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Analog Functional Assessment in General Education Settings.

James Alfred Levelle
Louisiana State University and Agricultural & Mechanical College

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ANALOG FUNCTIONAL ASSESSMENT IN GENERAL EDUCATION SETTINGS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agriculture and Mechanical College
in partial fulfillment of the
requirements for the Degree of
Doctor of Philosophy

in

The Department of Psychology

by
James A. LeVelle
B.A., University of North Texas, 1981
M.A., University of North Texas, 1984
M.A., Louisiana State University, 1995
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ABSTRACT

Persistent disruptive behaviors in school classrooms often result in referrals for behavior intervention services. Although research has supported several intervention strategies, limited research has focused on linking assessment to the selection of specific strategies. Experimental analysis procedures for assessing the function of behavior have been successful in the selection of specific strategies with developmentally disabled students and in special education environments. However, research in general education settings has been sparse.

In this study, an analog functional assessment approach utilizing experimental analysis procedures was conducted to assess the function of off-task behaviors in regular education settings. Conditions were established in each student's classroom to assess three variables often identified in relation to classroom disruptive behaviors; (a) peer attention; (b) teacher attention; and (c) task difficulty. A multielement design was employed whereby each variable was analyzed in two phases. First, an assessment phase examined the effects of peer and teacher attention delivered contingent upon the occurrence of off-task behaviors and the effects of presenting difficult math tasks with no attention available. Next, a treatment validation phase reversed the assessment conditions by delivering peer and teacher attention contingent upon on-task behaviors and presenting "easy tasks" with no attention available. The students' teachers conducted all sessions in the students' classroom.

Findings indicated that experimental analyses differentiated variables associated with off-task behavior with each of the five subjects. Elevated rates of off-task behavior
were observed in association with difficult tasks for three of the students, with peer attention for one student, and with both difficult tasks and peer attention for another student. However, treatment validations for the identified variables were successful in reducing off-task behaviors with only four of the five students. With each student, teachers were able to implement experimental analysis procedures with high levels of integrity. Additionally, teacher acceptability ratings supported the use of the assessment procedures. Overall, these findings support the efficacy of using brief experimental analyses, implemented by teachers in the classroom, to assess the function of elementary students' disruptive classroom behaviors.
CHAPTER 1

INTRODUCTION

Literature supporting the use of behavioral interventions to reduce disruptive classroom behaviors has been extensive, however, procedures for linking behavioral assessment to the selection of effective treatment strategies have received much less attention. Increasingly, the literature has supported the use of functional assessment procedures for linking specific environmental events to the selection of effective treatment strategies (Dunlap, Kern-Dunlap, Clarke, & Robbin, 1991; Kern, Dunlap, Clarke & Falk, 1994; Taylor & Romanczyk, 1994; Umbreit, 1995). These findings, along with recent revisions in the Individuals with Disabilities in Education Act (IDEA) mandating functional behavior assessments in certain cases, have led to increased interest in functional assessment.

Functional assessment is a general term encompassing various procedures for identifying specific antecedent and consequent events which are directly related to target behaviors (Broussard & Northup, 1995; Horner, 1994). Historically, the majority of the research in functional assessment has been conducted with individuals with developmental disabilities. Over the past fifteen years, much of this research has focused on the use of experimental (functional) analysis procedures to test hypotheses concerning the function of behavior. Functional analysis is a specific type of functional assessment involving the systematic manipulation of environmental events to experimentally evaluate hypothesized relationships (Broussard & Northup, 1995; Horner, 1994; Iwata, Vollmer, & Zarcone, 1990).
Functional analysis has been successfully applied to treat a variety of aberrant behaviors such as self-injurious behavior (Day, Rea, Schussler, Larsen, & Johnson, 1988; Iwata, Dorsey, Slifer, Bauman, & Richman (1982,1994); Iwata, Pace, Cowdry, Kalsher, & Cataldo, 1990; stereotypy (Mace, Browder, & Lyn, 1987), disruptive behaviors (Carr & Durand, 1985), aggressive behaviors (Mace, Page, Ivancic, & O'Brien, 1986), pica (Mace & Knight, 1986), and obscene language (Pace, Ivancic & Jefferson, 1994). Successful treatment strategies directly linked to identifying the function of a behavior through experimental analysis have included techniques such as withholding or decreasing positive reinforcement (Mace, et al., 1986; Mazeleski, et al., 1993;), time out (Mason & Iwata, 1990), differential reinforcement of other behavior (Steege et al., 1989), reduction of aversive stimulation (Horner, 1980; Weeks & Gaylord-Ross, 1981), escape extinction (Iwata et al., 1990), environmental enrichment (Horner, 1980), and providing functionally equivalent alternatives to target behaviors (Carr & Durand, 1985; Favell, McGimsey & Schnell, 1982).

The majority of research supporting the use of functional analysis in the selection of treatment strategies has been conducted with individuals with developmental disabilities. Applications of this technology with other populations have been relatively recent and less abundant. Regardless, the limited research in school and outpatient settings with children of average or above intelligence suggests that functional analysis can be an effective assessment tool with these populations as well. (Broussard & Northup, 1995; Cooper, Wacker, Sasso, Reimers, & Donn, 1990; Taylor and
Romanczyk, 1994). It is suggested, however, that further investigations with children of normal intelligence are needed (Lewis & Sugai, 1996).

The study described in this paper will extend the current research literature by examining the efficacy of using brief experimental analyses, implemented by the teacher in the classroom, to assess the function of elementary students' disruptive classroom behaviors. Hypotheses tested in the analysis will be based on common variables identified in the literature.

Research supporting the application of this approach is primarily found in the literature concerning functional analysis. A review of the literature will be divided into three sections. First, the essential elements defining functional analysis will be discussed. Second, research in functional analysis will be discussed, progressing from early landmark research to recent applications in school settings. Finally, the purpose of this study will be discussed within the context of the current literature.
CHAPTER 2

REVIEW OF THE LITERATURE

Functional Analysis

Definition and Purpose

Over the past 15 years, research in functional analysis has had a considerable impact on the field of behavior analysis. Holburn (1998) suggested that functional analysis (FA) is perhaps the greatest technological advancement in applied behavior analysis, or at least the most popular. It appears to have some advantages over other approaches because it is objective, clearly demonstrates the relationship between specific stimuli and targeted behaviors, provides a high degree of quantitative precision, and may lead to less punitive approaches (Iwata, Vollmer, and Zarcone, 1990). Evidence has also suggested that it can avoid repeated implementation of unsuccessful strategies (Iwata, et al., 1994, 1982).

Iwata, Vollmer, and Zarcone (1990) defined the presence of two variations of functional analysis. The first involves identifying a single variable based on reports and observations and testing to determine if a functional relationship exists between that variable and a specified behavior. This method for determining behavioral function has appeared in the literature for many decades although it is seldom referred to as functional analysis. The advent of experimental (functional) analysis allowed behavior analysts to discover the conditions under which behaviors occur (e.g., Hawkins, Peterson, Schweid, & Bijou, 1966). For example, Lovaas and Simmons (1969) hypothesized that social attention may be affecting a subject's rate of self-injurious behavior (SIB). Conditions
involving social deprivation, social satiation, and contingent social attention were compared and results suggested that self-injury may function to gain social attention. Carr, Newsom, and Binkoff (1976, 1980) also examined a single variable associated with subjects who exhibit aggressive and self-injurious behaviors. In this study escape was tested by comparing rates of aberrant behavior in demand versus no demand conditions. Results indicated that these behaviors served to access escape from a demand situation.

A second variation of functional analysis is characterized by less reliance on hypotheses derived from reports and observations and greater emphasis is placed on experimentally testing hypotheses concerning the function of challenging behaviors. This approach accounts for the bulk of the research termed functional analysis and predominates the following review of functional analysis.

**Research in Functional Analysis**

Functional analysis procedures evolved from research in developmental disabilities that sought to understand the environmental factors controlling behavior. In 1977, Carr conducted a study examining the effects of multiple environmental variables on high rates of self-injurious behaviors exhibited by severely handicapped participants. In this study, experimenters analyzed the effects of positive reinforcement, negative reinforcement, and automatic reinforcement on rates of self-injurious behavior and found differentiation based on the conditions employed. Iwata, et al. (1994, 1982) extended and refined Carr's findings by systematically conducting experimental analyses to assess the function of self-injurious behavior by utilizing four experimental conditions: positive reinforcement.
(attention contingent on SIB), negative reinforcement (escape from demands contingent on SIB), automatic reinforcement (no attention or toys), and a control condition (no attention, no demands, and the presence of play materials). In six of the nine subjects, self-injury was consistently associated with a specific stimulus condition suggesting that variability in behavior was a function of the stimuli presented. This research became a major breakthrough because of its ability to apply practical assessment procedures based on past empirical findings (Carr, 1994).

Carr and Durand (1985) advanced the scope of FA procedures by applying this technology with contingent stimuli and antecedent events. Experimenters manipulated contingent social attention from adults and task difficulty to determine effects on aberrant behaviors such as aggression, tantrums, and self-injury. Findings supported the efficacy of the procedures implemented in differentiating specific variables relevant to the function of the aberrant behaviors.

Expanding the applications of FA procedures into new settings, Repp, Felce, and Barton (1988) conducted a study in a classroom setting with three severely handicapped special education students who exhibited high rates of stereotypic and self-injurious behaviors. An experimental analysis was employed to test three hypotheses; self-stimulation, positive reinforcement, and negative reinforcement. First data were collected in two classrooms for each subject and a hypothesis was selected concerning the students' motivation. Next, a treatment based on the hypothesis was used in one classroom and a treatment based on another hypothesis was used in the second classroom. Finally, the
treatment that was most successful was implemented in both classrooms. Results of the analysis demonstrated the success of basing treatments on a functional analysis of behavior within its environmental context.

Application of functional analysis procedures continued to be broadened when Wacker, Wiggins, Fowler, and Berg (1988) demonstrated its utilization in developing skill acquisition programs. In this study, the goal was to train students with severe handicaps to make requests via microswitches. Researchers found that using information based on a functional analysis (i.e., identifying reinforcers and other relevant conditions) gives the clinician a major advantage in developing effective training procedures (Wacker, Wiggins, Fowler, & Berg, 1988).

Adding to the practical application of functional analysis, Northup, et al. (1991) implemented a brief functional analysis with severely handicapped individuals in an outclinic setting. Using experimental procedures over a 90-minute period, researchers successfully identified maintaining variables for aggressive behavior and an alternate response for the three subjects. Results indicated that each participant displayed a substantial reduction in aggressive behavior and a substantial increase in alternate behavior, thus providing a direct analysis of the equivalency of the contingency for maintaining either behavior.

By 1994, research involving functional analysis was extensive. Iwata, et al. (1994) completed a comprehensive review of 152 single case studies conducted over the past eleven years. Results indicated that the detection of differential responding was observed
in 95.4% of the cases and only 4.6% were undifferentiated. Overall, the authors concluded that functional analysis methodologies are highly effective in identifying environmental stimuli relevant to treatment selection for self-injurious behavior.

The application of functional analysis in populations other than the developmentally disabled began over a decade ago. For example, Cooper, Wacker, Sasso, Reimers, and Donn (1990) implemented functional analysis procedures with children of average intellectual ability in an outpatient setting. Experimenters conducted a brief, 90-minute, functional analysis of aberrant behavior. Variables hypothesized to have a functional relationship to the aberrant behaviors such as task difficulty and adult attention were experimentally manipulated. Results indicated that targeted behaviors varied as the level of attention and academic demands varied. This model for applying experimental analysis was described as time efficient and the intervention plans developed from the analyses were rated as acceptable by the participants' parents.

In a study linking severe disruptive behaviors to specific curriculum in the school, Dunlap, et al., (1991) provided further support for using hypothesis-driven interventions and examination of the context in which behavior is displayed. In this study, assessment focused on the function of inappropriate vocalizations exhibited by a 12-year-old who was described by respondents as having psychotic and delusional speech. Four hypotheses related to curriculum were tested including (a) participation in fine vs. gross motor activities, (b) short vs. long tasks, (c) functional vs. analogue tasks, and (d) choice vs. no choice of activities. Researchers were able to revise curriculum elements incorporating
information from the experimental analysis, which resulted in the elimination of disruptive behaviors, a reduction in inappropriate vocalizations, and an increase in social interactions. Mace and Lalli (1991) also applied functional analysis procedures to address inappropriate vocalizations. A descriptive assessment was conducted and two hypotheses were derived: (a) attention following bizarre speech and (b) escape following task demands. FA was able to differentiate the two conditions implicating positive reinforcement (attention) as a function of bizarre speech.

Cooper, et al. (1992) conducted two studies with 10 children comparing the results of a brief functional analysis conducted in an outpatient clinic to extended functional assessment in the classroom using similar methods. Interestingly, parents were able to implement the assessments with adequate integrity. They tested the effects of task preference, task demands, and adult attention on child behavior. Three children demonstrated improved behaviors by reducing task demands, one child improved with a preferred task, four children improved with changes in adult attention, and with two children, results were mixed, with no distinguishable pattern of performance. Results demonstrated that brief functional analyses conducted in analogue settings in an outpatient clinic can be effective in identifying effective treatment strategies for classroom behaviors and, in this case, was comparable to extended classroom assessments.

In another study conducted in school settings with two autistic students, descriptive and experimental analyses were conducted (Sasso, Reimers, Cooper, Wacker, Berg, Steege, Kelly, and Allaire, 1992). In this research, investigators conducted
functional analyses and then taught teachers to conduct a descriptive analysis and a classroom experimental analysis. Comparisons of the assessment procedures showed that each procedure identified negative reinforcement as a maintaining variable for aberrant behavior. Interventions based on this hypothesis were successfully implemented suggesting the applicability and utility of implementing functional analyses in school settings.

Kern, et al. (1994) conducted a descriptive assessment to develop hypotheses concerning the behavior of a bright, communicative elementary student described as having emotional and behavioral challenges. Five hypotheses were produced concerning variables maintaining aberrant behavior. Each of these hypotheses was then experimentally tested in the classroom and the results supported the each of the hypotheses. Finally, assessment-based interventions were developed and successfully implemented across three classroom environments; English, Spelling and Math classes.

In a larger study incorporating brief FA procedures, Taylor and Romanczyk (1994) reported the successful identification of variables associated with disruptive behaviors in the classroom in 14 of 15 students assessed. Harding, Wacker, Cooper, Millard, & Jensen-Kovalan (1994) also conducted a brief functional analysis, but in their study parents conducted the assessments in an outpatient clinic by using a prescribed hierarchy of antecedent and consequence treatment components for their children's problem
behavior. Selected treatment components resulted in achieving experimental control with six of seven children participating.

Combining functional analysis with curriculum-based assessment, Umbreit (1995) successfully selected an effective intervention for a third grader diagnosed with Attention Deficit Hyperactivity Disorder who attended an inclusive regular education class. Assessment and intervention involved three phases; (a) a brief functional analysis in an analogue setting, (b) a curriculum-based assessment, and (c) intervention. The analog assessment indicated that the subject's disruptive behaviors were maintained by escape from task. The curriculum-based assessment involving descriptive and experimental procedures suggested that social attention might also play a role. An intervention was developed combining these findings and resulted in the virtual elimination of all disruptive behaviors. One drawback, however, is that it is not known if one or both of the procedures resulted in the positive outcome.

Broussard and Northup (1995) also extended functional assessment and analysis procedures to the regular education classroom to assess students who may be at risk for more restrictive placement. Participants in the study included three elementary students within the average range of intellectual ability who exhibited disruptive behaviors such as aggression, property destruction, and noncompliance. Similar to procedures described by Cooper, et al. (1992), researchers followed an assessment sequence in which descriptive assessments are completed, hypotheses are formulated, and a brief functional analysis used to confirm the hypothesis. Hypotheses to be tested were selected among one of three
variables that have been well-established in the literature as pertinent to the population targeted: teacher attention, peer attention, and escape from academic demands. The level of teacher attention compared conditions involving contingent teacher attention in the form of disapproving statements to noncontingent teacher attention (approving comments or praise) delivered once per minute. The peer attention condition compared conditions in which no peers were present to conditions in which two peers were present to provide attention, and escape contrasted conditions with nonpreferred and preferred. In the teacher attention condition, whenever the participant displayed a target behavior the therapist made a disapproving statement.

A different hypothesis was selected for each subject based on the descriptive assessment and a brief functional analysis confirmed the selected hypothesis. Contingency reversals resulted in an increase in academic performance and near zero levels of disruptive behavior for all three students. The results demonstrated that a controlled functional analysis can be conducted in a regular education setting and that functional analysis may be feasible tool in developing prereferral interventions. However, one limitation of this study is that functional analysis of only a single variable does not preclude the possibility of multiple reinforcers for the same target behavior.

Lewis and Sugai (1996) provided additional evidence for the efficacy of applying FA procedures in regular education classrooms. First, researchers conducted a descriptive assessment leading to two hypotheses concerning the function of the disruptive behaviors exhibited by a non-disabled elementary student in a regular education program. The two
hypotheses, teacher attention and peer attention, were then tested by conducting a functional analysis in the classroom. Interventions developed, based on this assessment, were successful in significantly reducing disruptive behavior.

In summary, the literature strongly supports the efficacy of FA procedures for identifying environmental events relevant to the function of a behavior and for using this information as a basis for treatment choices. The research has also suggested that manipulation of environmental events to test hypotheses can take place in a variety of settings including both analogue and naturalistic settings. In each case, behavior functions to obtain one or more of the following: (a) positive reinforcement, (b) negative reinforcement, and (c) automatic reinforcement.

In regular education settings, analyses suggest that disruptive classroom behaviors commonly serve to gain teacher attention (Umbreit, 1996, Broussard & Northup, 1995), peer attention (Broussard & Northup, 1995; Umbreit, 1996), and/or escape from tasks or demands (Carr & Durand, 1985; Carr, Newsom, & Binkoff, 1976,1980; Weeks & Gaylord-Ross, 1981). Generally, researchers have identified the function of disruptive classroom behavior by implementing functional analyses focused on testing hypotheses derived through functional assessment.

In the current study, no preliminary descriptive or functional assessments were conducted. A brief experimental analysis testing three common functions of disruptive behavior: peer attention, teacher attention, and task difficulty. This analysis will take place in a regular education classroom with non-disabled students and the teacher will be
responsible for implementing the experimental analysis. This research will extend the current literature by answering two questions; (a) can a brief experimental analysis, testing three common hypotheses concerning the function of disruptive behavior in the classroom, successfully identify variables associated with disruptive behavior in a regular education setting and (b) can a teacher accurately implement experimental procedures for testing multiple variables in a regular education setting?

If the function(s) of a disruptive behavior can be identified in a brief experimental analysis without an initial assessment and within the educational context, then it is suggested that this approach may have some practical advantages over other methods. First, it will reduce the assessment time, yet maintain the precision and efficiency of treatment selection through experimental analysis. This may be especially important when applying assessment procedures in regular education classrooms where resources for assessing and treating non-disabled students may be scarce. Second, if it can be shown that teachers can successfully implement experimental procedures, then this will potentially increase the validity of the assessment because there is no need to intervene or to test whether the assessment results obtained by a therapist will extend to the teacher. Furthermore, it will support the potential efficacy of teachers using hypothesis-testing procedures as a tool for assessing disruptive behavior and resolving problems in the classroom.
CHAPTER 3

METHOD

Overview

Prior to conducting experimental sessions, assessment data relevant to the selection of subjects, identification of target behaviors, and development of session content was collected. First, a modified Problem Identification Interview (Kratochwill, 1995) was administered with teachers to specify target behaviors. Finally, each student’s math skills were assessed using Curriculum Based Measurements (Deno & Shapiro, 1985) to identify difficult and easy tasks for each participant.

Subsequent to obtaining preliminary assessment data, specific experimental conditions were established focusing on three variables often identified in relation to classroom disruptive behavior; (a) peer attention, (b) teacher attention, and (c) task difficulty. Initially, during the assessment phase, peer and teacher attention was delivered contingent upon the occurrence of off task behaviors. In the treatment validation phases, attention was contingent upon task engagement. Academic demands involved the presentation of a difficult math task during the assessment phase and an easy math task during the treatment validation phase.

All procedures were implemented by the classroom teacher who was instructed using techniques incorporating verbal elaboration, modeling, and role-play. Teachers were also provided a step-by-step written protocol and audio and/or visual cues, as needed, to enhance integrity when implementing procedures.
Participants

Student participants included five black elementary students ranging from five to ten years of age who attended school in a general education program in Baton Rouge, Louisiana (see Table 1). Participants were selected based on teacher reports and brief observations verifying the presence of disruptive classroom behaviors, which occur with high frequency during math class. Disruptive classroom behaviors reportedly occurred during math class, at least daily, for a two-week period. Teacher reports also indicated decreased task engagement during this class time. Parental consent was received for each child involved in the study (Appendix A). Peers who assisted experimenters in conducting peer attention sessions (peer confederates) were selected based on teacher report, an expressed desire to participate, and the consent of their parents (Appendix B).

Table 1  Ages and Grades of Subjects

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Elise</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Ricky</td>
<td>5</td>
<td>K</td>
</tr>
<tr>
<td>Jake</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Raul</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Brent</td>
<td>9</td>
<td>2</td>
</tr>
</tbody>
</table>

Teacher participation was based on the teachers' expressed willingness to conduct analyses within the classroom and their informed consent (Appendix C). Prior to consent, each teacher was informed of the following requirements of teacher participants: (a) must complete pencil and paper measures pertaining to the student and procedures used; (b) must participate in a structured interview (Appendix D), as well as other informal
meetings; (c) must be willing to implement experimental analysis procedures as instructed, with assistive cues; and (d) must be willing to allow multiple observations in the classroom during math class.

Setting and Materials

All sessions were conducted in the students' regular education classroom during math instruction. Participants were placed in the back of the room or facing away from classmates to control interaction with peers. Prior to beginning a session, teachers were provided the following items.

Math Worksheets

Prior to each session, teachers were provided either easy or difficult math tasks, depending on which session was to be conducted. Determination of easy and difficult tasks was based on previous curriculum based measures. Math worksheets for students attending first through fourth grades were taken from the Addison-Wesley Series and kindergarten math exercises were selected from the Houghton Series or from teacher materials. Frustrational level (difficult) math tasks were provided during sessions involving the initial academic demand condition and mastery level (easy) math tasks were provided during all other sessions.

Written Protocols for Sessions

Prior to beginning each session, the experimenter provided the teacher a written protocol for the session to be conducted which served as a reminder of steps involved in the condition (see Appendices E,F,G, H & I). An experimenter was also present to
provide audio or visual cues as needed. Visual cues involved gestures specified before beginning the session and were used during all sessions. Audio cues were used during several sessions with Ricky and involved the use of an audio device in which the experimenter could provide cues through an earplug worn by the teacher. Teachers were allowed to select between the two methods.

Response Definitions

Dependent Variables

The primary dependent variables in this study were off-task behaviors and work productivity. Criteria for subject selection emphasized three response classes of off-task behavior, which included talking out, out of seat and passive off-task behaviors. The following definitions include the dependent variables and other relevant behaviors measured:

1. On-task behavior was defined as remaining on-task for the duration of a 10-second whole interval recording. This includes facing in the direction of tasks and any talking, writing, or action pertaining directly to the performance of a task.

2. Off-task behavior was defined as any interval in which the student did not remain on-task for the duration of a 10-second whole interval recording.

3. Talking out behavior was defined as any audible projection from the larynx, not pertaining to subject matter.

4. Out of seat behavior was defined as an off task behavior in which the students' buttocks was not in contact with their chair.
(5) **Disruptive behavior** included talking out and/or out of seat behaviors.

(6) **Passive off-task** behavior included off-task behavior in which talking out and/or out of seat behaviors were not present.

(7) **Work productivity** was defined by the number of math digits accurately completed per minute during an observation period.

**Independent Variables**

Peer attention, teacher attention, and task difficulty were the independent variables manipulated in this study. Definitions are as follows:

(a) **Peer attention** was defined as any talking to, gesturing towards, and/or making physical contact with the target student.

(b) **Teacher attention** was defined as the teacher talking to, gesturing towards, and/or making physical contact with the target student.

(c) **Difficult tasks** were frustrational level math tasks. Frustrational level tasks were identified using procedures described by Deno and Shapiro (1985) and were defined as tasks in which the student achieves less than 70% accuracy.

(d) **Easy tasks** were mastery level math tasks. Mastery level tasks were identified using procedures described by Deno and Shapiro (1985) and were defined as tasks in which the student achieves at least 90% accuracy.
Measurement

Data collection

An observational coding system was developed to measure the dependent and independent variables (Appendix J). Data was collected concurrently during each experimental analysis session and provided a means to record off-task behaviors (e.g., passive off-task, talking out, and out of seat), task difficulty, and peer and teacher attention. Trained graduate students recorded off-task behaviors using 10-second partial interval recording. To foster an accurate accounting, observers timed intervals using a tape recorded 10-second cue. Graduate students also graded the accuracy of math tasks performed during each condition to ascertain work productivity.

During intervals where an observer was unable to view a measured variable (e.g., as when a target student’s face is blocked by teacher or peer), or brief interruptions occur (e.g., a student bumps the observer), the interval was not coded and an X was written over the interval.

Observer training for the graduate students collecting the data included direct instruction and practical application. First, observers were taught the precise definitions for each variable to be measured and the corresponding codes used on the data form. Second, observers viewed videotapes of students in actual classroom situations and coded their behavior based on the definitions learned. Criteria for successful mastery of the
training objectives were 80% in agreement with the experimenter for two consecutive 10-minute observations.

**Interobserver Agreement**

Interobserver agreement was determined during a minimum of 25% of all observations. Agreements were evaluated for each dependent and independent variable for each 10-second interval. Agreements occurred when both observers recorded the occurrence or nonoccurrence of a behavior during a 10-second interval identically. Interobserver agreement was calculated by dividing the number of agreements for each interval by the number of agreements plus disagreements for each interval and multiplying by 100 (Kazdin, 1982). Agreement will also be determined for work productivity measures. A minimum of two independent observers will independently score math worksheets for a minimum of 25% of the sessions.

**Procedural Integrity**

The integrity of experimental procedures was assessed by trained observers who recorded the occurrence of nonoccurrence of contingencies as prescribed by the experimental condition. For example, observers recorded that a target behavior occurred and any contingencies that follow. Visual or audio cues provided during sessions were also recorded. Procedural integrity was determined by the percentage of target behaviors followed by the correct teacher or peer responses. Correct responses must have occurred without additional responding and must have occurred within the 10-second interval or within two subsequent intervals following the interval. During treatment validation
teacher or peer responses occurring within two intervals or during the interval cued were accepted. Procedural integrity was not less than the 80% criteria for any of the sessions in this study. In addition, essential steps such as having the target student sit in the correct place in the classroom and providing the correct task were properly implemented for each session.

**Design**

A multielement design consisting of three assessment conditions and subsequent treatment validation sessions for each condition was implemented to test the differential effects on the dependent variables. All subjects participated in similar conditions that included a peer attention condition, a teacher attention condition, and an academic demand condition. In the initial attention conditions, attention was delivered contingent upon the occurrence of off task behaviors. In the treatment validation phase, attention was contingent upon the presence of task engaged behaviors. The academic demand condition involved the presentation of difficult math tasks in the initial phase and the presentation of easy math tasks in the treatment validation phase.

**Procedures**

**Problem Identification Interview - Modified (PII-M; Appendix D)**

Prior to implementation of experimental analysis procedures, a modified PII (Bergan & Kratochwill, 1990) was conducted with each teacher to identify target behaviors, determine approximate frequencies, and to specify the settings in which they occur. This information was used to select subjects who exhibit off-task behaviors with a
high frequency during math class. Informal observations will follow the PII to validate the presence of the high frequency behaviors described.

**Curriculum-Based Measurement**

Curriculum-based measures were obtained to identify mastery and frustrational levels in math (Deno & Mirkin, 1977; Lovitt & Hansen, 1976; and Shapiro, 1996). Mastery level tasks were defined as those in which the student scores 90% or greater on a math sheet worksheet during a 10-minute period. Frustrational level tasks were defined by scores below 70% on a math exercise during a 10-minute period. Materials used in the assessment for first through fourth graders were taken from the Addison-Wesley Series and assessment materials for kindergarteners were taken from the Houghton Series and from classroom materials. Results from the assessment were used to develop mastery level tasks or easy tasks and frustrational level tasks or difficult tasks. Easy tasks were used for all conditions except for the academic demand conditions which involved difficult tasks.

The following steps were taken to assess each student’s academic level: (1) Three probes were given using math problems currently being assigned in class. (Note: These probes were at the frustrational level for all subjects, except for Ricky); (2) Probes were repeated in earlier parts of the class text until Mastery level materials were found. For Ricky, Mastery level kindergarten materials were found; (3) Three probes were given at Mastery level; and (4) Frustrational level materials had already been identified for four of the subjects, but for Ricky, increasingly more difficult probes were used until frustrational level tasks were found in a first grade math text. Three probes were given at this level.
Teacher Training

Each teacher was taught a total of six conditions (e.g., three initial conditions and three reversal conditions) prior to conducting the experimental analysis. Training was comprised of four phases. First, teachers were furnished a written protocol for each condition which served as a reminder for the teacher when implementing procedures (see Appendices E through J). The protocol was a one-page step-by-step description of the teacher's procedures. Second, the experimenter provided instructions explaining each step described in the protocol and answered any questions. Third, the experimenter modeled the correct implementation of each condition. Finally, the teacher role-played the steps to demonstrate her knowledge of the procedures. Criteria for teacher training were the accurate demonstration of the designated steps with 100% integrity.

Peer Training

Peer confederates were selected by the teacher based on peers' past interactions with the target student and their willingness to participate. Training began with the experimenter instructing the peer confederates to implement the proper contingency when cued. In the first condition, confederates were instructed to say "You need to keep working" or a similar statement each time they are cued by the experimenter, which occurred following off-task behavior. In the treatment validation condition, they were taught to say, "You're doing great" or some similar statement of praise each time the experimenter presents a cue. Student confederates demonstrated each correct response at
least one time before proceeding. Peer confederates were also asked to avoid any other talking until signaled by the teacher or experimenter that the session has been completed.

**Experimental analysis**

All experimental sessions were conducted by the teacher and the sequence in which the three independent variables (e.g., peer attention, teacher attention, and task difficulty) presented were randomized. An experimenter provided audio or visual cues during conditions to ensure integrity. Conditions were conducted in 10-minute sessions and repeated until stability was achieved. Sessions during the assessment phase were alternated (e.g., A-B-C-A-B-C-A-B-C) to compare rates of disruptive behavior in the following experimental conditions: (a) peer attention contingent upon off-task behavior, (b) teacher attention contingent upon off-task behavior, and (c) the presentation of difficult math tasks. Respectively, treatment validation phases for each of these conditions will involve peer attention contingent upon task engaged behavior, teacher attention contingent upon task engaged behavior, and the presentation of easy math tasks.

**Peer Attention**

Testing the effects of contingent peer attention required two counter-posed conditions, (a) a condition in which peer attention is available only when the student is off-task, and (b) a condition in which peer attention is available contingent on task engagement. Prior to implementation of the procedures, the teacher had the target student and the peer confederate sit next to each other turned away from the class and both students were given easy math problems to complete. Next, the teacher instructed the
students to complete the problems and to wait until the teacher picks them up. Teachers were then to avoid all interaction with the students until the session is completed. If the target student requested attention, the teacher ignored the behavior as long as possible without disrupting the class (see Appendix E).

During the treatment validation phase, the peer attention condition was the same during the assessment phase, except that peer confederates praised the target student when cued by the experimenter following on-task behavior (e.g., You're doing a great job, Sarah!) (see Appendix F). The schedule of contingent social attention was estimated by determining the number of intervals in which peer attention was received during assessment phase sessions and then dividing this number by the total number of session intervals. Modifications were required for several subjects to ensure ample opportunity to experience social praise.

**Teacher Attention**

The effects of teacher attention were evaluated by contrasting two conditions involving contingent teacher attention. First, the teacher provided the student with an easy task to be completed at a desk facing away from peers. Next, the teacher gave the following instructions: "You need to work on your math quietly and stay in your seat." Finally, the teacher attended to the student contingent upon off-task behaviors by saying "You need to keep working" or a similar statement (see Appendix G). The experimenter presented audio or visual cues to ensure integrity. In the treatment validation phase, the teacher provided praise contingent upon on-task behavior (e.g. "Good work Johnny!").
At the end of each condition, the teacher was cued to pick up all worksheets (see Appendix H). Analogous to the peer treatment validation condition, the schedule of contingent social attention in the teacher reversal session was estimated by determining the number of intervals with teacher attention in the previous conditions and dividing them by the total number of intervals observed. This number determined the minimum schedule of attention for on-task behavior.

**Academic Demand**

The effects of task difficulty were evaluated by two conditions involving the manipulation of task difficulty. In the first condition, the teacher provided the target student a difficult math task and in the second condition, an easy math task was provided (see Appendix I). In each condition, the teacher gave the following instructions: "I want you to work on your math quietly. I will check back with you in a little while. Do you have any questions?" Peer attention was controlled during these sessions by placing the student at a desk or table facing away from peers. If the child sought the teacher’s attention, the teacher attempted to ignore the student’s behavior. If this led to disruptive behavior that could not be ignored by the teacher, the teacher, as a last resort, redirected the student back to their assigned task. Observers then recorded the event for evaluation of procedural integrity.

**Acceptability Measures**

Following the experimental analysis, the Assessment Rating Profile was administered (Appendix L) to determine whether teachers found the assessment
procedures used in this study to be acceptable. The Assessment Rating Profile is a six-point Likert scale ranging from "strongly disagree" to "strongly agree" and is based on the Intervention Rating Profile - 15 (IRP-15; Witt & Martens, 1983). This tool has been shown to be a valid and reliable measure for rating teachers' acceptability of interventions (Witt & Martens, 1983; Martens, Witt, Elliott, & Darveaux, 1985). Teachers were instructed to complete the ratings anonymously and to place them in an envelope where a student not participating in the study would pick them up.
CHAPTER 4

RESULTS

In the assessment phase of the experimental analyses, variables associated with off-task behavior were differentiated for each subject (Figure 1). Off-task behaviors were elevated in association with academic demands for three of the subjects, with peer attention for one subject, and for both peer attention and academic demands for one subject. Treatment validations were successful in demonstrating reductions in off-task behavior associated with the identified variables in 4 of the 5 subjects. In this chapter, specific findings will be reported for each subject’s experimental analysis followed by findings concerning procedural integrity, Interobserver reliability, and acceptability.

Elise

In the assessment phase of Elise’s experimental analysis, academic demands resulted in elevated levels of off-task behavior (Figure 1). More specifically, passive off-task behaviors were highly elevated and disruptive behaviors were seldom present (Figure 2). Disruptive behaviors were only observed during three academic demand sessions and occurred only two percent to four percent of each session. During the treatment validation phase, the presentation of easy tasks resulted in marked reductions in passive off-task behaviors and no disruptive behavior was observed. Reversals of peer attention and teacher attention contingencies resulted in rates similar to other sessions involving the presentation of easy tasks. However, sessions involving the peer confederate
Figure 1 Off-Task Behavior Across Sessions for Each Student
Figure 1 Continued
Figure 2  Comparison of Passive & Disruptive Off Task Behaviors for Elise
resulted in consistently low levels of off-task behavior during both assessment and treatment validation phases suggesting that the peers presence may have had a positive impact.

Measures of the frequency of peer and teacher attention were plotted in relation to the frequency of off-task behaviors for each session to examine the role of attention (Figure 3). During the assessment phase of the analysis, Elise did not receive high levels of attention, although attention was easily accessible through off-task behaviors. However, in the treatment validation phase rates are consistently lowest in sessions where the peer confederate is present, even though little or no attention was given.

Academic production, as measured by the rate of math digits completed per minute, varied considerably across all sessions (Figure 4). Rates during sessions involving frustrational level tasks remained low as would be expected. Rates during mastery level academic tasks varied from nine to twenty-seven digits per minute with no definite pattern associated with any one variable.

Ricky

Results of the assessment phase of the experimental analysis suggested that Ricky was responding differentially to peer attention (Figure 5), yet treatment validation sessions where peer attention was present following on-task behavior, did not result in marked reductions in off-task behaviors. Initial contingency reversal sessions resulted in reductions, but behavior levels similar to the assessment phase were soon apparent. The lowest rates in off-task behavior were observed during the teacher attention reversal phase.
Figure 3 Comparison of Off-Task Behavior & Attention Received for Elise
Figure 4  Digits Accurately Completed Per Minute for Elise
where teacher praise was given following 20 seconds of on-task behavior. To further examine this result, teacher and peer reversal sessions were alternated. Results indicated that teacher attention continued to be more powerful in reducing the frequency of all off-task behaviors. In analyzing the effects of task difficulty on off-task behavior, little difference was discernable between behavior for mastery and frustrational level tasks.

In comparing the effects of the experimental conditions on disruptive versus passive off-task behaviors, it was observed that disruptive behavior was highly elevated during the peer attention phase whereas passive off-task behavior was infrequent (Figure 5). During the treatment validation phase, passive off-task behaviors increased, yet disruptive behaviors decreased. Sessions involving teacher praise resulted in the lowest rates of disruptive behavior of all sessions and resulted in the highest levels of work productivity.

Academic production, as measured by the number of math digits accurately completed per minute, was highest during the assessment and reversal phases involving teacher attention (Figure 6). These sessions resulted in similar rates of production despite the lower rates of off-task behavior during the teacher attention contingency reversals. This suggests that teacher attention is most relevant to increased work production, but contingent positive praise for work productivity may be the most relevant to reducing disruptive off-task behaviors while increasing rate of production. However, another consideration affecting outcomes is the rate with which teacher attention was received (Figure 7). During the treatment validation phase attention was received an
Figure 5  Comparison of Off-Task Behavior & Attention Received for Elise
Figure 6  Digits Accurately Completed Per Minute for Ricky
Figure 7  Comparison of Off-Task Behavior & Attention
Received for Ricky
average of once every 6 intervals as opposed to once every 4 intervals during the
treatment phase.

Jake

For Jake, the assessment phase of the analysis resulted in higher rates of off-task
behavior during academic demand sessions. As displayed in Figure 1, additional academic
demand sessions were added to ensure stabilization of the data during the assessment
phase. Treatment validation sessions involving mastery level tasks support the relationship
between academic demand and higher rates of off-task behavior. Although all treatment
phase sessions demonstrated lower rates of off-task behavior, this may be attributed to the
presentation of mastery level tasks during all of the treatment sessions.

Although the results appeared to differentiate academic demands, the primary
concern with Jake had been his high level of disruptive behavior. During the analog
session's disruptive behavior occurred during only two sessions and during only two
percent of each session (Figure 8). To briefly test the effect of assigning mastery level
tasks in class, the experimenter used an ABA reversal design (Figure 9). First, a mastery
level task was given by the teacher using the same procedures used in the treatment
validation phase of the analysis, except that the task was given within class and the child
was not separated from his peers. In sessions 17 and 18, the teacher followed the same
procedures, but assigned Jake the same math tasks that were assigned to the class for that
day (frustrational level multiplication and long division math tasks). Sessions 19 through
21 represent a return to providing mastery level task assignments in class. Results indicate
Figure 8 Comparison of Passive & Disruptive Off-Task Behaviors for Jake
Figure 9: Comparison of Off-Task Behaviors When Given Easy Versus Hard Tasks in Class

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that off-task behaviors increased markedly when frustrational level math tasks were introduced in the regular classroom. Disruptive behaviors were a large percent of this increase. Rates were markedly reduced in sessions where mastery level assignments were provided. These results provide additional support for the academic demand hypothesis.

Treatment validation sessions testing the academic demand hypothesis also resulted in rates of work productivity similar to other sessions involving mastery level tasks (Figure 10). Analysis of the teacher's influence on productivity suggests that teacher directions to "Get back to work" were not as effective teacher praise for increasing academic productivity.

In analyzing the relationship between attention and off-task behaviors, it was also observed that rates of off-task behavior decreased when followed by teacher directions to "Get back to work" (Figure 11). Analysis of other sessions suggest that, other than this exception, attention appears to have little affect on off-task behavior.

Raul

During the assessment phase, Raul's rates of off-task behavior were markedly higher during academic demand sessions than during teacher or peer attention sessions (Figure 1). Subsequently, treatment validation of academic demands resulted in considerable reductions in off-task behavior. Rates of off-task behavior were low during all sessions involving mastery level tasks, except for one peer attention session during the assessment phase. During treatment validation, the session involving peer praise resulted
Figure 10  Digits Accurately Completed Per Minute for Jake
Figure 11 Comparison of Off-Task Behavior & Attention Received for Jake

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in the lowest rates, but all demonstrated marked reductions in comparison to sessions involving frustrational tasks.

A comparison of disruptive and passive off-task behaviors indicated that disruptive behavior occurred infrequently during all sessions (Figure 12). During the assessment phase, disruptive behaviors occurred during one academic demand session (7% of session) and one peer attention session (8% of session). During treatment validation, disruptive behaviors occurred during two of the four academic demand sessions (3% and 2% of sessions). While the analysis showed differential effects for passive off-task behaviors, the data do not support differential effects associated with disruptive behavior.

Analysis of the relationship between attention and off-task behavior suggests that peer and teacher praise contingent upon on-task behaviors may had a beneficial effect on Raul’s behavior (Figure 13). Peer and teacher praise resulted in the lowest rates of off-task behavior. Work production also increased when peer or teacher praise was delivered, but rates were only slightly higher than sessions involving no attention (Figure 14).

Brent

In the assessment phase of Brent’s analysis, mixed results were found where both academic demand and peer attention resulted in increased levels of off-task behavior (Figure 1.0). Initial results in the treatment validation phase suggested that peer attention may show stronger reversal effects. To further evaluate this possibility, additional sessions were added to the treatment validation phase; two academic demand sessions and two peer attention sessions. Treatment validations sessions involving the presentation of
Figure 12  Comparison of Passive & Disruptive Off Task Behaviors for Raul
Figure 13  Digits Accurately Completed Per Minute for Raul
Figure 14 Comparison of Off-Task Behavior & Attention Received for Raul
easy tasks showed decreases in off-task behavior initially, but rates soon returned to levels similar to those found in the assessment phase. Peer attention contingency reversals involving peer praise for on-task behavior resulted in reduced levels of off-task behavior during all treatment sessions. Interestingly, teacher attention contingency reversals also led to reductions in off-task behavior suggesting that teacher attention may also have an affect on off-task behavior and that teacher praise may be relevant to treatment. Further data would be required to confirm these hypotheses however.

Analysis of the differential effects of the experimental variables on passive versus disruptive behavior indicated that disruptive behavior was particularly sensitive to the introduction of peer praise in the treatment validation phase (Figure 15). Disruptive behavior was most frequent during the assessment phase peer attention sessions occurring an average of 37 percent of intervals. In the treatment phase, peer praise was introduced following periods of on-task behavior and rates dropped to 0 percent for all three sessions. Passive off-task behavior also decreased during these sessions, but less impressively. The average for passive off-task behavior across the assessment phase peer attention sessions was 18 percent as opposed to 14 percent across treatment phase peer attention sessions.

In comparing passive and disruptive behaviors, it was also observed that passive off-task behaviors were highest during the assessment phase academic demand sessions and during the treatment phase sessions involving mastery level tasks and no attention. This provides additional support for the hypothesis that disruptive behaviors function to gain peer attention.
Figure 15  Comparison of Passive & Disruptive Off Task Behaviors for Brent
Evaluation of the relationship between levels of attention and off-task behavior indicated that rates of off-task behavior remained highest when no attention was received and when the peer prompted the subject to work following off-task behavior (Figure 16). Rates were lowest when peer praise or teacher praise was delivered. This suggests that attention is not only relevant to off-task behavior but also important for maintaining on-task behavior.

Findings concerning work productivity demonstrate the expected improvements in academic production associated with removing academic demands in the treatment validation phase (Figure 17). Some increase in work productivity may also be associated with peer contingency reversal sessions, but the current data is inconclusive.

**Procedural Integrity**

Procedural integrity was measured for each session of the study and ranged from 94 to 100 per cent with an overall average of 99 percent. Appendix M displays the procedural integrity for each phase and session type conducted in the analysis. Overall, procedural integrity for the teacher averaged 99.6 percent and integrity for the peer confederate averaged 99 percent. The overall integrity levels for assessment phase sessions were as follows: academic demand (99%); peer attention (99%); and teacher attention (99%). The overall integrity for the treatment validation phase sessions was as follows: academic demand (99%); peer attention (99%); and teacher attention (100%).
Figure 16  Comparison of Off-Task Behavior & Attention Received for B
Figure 17  Digits Accurately Completed Per Minute for Brent
Interobserver Agreement

Interobserver agreement was determined for each subject for a total of 36 of the 80 sessions conducted or 45 percent of total sessions. Individually, Interobserver agreement was determined for 47 percent of the sessions conducted with Elise, 50 percent with Ricky, 38 percent with Jake, 50 percent with Raul, and 44 percent with Brent. Interobserver agreements for the 5 subjects ranged from 97 to 99 percent. Interobserver agreements for each type of session (i.e., academic demand, peer attention, teacher attention) were determined in 25 to 80 percent of the sessions for each subject and ranged in agreement from 96 to 98 percent (Table 1). Ranges and average percents of agreement for each behavior and session type are exhibited in Table 2. Averages of Interobserver agreement across sessions ranged 95 to 99 percent.

Table 2. Average Percent of Interobserver Agreement with Each Subject

<table>
<thead>
<tr>
<th></th>
<th>AD &amp; AD-TV</th>
<th>PA &amp; PA-TV</th>
<th>TA &amp; TA-TV</th>
<th>AVERAGE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elise</td>
<td>99</td>
<td>99.6</td>
<td>99</td>
<td>99</td>
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<tr>
<td>Ricky</td>
<td>96</td>
<td>94</td>
<td>98</td>
<td>96</td>
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<tr>
<td>Jake</td>
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<tr>
<td>Raul</td>
<td>99.5</td>
<td>99</td>
<td>98</td>
<td>99</td>
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<td>Brent</td>
<td>96</td>
<td>96</td>
<td>98</td>
<td>97</td>
</tr>
<tr>
<td>Average</td>
<td>98</td>
<td>96</td>
<td>98</td>
<td>97</td>
</tr>
</tbody>
</table>

AD - Academic Demand
AD -TV - Academic Demand - Treatment Validation Phase
PA - Peer Attention
PA - TV - Peer Attention - Treatment Validation Phase

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Table 3. Range of Interobserver Agreement and Average Percents of Interobserver Agreement for Each Behavior

<table>
<thead>
<tr>
<th></th>
<th>AD and AD-TV Sessions</th>
<th>PA and PA-TV Sessions</th>
<th>TA and TA-TV Sessions</th>
<th>Total Range &amp; Averages</th>
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<tr>
<td>% Off-Task</td>
<td>90 - 100</td>
<td>95</td>
<td>95 - 100</td>
<td>97</td>
</tr>
<tr>
<td>% Passive Off-Task</td>
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<td>94</td>
<td>93 - 100</td>
<td>96</td>
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<tr>
<td>% Disruptive Behavior</td>
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<td>88 - 100</td>
<td>95</td>
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<tr>
<td>% Talking Out</td>
<td>93 - 100</td>
<td>98</td>
<td>79 - 100</td>
<td>91</td>
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<tr>
<td>% Out of Seat</td>
<td>95 - 100</td>
<td>99</td>
<td>91 - 100</td>
<td>97</td>
</tr>
<tr>
<td>% Object Play</td>
<td>92 - 100</td>
<td>99</td>
<td>93 - 100</td>
<td>97</td>
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<tr>
<td>% Teacher Attention</td>
<td>98 - 100</td>
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<td>96 - 100</td>
<td>99</td>
</tr>
<tr>
<td>% Peer Attention</td>
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<td>99.6</td>
<td>86 - 100</td>
<td>95</td>
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<td>Average % for Sessions</td>
<td>98</td>
<td>96</td>
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<td>98</td>
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AD - Academic Demand
AD-TV - Academic Demand - Treatment Validation Phase
PA - Peer Attention
PA-TV - Peer Attention - Treatment Validation Phase

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Acceptability Measures

Each teacher was requested to complete the Assessment Rating Profile (Appendix L) following the conclusion of the experimental analyses. Only three of the four teachers involved in the study completed and returned the rating profiles. One of these teachers returned two profiles because she was involved in experimental analyses with two of the subjects. Results indicated that the teachers generally found the assessment procedures to be acceptable. The Assessment Rating Scale rated acceptability of the assessment procedures on a scale of one to six with one representing "strongly disagree" and six representing "strongly agree". Overall, the average of all ratings was four and the lowest average across teachers for any one item was four (Figure 9). Ratings averaged five on questions pertaining to the acceptability of the assessment for the child, the willingness to use the procedures again, and the fairness of the assessment procedures.
Table 4. Acceptability Ratings on the Assessment Rating Profile

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| Averages | 4  | 5  | 4  | 4  | 4        |

*Profiles for subjects 1 and 2 were completed by the same teacher*
CHAPTER 5
DISCUSSION

This study examined the efficacy of applying experimental analysis procedures in general education settings to identify variables associated with students' off-task behaviors. In addition, the degree to which teachers implemented the experimental procedures accurately in their classrooms as well as the acceptability of the procedures were evaluated. Findings concerning the major research questions addressed in this study, contributions to the current literature, limitations of the study, and implications for future research directions are discussed in this chapter.

Primary Research Question

The primary research question examined the efficacy of applying brief experimental analysis procedures in general education settings to assess the function of off-task behaviors. Sessions were conducted in subjects' classrooms and three hypotheses related to common functions of disruptive behavior which have been identified in the literature were tested; teacher attention, peer attention, and academic demands. In the assessment phase of the analysis, the effects of contingent teacher attention, contingent peer attention, and the presentation of academic demands (difficult tasks) were tested. In the treatment validation phase, reversals of the attention conditions were conducted where off-task behavior was ignored and attention was delivered contingent upon on-task behaviors. Reversals of the academic demand condition involved the presentation of mastery level math tasks in place of difficult tasks.
Specific variables associated with off-task behavior were differentiated for each of
the five subjects in the assessment phase. However, treatment validation supported these
findings with only four of the five subjects. Analyses with Elise, Raul, and Jake indicated
that off-task behaviors were sensitive to academic demands in the assessment phase and
treatment validation data supported these findings. With Brent, both academic demands
and peer attention were associated with increased off-task behaviors in the assessment
phase, but only peer attention was supported in the treatment validation phase. Reversal
of the academic demands in the treatment validation phase resulted in an initial reduction
in off-task behaviors followed by an increase. This return to increased rates of off-task
behavior suggests that factors other than the difficulty of the task were probably affecting
his behavior.

With Ricky, peer attention was differentiated in association with off-task behaviors
in the assessment phase, but contingency reversals were not successful. Teacher praise,
which was not the variable identified in the assessment, resulted in the lowest rates of off-
task behavior whereas peer praise, the identified variable, led to an initial drop in off-task
behavior followed by marked increases.

There are several possible reasons for this outcome with Ricky. First,
reinforcement is less likely to be effective if delayed (Reynolds, 1968). In the assessment
phase, attention was immediate, but in the treatment validation phase reinforcement was
delayed at least 20 seconds from the onset of on-task behavior. Second, the quality of
attention received during the treatment phase was not necessarily equivalent to that
received in the assessment phase. In the assessment phase, off-task behavior was followed by the peer confederate directing Ricky back to work. Ricky’s responses during this phase included questioning the peer’s actions, asking the peer to stop telling him what to do, and taking the peer’s worksheet. Any of these behaviors were then immediately followed by the peer telling him to get back to work. In this phase peer attention acted as a reinforcer increasing disruptive behaviors and passive off-task behaviors remained low.

In the treatment phase, the peer confederate praised Ricky when cued following 20 seconds of on-task behavior. Anecdotal information concerning responses during these sessions included Ricky asking the peer why she was telling him he did good, asking her to quit telling him he’s doing good, and name calling, such as saying “You bad girl.” The peer confederate ignored many of these responses. As a result, disruptive behaviors (talking out and out of seat) decreased during the treatment phase while passive off-task behaviors increased. These results suggest that disruptive behaviors may have been reduced through extinction and passive off-task behaviors may have increased to avoid the peer’s praise. Overall, these findings suggest that the type of peer attention received differentially reinforced different off-task behaviors. In the assessment phase disruptive behaviors were reinforced and passive off-task behaviors may have been punished by the peer’s demands to work from the peer. In the treatment phase, disruptive behaviors were ignored and passive off-task behaviors may have been negatively reinforced.

Although peer praise failed to increase on-task behavior, teacher praise was successful. Several factors related to Ricky’s ontogenetic history may explain the failure
of peer praise to act as a reinforcer and for teacher praise to succeed in reducing off-task behaviors. First, the type of attention that Ricky received from the peer was probably seldom, if ever, experienced by Ricky prior to the functional assessment. It is likely that peer praise for doing class work would lack the history of reinforcement of teacher praise and would not necessarily be established as a reinforcing event to Ricky. Also, in Ricky’s past participation in class under the teacher’s supervision he may have learned rule-governed behaviors (Skinner, 1969). If this true, then the teacher’s directions to perform his schoolwork may have served as a discriminative stimulus for work behaviors that would lead to reinforcement at some later point in time. This may explain why academic demand sessions and teacher attention sessions in the assessment phase of the analysis resulted in similar rates of off-task behavior. However, the reduction of off-task behaviors when teacher praise was introduced suggests that teacher praise is also reinforcing.

Another factor that may affect the strength of teacher praise as a reinforcer is the infrequency of teacher praise in relation to peer attention in a kindergarten class with 20 other students. The lack of access to teacher attention may have served as an establishing operation (Michael, 1982), thus strengthening the salience of teacher attention as a reinforcer.

Also of interest to the study was the extent to which teachers in a general education setting could accurately conduct an experimental analysis. Procedural integrity data that ranged from 99 percent to 99.9 percent support the conclusion that teachers can successfully employ these procedures during regular math class times. Teachers arranged
analog conditions, instructed subjects and peer confederates, as required, and used extinction, redirection, and reinforcement procedures correctly. However, experimenters collected data and provided cues for teachers throughout the experiment. These findings suggest that with minimal supports such as written protocols, cues, and a brief training session teachers can successfully implement experimental analog sessions. Also, based on the acceptability ratings provided by teachers in this study, it may also be an acceptable approach for many teachers. From a practical standpoint, these findings suggest that functional assessment involving controlled analog conditions can be conducted in the classroom, with the teacher acting as the primary experimenter.

Contributions to the Current Literature

Findings from the current study are consistent with past research applying experimental analyses in regular classroom settings (Broussard and Northup, 1995; Kern, Childs, Dunlap, Clarke, and Falk, 1994; Lewis and Sugai, 1996; and Umbreit, 1995) and thus provide further support for applying this technology. In addition, the findings extend the current literature in several ways. First, findings from this study demonstrate that brief experimental analyses conducted in the regular classroom settings can differentiate variables that function to increase off-task behaviors. Except for Broussard and Northup (1995), past research has involved lengthy assessment procedures that are time prohibitive to most school professionals.

A second contribution of this study concerns practical findings relevant to the development of a technology for conducting brief experimental analyses in the classroom.
Broussard and Northup (1995) demonstrated a practical model for assessing function of behavior in the classroom using descriptive assessments, classroom observations, and brief functional analyses. Assessment data was used to select one of three hypotheses; teacher attention, peer attention, or escape from academic demands. The selected hypothesis was then tested using a reversal design, which was implemented by a therapist in the student's classroom. In the current study, brief experimental analyses were conducted in the classroom by the student's teacher without utilizing descriptive assessments prior to the analysis.

This suggests two potentially beneficial variations in procedure; (1) conducting experimental analyses without descriptive assessment and (2) utilizing teachers as experimenters. If adequate results are achievable without descriptive assessments then this may suggest a more time efficient method that can be more readily applied by school professionals. However, the usefulness of this method relies on the assumption that at least one of the variables tested are relevant to the targeted behavior.

Having the teacher conduct experimental analyses has several advantages. First, by conducting analog analyses within the classroom with the teacher as the primary experimenter, conditions are maintained that are more similar to the natural classroom environment. This reduces the need for inference in making generalizations to the natural classroom environment. Second, the current approach allows for testing the teacher's effect on targeted behaviors. Another advantage of conducting analog analyses in the classroom is that these procedures are relatively brief, yet specific. With descriptive
assessments additional time may be required to collect the necessary data and events identified by the assessment are not validated.

Finally, another contribution of this study derives from conducting treatment validations for each variable assessed. In Broussard and Northup (1995), Umbreit (1996), and Lewis and Sugai (1996) treatment validations or reversals were only implemented for the variable assessed to be the function of the targeted behavior. Interestingly, in this study, rates during treatment validation were often as low or slightly lower for variables not shown to be associated with off-task behaviors, as for those identified in the assessment phase. These findings suggest that identifying specific variables associated with target behaviors does not necessarily lead to the selection of the best treatment. Also, it suggests that an advantage in conducting treatment validations for each variable assessed is that the experimenter can provide additional information concerning the reinforcing effects of each variable assessed. For example, with Elise peer attention resulted in consistently low rates of off-task behavior and with Ricky teacher praise had a strong influence on behavior.

Limitations

Several limitations to the experimental procedures implemented in this study were evident. First, even though the analog analyses were conducted in the back of the classroom, it is not known whether the results would generalize to regular classroom situations. Second, a relatively small numbers of data points were used and it is impossible to determine whether the results would have remained stable over time or
whether the approaches used in the treatment validation phase would have continued to result in positive outcomes. Third, only a limited number of variables were examined in this study. It is possible that variables other than those tested may have been relevant to the occurrence of off-task behaviors.

Finally, the use of frustrational level tasks during the academic demand sessions may have been less effective than using instructional level tasks. The advantage sought in using frustrational level tasks was that such tasks would provide greater contrast from mastery level tasks therefore more detectable differences in the responses from subjects. Also, with four of the five subjects, frustrational level tasks were currently assigned in the regular classroom and, therefore, using frustrational tasks seemed more relevant to the subjects' current classroom environment. However, it is not very enlightening to find that high rates of passive off-task behaviors occur when students are presented materials in which they may not be able to perform any part of the task. Particularly suspect are findings in which high rates of passive off-task behaviors were recorded in response to frustrational level tasks, yet the teacher’s primary complaint focused on disruptive classroom behaviors. Because this was the case with Jake, a brief reversal design was conducted in the classroom and the results suggested that generalization may be possible. However, if frustrational level tasks are likely to result in high rates of passive off-task behavior, then it cannot be assumed that such findings will always be meaningful to disruptive behaviors.
Additional difficulties are created by using frustrational level tasks because if these tasks often result in high rates of passive off-task behavior, conclusions from this study must rely solely on the analysis of disruptive behaviors, when possible, and on the assumption that off-task behaviors would be sensitive to peer or teacher attention when tested, if relevant to off-task behavior. For example, with Brent, rates of off-task behaviors during the assessment phase were elevated during academic demands and peer attention. Further analysis indicated that peer attention was more closely associated with disruptive behaviors. However, with Elise and Raul it must be assumed that off-task behaviors would have been sensitive to peer or teacher attention, if relevant, and that academic demands were the most relevant variable to off-task behaviors observed in the classroom.

Future Directions

The current research provides support for the use of experimental analysis procedures in the classroom and for the use of the teacher as experimenter. However, additional research is needed to determine the best procedures for conducting experimental analyses. Comparisons of various strategies for analyzing behavior and deriving effective strategies are required to eventually find the most effective and practical methods. Also, research exploring the relevance of using experimental analyses to select the best treatment choices is needed. It is not known whether assessing the function of behavior or variables associated with targeted behaviors necessarily leads to the most effective treatment solutions for regular education school children. Perhaps it is more
productive experimentally to test treatment choices based on possible functions of behavior or reinforcer surveys.

Finally, there is a need for research concerning the dimensions of reinforcers used in analyses. For example, research identifying the qualities that make attention reinforcing would be important to obtaining valid assessment findings and more successful treatments. Also, research concerning the effects of the teacher as a discriminative stimulus for completing class work is needed. Currently, it is not known to what degree the teacher's presence or actions may influence the student's behavior during analog assessments.
BIBLIOGRAPHY


APPENDIX A

PARENT CONSENT FOR RESEARCH PARTICIPATION

PURPOSE: Thank you for allowing your child to participate in this important project. In working with your child's teacher, we hope to provide some assistance to the teacher in developing some effective strategies for helping your child succeed in school.

PROCEDURE: As a participant in this project, your child's teacher will be asked to: complete questionnaires, participate in interviews, and to collect information about your child's behavior during class. In addition, we would like to conduct observations of your child in his or her class setting daily, with observations lasting between 30 and 90 minutes each day. These activities will be conducted to develop intervention recommendations. These recommendations will be shared with the classroom teacher. Your child's involvement in this project will last up to six to eight weeks. The benefits of this study are the potential of developing effective strategies for use in the classroom that will help my child increase appropriate classroom behavior.

All information will be coded and the identity of individuals participating will remain confidential throughout the study. Your child's name will not be placed on any material or records. Once the teacher terminates involvement, he or she will be
provided a summary of any information that might assist your child in the
classroom.

PARENT'S RIGHTS: Your agreement to allow your child to participate in this
project is voluntary. You have the right to withdraw your child from this project at
any time, and you may do so by contacting the experimenters named below. The
researcher and other members of the team will be available throughout the study to
answer any questions concerning the procedures and to ensure they are fully
understood. There will be no cost for participation in this study.

I HAVE READ AND UNDERSTAND THE PURPOSE OF THE PROJECT,
THE PROCEDURES INVOLVED, AND MY RIGHTS AS A
PARTICIPANT. I AGREE TO PARTICIPATE IN THIS PROJECT.

_________________  __________  __________
Signature    Date    Subject    Number

Joe Witt
Supervising Professor
388-4111

Jim LeVelle
Graduate Student
272-2620
APPENDIX B

PEER TUTORING CONSENT FORM

I give permission for __________ to participate in tutoring a classroom peer as part of a research project conducted by Joseph C. Witt, Ph.D. and the graduate students listed below. I understand that participation will involve tutoring a classroom peer in math for ten to twenty minutes per day for up to one week. Participation in the study offers your child the opportunity to strengthen existing relations with his or her peers and to develop positive interactions with a new peer.

I, the parent or guardian, understand that my child’s participation in this project will not cost me any money. I also understand that my child’s name will not be published, although data from this study may. I am free to withdraw consent anytime, and this will not affect any other services provided to the child.

______________________________       ____________
Signature (Parent/ Guardian)            Date
APPENDIX C

TEACHER CONSENT FORM FOR RESEARCH PARTICIPATION

PURPOSE: Thank you for cooperating in this important project on classroom interventions. Teachers who participate in this project will be providing valuable information about the instructional environment in the classroom as well as information about how interventions can be used to address the needs of children who are experiencing behavioral difficulties in the classroom. This information is important for future development of services for children and for teacher training as well. In addition, we hope to provide some assistance with a student in your class.

PROCEDURE: As a participant in this project, you will also be asked to provide some simple background information about yourself, complete two questionnaires about the identified student, participate in two meetings with the experimenter, and participate in some experimental conditions in which you will be required to ignore all inappropriate behavior displayed by the child for 10 minute sessions. In addition, you will be asked to allow classroom observations for the purpose of obtaining information pertaining to the classroom ecology. Permission will be obtained from the student's parent(s) to observe the student both within your classroom. You will be provided with a summary of any information that might assist you in the classroom. In addition, we wish to make ourselves available for
additional consultation concerning this child at your request. In order to maintain individual confidentiality, all information will be coded and the identity of all students and teachers participating will remain confidential.

**TEACHER’S RIGHTS:** Your agreement to participate in this project is voluntary. You have the right to withdraw from this project at any time. The researcher and other members of the team will be available throughout the study to answer any questions concerning the procedures and to ensure they are fully understood.

Following completion of the study, the researcher will be available for discussion and will provide any requested details regarding study procedures.

I HAVE READ AND UNDERSTAND THE PURPOSE OF THE PROJECT.

THE PROCEDURES INVOLVED, AND MY RIGHTS AS A PARTICIPANT. I AGREE TO PARTICIPATE IN THIS PROJECT.

______________________________  ____________________  ______________________
Signature                        Date                        Subject Number

Joe Witt
Supervising Professor
388-4111

Jim LeVelle
Graduate Student
272-2620
APPENDIX D

PROBLEM IDENTIFICATION INTERVIEW - MODIFIED

**Behavior Specification**

Definition: The consultant should elicit behavioral descriptions of client functioning. Focus is on specific behaviors of the child in terms that can be understood by an independent behavior. Provide as many examples of the behavior problem as possible (e.g. What does Cathy do?).

a. Specify the behavior(s):

b. Specify examples of each problem behavior:

c. Which behavior causes the most difficulty? (i.e., prioritize the problems from most to least severe)

d. Which if any of the behaviors generally occur together?

**Behavior Setting**

Definition: A precise description of the settings in which the problem behaviors occur (e.g., Where does John do this?).
a. Specify examples of where the behavior occurs:

b. Specify priorities (i.e., Which setting is causing the most difficulty?)

**Behavior Strength**

Definition: Indicate how often (frequency) or how long (duration) the behavior occurs. Behavior strength refers to the level or incidence of the behavior that is to be focused on. The question format used for each particular behavior strength will depend upon the specific type of behavior problem (e.g., How often does Shelly have tantrums? or How long do Brett's tantrums last?).

**Approach to Teaching or Existing Procedures**

Definition: Procedures or rules in force that are external to the child and to the behavior (e.g., How long are Sue and other student doing seatwork problems?)

**Data Collection Procedures**

Definition: Specify the targeted responses to record. This recording should include the kind of measure, what is to be recorded, and how it will be recorded. Specific details of data recording should be emphasized. (See data collection procedures - explain how we are planning to take data)
APPENDIX E

PROTOCOL: PEER ATTENTION FOLLOWING OFF-TASK BEHAVIOR

Protocol: Peer Attention

Following Off-Task Behavior

(1) Place student and peer confederate at desk in back of room turned away from peers

(2) Provide students with easy task worksheets

(3) Ignore all behaviors

(4) Walk away (avoid any further interactions)

   If student requests attention then tell them

   "you need to continue working"

(5) Go to student and pick up worksheets when 10 minutes are up
Protocol : Peer Attention

Following On-Task Behavior

(1) Place student and peer confederate at desk in back of room turned away from peers

(2) Provide students with easy task worksheets

(3) Ignore all student and peer behaviors

(4) Walk away (avoid any further interactions)
   
   If student requests attention then tell them
   
   "you need to continue working"

(5) Go to students and pick up worksheets
APPENDIX G

PROTOCOL: TEACHER ATTENTION FOLLOWING OFF-TASK BEHAVIOR

Protocol: Teacher Attention

Following Off-Task Behavior

1. Place student at desk turned away from peer

2. Provide student with an easy task worksheet

3. Ignore all behaviors except when cued

4. Listen or look for cue

   Then walk toward student and say

   "You need to get back to work"

5. Walk away and Ignore

   (avoid any further interactions)

   If student requests attention then tell them

   "you need to continue working"

6. Go to student and pick up papers when 10 minutes are up

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PROTOCOL: TEACHER ATTENTION FOLLOWING ON-TASK BEHAVIOR

Protocol: Teacher Attention

Following On-Task Behavior

(1) Place student at desk turned away from peer

(2) Provide student with an easy task worksheet

(3) Ignore all inappropriate behaviors

When Cued, walk to student & say

"You are doing a great job...Keep it up!"

(4) Go to student and pick up papers when 10 minutes are up
APPENDIX I

PROTOCOL: EASY OR DIFFICULT TASK

Protocol: Easy or Difficult Task

(1) Place student at desk-turned away from peer

(2) Provide student with difficult or easy task worksheets
depending on conditions tested

(3) Tell them
"do your best and I will check back with you"

(4) Walk away and Ignore (avoid any further interactions)

If student requests attention then tell them
"you need to continue working"

(5) Go to student and pick up papers when 10 minutes are up
APPENDIX J

OBSERVATIONAL CODING SYSTEM

The following codes will be used in recording relevant behaviors and events occurring during session. Additional notes will be taken should other important events affect the study.

OS = Out of Seat behavior  TO = Talking out behavior
OP = Object Play  TA = Teacher Attention
PA = Peer Attention  TAN = Tangible reward was received
ENGAGED = Task Engaged behavior
## APPENDIX K

### OBSERVATION FORM

**DATE**

**STUDENT**

**CLASS**

**TIME**

**TEACHER**

**CONDITION/TREATMENT**

**OBS**

**REL.**

### ANTECEDENT SETTINGS

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**TOTALS:**

OS TO OP TA PA TAN ENGAGED

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APPENDIX L

ASSESSMENT RATING PROFILE

(Based on the IRP-15; Martens, Witt, Elliott, & Darveaux. 1985)

The purpose of this questionnaire is to obtain information about your reaction to the assessment recently conducted in your classroom. Please circle the number that best describes your agreement or disagreement with each of the following statements concerning assessment procedures for the referred child. Please answer all questions even if you are unsure of your response.

1. This is an acceptable assessment procedure for the child’s problem behavior.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

2. Most teachers would find this assessment procedure appropriate for other behavior problems as well as the one identified.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

3. This assessment should prove effective in developing procedures for changing the child’s problem behavior.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

4. I would suggest the use of this assessment procedure to other teachers.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

5. The child’s behavior problem is severe enough to warrant the use of the assessment procedure.

   Strongly Disagree  1  2  3  4  5  Strongly Agree
6. Most teachers would find this assessment procedure suitable for the behavior problem identified.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

7. I would be willing to use this assessment procedure in the classroom setting.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

8. This assessment procedure should not result in negative side effects to the child.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

9. This assessment procedure would be appropriate for a variety of children.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

10. This assessment procedure is consistent with those I have used in classroom settings.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

11. This assessment procedure is a fair way to assess the child's problem behavior.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

12. This assessment procedure is reasonable for the behavior problem.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

13. I like the procedures used in this assessment.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

14. This assessment procedure is a good way to assess this child's behavior problem.

   Strongly Disagree  1  2  3  4  5  Strongly Agree

15. Overall, this assessment procedure should be beneficial for the child.

   Strongly Disagree  1  2  3  4  5  Strongly Agree
### APPENDIX M

**PERCENT OF PROCEDURAL INTEGRITY**

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VITA

James A. LeVelle was born April 11, 1955, in Dallas, Texas. He attended the University of North Texas where he received his bachelor of arts degree in psychology in 1981 and his master of arts degree in psychology in 1984. In 1995, he received his second master of arts degree in psychology at Louisiana State University where he is presently a doctoral candidate. In past years, he has served as program director for a mental health program for the developmentally disabled and director of psychological services with Louisiana's Office for Citizens with developmental Disabilities. Currently, he is a Certified School Psychologist with the Tangipahoa Parish School System.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: James A. LeVelle

Major Field: Psychology

Title of Dissertation: Analog Functional Assessment in General Education Settings

Approved:

[Signatures]

Major Professor and Chairman
Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

October 20, 1998