished master's thesis, The University of Southern Mississippi, Hattiesburg.

Miltenberger, R.G. (2001). *Behavior modification principles and procedures* (2nd ed.). Belmont, CA: Wadsworth.

Moore, J.W., Doggett, R.A., Edwards, R.P., & Olmi, D.J. (1999). Using functional assessment and teacher implemented functional analysis outcomes to guide intervention for two students with Attention-Deficit/Hyperactivity Disorder. *Proven Practice: Prevention and Remediation Solutions for Schools, 2*, 3-9.

Morgan, P.L. (2006). Increasing task engagement using preference or choice-making: Some behavioral and methodological factors affecting their efficacy as classroom interventions. *Remedial and Special Education, 27*, 176-187.

Mozzoni, M.P., & Hartnedy, S. (2000). Escape and avoidance hypothesis testing using an alternating treatment design. *Behavioral Interventions, 15*, 269-277.

Mueller, M.M., Edwards, R.P., & Trahant, D. (2003). Translating multiple assessment techniques into an intervention selection model for classrooms. *Journal of Applied Behavior Analysis, 36,* 563-573.

Mueller, M.M., Sterling-Turner, H.E., & Moore, J.W. (2005). Towards developing a classroom-based functional analysis condition to assess escape-to-attention as a variable maintaining problem behavior. *School Psychology Review, 34*, 425-431.

No Child Left Behind Act, P.L. 107-110, 20 USC § 7801 (2001).

O'Callaghan, P.M., Allen, K.D., Powell, S., & Salama, F. (2006). The efficacy of noncontingent escape for decreasing children's disruptive behavior during restorative dental treatment. *Journal of Applied Behavior Analysis, 39*, 161-171.

Peterson, S.M., Caniglia, C., & Royster, A.J. (2001). Application of choice-making intervention for a student with multiply maintained problem behavior. *Focus on Autism and Other Developmental Disabilities, 16*, 240-246.

Peterson, S.M., Caniglia, C., Royster, A.J., Macfarlane, E., Plowman, K., Baird, S.J. et al. (2005). Blending functional communication training and choice making to improve task engagement and decrease problem behavior. *Educational Psychology, 25*, 257-274.

Piazza, C. C., Fisher, W.W., Hanley, G.P., Remick, M.L., Contrucci, S.A., & Aitken, T.L. (1997). The use of positive and negative reinforcement in the treatment of escape-maintained destructive behavior. *Journal of Applied Behavior Analysis, 30*, 279-298.

Piazza, C.C., Moes, D.R., & Fisher, W.W. (1996). Differential reinforcement of alternative behavior and demand fading in the treatment of escape-maintained destructive behavior. *Journal of Applied Behavior Analysis, 29*, 569-572.

Reed, G.K., Ringdahl, J.E., Wacker, D.P., Barretto, A., & Andelman, M.S. (2004). The effects of fixed-time and contingent schedules of negative reinforcement on compliance and aberrant behavior. *Research in Developmental Disabilities, 26*, 281-295.

Roberts, M.L., Mace, F.C., & Daggett, J.A. (1995). Preliminary comparison of two negative reinforcement schedules to reduce self-injury. *Journal of Applied*

Behavior Analysis, 28, 579-580.

Shapiro, E.S. (1996). *Academic skills problems: Direct assessment and intervention.* New York: Guilford.

Steege, M.W., Wacker, D.P., Cigrand, K.C., Berg, W.K., Novak, C.G., Reimers, T.M. et al. (1990). Use of negative reinforcement in the treatment of self-injurious behavior. *Journal of Applied Behavior Analysis, 23*, 459-467.

Tucker, M., Sigafoos, J., & Bushell, H. (1998). Use of noncontingent reinforcement in the treatment of challenging behavior. *Behavior Modification, 22*, 529-547.

Vollmer, T.R., Marcus, B.A., & Ringdahl, J.E. (1995). Noncontingent escape as treatment for self-injurious behavior maintained by negative reinforcement. *Journal of Applied Behavior Analysis, 28*, 15-26.

Wesolowski, M.D., Zencius, A.H., & Rodriguez, I.M. (1999). Mini-breaks: The use of escape on a fixed-time schedule to reduce unauthorized breaks from vocational training sites for individuals with brain injury. *Behavioral Interventions, 14*, 163-170.

Zarcone, J.R., Fisher, W.W., & Piazza, C.C. (1996). Analysis of free-time contingencies as positive versus negative reinforcement. *Journal of Applied Behavior Analysis, 29*, 247-250.