BRIEF APPLICATION OF CONTINGENT REVERSALS:
TREATMENT UTILITY IN INCREASING
APPROPRIATE CLASSROOM
BEHAVIORS

by

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ABSTRACT

Brief Application of Contingent Reversals Treatment Utility in Increasing Appropriate Classroom Behaviors

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Identifying positive behavioral interventions for students who display disruptive behavior in the classroom has become a critical issue for schools due to the high frequency of these behaviors and recent changes in legislative requirements. To address this issue, the present study investigated the utility of brief experimental analysis approach as a means to identify the most efficient and effective interventions for three students displaying problem behaviors in the classroom. By using a multi-element design, the brief experimental analysis was conducted by randomly applying interventions for three common functions of problem behavior in the classroom: teacher attention, peer attention, and escape from task demand. Then, the effects of the most efficient and effective intervention on on-task, disruptive, and work completion behaviors were compared relative to a baseline condition over time. There were individual differences in responses to the intervention, but all students responded to at least one treatment.
Further, an extended analysis of the alternative baseline conditions using a BAB design was applied that included a treatment phase with the hypothesized efficient and effective treatment and a baseline phase. Results showed that selected interventions decreased disruptive behavior and increased on-task and work completion for all three participants over time relative to baseline.
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CHAPTER I
INTRODUCTION

Many teachers seek support from school psychologists in order to assist them with children who are experiencing behavioral difficulties in the classroom. Without adequate support, children’s behaviors problems are likely to persist and increase in severity over time (McMahon & Forehand, 2003). As a result, behavior problems are one of the most common reasons that children are referred for special education services (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002).

In response to the high incidences of behavior problems in schools, legislative requirements have emphasized the use and development of assessment procedures with high treatment utility that can identify efficient and effective interventions for students who are experiencing academic and behavioral difficulties (Gresham, Watson, & Skinner, 2001). To determine positive support that will most likely reduce problem behaviors, school psychologists are seeking to use assessment procedures with a high degree of treatment utility for efficient and effective positive behavioral interventions. Treatment utility is defined as the degree to which the assessment process leads to an efficient and effective intervention (Hayes, Nelson, & Jarrett, 1987). Given that students experience behavior difficulties for a variety of reasons, it is also imperative that assessment procedures are available to assist in the selection of conceptually relevant interventions that meet individual student needs.
For children who display external behavior problems, research has provided evidence for the treatment utility of functional behavioral assessment for the identification of intervention (e.g., Chafouleas, Riley-Tillman, & Sugai, 2007; Wright-Gallo, Higbee, Reagon, & Davy, 2006). For this reason, IDEA 2004 requires that functional behavioral assessments are conducted as a part of the child’s evaluation when suspected needs of the child include behavior problems, even when that child engages in behavior determined not to be a manifestation of the child’s disability. Although there are various types of functional behavioral assessment (FBA) strategies, experimental functional analysis (EFA) most reliably produces an efficient and effective intervention (Iwata & Worsdell, 2005) in comparison to other strategies. EFA apply a series of isolated, potentially efficient and effective contingencies that are analogues of naturally occurring consequences that frequently follows problem behaviors, and thus may be reinforcing and maintaining inappropriate behavior. This is done using standardized procedures to determine which contingency is maintaining an individual’s problematic behavior (Mace, 1994). A limited but growing body of research suggests that EFA may also have treatment utility when used with typically developing children in the regular education classroom (e.g., Boyajian, DuPaul, Handler, Eckert, & McGoey, 2001; Cooper et al., 2006; Wright-Gallo et al.). Although EFA is the most efficacious of the three methods at identifying the variables that maintain problem behavior, EFA limitations include time-consuming and complex procedures that are typically used in a contrived setting rather than the natural environment. In school settings, feasibility is just as critical as efficacy to provide needed support to a child within a reasonable period of time.
Results for a few studies suggests that Brief Experimental Functional Analysis (BEFA). during the functional analysis process can estimate the function of a behavior problem without demonstration of the stability of a condition-behavior functional relationship over time (Cooper et al., 1992). A typical BEFA analysis is usually performed in 90 minutes or less with one to three data points of behavior being analyzed for each condition. Conditions typically last 5 minutes, and there are generally between 5 to 10 administered conditions.

One concern of BEFA is that intervention decisions are based on a single data point that is likely to result in a false positive, whereas EFA intervention decisions are based on multiple data points thus reducing the likelihood of a false positive (Khang & Iwata, 1999). To help resolve this problem, the most recent BEFA methodology includes the use of some type of contingency reversal to further validate the accuracy of an identified reinforcing consequence that may be maintaining the problem. During the contingency reversal phase, a differential reinforcement of alternate (DRA) intervention procedure is applied. This DRA procedure presents the identified reinforcer following the occurrence of a desirable alternative replacement behavior but does not present the reinforcer following problem behavior. When the DRA procedure efficiently and effectively reduces problem behavior and increases the alternative behavior, the identified function maintaining the target behavior is further confirmed. Thus, contingency reversals are typically used to reduce the likelihood that false positives will be attained by replicating findings of a BEFA. The BEFA, however, even in a brief form, still remains complex and is difficult to ascertain in a classroom setting where control over potential reinforcers is not completely obtained. Thus, additional
investigations on more simplified assessment procedures that quickly lead to the selection of an efficient and effective intervention may be warranted.

Recently, the functional assessment approach has also been modified to evaluate the functions of behaviors that are not occurring as expected. This approach, termed brief experimental analyses (BEA), has been used primarily to identify intervention conditions that increase academic behaviors. This procedure involves the brief time application of various interventions to evaluate the effect on an individual’s academic performance. Interventions are systematically selected to address common reasons for academic deficits and are applied from the least to most intrusive method. The effects of each applied intervention are then compared to select the most efficient and effective intervention for ongoing implementation for that individual. This strategy has efficient and effectively identified interventions that efficiently and effectively increased in math performance (Carson & Eckert, 2003), reading performance (Jones & Wickstrom, 2002), and on-task behaviors (Gilbertson, Duhon, Witt, & Dufrene, 2008) when evaluated over time.

In relation to BEFA, an BEA for treatment effects on externalized behaviors could be considered as a series of contingent reversals that are frequently applied to determine which intervention increases appropriate behaviors. A modified BEA procedure for problem behaviors would consist of the brief application of different potentially reinforcing DRA treatment conditions to estimate the effect on behaviors that are not occurring as expected (i.e., appropriate behaviors) in addition to effects on problem behaviors relative to a baseline condition. For example, series of DRA interventions that withhold the three common reinforcers that maintain classroom
misbehavior (gaining teacher attention, gaining peer attention, and/or escape from aversive tasks) and present the reinforcer for appropriate classroom behavior may be applied to identify which condition most efficiently and effectively reduces problem behavior and increases desirable behavior relative to a baseline condition (Ervin et al., 2001; Kern, Hilt, & Gresham, 2004).

The modified variation of BEFA applying and evaluating the effects of DRA intervention conditions on problem and alternative behavior may be a promising and less intrusive approach for selecting interventions to increase appropriate behaviors that replace inappropriate problem behaviors. In school settings, which require efficient and effective methods, an immediate evaluation of treatment effects using a BEA approach for problem behavior may be a preferred alternative method of assessing variables that influence disruptive behavior in classrooms. In support of this premise, this study was based on the supposition that efficient and effective interventions for disruptive behavior can be identified by assessing the effects of briefly applied DRA treatments that address functions that commonly were found to maintain disruptive behavior in the classroom using an BEA procedure. Specifically, this study first investigated the utility of BEA for the identification of an efficient and effective intervention for students exhibiting behavior problems in the classroom using brief administration of DRA interventions in the classroom to evaluate on task, disruptive and work completion behavior change. Three DRA interventions were applied that (a) withheld teacher attention for disruption, peer attention for disruption, or escape from work, and (b) presented teacher peer attention or escape from work for appropriate levels of on-task and work completion behaviors. The efficiency and effectiveness of each intervention was compared to the
baseline condition to select the intervention that most efficiently and effectively
decreased disruptive behavior and increased on-task behavior and work completion. Next,
the selected intervention was implemented in the classroom during an extended analysis
to examine the efficiency and effectiveness of the selected intervention on behavior
change over time.
CHAPTER II
REVIEW OF LITERATURE

Managing disruptive behaviors is a major concern in the classroom and is a primary reason why children are referred to special education (Eidle, Truscott, Meyers, & Boyd, 1998). Research has suggested that early disruptive behaviors lead to poor school achievement (Farnworth, Schweinhart, & Berrueta-Clement, 1985; Gregory, 1995; Huesmann, Eron, Lefkowitz, & Walder, 1984; Huesmann, Eron, & Yarmel, 1987; Loeber, Tremblay, Gagnon, & Charlebois, 1989). In addition, children with disruptive behaviors are also more likely to have poor peer relationships (Grizenko, Papineau, & Sayegh, 1993; McCardle, O’Brien, Macmillan, & Kolvin, 2000; Shelton et al., 2000). Without intervention, these children are likely to persist in their disruptive behaviors through childhood and into adolescence, progressing from relatively less serious (e.g., talking out) to more serious (e.g., fighting, defiance) forms of conduct problems over time, causing further academic and social difficulties such as school failure or dropout (Edelbrock, 1985; McMahon & Forehand, 2003; Patterson & Yoerger, 2002; Shelton et al., 2000).

The purpose of this literature review is to review assessment strategies that have demonstrated treatment utility. Treatment utility is defined as the degree to which an assessment leads to efficient and effective intervention outcomes (Hayes et al., 1987). Given that children misbehave in school for different reasons, a behavioral assessment that considers individual differences is more likely to lead to efficient and effective intervention planning. The treatment utility of behavior assessments is also enhanced
when the assessment procedures leads to the identification of environmental factors influencing problem behaviors that can be modified. Three behavioral assessment procedures that assess differences in individual responses to environmental factors have been empirically supported as having treatment utility in school settings: FBA, BFA, and BEA. The following sections are organized around these three assessment practices and how they are considered to be critical to the development of efficient and effective school-based behavioral interventions. This literature review aims to describe the current status of these approaches and to integrate procedures that promote research on alternative practices in this area.

Functional Behavioral Assessment

One type of assessment strategy with high potential for treatment utility is FBA. This methodology uses a range of procedures to gather information about the antecedents and consequences that contribute to the occurrence and maintenance of behavior problems in order to develop a hypothesis regarding the function of the behavior problem. The function of behavior refers to the purpose, gain, or “pay off” that an individual is likely to receive when he/she performs the behavior. Understanding the functions of a recurring problem behavior can help lead to the development of an individualized intervention designed to reduce or eliminate the problem behavior. This can be accomplished in three ways. First, after identifying consequences that are following or maintaining undesirable behaviors, the identified consequences are eliminated such that the problem behaviors no longer obtain reinforcement. For a student who successfully gets teacher attention after being disruptive, a teacher can eliminate the
function of disruptive problem if he/she stops providing attention when a student engages in that problem behavior. Second, identified reinforcing contingencies of problem behaviors are reversed by applying identified reinforcing consequences contingent on appropriate behaviors. For example, the student acting out to get his/her teacher’s attention is given attention only when he/she is performing appropriate behaviors. Third, reinforcing contingencies of problem behaviors can be modified such that the consequence is less reinforcing in value, amount, or immediacy. For example, if a student acts out during a specific subject because the level of the curriculum may be too advanced, the teacher may modify the curriculum to a level that is reasonable for that child to accomplish. As a result, the child no longer needs to act out to escape from difficult work (Martens, Witt, Daily, & Vollmer, 1999).

FBA methodology consists of three primary methods of assessment that seek to identify reinforcement that maintains problem behavior. First, indirect measures such as behavioral interviews, checklists, rating scales, and questionnaires may be used to identify problem behaviors. This method is available at low cost, takes relatively little time and can help interventionists understand information about the antecedents and consequences of problem behavior. A limitation of this method is that outcomes can be subjective, difficult to interpret, and provide little information about appropriate intervention (Sprague & Horner, 1995).

The second FBA method is the descriptive direct observation method. Direct observational methods include Antecedent-Behavior-Consequence (ABC) charts, scatter plots, and interval time sampling observation procedures. Like interviews, these methods are also available at a relatively low cost; however, direct observation of child behavior
in the natural environment provides a more objective, quantitative measure. These measures tend to be more precise than the indirect method at determining what type and how often conditions in which problem behaviors occur in the natural setting through direct observation. Data from observations may be used to calculate conditional probabilities between an antecedent or consequential event and a behavior. For example, the probability that a problem behavior contacts a consequence such as teacher attention is estimated within a certain amount of time. The data yielded from direct observation only measures the degree to which an event occurs with behavior, which is a correlational relationship rather than a direct measure of the cause and effect relationship. Because the exact cause cannot be determined, descriptive data is interpreted with caution (Hanley, Iwata, & McCord, 2003). For example, an observed consequential event such as teacher attention provided for problem behavior may be observed less frequently than peer attention. However, for some children this teacher attention is occurring at an adequate amount to maintain problem behavior. Thus, comparison of teacher attention to peer attention rates given after problem behavior may lead to an inaccurate hypothesis in regards to the behavior functional relationship. Furthermore, direct observation methods may not identify all functions of behavior given that this method is restricted by the types of consequential events present in any given observation period (Lerman & Iwata, 1993).

Finally, the third method of FBA is functional analysis (FA). This method applies a series of isolated potentially efficient and effective contingencies of problem behaviors that are analogues of naturally occurring situations using standardized procedures to determine what contingency is maintaining an individual’s problematic behavior (Mace,
Two or more different antecedent or consequential events may be applied, in isolation, several times to compare relatively stable differences in the occurrence of excess problem behavior under each event. The isolated event that produces the highest levels of problem behavior in a controlled condition demonstrates that environmental event functionally causes or influences problem behavior in the natural environment.

The FA methodology, initially applied to the analysis of self-injurious behavior in clinical settings, was soon adapted to analyze environment-behavior interactions that maintained a wide variety of behavior disorders, such as aggression (Mace, Page, Ivancic, & O’Brien, 1986; Wacker et al., 1990), destructive behaviors (Slifer, Ivancic, Parrish, Page, & Burgio, 1986), disordered speech (Mace & Lalli, 1991; Mace, Webb, Sharkey, Mattson, & Rosen, 1988; Mace & West, 1986), stereotype (Durand & Carr, 1987; Mace, Browder, & Lin, 1987; Wacker et al.), pica (Mace & Knight, 1986), and tantrums (Carr & Newsom, 1985). The major advantage of the FA is that it is an approach to assessment that identifies a cause and effect functional relationship. Implementation of conditions with a high degree of control results in highly objective data, which increases the accuracy of developed hypotheses about functional relationships.

Unfortunately, FA is highly complex to implement and interpret. Because conditions are manipulated and applied one at a time in an analog setting, an important event that is occurring in the natural environment may not be applied and analyzed for hypothesis development. Further, several applications of a condition may establish or teach a new functional relationship thus making brief or few applications a preferable FA method (Lerman & Iwata, 1993). Finally, this process reveals a relationship by setting an
event that operationally sets off aversive problem behavior that may influence the acceptability of the implementation of this procedure.

Unfortunately, few studies have examined the utility of FA in schools with typically developing children. Ervin and colleagues (2001) conducted a meta-analytic review of functional analysis studies \((n = 100)\) implemented in school settings from 1980-1999. Several limitations regarding FA participants, procedures, and outcomes were presented. Of the 278 participants, 89% of the participants had one or more developmental disabilities, and 89% targeted self-injurious or aggressive behaviors. Only 12% were conducted in the general education classroom with little targeting academic progress (23%), which is the primary mission in classroom settings. Moreover, few included strategies (e.g., self-monitoring, peer mediations, skills training) to increase independent skill use with normally developed children. These findings support a limited treatment utility of FA for typically developing children.

According to a review conducted by Ellis and Magee (2004), functional assessments that link to efficient and effective interventions in school settings require several modifications from those assessments conducted in clinical settings. For example, conditions in efficient and effective functional assessment procedures used in school settings include peer attention conditions and modifications in the way escape conditions are conducted to assimilate typical classroom conditions. Moreover, intermittent attention and escape schedules are common in the classroom. Interestingly, Ervin and colleagues (2001) reported that escape from task was identified as a functional consequential event for only 3% of the students without disabilities relative to the 40% for the students with one or more disabilities. Adult and peer attention and access to preferred activities, were
more consistently shown as identified functions for general education students. Additional research is warranted to examine potential critical modifications required for children without or at-risk for a disability.

The determination of behavioral function may be difficult to ascertain in a classroom setting where control over potential reinforcers is difficult to completely obtain. For example, escape from classwork, teacher, and peer attention are frequently occurring in close proximity in a busy classroom. This concurrent schedule makes it difficult to isolate maintaining contingencies in the natural setting. One suggestion for this problem is the use of descriptive assessments in order to solve this limitation (Mace, 1994). Descriptive assessments might be useful in identifying what contingencies are occurring in the classroom and the reinforcement schedule of each contingency. This knowledge could then be used to enhance the accuracy of the functional analysis by testing conditions that were observed in the classroom and applying treatment consisting of a contingent reversal of an identified function on a similar schedule observed in the classroom.

Lerman and Iwata (1993) compared the use of descriptive assessment and EFA for assessing the variables that maintained self-injurious behavior for six mentally retarded adults living in a residential facility. Results indicated that the descriptive assessment yielded a larger number of potentially relevant contingents of reinforcement due to the uncontrolled nature of the observed interactions, while the experimental analysis showed more limited but very consistent patterns of problem behaviors with specific assessment conditions. Similar studies have yielded mixed results (Anderson & Long, 2002; Conroy, Fox, Crain, Jenkins, & Belcher, 1996).
English and Anderson (2006) have more recently compared the use of structured descriptive assessment (SDA) to FA in order to assess the variables that maintained problem behavior in three children with developmental delays. An FA procedure was conducted to assess the effects of antecedent and consequential events on problems behavior with the experimenter and a care giver administering the conditions. The timing and frequency of natural contingencies were observed to estimate the conditional probabilities (or percentage) of time that a consequence immediately followed inappropriate behavior. Conditions that had a high degree of probability were then used to develop hypothesis of behavioral functions for treatment development.

Although the FA and SDA procedures revealed identical antecedent conditions that predicted behavior problems, these two assessments suggested different hypothesis about reinforcing consequences. When interventions based on the results of each of the assessments were implemented and evaluated, data supported the treatment utility of the hypothesis derived from the SDA. Thus, SDA may be a useful assessment method for treatment development in a classroom setting, but more data is needed to assess treatment utility with general education students (Anderson & Long, 2002).

Brief Experimental Functional Analysis

The utility of a brief variation of FA methodology for treatment development has also been studied. A brief experimental functional analysis (BFA) consists of brief applications of different antecedent or potentially reinforcing conditions to estimate the effect on some behavior(s) relative to a baseline condition. Brief is defined by the number of times a condition is applied (e.g., one time) and by duration (e.g., 5 to 15
minutes). The results of each applied condition are compared to performance obtained during a baseline or control session to hypothesize the functions supporting or maintaining an observed behavior. Hence, this increases the efficient and effective of FA by estimating the function of a behavior problem based on a few data point, rather than applying a condition until stability is obtained to identify a condition-behavior functional relationship.

Several studies have investigated the use of BFAs to identify individualized functions of children’s problem behaviors. Using a brief multi-element design, Cooper, Wacker, Sasso, Reimers, and Donn (1990) were among the first investigators to examine the utility of a BFA process. Conducted within tightly controlled conditions, Cooper and colleagues (1990) showed that BFA was useful for briefly applying different types of antecedent environmental conditions that may be related to problem behavior. Following a baseline condition, four conditions requiring varying high or low levels of adult attention, and task difficulty were applied for one session to evaluate differential effects on inappropriate and off-task behaviors in an outpatient clinic setting. A comparison of relative changes in problem behaviors with these brief applications indicated individual differences in antecedent events (task difficulty and attention) that triggered problem behaviors for eight typically developing young children with behavior problems. An identified function of behavior problems was further confirmed and replicated for each child by reapplying the identified function condition following a control condition. Results of this brief withdrawal revealed that all selected functions were replicated for each subject.
Using a similar miniwithdrawal design, Northrup and colleagues (1991) examined the relative effects caused by brief manipulations of different types of social consequences contingent on problem behavior for three children with developmental disabilities who engaged in aggressive behavior. Up to three different consequential conditions were evaluated during one session following an alone condition. These conditions included presentation of a preferred tangible item, social attention, and escape from work contingent upon inappropriate behavior. Northrup and colleagues extended the design of the BEA by adding a “contingency reversal” phase. During a contingency reversal phase, the consequential condition that produced the highest aggression was contingently provided after the display of an appropriate replacement behavior for aggression but withheld for aggressive behavior. Results of the contingent reversal were then compared to the previous condition producing the highest percentage of aggressive behavior to confirm that the identified functional contingency also served to maintain an alternative replacement behavior. This finding was then replicated by reapplying the identified maintaining variable condition followed by another contingency reversal. Results revealed that each of the participants displayed a substantial reduction in aggressive behavior and a substantial increase in an alternate replacement behavior. The evaluation of a contingent reversal also provided an initial demonstration of a potentially efficient and effective treatment.

Several studies have compared outcome data obtained between a BFA and FA for developing interventions in clinical or residential settings. For example, in reviewing the data from 46 FA cases, Wallace and Iwata (1999) found that hypotheses developed about behavioral functions during the first 5-to-10 minutes of a session reliably matched the
hypothesis made from data collected from the entire 15-minute session. Khang and Iwata (1999) examined 50 sets of FA to determine variances in outcomes based on a single data point condition to an extended FA with 3 or more data points. Outcomes or hypothesis developed based on brief single point matched the extended FA outcome for 66% of the cases. These studies reveal that the BFA may lead to efficient and effective interventions, but may not be as accurate as the extended FA methods.

Brief Functional Analysis in Schools

Given the number of children experiencing behavioral problems, schools need an efficient and effective, but most importantly, efficient and effective assessment method to select interventions within a reasonable amount of time. Several studies investigating BFA in school settings have revealed promising results for children with behavior problems (Meyer, 1999), emotional or behavioral disorders (Wright-Gallo et al., 2006), attention-deficit/hyperactivity disorder (Boyajian et al., 2001; Brossard & Northrup, 1995; Umbreit, 1995), developmental disabilities (Carr & Durand, 1985), or severe intellectual disabilities (Day, Horner, & O’Neil, 1994).

Brossard and Northrup (1995) conducted a single subject BFA to evaluate the functions of problematic behavior in three elementary-school children who met criteria for attention-deficit/hyperactivity disorder (ADHD). The BFA conditions were conducted in a multi-element design measuring the effects of problematic behavior contingent upon teacher and peer attention. The BFA was followed by a contingent reversal phase that applied a DRA condition that corresponded to an identified function of the behavior problem. In the DRA procedure, engaging in an alternative replacement
behavior (hand-raising and verbally requesting staff attention or a brief break from task
demands) produced the requested functional consequence (escape or attention) that was
identified as the function of the target behavior (talking out or escaping from work)
during the BFA. For each participant, contingency reversal of an identified functional
contingency resulted in substantial reductions of target problem behavior or zero
occurrences of target problem behaviors suggesting that the differential effects of teacher
and peer attention can be identified during a BFA.

Boyajian and colleagues (2001) conducted a BFA to evaluate the functions of
disruptive behaviors displayed by preschool children in the regular education classroom.
Boyajian and colleagues incorporated a BFA, administrating conditions for only one
session followed by a contingent reversal DRA phase. Participants included three boys
enrolled in a daycare/preschool classroom for at least two days per week. Each child had
normal cognitive ability but met the *Diagnostic and Statistical Manual of Mental
Disorders (4th ed.; American Psychological Association, 1994; DSM-IV)* criteria for one
of the three subtypes of ADHD based on a semistructured parent interview and behavior
scales.

BFAs were conducted in 5-to-10 minute sessions with a 1-2 minute break
between sessions. Completion of the BFAs ranged from 2-4 days. A target (problem)
behavior and an appropriate alternative on-task behavior were recorded during direct
observation sessions. During the brief assessment phase, the two types of behaviors were
assessed in the following four controlled conditions: (a) free play (baseline), (b) adult
attention contingent on inappropriate behavior, (c) the presentation of a preferred item
contingent on inappropriate behavior, and (d) a 20-second escape contingent on
inappropriate behavior when given a difficult academic task. After administering each condition one time, conditions that produced the highest and lowest levels of inappropriate behavior were replicated a second time. Results revealed that BFA indicated a different variable maintaining each child’s problem behavior.

Following the BFA, a brief contingent reversal was also administered to further validate an identified function by demonstrating functional control of an identified consequential event. That is, during an assessment session, the contingency that most often produced inappropriate behavior was no longer provided for the undesired behavior (extinction). Instead, the identified maintaining contingency was reversed such that it was only given for appropriate behavior (DRA). During the brief contingent reversal, on-task behavior consistently increased to baseline play condition level, while the inappropriate disruptive behavior decreased for all three subjects. Further, the contingent reversal validated each of the identified variables.

Finally, an individual intervention was developed with the child’s teacher based on the hypothesis generated from the BFA data and conducted over time during an extended analysis. Results of the extended analysis showed that the interventions were efficient and effective in reducing the occurrences of aggressive behavior to zero or near-zero levels within several 5- to 10-minute analyses over a period of 2-4 days. Thus, these results were consistent with a growing body of research that demonstrates the utility of BFA for the identification of contingencies maintaining problem behaviors of children in regular education settings (Boyajian et al., 2001). Furthermore, this condensed identification process predicted the type of intervention that would be efficient and effective over an extended period of time. Given these promising results, additional
research is needed in general education classrooms with older normally developing students exhibiting disruptive behaviors.

Although a contingent reversal was validated on only one hypothesized function in prior studies (Boyajian et al., 2001; Brossard & Northrup, 1995), it would be valuable to further assess whether the analysis of the relative effects of more than one type of contingent reversal would indicate functional differences between consequences and inappropriate and appropriate behavior. If this were the case, then application of contingent reversals may serve to validate functions in a manner devoid of increases in the level and frequency of undesirable behaviors in the classroom that occur with application of potential maintaining functional conditions. Application of common contingent reversals may also provide quicker service by immediately focusing on the effects of a positive intervention support on behavior. These assessment characteristics are critical in school settings for functional assessment to be accepted by school personnel (Ellis & Magee, 2004; Walker & Sprague, 1999).

Several limitations of prior studies on BFA procedures used in schools warrant further research. Due to the variation in procedure and methodology used across and within studies, identification of critical efficient and effective components of a BFA is difficult. For example, duration of assessment methodologies varies greatly across studies. As a result, an appropriate length of time for a brief assessment has yet to be determined (Kern et al., 2004). Because most studies collected data in analogue settings without follow-up comparisons of intervention effects that addressed different functions in the classroom, the usefulness of these procedures in the natural classroom setting is not well-established (Meyer, 1999).
Experimental Brief Analysis

A contingent reversal used within a BFA process validates the reinforcing effects of a consequential variable on problem behavior by implementing a condition that only provides the consequence for appropriate behavior. If the appropriate behavior continues to increase when followed by the presentation of this consequence, then this contingent reversal condition confirms the functional event and behavior interpretation of the BFA data. The contingent reversal or DRA procedure is then applied as the treatment for appropriate behavior change. Such an application of contingent reversal is similar to a modified functional assessment approach termed BEA. This approach has been primarily researched for the identification of instructional variables that increase academic performance deficits that are not occurring as expected (Daly, Murdoch, Lillenstein, Webber, & Lentz, 2002; Daly, Witt, Martens, & Dool, 1997). Procedurally, various interventions that may support appropriate behavior deficits are applied one by one following a no treatment, or baseline, condition. The treatment that shows the largest increase in academic performance relative to a lower performance obtained in baseline is selected as the treatment that is most likely to continue supporting academic progress over time for an individual student.

The purpose of BEA for academic problems is to functionally match instruction and task demand with a student’s skill and language level to promote progress for students who are not responding adequately to classroom instruction. For example, Malloy, Gilbertson, and Maxfield (2007) investigated the utility of BEA as a means to identify the most efficient and effective instructional components to increase reading
performance for five regular education students classified as English Language Learners. During the BEA, five reading treatments were administered one by one with increasing language support in order to determine which intervention would be most appropriate to increase oral reading fluency. Each intervention addressed a different function or common reason for underachievement. These included: incentive for increased performance, modeling and error correction for skill acquisition deficits, additional practice and feedback for skill fluency deficits, and vocabulary practice for comprehension deficits. A miniwithdrawal multi-element design was used to examine relative effects of treatments on student reading performance. A comparison of treatment effects to the baseline condition showed that the five students responded to different strategies addressing different functions that commonly cause reading difficulties. The selected strategies continued to improve reading when applied for several weeks. Thus, these results support the utility of BEA as a means to efficient and effectively assess the effects of various reading interventions in an idiographic manner to find a strategy that promotes the largest gains for an individual student.

BEA utilizes intervention effects as assessment data by altering the instructional environment in a way that may functionally increase academic performance. This method is similar to the intervention applied in a contingency reversal condition that may functionally increase appropriate behavior while decreasing problem behavior. When a positive finding (i.e., problem behavior decreases, appropriate behavior increases) is demonstrated from a brief contingent reversal phase, then an hypothesis can be formed to estimate that the variable applied in the test is functionally related to the student’s problem behavior (Daly et al., 1997). One major disadvantage to BFA procedures
assessing behavioral excesses rather than behavior deficits is the purposeful increase of problem behavior for the intention of determining behavioral function (Repp & Karsh, 1994). This is in direct contrast to the recent emphasis on positive approaches in schools. This approach has the advantage of providing the teacher with information concerning the efficacy of a potential positive intervention strategy that matches existing classroom routines or structures.

Purpose and Objectives

Given the increasing number of students who are referred for interventions due to behavior problems combined with the difficulty of implementing FBA in the classroom, more research on efficient and effective FBA approaches that lead to positive interventions is warranted. The goal of this study is to examine the treatment utility of an assessment model that extends the brief functional assessment literature by employing the concepts of BEA and brief contingent reversals used in prior studies (Brossard & Northrup, 1995) in order to select the most efficient and effective intervention for students with difficulties in classroom behavior. The purpose of this study will be to evaluate the effects of DRA interventions based on three common outcomes of functional analysis to develop individualized treatment recommendations for students who experience behavior difficulties in the classroom. Basically, aberrant behavior will be placed on extinction and an appropriate alternative will be reinforced with one of three reinforcers: adult attention, peer attention, and escape from class work. Through the use of a brief multi-element design, treatments will be directly applied in the classroom to evaluate the effects on disruptive, on-task, and work completion behaviors as compared
to the baseline condition and to the results of other treatments. When a DRA treatment or combination of treatments improves student response, a brief reversal will be conducted to further confirm the effects on classroom behavior. This approach allows for the examination of the effects of positive intervention support within the classroom setting without (a) obtaining control that is difficult to achieve, (b) inducing inappropriate behaviors, or (c) removing a child from ongoing instruction. Using this method, we hypothesize that at least one brief DRA condition will improve behavior for each student, but that different interventions will be efficient and effective on each student due to different functions of problem behaviors. An extended analysis will also be conducted to examine the efficiency and effectiveness of the selected intervention over time relative to a baseline condition. Specific research questions include:

1. What is the treatment utility of brief experimental analysis for selecting behavioral interventions based on three common functional consequences of problem behavior: adult attention, peer attention, and escape from class work?

2. What is the most effective intervention for each student using brief experimental analysis (during classroom independent seatwork) on disruptive, on-task, and work completion behavior for students exhibiting behavior problems in the classroom?

3. What are the effects of the selected effective interventions on disruptive, on-task, and work completion behavior for students exhibiting behavior problems across an extended analysis?
CHAPTER III

METHODS

Participants

Participants consisted of three regular education students who were referred to researchers by their teachers due to concerns with high rates of disruptive behavior in the classroom. Participants included three second-grade students: two Latino males (Adrian and Derek), and one Caucasian female (Heather). None of these students had been previously referred or tested for special education. Although Spanish was the native language for Adrian, he no longer required English as a Second Language (ESL) services because his scores were within an upper English fluency limited proficiency range as determined by the IDEA Oral Language Proficiency Test given during the school year in which the study was conducted (Del Vecchio & Guerreo, 1995); nonetheless, school personnel continue to monitor his academic performance due to ongoing concerns about the limitations of oral proficiency tests for estimating proficiency of complex English-language skills needed for learning academic content (Jitendra & Rohena-Diaz, 1996). Specifically, Adrian scores on a standardized achievement test (Woodcock Johnson-III; Woodcock, McGrew, & Mather, 2001) given at the beginning of the year indicted that his basic reading skills to be on a 1.9 grade level, in addition, his reading comprehension skills were on a 1.8 grade level. Data taken from the Success Maker® program, used by the school as a regular part of student math instruction, indicated that Adrian was on a 2.3 grade level in overall mathematic competency.
Students were selected based on the following inclusion criteria. First, the students were nominated for intervention services by their teachers as students who have been exhibiting high frequency external behavior problems and low work completion. Second, students were screened for off-task and disruptive behavior. Student displaying 30% or more disruptive behavior across three 15-minute observations were then considered for participation in the study. Of the six students nominated by their teachers, only three students met criteria for the study; these three students were selected to participate in the study. To disconfirm a severe skill deficit as a potential reason for behavior problems, the teachers reported that students were reading at grade level. Further, all students read at grade level on a 1-minute curriculum based measurement (CBM) reading assessment that was conducted prior to their participation in the study (Good, Simmons, Kame’enui, Kaminski, & Wallin, 2002). Adrian, Derek, and Heather read at 50, 67, and 72 words per minute with better than 85% accuracy. These scores fell within a low- or no-risk range of scores based on benchmark at-risk, low-risk or no-risk ranges recommended for CBM assessments (Good, Gruba, & Kaminski, 2002; Shinn, 1989).

Peers were selected based on the following inclusion criteria. First, they were referred by the teacher as a peer who was not disruptive in the classroom and would be capable of following instructions from researchers. Second, were no more than 10% off task during any behavior screening for the target peer.

To obtain parental consent, informed consent packets were given to each selected student (target student and peer confederate). The students were instructed to take the packet home to their parent(s) or guardian. This packet contained a letter explaining the
study and the informed consent form asking parent(s) or guardian to choose whether or not they wanted their child to participate in the study (see Appendices A and B). Parents were also asked to complete a student demographics questionnaire that accompanied each of the consent packets (see Appendix C). Each parent(s) or guardian was contacted by phone once they received the packet. Each parent was given an opportunity to ask questions to the researchers. Adrian’s parents were contacted by a Spanish-speaking representative who was able to translate for the researchers. After a parent(s) or guardian completed the packet, the student was asked to bring a sealed completed packet to their teacher. To increase the number of parents who would respond, students were offered a small incentive if they returned the parent packet to their teacher, regardless of parental consent to participate the study. Parent consent and student assent was obtained for the first three selected students.

After obtaining parental consent (verbal and written) for student participation, each student’s academic and on-task behaviors were prescreened across three classroom observations in order to further document behavior problems. Five-second whole interval time sampling procedures were used to estimate the percentage of time each student was off-task and disruptive in a class of 23 to 28 students. All three students were disruptive more than 20% of the time and off task more than 25% of the time during three 15-minute observations. Further, observations of classwide on-task behaviors were conducted to confirm that each participant’s behavior problems were due to an individual problem rather than a classwide behavior problem. The average on-task behavior of each student’s classmates was obtained by rotating peer observations, one classmate at a time, during each 5-second interval for the length of the 15-minute observation. The mean
frequency of on-task behavior for all classmates was 80% or higher. This high percentage of on-task behavior suggested that most of the classmates were behaving as expected; thus, ruling out a classwide behavior problem.

Writing tasks were administered during all screening, baseline, and experimental conditions. The writing intervention was selected from three possible interventions (reading, mathematics, and writing) by the teacher.

Setting

All participants attended a public elementary school (kindergarten through sixth grades) in an urban district in a western state. The school population of approximately 363 students from preschool through sixth grade consisted of 28.9% Latino, 62.8% Caucasian, 3% African American, 2.5% Asian American, 1.9% Native American, and .8% other. Approximately 75% of all students at the school qualified for federal free or reduced lunch programs.

All screening and experimental sessions were conducted in each participant’s regular education classroom. Sessions were conducted as the students completed an independent writing task. The participant’s regular education teacher and approximately 30 of the participant’s classmates were present during each session. One to two researchers were also present to observe classroom behavior during each session.

Materials

Twenty-four writing worksheets were constructed for this study. Each worksheet consisted of a different “story starter” or a phrase written at top of the worksheet
followed by lines spaced for writing a story (see Appendix D). The writing story starters were randomly drawn from Aimsweb® W-CBM Story Starters. The average writing prompt was seven words, or one sentence in length (e.g. “I was walking through the woods when suddenly…”).

Dependent Variables

Three dependent variables were measured during all phases of the study. The first dependent variable measured in this study was student on-task behavior. On-task was defined as the student looking at or completing the assigned task with 80% or better accuracy, while working quietly, and remaining seated during the entire 5-second interval (Shapiro, 2004). Nonexamples of on-task behavior included talking, fidgeting with materials, incomplete work or incorrect work at 79% or less, being out of seat, staring out the window, and reading unassigned instructional material.

Disruption was the second dependent variable measured in this study. This problem behavior was defined as talking out to peers and teacher without teacher permission, using profanity or sexually related language, leaving assigned seating during instruction, making distracting facial expressions or obscene hand gestures to others in the classroom, and making repeated audible noises with tangible items (e.g., tapping pencil repetitiously on desk).

Completion of a math or reading worksheet (work completion) was the third dependent measure. Work completion was measured as the number of legible words written per student by the student during the 10-minute writing fluency session, baseline or experimental.
Data Collection Procedures

Direct observations of each of the participants were conducted during a series of 10-minute observations in his or her classroom (Shapiro, 2004). During the observations, the participants and their classmates were working on an independent writing task that was scripted by researchers, but directed by the regular classroom teacher. During the 10-minute task, researchers observed each participant in order to estimate the amount of time that he or she spent on-task and engaging in disruptive behaviors. On-task and disruptive behaviors were measured with a 15-second time sampling procedure using a prerecorded cassette tape with the words “ready, record” stated at the end of each interval. At the end of a 15-second interval, a trained observer recorded the student as “on task” on a recording sheet if the student had been on task the entire 15-second interval (see Appendices F and G). Disruptive behavior was recorded if this type of behavior occurred at any time during an interval.

After each session, the percentage of intervals at which the participants displayed on-task or disruptive behaviors were calculated. In addition, writing worksheets were collected so researchers could calculate the number of words written by each participant. Numbers that were not spelled out, and words that were misspelled but could not be phonetically read, were not counted as a written word; punctuation and capitalization were not considered in the word count.

Inter-Scorer Agreement

All observations were conducted by graduate or undergraduate psychology
students with prior training in direct observation techniques. The inter-observer agreement was evaluated by two independent observers across the experimental phases. Agreement for each observed behavior was calculated on an interval-by-interval point basis: agreements steps (i.e., both observers agreed that the behavior did or did not occur) was divided by agreements plus disagreements with the remainder multiplied by 100%. Inter-observer agreement was recorded for 32%, 36% and 40% of the classroom observation sessions for Heather, Derek, and Adrian, respectively. For the worksheets, scorer agreement was determined in the same manner for 32% of the sessions but on an item-by-item basis across all participants and experimental conditions. The inter-observer agreement was 96%, 98 %, and 97% for Heather, Adrian, and Derek, respectively. Agreement was 100% on all writing fluency probes across all three subjects.

**Experimental Conditions**

*Baseline*

Writing worksheets were administered during an independent work session in order to monitor each participant’s behavior and work completion progress throughout the seated work sessions. During the sessions, each of the participant’s teachers administered a writing worksheet to the entire class and provided them with standardized directions as described by Shinn (1989). Specifically, the teacher read the story starter written on top of the worksheet, gave students 1 minute to silently think about the story they would write, and prompted students to start writing the story on the worksheet. The teacher used her typical everyday monitoring procedures during student work time. After
10 minutes, the teacher told students to stop writing and the worksheets were collected. The papers were graded and scores were reported to students on the following school day. No intervention was provided to the students during the baseline condition.

DRA-Teacher Attention

The differential reinforcement of alternative behavior for the teacher attention condition was applied to determine if problem behavior was maintained by teacher attention (see Appendices H and I). To do this, researchers evaluated the effects of teacher attention in relation to on-task behavior and work completion, while concurrently ignoring disruptive behavior. A writing worksheet was administered in the same standardized format as in the baseline condition; however, during this condition, the teacher was given a Motiveaider® pager that vibrated every 2 minutes. When the pager vibrated, the teacher was instructed to give the target student attention if the student was on task and completing work. Attention consisted of the teacher being within close proximity of the student (2-3 feet), with verbal praise for appropriate behaviors (e.g., “thank you for working on your assignment”). If the student was not on task when the pager vibrated, the teacher ignored the student. After the timed writing session was completed, the student met with the teacher and the researcher observing behavior in the hall. The researcher counted the number of words written, and noted the legibility of the writing. If applicable, the teacher then gave the student verbal praise for appropriate on-task behaviors and for beating his/her best score while writing legibly.

DRA-Peer Attention

The differential reinforcement of alternative behavior condition for peer attention
was applied to determine if problem behavior was a result of peer attention by evaluating the effect of peer attention on on-task performance (see Appendices J and K). To provide peer attention for appropriate behavior, a classmate served as a peer confederate, who was seated next to the participating student in order to provide positive attention for appropriate working behaviors. This peer was trained to give the target student attention when the Motiveaider® pager vibrated if the student was on-task at the 2-minute interval during the 10-minute writing session. If the student was on-task when the Motiveaider® pager vibrated, the trained peer was instructed to quietly signal the peer and then state that the peer was working very hard, or working quickly. If the student was not on task when the pager vibrated, the peer was instructed to ignore the student. If needed, peers were prompted by researchers to provide praise or to ignore the student. A prompt was the use of a nonverbal gesture that was explained to the peer ahead of time. After the timed writing session was completed, the participant met with the peer and the researcher observing behavior in the hall. The researcher counted the number of words written and noted the legibility of the writing. If valid, the peer then gave the student verbal praise for appropriate on-task behaviors and for beating his/her best score while writing legibly.

*DRA-Escape*

The differential reinforcement condition for the escape condition was applied to determine if problem behavior is maintained by escape from work (see Appendices L and M). This was done by evaluating the effects of decrease work requirements which were earned contingent upon work completion. Prior to the 10-minute independent writing session, the student was told that he/she would have the chance to earn one sticker dot for
neat, legible, handwriting. and another sticker dot for “beating their previous best writing score” during the writing assignment. The students were then informed that these sticker dots could be used to cover up problems on an assignment that the teacher would give them later that day. After the writing fluency drill was completed, the observers met with the students in the hall where their handwriting legibility and number of words written was evaluated. Sticker dots were given if students met the legibility and writing goal. No praise was given for on-task behavior.

Experimental Design and Procedures

Brief Experimental Analysis

The first part of this study examined the utility of a BEA procedure for selecting an efficient and effective intervention for students with disruptive behaviors. A miniwithdrawal design was used to compare the relative effects of various intervention conditions to baseline performance on problem classroom behavior, on-task behavior, and work completion (Martens, Eckert, Bradley, & Ardoin, 1999). Following a baseline condition, three DRA treatment conditions, based on three common outcomes of functional analysis conducted in classrooms. These three treatment conditions were applied to determine which one of any of the conditions produced on-task results that were distinctly higher, and disruptive results that are lower than the baseline condition. The following conditions were presented in random order: DRA-escape, DRA-adult attention, and DRA-peer attention. Each intervention was presented for two consecutive sessions before a new intervention was introduced to a student. In contrast to prior brief experimental analysis studies, two intervention sessions were implemented rather than
just one intervention session (Daly, Martens, Hamler, Dool, & Eckert, 1999). Two intervention conditions were implemented for two reasons. First, the student may not fully comprehend what is expected without experiencing at least one complete intervention session. Second, interventions consisted of consequences or feedback that was not being experienced until the end of a session. Thus, one session may not adequately evaluate the extent that the intervention would promote behavior change.

The purpose of this series of conditions was to estimate the level of behavior change under the various treatment conditions that address common functions of misbehavior relative to baseline measurements. Decision-making guidelines, outlined in Table 1, were followed to select the intervention that most efficiently and effectively reduced disruptive behavior and most efficiently and effectively increased on-task and work completion behaviors.

To control the potential effects of measurement and practice, a miniwithdrawal was introduced for the intervention that produced the greatest gains relative to the baseline. For the miniwithdrawal, a second baseline condition was administered and then followed by a re-administration of the most efficient and effective treatment to assess potential replication of treatment performance gains.

All experimental conditions were conducted by teachers in the classroom setting with all classmates and in the presence of one to two research assistants. One session was conducted per school day for 3 days a week. During each DRA condition, research assistants met with the student prior to the session to explain the condition and to give a goal. The teacher then administered the writing worksheet to the class and followed
Table 1

Decision-Making Steps Used for Selecting Efficient and Effective Treatments Based on Brief Experimental Analysis Results

Step 1:
Choose two or more treatments that meet all the following criterions:
(a) Has the largest decrease when comparing change from baseline to treatment on disruptive behavior.
(b) Has the largest increase when comparing change from baseline to treatment on work completion.
(c) Has the largest increase when comparing change from baseline to treatment on on-task behavior.

If one treatment is selected then go to Step 4. If two or more treatments are selected go to step.

Step 2:
Choose the two or more treatments with on-task behavior > 80%.

If two or more treatments have similar low disruptive behavior and is >80% on task, select the treatment that has the highest academic performance.

If two or more treatment have similar high academic change and is >80% on task, select the treatment that has the lowest disruptive behavior.

If a treatment has been identified, go to Step 3.

If two treatments are still selected, choose the simplest treatment based on time and adult effort (TA most time>escape>PA least time) and go to Step 3.

Step 3:
Conduct a withdrawal baseline condition to determine if the hypothesis that the performance would decrease without intervention support is confirmed.

Following the implementation of a second baseline condition, conduct a replication of the selected treatment at Step 1 or 2 to further validate that the treatment is likely to be efficient and effective for that student.
intervention procedures with the target student during the 10-minute independent seatwork session.

*Extended Analysis*

For the second part of the study, a BAB (treatment, baseline, treatment) design was used to compare the effects of the most efficient and effective intervention (as previously identified from the BEA) relative to a baseline condition over time (Kazdin, 1982). The first phase was conducted by implementing the selected intervention over time in the classroom. Following this evaluation of treatment over time, the effects of a brief reversal phase back to the baseline condition was evaluated. Following the brief reversal phase, the efficient and effective treatment was reintroduced to examine the degree to which the treatment effects were replicated. During each phase, a 10-minute writing session was administered once per day, for 2 or 3 school days a week, for 8-10 consecutive weeks.

*Training for Administration of Assessment and Experimental Procedures*

Research assistants (undergraduate and graduate psychology students), teachers, and peer helpers were trained to administer the experimental intervention and baseline conditions by modeling and role-playing of all assessment and intervention administration steps (see Appendices H, I, J, K, L, and M). After learning the steps, trainees conducted procedures as a trainer observed and checked the steps implemented correctly on a procedural checklist. Training and observation continued until all of the
steps were implemented with 100% accuracy, and 90% or better inter-scorer reliability was obtained on two writing worksheets with the trainer.

Procedural Integrity

Observers also assessed procedural integrity during at least 32% of the experimental sessions, across all students. Using a procedural checklists of experimental steps the observer placed a checkmark next to each step that was completed during a session (see Appendices H, I, J, K, L, and M). Integrity of experimental procedures was computed by dividing the number of steps the examiner explained by the total number of steps listed, which was then multiplied by 100. The average for correctly implemented conditions was 99% (range, 96-100%).
CHAPTER IV
RESULTS

Figure 1 displays on-task, work completed, and disruptive behavior for the three participants during an initial baseline condition and the BEA. As shown in Figure 1, all participants showed an increase in on-task behavior and the amount of work completed relative to baseline. Simultaneously, all participants showed a decrease in disruptive behavior, which was reduced with the introduction of one or more interventions relative to baseline performance. Table 2 presents the improvement noted with the treatment condition relative to the baseline conditions on all passages (i.e., second intervention session minus average baseline performance divided by baseline performance, which was then multiplied by 100). Because the change in observed behavior between baseline and treatment on each intervention varied between students, the most efficient and effective intervention identified and applied during the extended analysis was not the same for all three participants. The results of the extended analysis for each participant are displayed in Figure 2. The descriptive statistics for the baseline and selected treatment condition across dependent measures during the BEA and extended analysis are displayed in Table 3. To present these varied results, each individual’s performance during the BEA and extended analysis will be discussed.

For Heather, as shown in Figure 1, disruptive behavior was reduced relative to baseline with all three interventions during both intervention administrations. Average work completion and time spent on task, however, was greatest relative to baseline during the DRO-ESC condition during both sessions. For this reason, the DRO-ESC
Figure 1. Number of correct words written per minute (CWPM; triangle symbol, percentage of on-task behavior (diamond symbol), and percentage of disruptive behavior (square symbol) for three participants across baseline, differential reinforcement of peer attention (DRA-PA), teacher attention (DRA-TA), and escape (DRA-E) during brief experimental analysis.
Table 2

*Intervention Improvement Relative to Average Baseline During Brief*

**Experimental Analysis**

<table>
<thead>
<tr>
<th>Student</th>
<th>Interventiona</th>
<th>Percent disruptive</th>
<th>Percent on-task</th>
<th>Words correct per minute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heather</td>
<td>DRA-TA</td>
<td>-30</td>
<td>7</td>
<td>-2</td>
</tr>
<tr>
<td></td>
<td>DRA-ESC</td>
<td>-33</td>
<td>54</td>
<td>40b</td>
</tr>
<tr>
<td></td>
<td>DRA-PA</td>
<td>-15</td>
<td>2</td>
<td>-10</td>
</tr>
<tr>
<td></td>
<td>DRO-ESC (2)</td>
<td>-43</td>
<td>65</td>
<td>36</td>
</tr>
<tr>
<td>Adrian</td>
<td>DRA-TA</td>
<td>-8</td>
<td>24</td>
<td>31b</td>
</tr>
<tr>
<td></td>
<td>DRA-PA</td>
<td>-5</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>DRA-ESC</td>
<td>-13b</td>
<td>29a</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>DRA-TA (2)</td>
<td>-15</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>Derek</td>
<td>DRA-ESC</td>
<td>-24b</td>
<td>52b</td>
<td>36b</td>
</tr>
<tr>
<td></td>
<td>DRA-TA</td>
<td>-22</td>
<td>15</td>
<td>-17</td>
</tr>
<tr>
<td></td>
<td>DRA-PA</td>
<td>3</td>
<td>-2</td>
<td>-1</td>
</tr>
<tr>
<td></td>
<td>DRA-ESC (2)</td>
<td>-24</td>
<td>55</td>
<td>83</td>
</tr>
</tbody>
</table>

* aDifferential reinforcement of alternative behavior (DRA), escape (ESC), teacher attention (TA), peer attention (PA), and baseline (BL).

bGreatest improvement of on-task behavior and word correct per minute and reduction of disruptive behavior

intervention was selected as the intervention most likely to produce desirable changes for all three monitored behaviors over time. Similar results obtained with the reapplication of the DRO-ESC that followed a second brief baseline condition further suggested that this intervention was likely to be an efficient and effective treatment condition for improving Heather’s classroom performance over time. As shown in Figure 2, data obtained during the extended analysis with Heather showed a clear differentiation between on-task, work completed, and disruptive behavior between baseline and treatment phases. When comparing Heather’s baseline and intervention conditions there
Figure 2. Number of correct words written per minute (CWPM; triangle symbol), percentage of on-task behavior (diamond symbol), and percentage of disruptive behavior (square symbol) during the extended analysis across baseline and participant’s selected treatments: differential reinforcement of alternating behavior for escape (DRA-E) for Heather and Derek, and DRA for teacher attention (DRA-TA) for Adrian. Symbol “≈” represents break for brief experimental analysis.
### Table 3

**Descriptive Statistics for Each Participant During Extended Analysis**

<table>
<thead>
<tr>
<th>Student</th>
<th>Conditions*</th>
<th>Disruptive %</th>
<th>On-task %</th>
<th>Academic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heather</td>
<td>Baseline</td>
<td>Mean (SD) 45 (29)</td>
<td>23 (19)</td>
<td>19 (24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 63</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 5-65</td>
<td>8-60</td>
<td>5-67</td>
</tr>
<tr>
<td></td>
<td>Escape</td>
<td>Mean (SD) 3 (3)</td>
<td>94 (6)</td>
<td>72 (21)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 2</td>
<td>84</td>
<td>66</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 0-7</td>
<td>88-98</td>
<td>54-101</td>
</tr>
<tr>
<td></td>
<td>Baseline</td>
<td>Mean (SD) 34 (2)</td>
<td>24 (14)</td>
<td>15 (19)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 34</td>
<td>18</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 32-35</td>
<td>15-40</td>
<td>2-37</td>
</tr>
<tr>
<td>Derek</td>
<td>Baseline</td>
<td>Mean (SD) 25 (3)</td>
<td>44 (9)</td>
<td>30 (18)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 25</td>
<td>42</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 25-30</td>
<td>38-63</td>
<td>8-50</td>
</tr>
<tr>
<td></td>
<td>Escape</td>
<td>Mean (SD) 16 (31)</td>
<td>76 (41)</td>
<td>97 (58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 0</td>
<td>95</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 0-63</td>
<td>14-98</td>
<td>14-150</td>
</tr>
<tr>
<td></td>
<td>Baseline</td>
<td>Mean (SD) 16 (19)</td>
<td>44 (37)</td>
<td>61 (58)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 5</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 2-45</td>
<td>13-98</td>
<td>17-150</td>
</tr>
<tr>
<td></td>
<td>Escape</td>
<td>Mean (SD) 5 (13)</td>
<td>89 (23)</td>
<td>122 (34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 0</td>
<td>98</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 0-2</td>
<td>98-100</td>
<td>132-151</td>
</tr>
<tr>
<td>Adrian</td>
<td>Baseline</td>
<td>Mean (SD) 16 (7)</td>
<td>64 (14)</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 17</td>
<td>66</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 2-25</td>
<td>45-77</td>
<td>21-53</td>
</tr>
<tr>
<td></td>
<td>Teacher</td>
<td>Mean (SD) 2 (2)</td>
<td>96 (2)</td>
<td>85 (15)</td>
</tr>
<tr>
<td></td>
<td>Attention</td>
<td>Median 2</td>
<td>95</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 0-5</td>
<td>95-98</td>
<td>72-102</td>
</tr>
<tr>
<td></td>
<td>Baseline</td>
<td>Mean (SD) 11 (8)</td>
<td>85 (5)</td>
<td>101 (16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Median 7</td>
<td>87</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 5-20</td>
<td>87-88</td>
<td>91-120</td>
</tr>
<tr>
<td></td>
<td>Teacher</td>
<td>Mean (SD) 0</td>
<td>99 (1)</td>
<td>96 (3)</td>
</tr>
<tr>
<td></td>
<td>Attention</td>
<td>Median 0</td>
<td>99</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Range 0</td>
<td>98-100</td>
<td>93-100</td>
</tr>
</tbody>
</table>
was a clear distinction showing lower disruptive behavior and greater on-task and writing behaviors with intervention.

For Derek, during the BEA, the observed behaviors varied when comparing the first and second administration of an intervention. However, only one intervention, DRO-ESC, performance remained at a more desirable behavior level during the second administration of the intervention. That is, DRO-ESC showed a greater reduction in disruptive behavior and showed a greater increase in on-task behavior and work completion more consistently over baseline performance as compared to the DRO-TA and DRO-PA conditions. During the second administration of the DRO-TA, work performance and on-task declined to levels at or below baseline performance. Disruptive behavior increased to baseline levels during the second administration of the DRO-PA. The mini-withdrawal led to similar results when DRO-ESC condition was reintroduced after two baseline sessions. Thus, the DRO-ESC intervention was selected as the intervention most likely to produce the greatest gains over time.

During the extended analysis, Derek showed a clear differentiation between the selected treatment and the baseline conditions. Derek showed greater gains obtained for work completion and on-task behavior and greater reductions in disruptive behavior with intervention. Specifically, on-task behavior was enhanced to 90% of the time with no disruptive behaviors during seven of the eight DRO-ESC sessions. Although the number of words written was more variable, Derek showed a steady improvement from no more than 50 words written during initial baseline sessions to greater than 100 words written during intervention sessions. This increase with DRO-ESC intervention was maintained although writing performance declined slightly at the end of the study.
For Adrian, on-task behavior increased and disruptive behavior was reduced with all three intervention sessions during the BEA relative to baseline. Because the average work completion was greatest relative to baseline during the DRO-TA, the DRO-TA intervention was selected as the intervention most likely to produce desirable changes for all three monitored behaviors over time. Similar results were obtained with the reintroduction of the DRO-TA after less desirable behavior levels obtained during a second baseline phase further suggested that this intervention was the most efficient and effective treatment condition for improving Adrian’s classroom performance over time.

Data obtained during the extended analysis with Adrian showed a slight differentiation for on-task and disruptive behavior between baseline and intervention conditions; however, Adrian’s overall disruptive behavior remained lower, and his overall on-task behavior remained greater, with intervention. No clear difference on work performance was obtained between the two conditions.

Student treatment acceptability was measured via the Children’s Intervention Rating Profile (CIRP; Witt & Martens, 1983). Heather, Derek, and Adrian each completed the CIRP anonymously and returned the instrument to one of the research assistants. The item and mean scores of the CIRP are presented in Table 4. Obtained scores for each item ranged from 0 to 5 with higher scores indicating greater acceptability (endorsements of items 1, 5, 6, and 7 were reversed when tabulating the total score to reflect the accurate direction of the children’s endorsements). Generally, students perceived the interventions as highly acceptable as indicated by a mean rating of 4.56 per item on a 5-point scale and the overall scores of 33, 31, and 32 out of a possible maximum score of 35.
Table 4

Frequency of Participants’ Ratings on Items from the Children’s Intervention Rating

Profile

<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Item Response Frequency</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The things used to deal with the problem were fair.</td>
<td>3 0 0 0 0 0</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>The teacher/parent was too harsh (means).</td>
<td>0 0 0 1 2</td>
<td>4.7</td>
</tr>
<tr>
<td>3</td>
<td>Things things used to deal with the problem might cause problems with my friends.</td>
<td>0 0 0 0 3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>There are better ways to handle this problem.</td>
<td>0 0 0 0 3</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>The things used would be good for other children.</td>
<td>2 0 1 0 0</td>
<td>4.3</td>
</tr>
<tr>
<td>6</td>
<td>I like the things used to handle this problem.</td>
<td>3 0 0 0 0</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>The things used for this problem would help other children do better in school.</td>
<td>1 0 0 1 0</td>
<td>3</td>
</tr>
</tbody>
</table>

Note. Ratings were provided based on the following scale: 1 = I agree very much; 2 = I sort of agree; 3 = I don’t agree or disagree; 4 = I sort of disagree; 5 = I disagree very much.

At the end of the extended analysis, the extent to which use of the interventions influenced the teacher’s acceptability of the process and interventions was assessed with the administration of the CIRP. The item and mean scores of the CIRP are presented in
Table 5. Teachers perceived interventions as highly acceptable as indicated by a mean rating of 5.15 per item on a 6-point scale.
<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Item Response Frequency</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This was an acceptable intervention for the child’s problem behavior.</td>
<td>0 0 0 0 0 2</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>Most teachers would find this intervention appropriate for behavior problems in addition to the one addressed.</td>
<td>0 0 0 1 0 1</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>The intervention was efficient and effective in changing the identified problem.</td>
<td>0 0 0 1 1 0</td>
<td>4.5</td>
</tr>
<tr>
<td>4</td>
<td>I would suggest the use of this intervention to other teachers.</td>
<td>0 0 0 1 0 1</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>The child’s behavior problem was severe enough to warrant use of this intervention.</td>
<td>0 0 0 0 0 2</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Most teachers would find this intervention suitable for the behavior problem addressed.</td>
<td>0 0 0 0 2 0</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>I would be willing to use this intervention in the classroom setting again.</td>
<td>0 0 0 0 1 1</td>
<td>5.5</td>
</tr>
<tr>
<td>8</td>
<td>The intervention did not result in negative side effects for the child.</td>
<td>1 1 0 0 0 0</td>
<td>5.5</td>
</tr>
<tr>
<td>9</td>
<td>The intervention would be appropriate for a variety of children.</td>
<td>0 0 0 0 1 1</td>
<td>5.5</td>
</tr>
<tr>
<td>10</td>
<td>This intervention is consistent with those I have used in the classroom settings.</td>
<td>0 0 0 0 1 1</td>
<td>5.5</td>
</tr>
<tr>
<td>11</td>
<td>This intervention was a fair way to handle the child’s problem behavior.</td>
<td>0 0 0 0 1 1</td>
<td>5.5</td>
</tr>
<tr>
<td>12</td>
<td>This intervention was reasonable for the behavior problem addressed.</td>
<td>0 0 0 0 0 2</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>I liked the procedures used in this intervention.</td>
<td>0 0 0 0 0 2</td>
<td>6</td>
</tr>
<tr>
<td>14</td>
<td>This intervention was a good way to handle the identified behavior problem.</td>
<td>0 0 0 0 2 0</td>
<td>5</td>
</tr>
</tbody>
</table>

*(table continues)*
<table>
<thead>
<tr>
<th>#</th>
<th>Item</th>
<th>Item Response Frequency</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>Overall, the intervention was beneficial for the child.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>The intervention quickly improved the child’s behavior.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>5.5</td>
</tr>
<tr>
<td>17</td>
<td>The intervention produced a lasting improvement in the child’s behavior.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>The intervention improved the behavior to the point that it did not noticeably deviate from other classmates’ behavior.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>Soon after using the intervention, a positive change in the problem behavior was noticed.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>20</td>
<td>The child’s behavior will remain at an improved level even after the intervention is continued.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>4.5</td>
</tr>
<tr>
<td>21</td>
<td>Using this intervention not only improved the child’s behavior in the classroom, but in other settings (e.g., other classrooms).</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>When comparing this child with a peer before and after use of the intervention, the child’s and peer’s behavior were more alike after using the intervention.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4.5</td>
</tr>
<tr>
<td>23</td>
<td>This intervention produced enough improvement in the child’s behavior so that the behavior no longer is a problem.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>Other behaviors related to the problem behavior are also likely to be improved by the intervention.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

*Note.* Ratings were provided based on the following scale: 1 = *strongly agree*; 2 = *disagree*; 3 = *slightly disagree*; 4 = *slightly disagree*; 5 = *agree*; 6 = *strongly agree.*
CHAPTER V
DISCUSSION

Using a multi-element brief experimental analysis the effects of teacher attention, peer attention, and escape from task demand were evaluated in order to identify the most efficient and effective intervention on on-task, disruptive, and work completion behaviors as compared relative to a baseline condition over time. The initial and extended analysis of alternative baseline conditions using a BAB design showed that there were individual differences in responses to the intervention for each student with each student responding to at least one intervention. Selected interventions decreased disruptive behavior and increased on-task and work completion for all three participants over time relative to baseline.

The results provide preliminary support for the utility of this procedure based on a BEA approach for selecting efficient and effective and positive interventions for students displaying disruptive behaviors in the regular education classroom. A unique feature of procedures used in this study extend prior FBA research (Day et al., 1994; Kearn et al., 2004; Meyer, 1999) by examining the differential effects of DRA interventions on classroom behaviors that positively addressed three common functions of behavior problems in a natural classroom setting. Similar to previous studies on the utility of BEA for identifying interventions to increase academic performance, different types of classroom behavioral interventions were identified as being efficient and effective for disruptive students. Differences in individual responses suggest differences in students’ needs that potentially correspond to differences in individual functions of disruptive
behavior. The extended analysis further confirmed positive results for the selection of positive behavior interventions for all three students over time. However, it is important to note that these intervention effects were found within well-managed classrooms. In order to rule out classwide problems, the classes were screened and the class as a whole was observed to be on task at least 80% or more of the time during the observation. Moreover, all teachers effectively managed to have students quickly complete transitions (moving from one activity to another) within 2 minutes during informal observations.

In addition to the examination of the effect of each experimental condition on classroom behavior to determine the condition that led to the most decrease in disruptive behavior, the enhancement and maintenance of adequate academic performance with each condition was considered. Although few FBA studies include academic performance as an intervention goal, this performance is the critical concern in education settings. Academic performance was enhanced for Heather and Derek with at least one intervention during the brief assessment relative to baseline. Adrian’s work completion, however, increased during the extended baseline even though the observed rate level was lower than rates observed with the intervention conditions. It is possible that the writing task was an intervention for Adrian that increased his writing due to consistent practice and feedback. This may also explain why work completion did not substantially decrease during the return to baseline during the extended analysis.

While results of this study suggested that the approach used in the study may be useful when the purpose of assessment is to generate treatments in the natural settings, it is important to note that this procedure as presented in this study did not confirm the maintaining functional relationship between the problem behavior and efficient and
effective reinforcer that occurred prior to intervention. During the process, a new contingent relationship may have been learned by the target student. Alternatively, a DRA intervention may be efficient and effective because the procedure provided a thicker reinforcement schedule for the alternative behavior than is present for the current response-reinforcer relationship for problem behavior in the classroom. However, immediately showing a direct relationship between a hypothesized reinforcer and desired responses (on-task and work completion) while reducing an undesirable response (disruption) in the classroom setting may be an appealing process to school personnel for several reasons. First, many school personnel are reluctant to conduct functional analysis in classrooms because these analyses explicitly set the occasion for high rates of problem behavior. These results suggest an alternative method that allows school personnel to apply trials of reinforcers for an alternative and more acceptable response to identify the reinforcer that must be manipulated in order to reduce problem behavior over time. Using this procedure, no functional assessment that explicitly sets the occasion for disruptive behaviors was applied.

Second, time constraints in training and conducting a functional analysis process are a logistical concern in the school setting that should be considered when investigating the treatment utility of FBA approaches (Shriver, Anderson, & Proctor, 2001). Analysis of literature on FBA shows that researchers have been primarily involved in the hypothesis testing phase of the FBA process that limits knowledge about the extent to which procedures can be feasibly and accurately used by teachers and other school personnel in classroom settings (Ervin et al., 2001; Hoff, Ervin, & Friman, 2005). In this study, the teachers were involved in the direct application of each treatment
assessment condition in the child’s natural classroom setting and were privy to data collected during each condition. Thus, the teachers were able to learn the procedures and directly observe and compare differences in the change in behavior from one intervention to another. All teachers spent time attending several brief training sessions to learn all three interventions. While each training session for teachers and peers required no more than 5 minutes, training had to be done before or after school to ensure that the teacher was able to supervise the classroom during regular class hours, and the peer able to participate in his or her classroom activities. Training the teacher and peer during regular classroom hours may detract from instruction time or may cause the peer to lose access to instruction during the time the research is conducted.

Conducting an analysis with teachers during a typical daily classroom activity within 15 minutes per session may be brief enough to make the utility of this type of analysis a reasonable process to conduct in a school setting. The teachers’ positive ratings on the acceptability of the intervention process suggested that they found the process to be useful, efficient, effective and reasonable. In fact, all teachers reported that they continued to effectively use the writing intervention with other students. Additionally, the students’ positive ratings of the intervention process suggested they found the process to be useful and fair as well. Given that time to conduct an FBA in prior studies has ranged from a week to 30 days (Quinn et al. 2001), and the current study was conducted in 10 school days with one session per day, this method may not be the most efficient and effective method but may be a reasonable option. Future research may compare strengths and limitations with various assessment method options that most efficiently and effectively lead to the development of efficient and effective
interventions. A potential practical advantage of this approach is that it is not necessary to remove the target student from his or her natural environment in order to conduct an analogue functional analysis. Given that there are few empirically based examples of the FBA process that have been conducted in a classroom setting, external validity of the approach was enhanced by conducting the assessment in the natural classroom context rather than a highly controlled condition in an analog setting. Due to the importance of academic performance in school settings, data were also collected not only on each student’s problem behavior during the class assignment but also on each student’s academic responding during a class assignment. Yet, conducting an analysis into the classroom settings makes it difficult to control for the presence of uncontrolled sources of reinforcement for aberrant behavior and for appropriate behavior that may explain behavior change in the brief analysis conditions. Future studies may focus on identifying the specific benefits and limitations of conducting an FBA in the natural environment.

Although the results provide preliminary support for the utility of this approach, a number of limitations are associated with this current method that should be considered in future studies. For example, the small sample of second grade-students with disruptive behavior during a writing assignment limit the generalizability of the presenting findings to other children with disruptive behaviors in other grades and subject areas. Moreover, evidence supporting the utility of BEA is limited to specific type and number of treatments applied in this study. Only three potential functions of disruptive and off-task classroom behavior were investigated. Results from the extended analysis showed that behaviors were responsive to at least one of the tested variables, but other variables that were not present in the analysis cannot be ruled out. Several studies have successfully
employed a multi-assessment method to identify additional idiosyncratic reinforce-
relations in the natural setting including teacher and student interviews, questionnaires,
and direct observations. Accurate selection of intervention for this type of assessment
needs to be further investigated when problem behaviors are influenced by multiple
maintaining variables and for students with both behavior problems and academic skill
deficits. In the current study, the best intervention was selected and administered during
the extended analysis, but more than one intervention resulted in a decrease in disruptive
behavior and an increase in work completion for all three participants.

According to Wacker, Berg, Harding, and Cooper-Brown (2004), treatment utility
of brief assessments is limited by the potential of false positives (i.e., select an inefficient
and effective treatment) and false negatives (i.e., eliminate a successful treatment).
Interpretation of change in behavior during single treatment sessions identifies an
efficient and effective intervention based on changes in the magnitude of a response
without consideration of changes in behavior trends over time. Prior research has shown
that target behaviors fluctuate substantially across sessions within any given test
condition. This limitation also applies to the decision-making process used in this study,
which may lead to an inaccurate selection of interventions that would be successful over
long period of time. Given this limitation, it is also important to note that performance
did not immediately reverse to initial performance when baseline was first administered.
The results suggested that the first sessions were more likely to result in false negatives
than the second session. One plausible explanation may be that the participants did not
come across the contingencies present in each condition for a sufficient amount of time
to influence behavior. Although verbal instructions were given prior to each condition in
attempt to make change in conditions salient to the student, the student may not have fully understood the change in applied consequences until experiencing at least one session with change. It is also important to note that performance reversed during the second baseline phase during the withdrawal, but behavior did not immediately reverse to initial performance during the first session. Thus, at least two sessions may be warranted to make accurate decision making about efficient and effective interventions. Unfortunately, two sessions makes the process more time consuming as compared to treatment session administered during the BEA to select academic interventions. Additional studies should focus on the number of sessions needed to adequately reduce false negative without an extensive number of sessions that would extend time.

The findings of this study are also to be interpreted with caution due to the several procedures used in this study. Although potential carry-over of treatment effects subsequent to administered conditions were minimized by alternating the order of conditions, an additional limitation of this study is that few alterations were used due to the small number of participants. Another limitation is that this study did not evaluate the difference in efficiency and effectiveness of the interventions that were not selected in the extended analysis relative to the selected intervention derived from the BEA. Although decreases in disruptive behavior was obtained over time with the selected treatment as predicted from the BEA results, it is not possible to know whether gains would have been greater with the other interventions based on these results.

Limitations notwithstanding, the use of this procedure used in the study showed individual differences in response to interventions with brief exposure to treatments that addresses different functions of behavior problems. This type of procedure is consistent
with the current reform agenda to include positive supportive practice for students with challenging problem behaviors. Overall, the findings of this study are encouraging, yet suggest the need for further research. The specific benefits and limitations of conducting this type of procedure in the classroom setting is still largely unknown and certainly more extensive follow-up studies are needed to assure that promising outcomes are maintained over time.
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Appendix A:

Informed Consent
INFORMED CONSENT

Tips on Interventions for Parents and Students

Introduction/Purpose: We are writing to request permission to include your child in a new study with Utah State University Psychology Department entitled, “Treatment Utility of Brief Application of Contingent Reversals Addressing Common Functions of Misbehavior to Increase Appropriate Classroom Behaviors”. The study will help to find simple and quick ways to help students with work completion problems in the classroom receive appropriate and customized intervention. This assessment will help teachers and school personnel determine what type of support best helps each child learn in the regular education classroom. Your child would be working with Jaclyn Knapp, a student working on a Masters degree in school psychology. Jaclyn will be working, under the supervision of Dr. Donna Gilbertson.

Procedures: If you agree to allow your child to participate, your child will be asked to complete several brief academic tasks along with his or her classmates. All tasks and procedures will be monitored by Jaclyn Knapp, a graduate researcher, and two graduate assistants. These tasks will be a basic writing, reading, or mathematics worksheets. Your child will complete these tasks in the regular education classroom with his or her classmates and will not be missing any classroom time. For children who may require additional academic support to stay on task or to complete tasks, then various simple strategies will be briefly tried out in the classroom to determine what works best for that child. This may include earned rewards or additional teacher or peer praise and instructional support that will be given in the classroom. Once we have identified the teaching strategy that shows the greatest improvement, we will continue to use and evaluate the efficient and effectiveness of the strategy work for about four weeks. In addition, we would like you to tell us a little bit about your child by filling out a brief survey.

Risks: We do not anticipate serious risks associated with the procedures being used in this study. If any unforeseen risks are identified, we will immediately notify you of these.

Benefits: We hope to be able to obtain important information about how to best help children struggling with problems remaining on task to complete tasks in the classroom. In addition, we hope to provide the schools with a better and easier method to develop interventions that will help children using a positive approach that can be used in children’s everyday classroom routine.

Confidentiality: We will also keep the results of your child behavioral and academic assessments and the information on the survey you return confidential. We will keep the results of your child’s behavioral and academic assessments confidential. You and your child’s identity will remain confidential at all times. During the meetings, participants will be informed of confidentiality procedures and will be asked to verbally agree, in the group setting, to maintain confidentiality of participants’ identities as well as the content of the group discussion. In addition, your child will be asked to “sign in” before each session at which time confidentiality will be reviewed with him/her.
INFORMED CONSENT

Tips on Interventions for Parents and Students

Any documentation that is produced and collected in this study will be stored in a locked filing cabinet during the study and for one year after the study is published, or five years after the termination of data collection, whichever span of time is greater.

We are planning to present the results of this study at professional conferences and have the study published in a peer reviewed journal. In addition, data will be informally presented to the teachers who participated in the study, and school administration. Subjects may obtain a copy of the findings of the study if they so desire. If you have questions about study outcomes or wish to obtain a copy of study findings please contact us by phone or email through Jaclyn Knapp (801) 643-5225 or jknapp@dsdmall.net.

Voluntary Participation and Right to Withdraw: Your participation in this study is completely voluntary. You can withdraw your participation at any time without consequence or loss. You have the right to ask questions at any time. If you have any questions or concerns about participation in this study, you may contact USU IRB at (435) 797-1821 or by email at true.rubal@usu.edu. You may also contact the Davis County School District’s IRB through the Research and Assessment Department at (801) 402-5305.

USU IRB Approval: This study has been approved by the USU Institutional Review Board and the Davis School District Research and Assessment Department. If you have any questions or concerns about your rights this study, you may contact the USU IRB at (435) 797-1821 or by email at true.rubal@usu.edu. You may also contact the Davis County School District’s IRB through the Research and Assessment Department at (801) 402-5305.

Copy of Consent: This package contains two copies of this Informed Consent Form. Please check if you would like your child to participate, sign both and retain one copy for your files. Please have your child return one signed copy with the survey you choose to complete in the attached envelope.
**Researcher's Statement:** “I certify that the research study has been explained by me or my research staff, and that the parent/guardian understand the nature and purpose, possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

<table>
<thead>
<tr>
<th>Donna Gilbertson, Ph.D.</th>
<th>Jaclyn King Knapp, B.S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Investigator</td>
<td>Graduate Researcher</td>
</tr>
<tr>
<td>(435) 797-2034</td>
<td>(801) 643-5225</td>
</tr>
</tbody>
</table>
INFORMED CONSENT

Tips on Interventions for Parents and Students

Please check one and sign if agreeing to participate:

____ YES, I am willing to have my child participate in this study.

____ NO, I do NOT want to participate in this study and I do not want my child to participate.

Signature of Parent/Guardian___________________________________ Date_____________

Printed Name of Parent / Guardian _________________________________
Printed Name of Child__________________________________________

Youth Assent: I understand that my parent(s) know about this support I will receive to help me follow class rules and complete work and that they have given permission for me to participate. I understand that it is my decision if I want to be in this study. If I do not want to be part of this support or if I change my mind later and want to stop, no one will be upset. I can ask any questions anytime about this study now or later. By signing below, I agree to participate.

Student’s Signature: ________________________________ Date______________
Appendix B:

Peer Informed Consent
INFORMED CONSENT

Tips on Interventions for Parents and Students

Introduction/Purpose: We are writing to request permission to include your child in a new study with Utah State University Psychology Department that will help to find simple and quick ways to help students with work completion problems in the classroom receive appropriate and customized intervention. This assessment will help teachers and school personnel determine what type of support best helps each child learn in the regular education classroom. Your child would be working with Jaclyn Knapp, a student working on a Masters degree in school psychology. Jaclyn will be working, under the supervision of Dr. Donna Gilbertson.

Procedures: If you agree to allow your child to participate, your child will be asked to help the teacher coach or praise other students who complete a working goal doing a 15 minute work time in the classroom. Your child and several other classmates will be asked if they would be willing to provide this type of support for about 2 weeks.

Risks/Benefits: We do not anticipate serious risks associated with the procedures being used in this study. If any unforeseen risks are identified, we will immediately notify you of these. We hope to be able to obtain important information about how to best help children struggling with work completion in the classroom. In addition, we hope to provide the schools with a better and easier method to develop interventions that can be used in children’s everyday classroom routine.

Confidentiality: We will also keep the results of your child behavioral and academic assessments and the information on the survey you return confidential. We will keep the results of your child’s behavioral and academic assessments confidential. You and your child’s identity will remain confidential at all times. During the meetings, participants will be informed of confidentiality procedures and will be asked to verbally agree, in the group setting, to maintain confidentiality of participants’ identities as well as the content of the group discussion. In addition, your child will be asked to “sign in” before each session at which time confidentiality will be reviewed with him/her. Any documentation that is produced and collected in this study will be stored in a locked filing cabinet during the study and for one year after the study is published, or five years after the termination of data collection, whichever span of time is greater.

We are planning to present the results of this study at professional conferences and have the study published in a peer reviewed journal. In addition, data will be informally presented to the teachers who participated in the study, and school administration. Subjects may obtain a copy of the findings of the study if they so desire. If you have questions about study outcomes or wish to obtain a copy of study findings please contact us by phone or email through Jaclyn Knapp (801) 643-5225 or jknapp@dsdmal.net.
INFORMED CONSENT

Tips on Interventions for Parents and Students

ttrue.rubal@usu.edu. You may also contact the Davis County School District’s IRB through the Research and Assessment Department at (801) 402-5305.

**Copy of Consent:** This package contains two copies of this Informed Consent Form. Please check if you would like your child to participate, sign both and retain one copy for your files. Please have your child return one signed copy with the survey you choose to complete in the attached envelope.

**Researcher’s Statement:** “I certify that the research study has been explained by me or my research staff, and that the parent/guardian understand the nature and purpose, possible risks and benefits associated with taking part in this research study. Any questions that have been raised have been answered.”

__________________________________________
Donna Gilbertson, Ph.D. Jaclyn King Knapp, B.S
Principal Investigator Graduate Researcher
(435) 797-2034 (801) 643-5225

Please check one and sign if agreeing to participate:

_____ YES, I am willing to have my child participate in this study.

_____ NO, I do NOT want to participate in this study and I do not want my child to participate.

Signature of Parent/Guardian________________________________ Date_________________________

Printed Name of Parent / Guardian _________________________________________________

Printed Name of Child______________________________________________________________
INFORMED CONSENT

**TiPS**

Tips on Interventions for Parents and Students

**Youth Assent:** I understand that my parent(s) know about this study where I will be asked to help the teacher coach or praise other students who complete a working goal doing a 15 minute work time in the classroom for the next two weeks. I understand that it is my decision if I want to do this. If I do not want to be part of this or if I change my mind later and want to stop, no one will be upset. I can ask any questions anytime about this study now or later. By signing below, I agree to participate.

Student’s Signature: ____________________________ Date _____________
Appendix C:

Parent Packet
Parent Information

1) Your gender (Check one):     _______ male     _______ female

2) Relationship to child (Check one):

     _____ biological parent     _____ adoptive parent     _____ legal guardian
     _____ other ________________

3) Highest level of education completed (Check one):

     _____ did not complete high school
     _____ completed high school
     _____ completed some college
     _____ completed college degree
     _____ completed graduate/postgraduate education

Child Information

1) Child’s age: _____ Birth date: ______________

2) Child’s grade level: _____

3) Child’s gender (Check one): _____ male     _____ female

4) Child’s ethnicity (Check one):

     _____ Latino/a     _____ African American     _____ Caucasian
     _____ Asian     _____ Native American     _____ Other
     ________________

5) Has your child ever been diagnosed with any psychological, learning and/or behavioral disorders?

     _____ no     _____ yes (Please specify which ones:_______________________________)
Appendix D:

Example Writing Worksheet
Sometimes I think my friend has superpowers. Every time he is around….
Appendix E:

Teacher Scripted Instructions for Writing Probe Administration
(10 minutes)

1. Pass out papers face-down, instructing students not to turn them over until you tell them to do so.

2. “Please write your first and last name on the back of your paper. Please write your teacher’s name next to your name.” Pause briefly to allow students to write their names.

3. “This is a writing assignment. Turn your papers over and you will see a sentence at the top of the page. You will be writing a story using this sentence.

4. Read the sentence on the worksheet. “You will have one minute to think about what you would like to write. Do not begin writing until I say begin. Are there any questions?”

5. Set timer for one minute. “This is your one minute think time.” Begin timer.

6. Wait one minute. Set timer for ten minutes.


8. “Stop. Raise your papers and put your pencils down.”

9. Collect papers and give to service provider/consultant.
Appendix F:

Descriptive Functional Assessment Tracking Sheet
Part I: Completed Observation sheets DUE: ______________________

To complete the chart:

Turn on recorder. Listen for audio signal on tape “Ready begin”. Observe the child for 10 seconds.

Listen to audio signal “Record 1” on tape. Mark the appropriate codes in BOX 1 if you see any of the four behaviors occurring at any time during that 10 seconds:

- **Dis** = disruptive behavior such as talking-out to peers and teacher without teacher permission, using profanity or sexually-related language, leaving their desk during instruction, making distracting facial expressions or obscene hand gestures to others in the classroom, and making repeated audible noises with tangible items (e.g., tapping pencil or paper clip repetitiously on desk).

- **PA** = peer attention or interaction such as talking with, playing with, bothering, getting peers to laugh, signal to each other

- **TA** = teacher attention could be positive (help, praise, touch, prompt) or negative (reprimand, name on board, moving away from peers)

- **Off task or On-task** = off-task behavior will include talking, fidgeting with materials, incomplete work or incorrect work at 79% or less, being out of seat, staring out the window, and reading unassigned instructional material; therefore, on-task is defined as a student looking at or completing the assigned task with 80% or better accuracy, working quietly, and seated during the entire five-second interval.

    d) observe the child for another 10 seconds and record any of the 4 behaviors in BOX 2 if they are observed during the 10 second interval.

    e) Complete each BOX in the manner using 10 second intervals.
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**IMPORTANT:** Collect the any work produced by the child and record work completed. 

_________ correct and ___________ errors or _________ words written
Appendix G:

Writing Probe Administration Procedural Integrity
Date: ________   Student: _________   Teacher: ___________   Observer: _____________

_____ Passed out papers face-down, instructing students not to turn them over until teacher told them to do so.

_____ Teacher instructed students to write their first and last name on the back of their paper and then briefly passed to allow students time to complete the instruction.

_____ Teacher instructs the children that they will be writing a story using the sentence at the top of the page.

_____ Teacher reads the sentence at the top of the worksheet and tells them that they will have one minute to think about the sentence.

_____ Teacher asks if they have questions.

_____ Teacher instructs tells them that they have one minute to think and begins the timer.

_____ Teacher waits one minute .

_____ Teacher sets the time for ten minutes, and say “Begin.”

_____ Teacher waits three minutes and then instructs the students to put their pencils down and raise their papers.

_____ Papers are collected and given to the observer.

Steps completed/Steps possible ______ ______ ______ ______ ______ ______ ______

Percent of steps completed. ______ ______ ______ ______ ______ ______ ______
Appendix H:

Teacher Attention Intervention Integrity Script
The graduate researcher asks the teacher to clip the Motiveaider® on to his/her waist just under the shirt.

The graduate researcher explains to the teacher that after she begins the ten minute timing, she will stand within in two foot proximity from the target student and touch him/her on the shoulder and tell him/her that she appreciates it when he/she does his/her best writing.

Next, teacher will start the Motiveaider® which is set for 2 minutes.

Once the Motiveaider® vibrates, the teacher will either reinforce the student with praise for working hard if he/she is on-task or ignore the student if he/she is not on task.

Once the timing is complete, the teacher removes the Motiveaider® outside of the classroom and gives it to the graduate researcher.

Steps completed/Steps possible

Percent of steps completed.
Appendix I:

Teacher Attention Intervention Integrity
___ Passed out papers face-down, instructing students not to turn them over until teacher told them to do so.

___ Teacher instructed students to write their first and last name on the back of their paper and then briefly passed to allow students time to complete the instruction.

___ Teacher instructs the children that they will be completing a writing worksheet.

___ Teacher informs them that she will read the writing prompt and then they will have one minute to think.

___ Teacher informs them that when she says “START” they are to turn the paper over and begin writing.

___ Teacher asks if they have questions.

___ Teacher sets timer for one minute, says “READY, THINK,” and begins timing.

___ Teacher sets the timer for ten minutes, says “START” and begins timing.

___ Teacher approaches the target student, stands in two foot proximity, touches, him/her on the shoulder and tells him/her that she appreciates it when he/she does their best writing.

___ Teacher starts the concealed Motiveaider® (set for 2 minutes) and reinforces the student with praise (standing in a two foot proximity) if he/she is on-task when the pager vibrates. If the student is not on-task when the pager vibrates, the teacher ignores the student.

___ When the time rings, teacher says, “STOP. Raise your papers and put your pencils down.”

___ Papers are collected and given to the observer.

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<table>
<thead>
<tr>
<th>Steps completed</th>
<th>Steps possible</th>
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Percent of steps completed.
Appendix J:

Peer Attention Intervention Integrity Script
The graduate researcher explains to the peer that their participation in the study is completely voluntary, and that he/she can withdraw at any point. The researcher also explains that the study is confidential, and what that means.

He/she is then asked to “sign in” and sign that they will keep the information confidential.

The graduate researcher asks the peer to clip the Motiveaider® on to his/her waist just under the shirt.

The graduate researcher explains to the peer that after the teacher tells the class to “START WRITING” he/she will get the target students attention, and tell him/her that he/she is impressed when the student does his/her best writing.

Next, peer will start the Motiveaider® which is set for 2 minutes.

Once the Motiveaider® vibrates, the peer will either reinforce the student with praise for working hard if he/she is on-task or ignore the student if he/she is not on task.

Once the timing is complete, the peer removes the Motiveaider® outside of the classroom and gives it to the graduate researcher.

The peer then “checks out” by reporting to the graduate researcher how things went. The peer is praised for his or her efforts and reminded that the study is “confidential.”
Appendix K:

Peer Attention Intervention Integrity
Passed out papers face-down, instructing students not to turn them over until teacher told them to do so.

Teacher instructed students to write their first and last name on the back of their paper and then briefly passed to allow students time to complete the instruction.

Teacher instructs the children that they will be completing a writing worksheet.

Teacher informs them that she will read the writing prompt and then they will have one minute to think.

Teacher informs them that when she says “START” they are to turn the paper over and begin writing.

Teacher asks if they have questions.

Teacher sets timer for one minute, says “READY, THINK”, and begins timing.

Teacher sets the timer for ten minutes, says “START” and begins timing.

The peer leans over to the target student (within two feet) and offers the target student admiration for being able to write/do so much during writing time.

The peer starts the concealed Motiveaider® (set for 2 minutes) and reinforces the student with praise for working so hard if he/she is on-task when the pager vibrates. If the student is not on-task when the pager vibrates, the peer ignores the student.

When the time rings, teacher says, “STOP. Raise your papers and put your pencils down”.

Papers are collected and given to the observer.
Appendix L:

Escape Intervention Integrity Script
In the hallway, just before the timing, the graduate researcher explains to the student that his/her participation in the study is completely voluntary, and that he/she can withdraw at any point. The researcher also explains that the study is confidential, and what that means.

The graduate researcher then introduces the dots to the target student and informs him/her that the dots can be earned and used to cover up problems on the assignment.

The graduate researcher then presents an assignment (approved by the teacher) and shows the student how he/she can use the dots.

The student is informed that he/she can earn a dot by beating his/her score, or writing more words than he/she did the previous session. The student is also informed that he/she can earn another dot for neat, legible handwriting.

The student is then sent back to the classroom to do the writing timing with his/her class.

Once the timing is complete, the student returns to the hall where his/her words per minute are tabulated, and the neatness / legibility of the writing is assessed.

The student is then given the earned dots and sent back to class.

The graduate researcher checks back with the teacher before the next session to ensure the dots were used.

Steps completed/Steps possible

Percent of steps completed.
Appendix M:

Escape Intervention Integrity
Date:_______  Student:_______   Teacher:_______   Observer:_______

_____ Passed out papers face-down, instructing students not to turn them over until teacher told them to do so.

_____ Teacher instructed students to write their first and last name on the back of their paper and then briefly passed to allow students time to complete the instruction.

_____ Teacher instructs the children that they will be completing a writing worksheet.

_____ Teacher informs them that she will read the writing prompt and then they will have one minute to think.

_____ Teacher informs them that when she says “START” they are to turn the paper over and begin writing.

_____ Teacher asks if they have questions.

_____ Teacher sets timer for one minute, says “READY, THINK”, and begins timing.

_____ Teacher sets the timer for ten minutes, says “START” and begins timing.

_____ When the time rings, teacher says, “STOP. Raise your papers and put your pencils down”.

_____ Papers are collected and given to the observer.

_____ The target student is taken out into the hall where the graduate researcher counts the number of words written, and evaluates the handwriting. If the student has beaten his/her words written, and if his/her handwriting is neat an legible, he/she earns a dot(s) for meeting the criteria.

_____ The teacher keeps track of dots used and reports back to the graduate researchers.

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Steps completed/Steps possible

---

Percent of steps completed.