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# Function based interventions versus non-function based interventions within a general education setting

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FUNCTION BASED INTERVENTIONS VERSUS NON-FUNCTION BASED  
INTERVENTIONS WITHIN A GENERAL EDUCATION SETTING

A Thesis

Submitted to the Graduate Faculty of  
Louisiana State University and  
Agricultural and Mechanical College  
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by  
Michael J. Vance  
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## **ABSTRACT**

Functional Behavioral Assessment is a multi-method set of strategies used to determine a particular behaviors purpose. This method, currently seen as the gold standard for creating behavioral interventions, has since 1997 been required by law for a number of special education concerns. While there is a great deal of data supporting the use of function based interventions for populations with low incidence disabilities, little has been done to analyze their effectiveness for more typically developing children. Given that functional behavioral assessment can be quite time consuming and requires prior training the purpose of this study is to compare function based interventions to empirically validated non function based interventions for more typically developing children exhibiting problem behaviors within a general education setting.

## **INTRODUCTION**

Since the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 1997, public education has been going through a paradigm shift that has reexamined the conceptualization of academic difficulties and in school behavior problems. In the past a child with disabilities problem behavior or academic failure was seen as an unmanageable result of an unchangeable internal construct, most appropriately dealt with in the confines of a separate special education classroom. There is currently a push to instead be open to the possibility that undesirable behaviors and poor academic performance could be environmentally motivated rule governed behaviors. This shift has facilitated new levels of teacher responsibility for student success and has created a number of hurdles to be overcome before a student receiving special services can be removed from their current educational placement.

When compared to previous philosophies of special education this current paradigm comes in direct contrast. Prior to IDEA educators, particularly school psychologists adhered to a structural approach to educational difficulties. Problem behaviors and academic failures were examined through a battery of tests meant to examine a child's cognitive ability and other stable internal traits so that a label could be given to explain the student's particular difficulty. While this approach isn't inherently flawed, it overlooks a number of environmental factors that could be arranged in a way so that difficulties dissipate. Knowing that a child who is not reading at grade level has an IQ of 85 tells a very different story depending on if his teacher is effectively teaching reading or not. It is not out of the question that all of the children in his class are also

reading below grade level. What is important in this case is the environment first and internal constructs second. Structural approaches to education are often seen as merely admiring a problem rather than collecting information that could possibly be helpful in changing it.

The current zeitgeist in special education is more closely linked to a functional approach for dealing with problem behaviors and academic difficulties. Rather than spending excessive time giving norm referenced tests or moving children with problem behaviors to separate classrooms school personnel are being required to examine possible environmental factors contributing to a student's problems. This is far more consistent with the protection of a student's right to receive free appropriate public education (FAPE) in the least restrictive setting.

## **IDEA**

With the passage of IDEA 97 congress required individualized education programs (IEP) for children with labeled disabilities so that educational goals based off of previously validated effective teaching strategies could be drawn out both before and during a school term. The Office of Special Education Programs goes as far as saying "the needs of the individual are of paramount importance in determining the behavior strategies that are appropriate for the inclusion in the child's IEP (Individualized Education Program)" (OSEP Questions and Answers 1999). With these individualized plans teachers and administrators meet with parents to plan out a student's education and from then on are legally responsible for those goals being met. While commonly seen as

an annoyance among teachers this process guarantees children with disabilities Free Appropriate Public Education (FAPE) and their parents a say in their child's education.

IDEA also provided a new set of protections to teachers and administrators. In a move designed to make "schools safer more orderly environments that are conducive to learning" (Senate Report, 1997 as cited in Drasgow & Yell, 2001, p. 239). IDEA provided teachers with the ability to suspend students for longer periods of time and even relocate children involved in weapon/drug related incidents into interim alternative educational setting (IAES) for up to 45 consecutive days.

In an attempt to balance both these needs to keep a student within the least restrictive setting and at the same time protect other students rights to a safe, unobstructed learning environment IDEA 97 requires the use of a Functional Behavioral Assessment (FBA) in a number of situations in which a student's behavior impedes his or her own learning or the learning of others (Drasgow & Yell, 2001) before a complete change in placement can occur. Functional Behavioral Assessment is a multi-method assessment strategy used for gathering information about antecedents, behaviors, and their consequences in an effort to determine a particular behaviors function (Gresham, Watson, & Skinner, 2001). Once a behaviors function is determined an intervention that monopolizes on this information can be put in place. For example if a behavior is shown to be reinforced by attention, attention can be withheld when that particular behavior occurs but given readily when a more appropriate behavior occurs. Under IDEA FBAs are required (if one has not previously been conducted) within ten days from when:

- (A) Suspensions or placements in an alternative setting exceed 10 consecutive days or amount to a change in placement.
- (B) A student is placed in an interim alternative educational setting for 45 days when his or her misconduct involves weapons or drugs.
- (C) A due process hearing officer places a student in an interim alternative educational setting for behavior that is dangerous to himself or herself or others. (Individuals with Disabilities Education Act).

After this assessment is completed an individual's IEP is reexamined by school personnel and amended as necessary. If it is unreasonable to make the necessary changes within the current environment a change in placement may be necessary, but prior to this decision all other feasible options must be considered.

### **FBA**

Functional assessments of behavior can be linked to a long history of psychologists who were more concerned with particular behaviors controlling variables than the topography of the behavior itself. Though at first this concept seems a bit odd it makes perfect sense given that similar behaviors can serve many different purposes across different settings and individuals. For example a teen's cursing behavior in front of his teachers could be maintained by operantly conditioned escape from an aversive task such as completing a difficult assignment. The same cursing behavior in front of a group of friends in the cafeteria could have a long history of being reinforced by positive social attention. In this, what interests many psychologists, particularly behavior analysts dealing with problem behaviors, is not the behavior itself but the environmental events

that increase or decrease the probability of that behavior occurring, not the what but the why (Carr, 1993). This stems from a fundamental behaviorist position suggesting that behaviors, even problematic ones, are “rational and reasonable reactions to antecedents and consequences present in the environment” (Durand, 1987).

At its most basic level, behaviorists would suggest that all operant behavior is motivated by positive reinforcement (the introduction of a stimulus that increases the likelihood of that behavior occurring in the future) or negative reinforcement (the removal of an aversive stimulus that increases the likelihood of that behavior occurring the in the future) (Skinner, 1953). It has been suggested, as a result of much research that these categories can be made a little clearer. Behaviors can serve a number of purposes but most commonly fall into one of the following functional categories:

(a) Social attention/communication (positive social reinforcement); (b) access to tangibles or preferred activities (material or activity reinforcement); (c) escape, delay, reduction, or avoidance of aversive tasks or activities (negative reinforcement); (d) escape or avoidance of other individuals (negative social reinforcement); and (e) internal stimulation (automatic or sensory reinforcement) (Carr, 1994 as Cited in Gresham et. al. 2001).

With the knowledge of a particular behaviors function, behavior analysts have been able to manipulate environmental antecedents and consequences to effectively decrease or increase a particular behavior. This technology has been for a long time seen as the most effective way to decrease severe problem behaviors such as self injurious behavior and has more recently been applied to the classroom setting. For example if a

student's disruptive behavior was maintained by peer attention such as the cursing behavior in the previous example an intervention could be put into place where peer attention was put on extinction for that particular behavior but was available contingent upon a more appropriate behavior such as class work completion. This would theoretically decrease disruptive behavior and increase more socially acceptable behavior while still fulfilling the student's desire for peer attention. For behaviors whose functions aren't readily obvious the functional behavioral assessment could also protect against creating interventions that inadvertently reinforce a problem behavior. For example if a student's disruptive behavior was maintained by escape from aversive tasks, sending a child to time out contingent on disruptive behavior could theoretically reinforce the behavior rather than punish it, as common thought might be dictate.

Functional Behavioral Assessment, despite only being mandated by law since 1997, has for some time been seen as best practice. Unlike many of the previously used assessment strategies such as cognitive ability tests, functional behavioral assessments are not definitive procedures in which the outcome is a classifiable problem that can be fixed easily by some miracle drug or a change in placement. Instead it is multimethod process including any number of procedures directed at gaining a better insight of what purpose a particular problem behavior serves in a specific setting for an individual. This process can include: (1) indirect measures such as archival research, norm based assessments, teacher rating forms, and teacher interviews; (2) direct assessments such as direct behavioral observations, and (3) experimental assessments in functional analysis.

**Indirect Methods.** Indirect methods of FBA such as functional assessment interviews, archival searches, norm-based behavior rating scales, social skills ratings, and adaptive behavior assessments are assessment measures that can be conducted outside of the context where a particular problem behavior has occurred (Cone, 1978; Gresham & Noell, 1999 as cited in Gresham et. al., 2001). While all information taken through indirect means can be useful in the creation of testable hypotheses they should not be the sole step of an FBA (Watson & Steege, 2003). Given the nature of indirect assessments reports may be unintentionally biased because of the informant's closeness to the problem behavior and can include a component of reactivity. Despite these shortcomings indirect methods should be used as a means of describing what situations a behavior is most likely to occur in from informants who have previously experienced the behaviors firsthand. Indirect assessments are particularly important in cases where problem behavior is relatively low in frequency but high in intensity. (Gresham et. al. 2001, Watson et. al., 2003).

**Direct Methods.** Unlike indirect methods, direct methods examine actual behavior as well as it's antecedents and consequences as a means of understanding function. Here the emphasis is placed on the direct observation of operationally defined behavioral characteristics that can include traits such as frequency, duration, intensity, and latency. Direct methods could include anything from frequency recording to the computations of conditional probabilities based off of Antecedent-Behavior-Consequence recordings. While these methods tend to be more objective than indirect measures it is

important to remember that at best these methods will lead to correlational suggestions about a particular behaviors function.

**Experimental Functional Analysis.** Functional analysis is the experimental manipulation of antecedents and consequences in order to find a causal relationship between a behavior and a consequence. This procedure while possibly more informative is far much more labor intensive and is infrequently utilized within a typical educational setting (Vollmer & Northup, 1996). Within an experimental functional analysis an individual is exposed to a number of different tightly controlled conditions each set up to test potential maintaining variables effects on a target behavior. Rather than waiting for an antecedent to present itself in the natural setting, as would be seen within an A-B-C recording procedure, within an experimental functional analysis experimenters would control the occurrence of specific antecedent events and also control the consequences.

First conceptually described by Carr in 1977, experimental functional analysis gained much recognition and wide use in 1982 when the creation of an analogue experimental analysis was conducted (Iwata, Dorsey, Slifer, Bauman, Richman, 1994). Within Iwata's analog FA experimenters manipulated a number of antecedents and consequences within a highly controlled setting to see which perceived function a particular behavior was playing. Since then the traditional functional analysis (Iwata, 94) has been considered the gold standard in assessing problem behaviors for people with low incidence disabilities. Although this procedure is not necessarily a mirror of the natural setting, it is the most quantitatively precise of possible FBA methods (Iwata, Vollmer, & Zarcone, 1990; Iwata, Vollmer, Zarcone, & Rodgers, 1993 as cited in

Cunningham & O'Neill, 2000). When the results of a functional analysis come out clear it is hard to deny that within experimental conditions a behavior served a particular function. In fact some researchers would suggest that “interventions efforts should begin with a thorough functional analysis and that hypotheses derived from such an analysis should form the basis for choosing and designing treatments” (Carr, 1994). For this reason functional analysis has been widely used within the field of behavior analysis particularly in the assessment of individuals with severe mental retardation or developmental disabilities engaging in self injurious behavior. Often used as a last resort because of the amount of time it takes and ethical issues concerned with reinforcing problem behavior, functional analysis provides a “direct conceptual link between assessment and treatment” (Schill, Kratochwill, & Elliott, 1998).

### **Current Controversy**

A great wealth of research on functional assessment and more specifically experimental functional analysis has been conducted using children with severe developmental delays or mental retardation as their participants very often in the assessment and treatment of self injurious behavior. Since the majority of the conceptual research backing FBAs was conducted in these highly controlled situations by well trained behavior analysts there has been much criticism suggesting that they are inapplicable and invalid with a number of milder disabilities (such as students with emotional or behavioral disorders) in more natural settings (Nelson, Roberts, Mathur, & Rutherford, 1999; Sasso, Conroy, Stichter, & Fox, 2001; Scott, Meers, & Nelson, 2000; Stage, 2000). There is also a great deal of criticism suggesting that even if FBAs were

applicable to the school setting school personnel would not be trained enough to perform them adequately especially given the lack of consensus of what an FBA consists of (Nelson et. al. 1999).

Despite these criticisms there is a growing literature of classroom based FBAs (see Lewis & Sugai, 1996; March, 2002; Ervin, DuPaul, Kern & Friman, 1998; Broussard & Northup, 1995; Boyajian, DuPaul, Handler, Eckert, & McGoey, 2001) that would suggest that function based interventions based off of FBAs can be used to create effective interventions within a classroom.

While FBA technology has done a great deal in creating function based interventions for children with severe low incidence disabilities in highly controlled settings (Blakeslee, Sugai, & Gruba, 1994; Cooper, Wacker, Sasso, Reimers, & Donn, 1990; Gresham, Quinn & Restori, 1999; Iwata et al., 1994), little has been done in the comparison of non-function based and function based interventions for more typically developing children with high incidence disabilities who make up the bulk of the population served under IDEA (Specific learning disabilities, mild mental retardation, emotional behavior disturbance etc.). In addition several meta-analyses suggest that prior knowledge of a behaviors function does little to increase the effectiveness of that intervention as compared to standard non function based behavioral interventions (Gresham, McIntyre, Olson-Tinker, Dolstra, McLaughlin & Van, 2004; Stage & Quiroz, 1997). This has led many in the field to question whether or not function matters in the creation of typical interventions within the classroom (see Gresham et. al., 2004; Sasso et. al., 2001; Schill et. al., 1998).

## **PURPOSE**

While FBA is currently seen as the gold standard within education as the means to creating interventions for children protected under IDEA, much of the research backing the use of function based interventions (rather than nonfunction based empirically validated interventions) was not conducted with the population most commonly served under IDEA. These children, unlike those with severe mental retardation or developmental disabilities, are far more typical and could theoretically respond to less intensive empirically validated interventions. This raises some questions given the amount of time necessary to derive a particular behaviors function within a general education classroom. The current study aims to examine the relative effectiveness of function based interventions as compared to a well implemented empirically validated intervention within a general education setting. The experimenter hypothesizes that the two interventions will produce similar effects despite common belief that function based interventions will produce more significant effects.

The interventions examined are going to be differential reinforcement for the function based intervention and self monitoring for the non function based intervention. Both of these interventions have been widely used in the reduction of problem behavior and have been ranked as the two most effective individualized interventions (Differential Reinforcement  $ES = .95$ , Self Monitoring  $ES = .97$ ) within a public education setting (Stage et. al., 1997).

## **METHOD**

### **Participants**

The lead researcher contacted a number of principals within a metropolitan area and asked them to locate students who were between first and fifth grade who were engaging in high frequency problem behaviors within a general education classroom. It was further specified that participants would need to be either typically developing and receiving no special services or have a high incidence disability but still spend 85% or more of their time within a general education classroom. Students with more severe disabilities or those spending less than 85% of their time within a general education classroom were not considered for inclusion since there are already a number of studies examining interventions based off of FBAs for this population.

Carlos was an African American fifth grade student who was typically developing. He was referred for a number of disruptive behaviors such as frequently blurting out, fighting with his teacher after being corrected, walking around the room during instruction time, and infrequent crying tantrums. During assessment and treatment time Carlos was suspended 2 times once for cursing at his teacher and another time for leaving the room without permission when a substitute was in the room. Carlos read a median of 68 words per minute on 5<sup>th</sup> grade material leaving him just above the 10<sup>th</sup> percentile of 5<sup>th</sup> graders nationally according to AIMSwebs national standards (AIMSweb, 2007). He also completed multiplication at a mastery level completing a median of 69 digits correct when working on multiplication similar to what was instructed within the classroom.

Melissa was an African American fourth grade student who was typically developing. She was referred for frequently fighting with her teacher and other students which had escalated to her engaging in physical violence and book throwing. One such event after school had led to police involvement. Her teacher suggested that her math competency was less than other students in the class and that most of her problem behaviors occurred during math class, where she had previously refused to take tests. When Melissa does not do work, her teacher explained that she goes over to her desk and works the problem together with her, but can't stop class every time Melissa does not work. These problem behaviors had led for the school counselor to start a FBA, even though not required by law, in the days prior to my first teacher interview. Up until the collection of the last data point no progress had been made past giving her teacher a teacher rating form.

Melissa read a median of 67 words per minute on 4<sup>th</sup> grade material placing her at between the 10<sup>th</sup> and 25<sup>th</sup> percentile of 4<sup>th</sup> grade students nationally according to AIMSweb national standards (AIMSweb, 2007). Melissa did not understand multiplication, as her teacher suggested, but was instructional (completed over 26 digits correct) in both addition and subtraction which were the most frequently covered topics within her math class.

Stacy was an African American 5<sup>th</sup> grade student who was typically developing. Stacy was referred for behavior outbursts related to being corrected and being generally rude and disrespectful. During these outbursts she has yelled at her teacher, cried, and thrown books onto the floor. She frequently gets up without permission to ask questions

that are irrelevant to the topic at hand. Her teacher says that she knows it's that she "loves the attention" so she has been trying to ignore any problem behaviors. During as the original baseline period Stacy was suspended twice for fighting with her teacher and the physical education teacher for 2 and 4 days respectively. Stacy is reading a mean of 121 words per minute of 5<sup>th</sup> grade material placing her in the top 50% of 5<sup>th</sup> graders nationally according to AIMSweb national standards (AIMSweb, 2007). She also completed over a mean of 107 digits correct in single digit multiplication and single by double digit multiplication which is what her class was working on when assessment started this level leaves her at the top 90% of 5<sup>th</sup> graders nationally according to AIMSweb, 2007 standards.

### **Setting**

All observations and intervention implementation was conducted within the student's general education classroom to provide the most naturalistic and externally generalizable setting possible. Direct observations during the functional behavioral assessment and intervention phases during treatment were conducted during periods when teacher reports suggested the highest occurrence of problem behaviors. For Carlos all observations were conducted in the afternoon directly after recess during science instruction. For Melissa all observations were conducted after lunch during math and science instruction. For Stacy all observations were conducted between a reading block and lunch during science and social studies instruction. All three classrooms had between 20-28 students with desks in cluster configurations. Both Carlos and Melissa's

classrooms were inclusionary classrooms for at least part of the day. Classroom instruction did not vary based off of the participation of special needs students.

## **Procedures**

**Functional Assessment of Problem Behavior.** The experimenter sent an announcement of the current experiment (Appendix 1) to a number of elementary public schools within East Baton Rouge parish. Upon teacher referral of students engaging in a high incidence problem behavior within their classroom, who are also considered to be academically competent, an initial problem identification interview (PII) and preliminary classroom observation will be conducted. If the participant appeared to meet the requirements set out previously and engaged in frequent problem behaviors or was consistently off task a letter of parental consent was sent home (Appendix 1). Upon the return of parental consent the lead experimenter conducted a Functional Assessment Interview (O'Neill, Horner, Albin, Sprague, Storey, & Newton, 1997). While not necessarily the most popular functional assessment interview, this interview has a wealth of data supporting its relative congruency with traditional functional analysis in computing a particular behaviors function (Cunningham et. al., 2000).

After a review of the functional analysis interview the experimenter conducted a series of direct observations of problem behaviors using the Functional Assessment Observation sheet (O'Neill et. al., 1997). In addition baseline data was collected on the percentage of intervals on task and off task using a 10 second whole interval method. These observations consisted of 15-16 minute sessions that were spaced out at least 4 minutes apart with no more than three sessions run on any given day

After the completion of a functional assessment interview and direct observations, the experimenter generated a hypothesis of behavior function based off of the interview data and the percentage of intervals during the last three baseline sessions associated with a particular consequence (peer attention, teacher attention, escape from task). Peer attention was defined as any direct peer attention in the form of touching, talking to or looking at target student. Teacher attention was defined as speaking directly to the target student regardless of proximity. Escape was defined as the removal of an academic task previously presented to target student. Despite only being correlational in nature, these estimates allowed for a best guess as to a behaviors function and have previously led to the creation of effective interventions in a number of studies (Dunlap et. al., 1993; Grandy & Peck, 1997; Kern, Childs, Dunlap, Clarke, & Falk, 1994; Storey, Lawry, Ashworth, Danko, & Straing, 1994 as cited in Sterling-Turner, Robinson, Wilczynski, 2001). Behavior was considered to serve the function most highly correlated with a particular response and the all teachers were given an opportunity to voice a concern if this does hypothesis did not seem reasonable. The hypotheses generated by the experimenter were all accepted during interview prior to treatment implementation.

The experimenter hypothesized that all three student's problem behaviors were maintained by social attention, comprised both by teacher and peer attention. While some of their behaviors may have delayed academic tasks these tasks were still required and frequently completed. During the last three sessions of the initial baseline Melissa was actively disruptive in 27.08% of the intervals 1.28 % of those were associated with teacher attention and 74.35% were associated with peer attention. Melissa was on task

for 22.56% intervals during the last three sessions of baseline and they were associated with teacher attention 26% of the time and peer attention 0% of the time. During the last three sessions of his first baseline Carlos was actively disruptive in 28.14% of the intervals which was associated with teacher attention 21.05% of the time and peer attention 30.26% of the time. He was on task in 32% of the intervals which was associated with teacher attention 31% of the time and peer attention 0% of the time. During the last three sessions of her first baseline Stacy was actively disruptive 31% of the intervals which was associated with teacher attention 1.19% of the time and peer attention 78.57% of the time. Stacy was on task 35% of these intervals which was associated with teacher attention 10.5% of the time and peer attention 1.05% of the time. All three teachers agreed that it was plausible that problem behaviors were being maintained by access to social attention and agreed to allow treatment training and treatment implementation to start given this hypothesis.

**Academic Assessment.** Before any individualized assessment was conducted participants were asked for their consent to participate in the study and sign a sheet informing them of their right to participate or drop out at any time (Appendix 1). In order to further assess factors contributing to problem behavior the experimenter conducted a brief academic assessment. Within this assessment the experimenter assessed participant's oral reading fluency and math competency using previously generated math worksheets tailored to the information the participants class was currently reviewing. Oral reading fluency was assessed using DIBELS reading passages matched to the participant's grade level. These assessments were conducted to examine the possibilities

of academic difficulties which may be contributing to the occurrence of problem behaviors.

### **Experimental Phase**

**Research Team.** All sessions were conducted by the primary experimenter a third year graduate student in school psychology working on his Masters project. In addition to this experimenter the research team was made up of two other school psychology graduate students and a well trained research assistant who had previously graduated with an undergraduate's degree in psychology. Team members were trained in data collection using a whole interval time sampling procedure prior to data collection.

**Experiment Sessions.** All sessions during the experiment were conducted within periods of independent seat work or classroom instruction and lasted for 16 minutes. In the event that a session was cut short due to unexpected breaks in the day or the administration of a test all sessions that were at least ten minutes were still included. The timing for these observations was based both off of teacher availability and from previously conducted functional assessments. Sessions were conducted on a regular basis that depended on teacher availability, student availability, and non-testing situations. For Carlos and Stacy data was typically collected three days a week, for Melissa data was collected 4 days a week. During all sessions experimenters ignored problem behavior, while instructing the teacher to respond in a typical fashion whenever an experimenter was in the room.

**Baseline.** The teacher was directed to react in whatever manner he or she typically does contingent on the occurrence of problem behavior. During these sessions

the experimenter collected data on the percentage of intervals on and off task using a whole interval time sampling technique with 10 second intervals. A student was marked on task if he or she was working on the assigned material or facing a teacher during instruction. A student was marked actively disruptive if he or she was talking out, out of seat without permission, or touching others. A student was marked off task not actively disruptive if they were in their seat and not on task but doing something else to occupy their time not related to the material at hand. This included but was not limited to drawing, reading another book, and rummaging through desk for materials when not assigned to change tasks by a teacher. Baseline sessions were conducted until there were at least 3 relatively stable data points of off task behavior per session.

**Function Based Intervention: DRO function.** Differential reinforcement of other behavior (DRO) is a procedure in which reinforcement is provided on the non-occurrence of a particular behavior. During this particular DRO procedure the experimenter provided social attention contingent on the nonoccurrence of actively disruptive or off task behaviors (as described in baseline description) for a two minute period. This time was agreed upon by the teacher and the experimenter but in all cases participants had gone more than two minutes on task during at least two baseline sessions. This was a resetting DRO to allow for the most opportunities to receive reinforcement. At the end of every two minute period of consistent on task behavior the experimenter went over to the student and provided approximately 3 seconds of attention in the means of physical proximity and also verbal praise such as “I like the way you’re working”, “You’re doing a great job taking notes” or “That was a good question you just asked”.

**Standard Intervention: Self Monitoring.** Self monitoring is a typical classroom intervention that involves self observation and self recording (Cole & Bambara, 2000). As an intervention it has been effectively implemented in a number of populations across many diverse settings. For the classroom environment self monitoring makes sense because the bulk of the intervention is completed by the student, without requiring additional effort on the teacher's part.

Students were taught a self monitoring procedure in which they recorded the occurrence/non occurrence of problem behavior on a fixed time interval, agreed upon by teacher and experimenter. After the first series of baseline sessions students were trained to self monitor prior to treatment phase with at least 85% treatment integrity as compared to experimenter ratings. At the beginning of each self monitoring session the experimenter provided the student with a MotivAider® set to vibrate on a fixed two minute interval and a record sheet (Appendix 2). The MotivAider® is a small electronic device that discretely vibrates on previously set intervals. Every time the interval was complete, and the MotivAider® vibrated, the students were instructed to record whether or not they were on or off task for the entire two minute interval. The two minute interval was picked both because students had completed at least one baseline session where they were on task for two minutes and to equate the time in self monitoring and DRO sessions. At the end of the two minute interval students were instructed to place a check on the form if they had been working on material assigned by their teacher, had not talked to any other student, and had not done anything to disrupt the class. Students were instructed to place an X on the sheet if they had been out of their seat without permission,

were talking, done something to disrupt the class, or had been doing any activity they were not supposed to be engaged in. The experimenters recorded on and off task behaviors using the same method as in baseline and during the DRO treatment. At the end of the session the experimenter went to the participant's desk, discretely collected the recording sheet and Motivader®, examined the recording sheet for accuracy and provided a previously assessed preferred item contingent on reporting correctly at least 7 of 8 intervals. For Mellisa and Stacy this preferred item was small packages of sour candy and for Carlos this item was one of a series of sports trading cards. If students did not accurately report behavior on at least 7 of the 8 intervals the experimenter ran training sessions until the participant did accurately report in at least 87.5% of intervals and then reran the session. If there were differences in interobserver agreement between experimenters the student was given the most favorable possible outcome.

**Interobserver agreement (IOA).** IOA was collected by two school psychology graduate students and one other student who had recently completed an undergraduate degree in psychology. All three were trained in data collection and were required to have 90% reliability with the lead experimenter prior to collecting agreement data. IOA was determined by comparing two separate raters records on an interval by interval basis and dividing the number of agreements by the total number of intervals and multiplying by 100. IOA was collected during 51.7% of sessions run and had an overall mean of 93.11% agreement. For Carlos IOA was assessed in 44.9% of sessions, had a range of 73-100% and had a mean agreement of 92.48%. For Melissa IOA was assessed in 42.86% of sessions, had a range of 78.13-100% and had a mean agreement of 94.88%. For Stacy

IOA was assessed in 63.38% of sessions, had a range of 79.17-100%, and had a mean of 92.44%. Although IOA was conducted all data reported was based off of data collected by the primary experimenter.

### **Design**

A nonconcurrent multiple baseline across subjects with a multielement treatment phase was used to evaluate the effects of the two interventions. During the treatment phase treatment order was designated based off of three separate random number charts. This arrangement allowed for some days where only one intervention was implemented decreasing the chances that the DRO intervention would be associated with any sort of reward other than the contingent attention related to on task behavior. After initial treatments reached stability a brief second baseline phase was conducted and followed by a second treatment phase.

## RESULTS

Results for percentage of intervals on task are presented in figure 1. Means and standard deviations for percentage of on task behavior per session appear in table 1. Effect sizes for treatments are provided in table 2. A no assumptions effect size (Busk & Serlin, 1992) was calculated by taking the mean of the last three treatment sessions minus the mean of last three sessions of the first baseline divided by the standard deviation of the last three first baseline sessions. Since the last three points of any phase should be relatively stable it has been suggested (Swanson & Sachse-Lee, 2000) that taking the last three data points when computing the effect size should standardize across studies with differing amounts of variability and more importantly number of total baseline sessions.

### Participant One

Both treatments increased Carlos' level of on-task behavior (Figure 1). The mean of Carlos' baseline level of intervals on task per session was 35.87 and was increased to a mean of 72.83% during DRO sessions and 93.28% during self monitoring sessions (Table 1). DRO produced an effect size of 1.82 and self monitoring produced an effect size of 2.35 both large by Cohen's D standards (Table 2).

Table 1

Mean percentage of on-task intervals for each participant, phase and condition

	Base Line	DRO	Self Monitoring	Total Treatment
<b>Participant</b>				
<b>Carlos</b>	35.87 (26.02)	72.83 (8.13)	93.28 (5.30)	83.54 (12.38)
<b>Melissa</b>	40.08 (21.39)	80.69 (11.78)	97.84 (2.31)	89.98 (11.80)
<b>Stacy</b>	58.70 (22.75)	78.35 (9.87)	92.42 (5.19)	86.95 (10.00)
<b>Total</b>	45.25 (24.88)	72.46 (6.74)	94.40 (4.60)	84.85 (12.60)

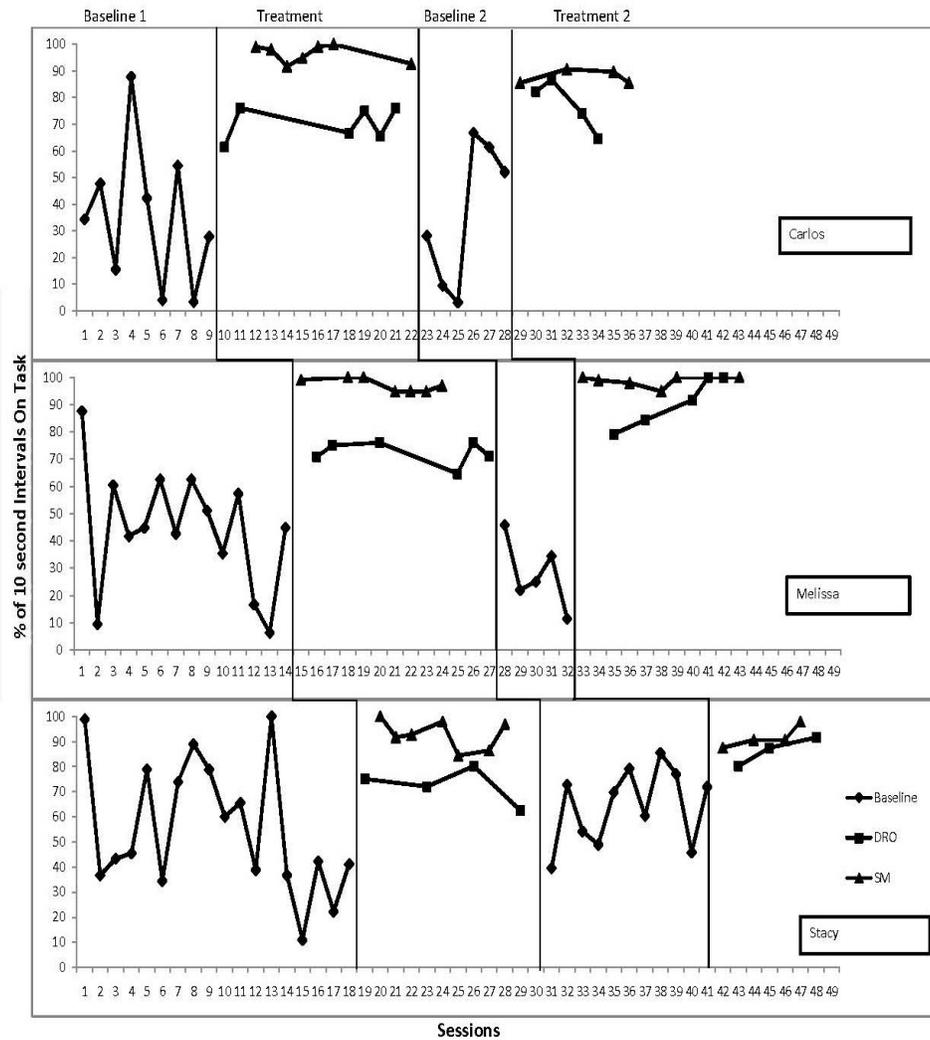


Figure 1. Results for all participants across phase. Mean percentage of intervals on task.

### Participant Two

Both treatments increased Melissa’s level of on-task behavior (Figure 1). The mean of Melissa’s baseline level of intervals on task per session was 40.08% and was increased to a mean of 80.69 during DRO sessions and 97.84 during self monitoring sessions (Table 1). DRO produced an effect size of 3.73 and self monitoring produced an effect size of 3.79 both large by Cohen’s D standards (Table 2).

### Participant Three

Both treatments increased Stacy's level of on-task behavior (Figure 1). The mean of Stacy's baseline level of intervals on task per session was 58.69% and was increased to a mean of 78.36% during DRO sessions and 92.42% during self monitoring sessions (Table 1). DRO produced an effect size of 4.57 and self monitoring produced an effect size of 5.15 both large by Cohen's D standards (Table 2).

Table 2

Mean effect size for each intervention and across participant

	<b>ES DRO</b>	<b>ES SM</b>	<b>ES T</b>
<b>Participant</b>			
<b>Carlos</b>	1.82	2.35	2.08
<b>Melissa</b>	3.73	3.79	3.89
<b>Stacy</b>	4.57	5.15	5.18
<b>Total</b>	3.37	3.76	3.72

## **DISCUSSION**

The current results suggest that both DRO and self monitoring can be used effectively to decrease problem behavior within a general education setting with both procedures showing large effect sizes for all participants. While it was hypothesized that both interventions would perform similarly the current data would suggest that the self monitoring procedure may be moderately more effective for all participants.

### **Practical Implications**

Given the current belief that function based interventions are the most effective way to decrease problem behaviors within a general education setting, the current study questions whether it is always worth the extra time and effort put into their creation and implementation. Even though function based interventions have been repeatedly tested within a lab or small classroom setting the requisite bridge studies to regular classrooms haven't been conducted.

A number of hallmark properties of function based interventions may not even be appropriate for regular classroom procedures. While it was relatively easy for the experimenter to not reinforce problem behaviors during the DRO condition it would be difficult to instruct a whole class to ignore any acting out behaviors. It would also be seemingly difficult for a teacher to allocate attention on a DRO or DRA schedule with an extinction component given that regardless of the existence of problem behavior some attention may be appropriate or even required during typical instruction. If a student with problem behavior maintained by social attention is hitting one of his classmates during instruction and then asks appropriately for guidance on a particular problem it could be

seen as ethically questionable to instruct a teacher to ignore his appropriate requests until he has went for a period of time without being actively disruptive. While these procedures may in fact be empirically based and the most appropriate procedures given unlimited resources their applicability within a general education classroom seems limited.

If there were no effective empirically based interventions that could reduce problem behavior without a hypothesis of a behaviors function then these would obviously be the most effective way to decrease problem behaviors within a classroom. Given the existence of a number of run of the mill interventions though current data would support using the more general intervention first and then proceeding to a more tightly controlled intervention based on a behaviors function second.

### **Limitations and Future Directions**

Despite being equated on interval and behaviors recorded across treatment procedures there was a lack of control of reinforcement available. Furthermore attention and tangibles delivered were not presented at the same frequency and were not assessed for reinforcer quality. The experimenter tried to reduce the effect of rewards given during the self monitoring procedures on percentage of intervals on task by making rewards contingent on agreement rather than on any specified percentage of intervals on task. If agreement was not at 87% a reward was not delivered regardless of percentage of intervals on task. Sessions were rerun both for times when the participant perceived themselves to be more on task than the experimenter but also for sessions where they perceived themselves to be less on task than the experimenter.

Future research could examine the effectiveness of a self monitoring procedure and a DRO procedure where the DRO was nonresetting. In this case reinforcement and the signal to self monitor would be on the same schedule rather than the possibility of both being on the same schedule as was seen in the current study.

**Function Based Intervention.** The lack of an experimental functional analysis greatly reduces the confidence associated with the hypothesized behavior function. While the FAI and FAO have repeatedly shown high correlation with traditional experimental functional analyses (Cunningham et. al., 2000) without an experimental phase behavior function can only be hypothesized. Furthermore while all students did receive attention contingent on problem behavior it could be suggested that they were also temporarily escaping from tasks even if they were not removed from them. Future research could examine function based interventions used with typically developing children in a general education classroom with functions determined through experimental analyses conducted in either an analog or classroom setting.

A second limitation of the DRO procedure was the lack of a true extinction component. While problem behavior postponed the availability of attention from the experimenter attention was still available from both peers and instructors at baseline levels and oftentimes was available contingent on problem behavior. While this is in some respects a limitation, given the stability of behavior under the DRO condition it could also be seen as a more easily accessible intervention for a typical classroom. As previously noted it would be very difficult to include a true extinction component for socially maintained behaviors within a typical classroom, but including a DRO schedule

on top of what is typically available from peers may be a good starting place for teacher implemented DRO type interventions within a classroom. Future research could examine the effectiveness of a nonresetting DRO run by the teacher using similar procedures to the condition run during the current experiment.

**Self Monitoring.** Despite its effectiveness in reducing problem behavior within a classroom this study did little to explain why self monitoring worked better than a DRO based procedure. Little is known about the operant causes for self monitoring effectiveness for reducing behaviors. Future research should examine if there is some sort of attention associated with self monitoring. It could be some sort of self attention that is occasioned by the signal. It could also be that reporting on task behavior is in itself reinforcing which over time and a number of participants could be examined. There is also a possibility that the knowledge that eventually an experimenter will examine the record sheet could be a reinforcer for appropriate behaviors and a punisher for problem behaviors. Lastly there is a possibility that previously conditioned rules also could play a part in this, when there is knowledge that someone is observing their behavior. If this is the case though, behavior should look more similar for all sessions after the initial baseline which was not the case.

The current study suggests that a function based intervention can be used within a general education classroom to decrease and stabilize problem behaviors. This being said it also suggests that an empirically validated nonfunction based procedure may provide a greater reduction in problem behavior for some students. Given this knowledge it seems reasonable to suggest that practitioners first employ a standard empirically based

intervention before moving to a more time consuming difficult to control function based intervention for typically developing children within the general education classroom.

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## **APPENDIX 1 CONSENT FORMS**

### **Informed Consent to Participate in Research**

My name is Michael Vance and I am a second year doctoral student in Louisiana State Universities School Psychology Program. As a part of the requirements for a masters degree I am required to complete a research thesis and I have elected to study the effectiveness of interventions within the general education classroom that are developed through behavioral assessment. My study aims to examine the effectiveness of interventions developed through an behavioral function based assessment as compared to interventions not based on this type of assessment that have been shown to work in prior research.

For my study, function based interventions vs. non-function based interventions within a general education setting, I am looking for students between first and fifth grade who spend at least 85% of their time in the general education classroom and engage in a high frequency problem behavior. These behaviors can include but are not limited to talking out, inappropriately getting out of their seat, aggression towards another student within the classroom, etc. Students may or may not be receiving special services under IDEA or Section 504. I would also like for participants to be functioning on grade level academically despite engaging in problem behaviors.

Once involved in the study a functional behavioral assessment will be conducted on the problem behavior and two in class interventions, conducted by highly trained graduate and undergraduate students, will be conducted to assess the most effective intervention for that particular child. Since the interventions will be conducted within the

regular education setting during typical classroom instruction, there is little risk to the student of exclusion or missing out on instruction. At the completion of the study teachers will be shown how to use the most effective intervention and the lead experimenter will be available for future consultations.

This study aims to gain a better understanding of what types of interventions are most suitable for children engaging in problem behaviors within the general education setting. All services will be provided free of charge, and information pertaining to the project will be confidential unless disclosure is legally compelled. While the information collected during this study will be examined for possible future publications, any identifiable information will be coded so that all participants and their teachers are unrecognizable to anyone other than the primary research team. If you have any further concerns or questions about the nature of this study please let me know. You are free to withdraw from this study at any time.

If you have questions about subjects' rights or other concerns please contact Dr. Robert C. Mathews, Institutional Review Board, (225) 578-8692. Please keep the additional copy of this letter for your records if you chose to participate.

Thank you for your time

Michael Vance  
Department of Psychology  
Louisiana State University  
Baton Rouge, LA 70803  
504-812-0318

If you chose to participate please complete the information below.

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Name (print)

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Signature

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Date

## **Informed Consent to Participate in Research**

Dear Parent,

My name is Michael Vance and I am a doctoral student in school psychology at Louisiana State University. As a part of the requirements for my Masters degree I am conducting an experiment on the effectiveness of two different class based interventions aimed at the reduction of problem behaviors. For my study, function based interventions vs. non-function based interventions within a general education setting, I am looking for students between first and fifth grade who spend at least 85% of their time in the general education classroom and engage in a high frequency problem behavior.

Your child has been teacher referred as engaging in a high frequency problem behavior. While your child's participation in this research is completely voluntary, the exposure to these scientifically based interventions could decrease classroom problem behavior and aid in the development of a more suitable classroom environment. Interventions will include self monitoring procedures, where participants will record the occurrence of their own problem behaviors and also rewards contingent upon good behavior. All interventions will be conducted within the classroom during regular education hours, so there is little risk of exclusion or missing out on any regular instruction. . All services will be provided free of charge, and information pertaining to the project will be confidential unless disclosure is legally compelled. While the information collected during this study will be examined for possible future publications, any identifiable information will be coded so that all participants and their teachers are

unrecognizable to anyone other than the primary research team. You are free to withdraw from your child from this study at any time.

Please keep the additional copy of this letter for your records if you chose to participate.

Thanks for your time

Michael Vance  
Department of Psychology  
Louisiana State University  
Baton Rouge, LA 70803  
504-812-0318

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\_\_\_\_\_

\_\_\_\_\_ I give my permission for my child to participate in this study.

\_\_\_\_\_ No, I prefer that my child not participate.

\_\_\_\_\_ I was provided a copy of this permission form for my records.

Date: \_\_\_\_\_ Parent/ Guardian: \_\_\_\_\_

Student: \_\_\_\_\_ Signature: \_\_\_\_\_

If you have additional questions about participants rights or other concerns regarding the research component of this activity you can contact: Robert C. Mathews, Institutional Review Board, Louisiana State University, (225) 578-8692.

## Child Assent

Hi I would like to work with you on some of problem behaviors you've been having within your classroom. Your parent(s) and teacher have said its ok that I work with and think it would be a good idea. A grown up from LSU will meet with you everyday to try out some strategies to help you be more successful in the classroom.

As part of this project some of the adults at LSU would like to learn about ways to help other students to be more successful at school too. As part of this we would like your permission to include your results in our research. You would not be personally named in any of our research and you do not need to do anything differently than what your parent(s) and teacher have already decided would be a good idea.

May we use your results as part of our research to learn more ways to help students learn?

YES

NO

---

Child's signature

Age

Date

---

Witness

Date

The witness must be present for the assent process, not just the signature.

## APPENDIX 2 SELF MONITORING FORM

Date: \_\_\_\_\_

To help keep me focused, working hard, and to help me behave better I am going to keep track of how I'm doing in class. When I am given this buzzer by my teacher I will start it and then put it in my pocket until I give it back to my teacher at the end of class.

Whenever the buzzer goes off I will:

Put a check in the next box if during the time period I

1. Was working on the material assigned by my teacher
2. Had not talked to any other student
3. Had not done anything to disrupt the class

Put an X in the next box if I was not in my seat, talking, or doing something other than what I was supposed to be working on

As soon as I put a mark in the box I will go quickly go back to work.

1.	2.	3.	4.	5.	6.	7.	8.
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## VITA

Michael Vance graduated *cum laude* with a Bachelor of Science degrees in psychology and political science from Syracuse University in 2005. During his years at Syracuse he worked on a series of school based intervention projects with under Dr. Tanya Eckert and Dr. Laura Lee McIntyre. He is currently working under Dr. Frank Gresham in pursuit of a doctoral degree in school psychology at the Louisiana State University.