Effectiveness of Teacher-Implemented Function-Based Interventions Versus Non-Function-Based Interventions for Preschoolers

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EFFECTIVENESS OF TEACHER-IMPLEMENTED FUNCTION-BASED INTERVENTIONS VERSUS NON-FUNCTION-BASED INTERVENTIONS FOR PRESCHOOLERS

by

Katherine Marie Bellone

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

August 2013
ABSTRACT

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Disruptive behaviors occur frequently in preschool classrooms. Children who exhibit early-onset behavioral concerns in educational settings are at greater risk for negative developmental outcomes than their peers. In order to address problem behaviors in the classroom, practitioners may use functional assessment methodology to design an individualized intervention tied to the function of the behavior. Alternatively, practitioners may choose to use an evidence-based practice, not tied to behavioral function, shown to be beneficial through research. Though much research states the need for empirical comparisons between function-based interventions and non-function-based interventions, past comparisons have often been unbalanced, such that the interventions included for comparison were not matched in terms of strength. Therefore, the current study sought to directly compare function-based interventions developed following a teacher-implemented brief functional analysis to an evidence-based practice, the Mystery Motivator to improve behavioral outcomes for four preschool children attending Head Start. By comparing these two interventions, a better understanding of the treatment utility of functional assessment methodology for typically-developing children in traditional educational settings can be determined.
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# TABLE OF CONTENTS

ABSTRACT ................................................................................................................................. ii

ACKNOWLEDGMENTS .............................................................................................................. iii

LIST OF TABLES ................................................................................................................... v

LIST OF ILLUSTRATIONS .................................................................................................. vi

CHAPTER

I. INTRODUCTION .................................................................................................................. 1

    Review of the Literature
    Summary and Purpose of the Present Study
    Research Questions

II. METHOD ............................................................................................................................. 16

    Participants and Setting
    Materials
    Procedures

III. RESULTS ......................................................................................................................... 35

    Functional Analysis
    Intervention
    Acceptability
    Intervention Efficiency

IV. DISCUSSION ..................................................................................................................... 50

    Research Question One
    Research Question Two
    Research Question Three
    Research Question Four
    Research Question Five
    Limitations
    Implications for School-Based Practice

APPENDIXES ...................................................................................................................... 63

REFERENCES ......................................................................................................................... 88
LIST OF TABLES

Table

1. Scores Obtained on the Intervention Rating Profile-15 ........................................47
2. Rates of Change in Problem Behavior .....................................................................48
3. Rates of Change in Appropriate Engagement ..........................................................49
LIST OF ILLUSTRATIONS

Figure

1. Results of Jackson’s Brief Functional Analysis .................................................. 36
2. Results of Percy’s Brief Functional Analysis ...................................................... 37
3. Results of Derrick’s Brief Functional Analysis .................................................. 38
4. Results of Marcus’s Brief Functional Analysis .................................................. 39
5. Appropriate engagement, measured as percent of intervals during which appropriate engagement occurred .............................................................. 41
6. Problem behavior, measured as percent of intervals during which the target problem behavior occurred ........................................................................ 44
CHAPTER I
INTRODUCTION

Preschool-aged children exhibit behavior problems in the classroom at a frequent rate (Qi & Kaiser, 2003). Early onset behavior problems are often stable and predictive of numerous negative developmental outcomes (e.g., externalizing problems, school dropout, academic difficulties, internalizing problems, incarceration) if not properly addressed (Campbell, 1995; Henry, Caspi, Moffitt, & Silva, 1996; Meagher, Arnold, Doctoroff, Dobbs, & Fisher, 2009). While this presents as a concern for all preschoolers with challenging behaviors, it is of particular detriment to children of low socioeconomic backgrounds. One of the major risk factors for developing early behavior problems is low socioeconomic status due to the fact that living in impoverished conditions strongly impacts outcomes for children (Murphy, Theodore, Aloiso, Alric-Edwards, & Hughes, 2007; Webster-Stratton & Hammond, 1998). Qi and Kaiser (2003) identified that children of low socioeconomic backgrounds face a risk of developing significant behavior problems 10 times more often than children in the general population. Clearly, early and effective intervention is necessary, especially for those preschool children facing socioeconomic challenges.

Due to the numerous documented effects of poverty on a child’s developmental outcomes, Head Start, a federal preschool program, was developed several decades ago with the aim of promoting the cognitive, social, and emotional development of children under five years old from low-income families (Head Start Child Outcomes Framework, 2003). Past research has estimated that approximately 20% of the children attending Head Start exhibit behavioral concerns, yet only about 2% receive services related to social and behavioral needs (Kaiser, Cai, Hancock, & Foster, 2002). Obviously, there is
great need to evaluate behavioral intervention effectiveness among this population, as children entering preschool settings, such as Head Start, who already exhibit problem behaviors begin their formal schooling in a disadvantaged position that impedes future academic and social progress.

In one study related to the educational ramifications of disruptive classroom behaviors, Carr, Taylor, and Robinson (1991) demonstrated that children’s behavior problems in the classroom alter teacher engagement with the student in that teachers delivered task demands at a lower rate to children with behavior problems than to children without behavior problems. Additionally, beyond providing the child with fewer opportunities to respond, the teachers included in the study changed the type and content of the task demands given to the child with behavior problems in an attempt to avoid misbehavior, possibly diminishing the quality of the child’s educational experience (Carr et al., 1991). Based on this study, it is not surprising that recent research has shown that problem behaviors in preschool classrooms predicted lower literacy outcomes for at least the first two years following preschool (Bulotsky-Shearer & Fantuzzo, 2011). Due to the persistent and detrimental nature of behavior problems in preschool children from low-income families, the importance of early identification and treatment is obvious.

In order to address behavior problems in the classroom, practitioners employ several methods of intervention development. One method of developing behavioral interventions is functional assessment. Gresham, Watson, and Skinner (2001) describe functional assessment as “the full range of procedures that can be used to identify the antecedents and consequences associated with the occurrence of behavior” (p. 158). Functional assessment procedures may include indirect methods (e.g., teacher interviews, records reviews, behavioral rating scales, direct observations, checklists), direct-
descriptive methods (e.g., direct observations) and experimental methods, such as experimental functional analysis (Gresham et al., 2001). Data from a functional assessment can be used to develop a targeted intervention that is specific to the referred child and addresses the cause of a problem behavior in order to decrease its occurrence.

Beyond functional assessment, practitioners may design interventions based on evidence-based practices that have been demonstrated to be effective through research. One such evidence-based practice is the token economy. In past research, token economies have been shown to be effective in a multitude of settings and with many different age groups (Kazdin & Bootzin, 1972; O’Leary & Drabman, 1971). Specifically regarding preschool children, token economies have been shown to be effective for increasing prosocial behaviors, as well as decreasing problem behaviors (Filcheck, McNeil, Greco, & Bernard, 2004; McGoey & DuPaul, 2000; Reitman, Murphy, Hupp, & O’Callaghan, 2004; Wolfe, Adlai Boyd, & Wolfe, 1983). One extension of the token economy is the Mystery Motivator, which uses performance feedback and reinforcer uncertainty, through the use of a variable schedule of reinforcement, to improve behavior of both individual children and groups of children (Rhode, Jenson, & Reavis, 1992; Schanding & Sterling-Turner, 2010).

For the practitioner, the choice of behavioral intervention is impacted by several considerations. One consideration is effectiveness of the intervention, yet efficiency must also be taken into account due to the numerous demands placed on school personnel. Function-based interventions have been shown to effectively address problem behaviors across many behavioral topographies, participant demographics, and settings; however, developing an individualized intervention based on a functional assessment may require more time than choosing an evidence-based practice without conducting a
functional assessment (Carr, Robinson, Taylor, & Carlson, 1990; Kern, Choutka, & Sokol, 2002). Therefore, directly comparing a function-based intervention to an intervention based on an empirically-supported practice is warranted. Though many researchers have stated the need for such research, there is a lack of empirical comparisons between function-based interventions and non-function based interventions. Furthermore, those studies that have conducted such comparisons present limited findings. The following review of the literature will describe functional assessment, function-based interventions, and the Mystery Motivator intervention, as related to providing behavioral services for preschool children. In addition, the limited research comparing function-based interventions to empirically-supported interventions not based on a functional assessment will also be discussed.

Review of the Literature

Functional Assessment

The idea of assessing behavioral functions was first presented by Carr (1977) in his work on self-injurious behavior. Carr’s work encouraged Iwata, Dorsey, Slifer, Bauman, and Richman’s (1982) seminal article that established the experimental conditions of functional analysis: social disapproval, academic demand, unstructured play, and alone. Furthermore, Iwata et al. determined that functions of behaviors are largely idiographic and provided future researchers with a methodology to evaluate the effects of environmental variables on behavioral occurrence. As seen in the work of Carr (1977) and Iwata et al. (1982), functional assessment was originally limited to residential settings with individuals with developmental disabilities who exhibited self-injurious behavior. Due to its value as a tool for intervention development, functional assessment has more recently been applied to broader populations and used in more diverse
environments, such as with typically-developing children in traditional educational settings (Ervin et al., 2001; Gresham et al., 2001). However, Ervin et al. (2001) identified several areas of research within the field of school-based functional assessment in need of further investigation, including acceptability of functional assessment methods to school personnel and relative effectiveness of functional assessment in comparison to other methods of designing interventions. Gresham et al. (2004) reviewed school-based functional assessment and intervention studies in order to evaluate whether interventions matched to behavioral function were more effective than interventions not linked to behavioral function. Based on the available literature, the authors concluded that function-based interventions were no more effective than those not based on functional assessment using statistical calculations (i.e., effect sizes, percentage of non-overlapping data). However, due to limitations identified by the authors (e.g., a possibly biased sample), as well as issues with interpretation of the statistical measures, the findings are limited. Therefore, a direct empirical comparison of function-based interventions to behavioral interventions not based on functional assessment data is warranted. Another area in need of further exploration is the participation of teachers in classroom-based functional assessment, as previous researchers have indicated that this is an important extension of the existing functional assessment literature that has often been neglected (Hanley, Iwata, & McCord, 2003). The following section will discuss the involvement of classroom teachers in functional assessment procedures.

**Teacher Participation in Functional Assessment**

While school practitioners are often charged with the responsibility of conducting a functional assessment, recent research has turned its attention to teacher-implemented functional assessments. Possible advantages of training teachers to implement functional
analyses include creating a more ecologically-valid assessment (e.g., more naturalistic environment), providing teachers with a useful methodology to address problem behaviors, reducing cost and time requirements for school-based practitioners, and bringing the student’s behavior under the control of the teacher who works with the student daily (Watson, Ray, Sterling-Turner, & Logan, 1999). Despite these positive attributes, research has indicated that only about 50% of classroom-based functional analyses involved teachers presenting the functional conditions (Solnick & Ardoin, 2010). However, when given the opportunity, teachers have successfully implemented functional assessment conditions in traditional educational settings in numerous studies (Doggett, Edwards, Moore, Tingstrom, & Wilczynski, 2001; Erbas, Tekin-Iftar, & Yucesoy, 2006; Kamps, Wendland, & Culpepper, 2006; Moore et al., 2002; Wright-Gallo, Higbee, Reagon, & Davey, 2006).

While it was previously believed that extensive training was necessary to implement functional analysis sessions, the results of several studies have indicated that teachers with no previous experience in functional assessment were able to effectively and accurately implement functional analysis conditions following minimal training (Doggett et al., 2001; Skinner, Veerkamp, Kamps, & Andra, 2009; Wallace, Doney, Mintz-Resudek, & Tarbox, 2004; Watson et al., 1999). Furthermore, teachers rated functional assessment procedures as acceptable (Doggett et al., 2001; Skinner et al., 2009; Wright-Gallo et al., 2006). While these studies present a promising extension of functional assessment methodology, several limitations were noted, including only conducting two conditions within the functional analysis (Doggett et al., 2001; Moore et al., 2002) and lack of procedural integrity data (Kamps et al., 2006; Skinner et al., 2009). Therefore, future research on teacher-implemented functional assessments is needed.
**Function-Based Interventions**

As described in the functional assessment literature, function-based interventions are expected to be highly effective due to the nature of the intervention planning process. By devising an intervention that is based on the hypothesized controlling variables of the problem behavior, an effective treatment can be developed (Carr et al., 1990; Kern et al., 2002). Function-based interventions improve behavior by weakening the relationship between the maintaining variable (reinforcer) and a maladaptive response or strengthening the relationship between an adaptive response and a reinforcer (Gresham et al., 2001). Interventions based on functional assessment have been broadened to populations and settings other than their traditional use for individuals with developmental disabilities in residential facilities, including children with emotional and behavioral disorders in regular and special education settings (Lane et al., 2009; Smith & Sugai, 2000) and children with attention-deficit/hyperactivity disorder in regular and special education settings (Northup, Broussard, Jones, & George, 1995; Stahr, Cushing, Lane & Fox, 2006; Umbreit, 1995).

In addition to the extension of functional assessment-based interventions to traditional educational settings with children without severe disabilities, some research, albeit limited, has investigated the use of function-based interventions within preschool children. Several investigations in particular (Boyajian, DuPaul, Handler, Eckert, & McGoey, 2001; Dufrene, Doggett, Henington, & Watson, 2007; McLaren & Nelson, 2009; VanDerHeyden, Witt, Joseph, & Gatti, 2001) have demonstrated the effectiveness of function-based interventions to decrease problem behaviors in preschool children. Unfortunately, relative to the broader functional assessment literature, functional assessment research with preschool children in the classroom constitutes only
approximately 15% of school-based functional assessment studies (Solnick & Ardoin, 2010).

While multiple studies have demonstrated successful uses of functional assessment and intervention with preschool children in the naturalistic environment, there are limitations to those studies. First, function-based interventions were either conducted in isolation (Boyajian et al., 2001; McLaren & Nelson, 2009) or compared to contraindicated interventions (VanDerHeyden et al., 2001). Thus, it is not known if another evidence-based procedure would have been as successful as the function-based interventions that were investigated. Second, some of the studies included consultant-implemented functional analysis conditions, which may limit the ecological validity of the assessment findings. In particular, findings from consultant-implemented functional analysis sessions may not generalize to the teacher. Finally, of the studies focusing on function-based interventions for preschoolers, very few track both problem behavior and appropriate replacement behavior. Thus, even though decreases in problem behaviors may be noted, it is unclear whether these decreases co-occur with increases in appropriate behavior. More research into function-based interventions for improving behavior among preschoolers is needed to clarify these issues.

As previously mentioned, few studies have included direct comparisons of function-based and non-function-based interventions; however, an emerging literature is available. One such investigation is found in Ellingson, Miltenberger, Stricker, Galensky, and Garlinghouse (2000), which looked at classroom use of functional assessment and compared the effects of a function-based intervention to a non-function-based intervention. The function-based intervention was more effective than the non-function-based intervention for one of the three participants, but the results for the other
two participants were less clear with much overlap between interventions. Due to the overlapping data, determination of relative effectiveness was difficult (Ellingson et al., 2000). Ingram, Lewis-Palmer, and Sugai (2005) conducted a systematic replication of Ellingson et al. (2000) and determined that treatment effects were larger and more stable under the function-based intervention. In another investigation, Newcomer and Lewis (2004) examined the effectiveness of function-based interventions to non-function-based interventions to address behavior problems in three elementary students in a traditional educational setting. In this investigation, the function-based interventions were more effective at reducing problem behaviors than the non-function-based interventions for two of the three participants but were less clear for a third participant.

Though these earlier studies compared function-based interventions to non-function based interventions, limitations must be noted. First, the comparisons are occasionally unbalanced, such that a multi-component functional intervention (e.g., differential reinforcement) is compared to a single-component non-function-based intervention, such as prompting (Ellingson et al., 2000; Newcomer & Lewis, 2004). Secondly, there are inconsistent methodologies employed across studies, such as failure to complete functional analyses to confirm behavioral function and use of measures that have not been psychometrically validated (Ingram et al., 2005). Lastly, Newcomer and Lewis (2004) identified threats to internal validity due to their chosen experimental design that influenced the degree to which the results could be attributed to only the difference in intervention. Given these limitations, a more balanced and direct comparison is warranted in order to verify the previously discussed findings.

In one recent investigation, Bellone (2011) directly compared a function-based intervention to an evidence-based non-functional intervention to improve behavior of
three preschool children. Following a researcher-conducted functional analysis of the target behavior for each participant, two interventions were implemented by the teacher during classroom activities to determine which intervention would more effectively address problem behavior and increase appropriate behavior. Specifically, a differential reinforcement of alternative behavior procedure tied to the function identified during the experimental analyses (i.e., attention) was empirically compared to a token economy (i.e., sticker chart and treasure box) using an alternating treatments design. While results of the study demonstrated superiority of the function-based intervention for two of the three participants, several limitations were noted. First, treatment effectiveness and teacher acceptability were the only outcome measures used in support of the function-based intervention, neglecting factors such as efficiency and cost-effectiveness. A second limitation was that academic tasks were not held constant across classrooms. Therefore, possible antecedent factors related to task may have affected behavioral occurrence. Third, undifferentiated results of the functional analyses necessitated the use of extended analyses for all three participants, which lengthened the assessment period and delayed the onset of intervention. Furthermore, the primary researcher, rather than the teacher, conducted the analyses for all three participants, which may have limited the ecological validity of the assessment. Finally, while Bellone (2011) compared a function-based DRA procedure to a token economy, additional studies are needed comparing function-based interventions to other empirically-supported interventions (e.g., Mystery Motivator).

In summary, functional assessment has demonstrated utility for intervention development across multiple settings, populations, and response topographies. Despite the large body of research on functional assessment and function-based interventions,
several deficits in the literature must be noted. First, investigations of functional assessment-based interventions with preschool children (e.g., Boyajian et al., 2001; Dufrene et al., 2007; VanDerHeyden et al., 2001) are scarce. Another area that requires more research is the relative effectiveness of function-based interventions when compared to effectiveness of other interventions. More specifically, the few direct comparisons that have been made in the past between function-based interventions and non-function-based interventions have often been unbalanced, such that the function-based intervention was either more comprehensive or included more components than the single-component, non-function-based procedure (e.g., Ellingson et al., 2000; Ingram et al., 2005; Newcomer & Lewis, 2004). An unbalanced comparison may increase the likelihood of the function-based procedure appearing superior due to a design flaw rather than a true superiority of effect.

*Mystery Motivator*

Beyond using functional assessment to develop interventions, evidence-based practices not tied to behavioral function offer another option. One such evidence-based practice is the token economy, which has been shown to be effective in a broad array of populations and in a wide range of settings (Kazdin & Bootzin, 1972; O’Leary & Drabman, 1971). Token reinforcement systems involve the use of a token as a means of reinforcement contingent on appropriate behavior and a system for exchanging the token for other reinforcers (O’Leary & Drabman, 1971). Token systems in the classroom have been used effectively to improve academic, social, and behavioral outcomes for children and young adults. Additionally, token economies have been shown to effectively decrease problem behaviors and increase prosocial behaviors in preschool children.
One extension of the token economy is the Mystery Motivator intervention, first presented by Rhode et al. (1992). Mystery Motivator interventions typically involve two major components, both of which use the concept of reinforcement uncertainty to increase behavioral motivation (Schanding & Sterling-Turner, 2010). First, a behavioral chart is used on which a daily calendar appears. Certain days on the chart are pre-determined to be reward days but are concealed from the child either using invisible ink or paper. Secondly, the specific reward that can be earned is kept secret until the child reaches a pre-set behavioral criterion and uncovers a reward day on the behavior chart. By keeping both the possibility of reinforcement, as well as the reward that can be earned, a mystery, an indiscriminable contingency is used. An indiscriminable contingency is one in which the “learner is unable to predict which responses will produce reinforcement” (Cooper, Heron, & Heward, 2007, p. 636). This type of contingency has been found to promote maintenance of behavior (Cooper et al., 2007).

The Mystery Motivator can be used for individuals or as a group contingency to improve behavior for a variety of age groups across settings (Moore & Waguespack, 1994). While sometimes used as one component within a packaged classroom intervention (De Martini-Scully, Bray, & Kehle, 2000; Kehle, Bray, Theodore, Jenson, & Clark, 2000; Mottram, Bray, Kehle, Broundy, & Jenson, 2002; Musser, Bray, Kehle, & Jenson, 2001), the Mystery Motivator intervention can also be effectively used in isolation to address behavior problems in preschool children (Murphy et al., 2007; Robinson & Sheridan, 2000), elementary students (Moore & Waguespack, 1994), and high school students (Schanding & Sterling-Turner, 2010). Additionally, the Mystery
Motivator intervention has been found to be acceptable based on parent and teacher ratings (De Martini-Scully et al., 2000; Kehle et al., 2000; Moore & Waguespack, 1994; Mottram et al., 2002; Murphy et al., 2007; Musser et al., 2001) due to ease of implementation, efficiency, and effectiveness.

Summary and Purpose of the Present Study

Intervention selection is guided by several considerations. One such consideration is overall effectiveness of an intervention, yet given scarce resources in schools, efficiency and feasibility must also be considered. The functional assessment literature provides numerous examples of the use of functional assessments to identify the environmental determinants of behavior in order to create interventions that effectively improve behavior. Interventions based on functional assessment information have been shown to address problem behaviors across multiple referral concerns, participant demographics, and treatment settings. However, the functional assessment literature is still limited with regard to use in preschool populations, relative effectiveness of function-based interventions and non-function-based interventions, and modifications of functional assessment procedures to increase treatment utility and validity as an assessment tool (e.g., inclusion of teachers in implementation of functional analysis conditions). Moreover, there are still concerns regarding the efficiency and feasibility of functional assessment in many applied settings, including schools. In particular, developing an individualized intervention based on a functional assessment may require more practitioner time than choosing an evidence-based practice, such as the Mystery Motivator. Though much research emphasizes the need for intervention comparisons to evaluate effectiveness, there is a lack of appropriate comparisons between function-based interventions and non-function based interventions. Therefore, a direct comparison
between a general intervention shown to be effective through research and an individualized intervention based on functional assessment data is warranted.

The purpose of the current study is to directly compare an intervention based on information gained through a functional assessment to an evidence-based intervention, the Mystery Motivator, to decrease problem behaviors while increasing appropriate behaviors in children attending preschool. By directly comparing these two treatment choices, the utility of functional assessment as a tool for developing effective treatments can be investigated. Treatment utility is an important consideration when evaluating assessment techniques.

Research Questions

The following research questions will be evaluated:

1. Are there differences in occurrences of problem behavior when a function-based intervention is used versus a non-function-based intervention?

2. Are there differences in occurrences of appropriate behavior when a function-based intervention is used versus a non-function-based intervention?

3. Do teachers rate the use of functional assessment procedures in the classroom as acceptable when they are actively involved in implementing the functional analyses?

4. Are there differences in teacher ratings of acceptability dependent on whether the intervention is function-based or non-function-based?

5. How does intervention efficiency differ, with regard to time and cost, between a function-based intervention and a non-function-based intervention?
CHAPTER II

METHOD

Participants and Settings

Four preschool children identified through teacher referral for problem behavior in the classroom participated in this study. Participants were included in the study based on the following criteria: (a) the child was enrolled in a preschool program, (b) the parent/guardian and teacher consented to participation, and (c) the child’s problem behavior occurred frequently based on teacher report and observation. Exclusion criteria were (a) the child’s behavior was found to be maintained by access to tangibles, (b) there was an intervention already in place to address the child’s problem behavior, or (c) the child’s behavior during a screening observation did not occur at a level that would allow for determination of treatment effects (i.e., problem behavior occurred during less than 20% of observed intervals). Based on these criteria, no participants were excluded from the study. Approval from The University of Southern Mississippi’s Institutional Review Board was obtained prior to beginning the study. See Appendixes A and B for IRB approval and consent forms, respectively.

Data collection sessions occurred in the participants’ classrooms during routine classroom activities. The specific instructional setting (e.g., morning routine, center time) was determined individually based on information gathered during the teacher interview. Specifically, for three participants (Jackson, Derrick, and Marcus), large-group morning instruction was identified by the teacher as the most problematic time of day. During large-group morning instruction, teachers reviewed basic concepts (e.g., alphabet, numbers, shapes, and days of the week) with the entire class. Small-group center time was identified as the most problematic instructional setting for one participant
(Percy). During centers, the children were divided into groups of four or five children and rotated through activity areas in the classroom (e.g., building blocks, housekeeping, art). All participants were enrolled in preschool programs through a local Head Start agency. At least 90% of children attending these programs have been identified as living at or below the federal poverty level (P.A.C.E., 2012).

Jackson

Jackson was a 4-year-old African American male enrolled in a Head Start classroom located on the campus of a public elementary school. There were 19 children in the classroom with one teacher and one assistant teacher. Jackson was referred for services for talking out, leaving his assigned area without permission, and having frequent tantrums during large-group morning instruction. During the screening observation, Jackson left his assigned area more often than he engaged in the other two referral concerns. Specifically, Jackson left his assigned area during 73% of observed intervals and engaged in inappropriate vocalizations during 68% of observed intervals. No tantrums were observed. Furthermore, leaving his assigned area without permission was identified as his most disruptive problem behavior by the teacher. Therefore, out of area served as the target behavior. Jackson did not have any diagnoses prior to the study and had not received any previous behavioral interventions. Jackson’s teacher was an African American female with a certificate in Early Childhood Development. She had been teaching for over 20 years and had no prior experience with functional behavior assessment.

Percy

Percy was a 3-year-old African American male enrolled in a preschool classroom at a Head Start center. There were 18 children in the classroom with one teacher and one
assistant teacher. Percy was referred for physical aggression toward peers, noncompliance, and inappropriate vocalizations during small-group centers. During the screening observation, *inappropriate vocalizations* occurred more often than noncompliance or aggression and were chosen as the target behavior. Specifically, inappropriate vocalizations occurred in 40% of intervals, aggression occurred in 2% of intervals, and noncompliance was never observed. Percy did not have any diagnoses prior to the study and had not received any previous behavioral interventions. Percy’s teacher was an African American female with four years of teaching experience. She held a Master’s degree and had limited reported experience with functional behavior assessment.

*Derrick*

Derrick was a 4-year-old African American male enrolled in a preschool classroom at a Head Start center. There were 19 children in the classroom with one teacher and one assistant teacher. Derrick was referred for physical aggression toward teachers and peers, talking out, and off-task behavior during large-group morning instruction. During the screening observation, *off-task behavior* occurred most often and was determined to be a behavior that often preceded the other problem behaviors. Specifically, off-task behavior occurred in 45% of observed intervals, as compared to aggression, which occurred in 2% of observed intervals, and inappropriate vocalizations, which occurred in 27% of observed intervals. Therefore, off-task behavior served as the target behavior for the current study. Derrick did not have any diagnoses prior to the study and had not received any previous behavioral interventions. Derrick’s teacher was an African American female with six years of teaching experience. She held a Master’s degree and had no prior experience with functional behavior assessment.
Marcus

Marcus was a 4-year-old African American male enrolled in a preschool classroom at a Head Start center. There were 20 children in the classroom with one teacher and one assistant teacher. Marcus was referred for physical aggression toward peers and teachers, inappropriate vocalizations, and noncompliance during large-group morning instruction. During the screening observation, *inappropriate vocalizations* occurred most often and, therefore, served as the target behavior. Specifically, inappropriate vocalizations occurred in 50% of observed intervals, as compared to noncompliance, which was observed in 8% of intervals, and aggression, which occurred in 3% of observed intervals. Marcus did not have any diagnoses prior to the study and had not received any previous behavioral interventions. Marcus’s teacher was an African American female with four years of teaching experience. She held a Bachelor’s degree and had limited reported experience with functional behavior assessment.

Materials

The Functional Assessment Informant Record for Teachers: Preschool Version II (FAIR-T P II) (Appendix C) is a revised version of the FAIR-T P (Dufrene et al., 2007), which was a semi-structured interview instrument that measured common demands, expectations, and situations in the preschool classroom. Research on the original FAIR-T P indicated preliminary evidence for convergent and treatment validity, as data from the FAIR- T P were found to match data from direct observations and experimental functional analyses (Dufrene et al., 2007; LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010; Poole, Dufrene, Sterling, Tingstrom, & Hardy, 2012). The FAIR-T P II includes a rating scale format on which respondents (e.g., teachers, assistant teachers)
rate the extent to which problem behaviors occur and the extent to which those behaviors are preceded by certain antecedent events and followed by various consequent events.

The FAIR-T P II is divided into four sections. The first section contains items related to teacher and student demographic information, as well as information regarding the student’s level of compliance, accuracy for compliance, work completion, and accuracy of work. In section two, the teacher selects one to three problem behaviors from a list of common classroom behavioral concerns and ranks the problem behaviors in order of severity. Additionally, the teacher rates each behavior on several dimensions including (a) manageability, (b) intensity, (c) frequency, and (d) duration. Section three assesses antecedent events that are associated with the problem behavior(s) and contains 27 items that are useful for hypothesizing which antecedent events (e.g., difficult tasks, large group activities, transitions) may be triggering the problem behavior. Section four assesses consequences that typically follow problem behaviors and contains 20 items that can be used to hypothesize about the consequences (e.g., access to teacher attention, escape from task demands) that may maintain occurrence of the problem behavior. The items in sections three and four are rated on a scale from 0 to 3, with 0 corresponding to Never Happens and 3 corresponding to Happens Very Often.

*Intervention Rating Profile-15 (IRP-15)*

A modified Intervention Rating Profile-15 (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985) was used to determine teacher acceptability of each of the intervention procedures used in this study (Appendix D). The IRP-15 consists of 15 Likert-style statements with scoring that ranges from Strongly Disagree (1) to Strongly Agree (6). Scores on the IRP-15 range from a total score of 15 to a score of 90, with lower scores indicating less acceptability by the rater. A total score above 52.5 represents an
acceptable rating (Von Brock & Elliott, 1987). The IRP-15 has been established as internally consistent (Cronbach’s alpha = .98) (Martens et al., 1985). Additionally, all items load on a single factor, General Acceptability (Martens et al., 1985). For the purposes of the study, the measure was adapted such that future tense items were changed to past tense, as the measure was completed following intervention implementation. Previous research has indicated that these types of modifications do not negatively impact psychometric properties of the IRP-15 (Freer & Watson, 1999).

Assessment Rating Profile-Revised (ARP-R)

The Assessment Rating Profile-Revised (ARP-R; Eckert, Hintze & Shapiro, 1999) was used to assess teacher acceptability of functional assessment procedures (see Appendix E). The ARP-R is a one-factor measure that involves 12 Likert-style items with ratings that range from Strongly Disagree (1) to Strongly Agree (6) and total scores that range from 12 to 72. The ARP-R has demonstrated adequate internal consistency, with Cronbach’s alpha found to range from .94 to .99 and all items loading onto a single factor, General Assessment Acceptability (Eckert et al., 1999).

Dependent Measures

The study had two primary dependent measures. For each participant, both a problem behavior and an appropriate replacement behavior were defined based on information gathered during the teacher interview. In the event that two or more behaviors were identified by the teacher, each of the behaviors was observed during the screening observation and the behavior that occurred most frequently served as the target behavior for the study. Based on expected behaviors within preschool classrooms, appropriate engagement was defined as the student’s body oriented toward task or teacher with eyes on academic materials or looking at the teacher and responding to
academic demands when individually or whole-group requested (i.e., verbal or gestural response). For the three participants (Jackson, Derrick, and Marcus) for whom large-group instruction was chosen as the target setting, this involved sitting in their assigned spot on the carpet facing the teacher and responding to prompts and questions from the teacher (e.g., “what day is it today?”). For Percy, for whom small-group center time was chosen as the target setting, this involved remaining in the assigned area (e.g., blocks, housekeeping, art), participating in the activity with peers, and exhibiting verbal behavior that was pertinent to the task (e.g., “I’m playing with blocks,” “My crayon is red”).

While the definition for appropriate engagement was the same across participants due to the nature of the classrooms, the definition of problem behavior was specific to the referral concern. For Jackson, out of area behavior was defined as leaving his designated area (i.e., square marked with an outline on the carpet) without teacher permission. For Percy and Marcus, inappropriate vocalizations were defined as any verbal sound or utterance that was either unrelated to the academic task or said at an inappropriate time (e.g., while the teacher was engaging in instruction). For Derrick, off-task behavior was defined as breaking eye contact with academic materials or the teacher for longer than five consecutive seconds.

All sessions were conducted within each child’s classroom during routine classroom activities and were 10 minutes in length. A 10 second partial-interval recording scheme was used for all observation sessions and was chosen based on the topography of the dependent measures. An Mp3 player and headphones were used to cue the observers to record the occurrence of the dependent measures every 10 seconds.

In addition to the two primary dependent measures, other indicators of intervention effectiveness were collected, including efficiency, cost-effectiveness, and
acceptability. Efficiency, with regard to time and cost, was measured by tracking the total time (in minutes) required by the researcher and teacher to develop and implement each intervention. Total time included assessment time (i.e., functional assessment) and meetings with the teacher. Cost-effectiveness was assessed by recording any monetary resources required for intervention implementation. Finally, acceptability of assessment and intervention procedures was assessed using the ARP-R and IRP-15, respectively.

**Design and Data Analysis**

A brief functional analysis was used to evaluate the occurrence of the problem behavior under various conditions that correspond to the possible functions of behavior. The brief functional analysis included a multi-element design followed by a contingency reversal, similar to the design used in Boyajian et al. (2001). An Alternating Treatments Design (ATD) was used to evaluate the differential effects of the function-based intervention and the non-function-based intervention. An ATD is a design that can be used to compare multiple treatments effectively in single-case research (Barlow & Hayes, 1979). Based on the nature of the proposed interventions, an ATD was an advantageous choice for the study due to its rapid alternations of treatment conditions and application of treatments within a close temporal period. Two experimental conditions (i.e., Mystery Motivator, function-based intervention) and a control condition (i.e., no intervention) were manipulated in a semi-random fashion. Using a semi-random order serves as a counterbalancing measure and helps to minimize sequencing effects (Hayes, Barlow, & Nelson-Gray, 1999). In addition, the inclusion of an embedded control condition aided in the evaluation of treatment effects. For all but one participant (discussed later), only one intervention condition was presented per school day to minimize the concern of multiple treatment interference, which is a potential threat to internal validity in an ATD. To
further reduce multiple treatment interference, an independent verification phase with the 
treatment that demonstrated the greatest effect on behavior was conducted following the 
ATD to assess whether the interaction of the two treatments affected behavioral 
ocurrence (Barlow & Hayes, 1979).

Data were represented graphically to allow for visual inspection and evaluation 
based on changes in the data series. Due to the nature of the ATD, the primary 
demonstration of effects across series was determined by inspecting divergence across 
conditions. Additionally, because there were two dependent variables that were 
measured during the intervention evaluation (i.e., appropriate engagement and problem 
behavior), appropriate engagement was chosen as the variable that would be used to 
make phase change decisions.

Procedures

Teacher Interview

Following teacher referral and consent, the FAIR-T P II was independently 
completed by the teacher to gain preliminary information regarding the participant’s 
problem behaviors. A follow-up interview was completed by the researcher to verify 
information and develop operational definitions of the target problem behavior for each 
participant. Teacher interviews were conducted outside of regular class time in a quiet 
location with limited distractions and lasted between 10 and 25 minutes.

Screening Session

After the teacher interview was completed, one 10 minute screening observation 
was conducted to ensure that the problem behavior occurred at a sufficient level to allow 
for determination of treatment effects (i.e., at least 20% of intervals). Occurrences of 
both problem behaviors and appropriate behavior were tracked. Because multiple
problem behaviors were identified by the teachers for each participant, the screening observation allowed determination of the problem behavior that occurred during the greatest percentage of intervals, which served as the target behavior thereafter. Additionally, the level of appropriate behavior observed during the screening observation served as the criterion for the Mystery Motivator intervention. During screening observations, all children engaged in problem behavior during 20% or more of the observed intervals, and no children were excluded from the study.

**Brief Functional Analysis**

For each participant, a brief experimental analysis was conducted to determine the consequent event that was maintaining the target problem behavior. Occurrence of the problem behavior was recorded across functional conditions to identify which condition produced the highest level of problem behavior and was, therefore, considered the maintaining function of the behavior. The procedures for the classroom-based brief functional analysis were adapted from the procedures used by Boyajian et al. (2001).

Four conditions were manipulated in the functional analysis, three conditions corresponding to consequent events that may serve as a function of behavior plus a control condition. By manipulating these events, a hypothesis statement was developed which could then be used to inform intervention development. The four functional conditions were access to tangible, access to teacher attention, escape from task demands, and a free play condition, which served as a control. The order of conditions for each child was decided randomly based on a drawing. Each condition name was written on a piece of paper and drawn from the group of four pieces of paper. The order in which the names were drawn (i.e., 1-4) determined the order of conditions. Each condition was tested on a separate day, with the exception of the conditions for one participant.
(Derrick). In Derrick’s case, due to an impending holiday break, two experimental sessions were conducted per day with a 15 minute period between sessions to complete the analysis prior to the break. During all conditions, the classroom teacher or teacher assistant delivered the specified reinforcer based on prompts from the primary experimenter following training. Teacher training involved the primary researcher reviewing the protocols, modeling procedures, and providing feedback. See Appendixes F-I for protocols.

Following implementation of the four functional analysis conditions, a contingency reversal phase was conducted in which the consequence that produced the highest level of inappropriate behavior during the functional analysis was presented following the occurrence of appropriate behavior. Reversing the contingency allowed for verification of the functional relationship between the target behavior and consequent event.

Conditions for Brief Functional Analysis

Tangible condition. Prior to the functional analysis, a brief preference assessment was conducted based on the procedures developed by Carr, Nicolson, and Higbee (2000). During the preference assessment, the child had free access to an array of eight toys and chose one from the selection. After the child chose an object, the child had 10 seconds of interaction with the object before it was removed, and the child was asked to choose from the remaining objects until there were none left. Only the object identified as highly preferred (i.e., chosen first in the preference assessment) was used during the tangible condition to increase the likelihood of using an item that was possibly a potent reinforcer for the participant. Immediately before the tangible condition, the participant had unrestricted access to the preferred item for two minutes. Once the teacher instruction
began, the object was removed, and data collection commenced. Each occurrence of the target problem behavior resulted in the child gaining access to the preferred tangible for 30 seconds. No other programmed consequences accompanied occurrence of the problem behavior or appropriate behavior.

**Attention condition.** Immediately prior to the attention condition, all preferred objects were removed from the participant, and the teacher provided two minutes of positive attention to the participant (e.g., praise statements, conversation) to increase the likelihood of the teacher functioning as a reinforcing stimulus for the child. Once teacher instruction began, the teacher told the participant that she must do work now and withdrew all attention from the participant. Contingent upon occurrence of the target problem behavior, the teacher provided the participant with attention in the form of three verbal reprimands (e.g., “No talking! You’re not supposed to be talking. You need to listen!”). After the reprimands were delivered, the teacher diverted attention back to classroom activities. All behaviors other than the target behavior were ignored, and no other programmed consequences were provided for occurrence of the problem behavior or appropriate behavior.

**Escape condition.** Once teacher instruction began, the teacher ceased to present task demands to the participant contingent upon any occurrence of the target problem behavior. When the target problem behavior occurred, the task was removed for 30 seconds and then re-presented to the participant. Depending on the preference of the teacher, this either involved removing the child from the group by turning him away or stopping instruction to the entire class by the teacher turning her back to the class for 30 seconds. Two teachers (Jackson, Percy) chose to stop instruction and two teachers (Derrick, Marcus) preferred to turn the child away contingent on occurrence of the
problem behavior. If a participant did not respond to the task demand or exhibit any
problem behaviors that would result in contingent escape, a three prompt hierarchy was
used by the teacher. The three prompt hierarchy involved a verbal command issued first,
followed by a verbal command with a physical gesture, and finally, physical guidance.
Upon each task being re-presented, the participant had five seconds to initiate compliance
with the task before the teacher engaged in the prompt hierarchy. A brief praise
statement (e.g., “Good job!”) was provided when the child appropriately completed tasks
without requiring physical guidance. No other consequences were provided for
occurrence of the target behavior or appropriate behavior.

Control condition. During the control (free play) condition, the participant had
unrestricted access to objects and activities typically preferred by preschool children
(e.g., toys, games). The teacher did not place any demands on the participant and there
were no consequences for occurrence of the target problem behavior or for occurrence of
appropriate behavior. The teacher sat with the student in a quiet location away from the
other students and provided intermittent non-contingent attention in the form of neutral
statements (e.g., “I’m reading a book.”) every 30 seconds (Iwata et al., 1982).

Contingency reversal phase. During the contingency reversal, differential
reinforcement of other behavior (DRO) occurred and the consequence that produced the
highest level of the target behavior during the brief functional analysis was re-presented;
however, instead of being presented as a consequence for the target problem behavior, it
was presented for the absence of the problem behavior. For example, if attention was
identified as the maintaining function of the target behavior during the brief functional
analysis, during the contingency reversal, attention was provided to the participant based
on absence of the target behavior. The participant had the opportunity to earn
reinforcement every 30 seconds. A BAB reversal design was used, in which Condition B represents the contingency reversal and Condition A represents the contingency that resulted in the greatest amount of the problem behavior during the original brief functional analysis.

Conditions for Treatment Evaluation

Function-based intervention. Following the brief functional analysis, an intervention was developed based on the identified function of each participant’s problem behavior. The function-based intervention involved a component intended to decrease the target problem behavior and one to increase occurrence of a functionally-equivalent replacement behavior, appropriate engagement. Specifically, an extinction procedure was used in which the target problem behavior was ignored, and access to the identified reinforcer was gained contingent on occurrence of appropriate engagement. Access to teacher attention was identified as the function of the target behaviors across all four participants. Therefore, intervention consisted of contingent positive teacher attention (i.e., praise statements) only when appropriate classroom behavior occurred, not when the target behavior occurred. Participants had the opportunity to earn verbal praise for the first occurrence of appropriate engagement following a 30 second interval in which problem behavior did not occur. On a 30 second fixed interval schedule, the researcher cued the teacher when the reinforcer should be provided using an index card with “3 praise statements” written on it. In order to increase discriminability between the intervention conditions, prior to beginning data collection the teacher delivered a function-specific statement to the participant (i.e., for attention-maintained behavior, “If you are good today, I will tell you ‘you did a good job.’”). See Appendix J for protocol.
Non-function-based intervention. As a comparison to the function-based intervention, a non-function-based Mystery Motivator intervention served as a second treatment condition. The Mystery Motivator intervention was developed based on procedures used in Murphy et al.’s (2007) investigation in a preschool classroom. However, the intervention was modified such that the reinforcer was earned contingent on earning checks for appropriate behavior instead of checks for misbehavior and was used as an individualized intervention, rather than a class-wide contingency. Specifically, each participant had a chart on which the teacher drew checks contingent on occurrence of appropriate engagement using a differential reinforcement of alternative behavior (DRA) procedure. Participants had the opportunity to earn a check for the first occurrence of appropriate engagement following a 30 second interval in which problem behavior did not occur. When appropriate engagement was observed by the experimenter, the teacher was cued to place a check on the child’s chart using an index card with “Check” written on it. If the preset criterion number of checks was met, the child had the opportunity to draw out of an envelope that contained one X (i.e., no reward today) and four pictures of prizes (i.e., reward today). If a picture of a prize was drawn, the child picked a toy from an opaque box (provided by the researcher). The number of checks required per session to access the Mystery Motivator was determined based on the level of appropriate engagement observed during the screening observation and was set at five checks for each participant. Setting the criterion based on the initial occurrence of appropriate behavior improved the likelihood of the participant’s success in achieving the criterion. In fact, the criterion was met in all sessions except for one session for one participant (Marcus). In order to increase discriminability between conditions, prior to beginning each non-function-based condition session, participants were told “If you are
good today, you will earn checks. If you get five checks, you might get to pick a mystery prize.” See Appendix K for a detailed protocol.

**Control condition.** A control condition was included in order to provide a measure of behavior while no intervention was in place. During the control condition, the teacher conducted a typical activity as she would under normal conditions. Furthermore, the primary experimenter did not interact with the participant, and the intervention items were not present in the classroom.

**Teacher Training**

The primary researcher trained participating teachers during brief (i.e., five minutes) discussions prior to each session for both functional analysis conditions and intervention sessions using behavioral skills training (Miltenberger, 2008). Training strategies included reviewing the pertinent protocol, providing examples, and modeling appropriate procedures. Additionally, teachers practiced implementation during training and were given performance feedback both during and after the session (e.g., praised for appropriate use of procedures or given corrective feedback for incorrect use).

**Interobserver Agreement, Procedural Integrity, and Treatment Integrity**

Interobserver agreement (IOA) data were collected during brief functional analysis conditions and during each experimental condition for every participant. IOA was calculated by dividing the total number of agreements (occurrence and nonoccurrence) by the total number of agreements plus disagreements and multiplying by 100. For Jackson, IOA was collected for 100% of functional analysis sessions with an average agreement of 97.14% (range = 91.67-100%) and for 71.43% of intervention sessions with an average agreement of 94.04% (range = 90.83-98.33%). For Percy, IOA was collected for 100% of functional analysis sessions with an average agreement of
95.41% (range = 93.33-100%) and for 40% of intervention sessions with an average agreement of 95.72% (range = 90-100%). For Derrick, IOA was collected for 85.71% of functional analysis sessions with an average agreement of 94.17% (range = 86.67-100%) and for 53.33% of intervention sessions with an average agreement of 94.27% (range = 83.33-100%). For Marcus, IOA was collected for 85.71% of functional analysis sessions with an average agreement of 95.56% (range = 93.33-98.33%) and for 41.67% of intervention sessions with an average agreement of 93.59% (range = 85.89-97.5%).

Observers were trained to a 90% agreement criterion for behavioral observations prior to assisting with the study. If an observer’s agreement with the primary researcher fell below 90%, the observer was retrained on the observation procedures and operational definitions by the primary experimenter and had to obtain 90% agreement before the observer’s data were used for the study. Re-training occurred three times during the course of data collection; however, the criterion was met immediately after the re-training session. Only the primary researcher’s data were graphed.

Procedural integrity data were collected for all functional analysis sessions to ensure that the teacher adhered to the protocols for each functional condition (see Appendixes L-O for protocols). A checklist with all functional analysis procedures was used to evaluate integrity. Data are reported as percentage of steps completed accurately. Additionally, interrater agreement on procedural integrity was collected for a minimum of 33% of observations. For Jackson, procedural integrity was 100% with 100% IOA on integrity. For Percy, procedural integrity averaged 94.05% (range = 83.33-100%) with 100% agreement on integrity. For Derrick, procedural integrity averaged 92.92% (range = 85.7-100%) with 100% agreement on integrity. For Marcus, procedural integrity averaged 82.53% (range = 80-100%) with 100% agreement on integrity.
Treatment integrity data were gathered for all intervention and control sessions with the aid of a checklist to ensure that the interventions were implemented appropriately by the classroom teachers (see Appendixes P-R for protocols). Interrater agreement on treatment integrity was collected for a minimum of 40% of those observations. Treatment integrity scores are reported as the percentage of treatment steps on the checklist completed accurately. For Jackson, treatment integrity was 100% with 100% agreement across all conditions. For Percy, treatment integrity averaged 98.33% with 100% agreement across conditions. Specifically, integrity averaged 94.44% (range = 83.33-100%) for the function-based, 100% for the non-function-based, and 100% for the control condition. For Derrick, treatment integrity averaged 96.3% with 100% agreement across conditions. Specifically, integrity averaged 91.67% (range = 83.33-100%) for the function-based, 100% for the non-function-based, and 100% for the control condition. For Marcus, treatment integrity averaged 89.44% with 100% agreement across conditions. Specifically, integrity averaged 83.33% (each session = 83.33%) for the function-based, 85% (range = 75-100%) for the non-function-based, and 100% for the control condition.
CHAPTER III

RESULTS

Functional Analysis

*Jackson*

During the FAIR-T P II follow-up interview, the teacher indicated that Jackson frequently left his assigned area, which resulted in him escaping task demands (i.e., teacher terminating presentation or delaying presentation), accessing preferred tangibles (i.e., going to toy area), and accessing peer attention (i.e., laughter) and teacher attention in the form of reprimands, redirections, interruptions, and physical contact to return him to his assigned area. Per teacher report, access to teacher attention was the most common consequence for the out of seat behavior. Results obtained from the functional analysis for Jackson are shown in Figure 1. During the tangible condition, Jackson’s out of area behavior occurred in 18.33% of the observed intervals. During the attention condition, Jackson left his assigned area in 31.67% of the observed intervals. During the escape condition, Jackson’s out of area behavior occurred in 5% of the observed intervals. During the free play (control) condition, Jackson never left his assigned area. To verify that access to teacher attention was the maintaining function of Jackson’s out of area behavior, a contingency reversal was implemented during which he left his assigned area in 13.33% of the observed intervals for the first implementation and 10% of intervals during the second contingency reversal. When the original attention condition was re-implemented, Jackson left his assigned area during 70% of observed intervals. Based on the results of the analysis, it was determined that Jackson’s out of area behavior was maintained by access to teacher attention.
**Figure 1.** Results of Jackson’s Brief Functional Analysis.

**Percy**

During the FAIR-T P II interview, the teacher indicated that Percy engaged in frequent inappropriate vocalizations that resulted in escaping task demands (i.e., teacher terminating, reducing, or altering presentation of material), accessing preferred activities (e.g., teacher changing instructional materials to please Percy), accessing negative peer attention (i.e., disapproving verbal comments) and accessing teacher attention in the form of redirections, interruptions, and comforting. Results obtained from the functional analysis for Percy are shown in Figure 2. During the free play (control) condition, Percy did not exhibit any inappropriate vocalizations. During the escape condition, Percy engaged in inappropriate vocalizations during 11.67% of the observed intervals. During the attention condition, Percy engaged in inappropriate vocalizations during 28.33% of the observed intervals. During the tangible condition, Percy engaged in inappropriate vocalizations during 8.33% of the observed intervals. To verify that access to teacher attention was the maintaining function of Percy’s inappropriate vocalizations, a contingency reversal was implemented during which he engaged in inappropriate vocalizations.
vocalizations in 3.33% of the observed intervals for the first implementation and 8.3% of intervals during the second contingency reversal. When the original attention condition was re-implemented, Percy engaged in inappropriate vocalizations during 45% of observed intervals. Based on the results of the analysis, it was determined that Percy’s inappropriate vocalizations were maintained by access to teacher attention.

![Figure 2. Results of Percy’s Brief Functional Analysis.](image)

**Derrick**

During the FAIR-T P II interview, the teacher indicated that Derrick engaged in off-task behaviors that resulted in escaping task demands (i.e., teacher terminating or altering presentation of material, starting a new activity), accessing peer attention (i.e., laughing, negative comments) and accessing teacher attention in the form of redirections (verbal and physical), interruptions, and comforting. Results obtained from the functional analysis for Derrick are shown in Figure 3. During the tangible condition, Derrick engaged in off-task behaviors during 38.33% of the observed intervals. During the free play (control) condition, Derrick engaged in off-task behaviors during 6.67% of observed intervals. During the escape condition, Derrick engaged in off-task behaviors during 18.33% of the observed intervals. During the attention condition, Derrick
engaged in off-task behaviors during 88.33% of the observed intervals. To verify that access to teacher attention was the maintaining function of Derrick’s off-task behaviors, a contingency reversal was implemented during which he engaged in off-task behaviors in 23.33% of the observed intervals for the first implementation and 21.67% of intervals during the second contingency reversal. When the original attention condition was re-implemented, Derrick engaged in off-task behaviors during 81.67% of observed intervals. Based on the results of the analysis, it was determined that Derrick’s off-task behaviors were maintained by access to teacher attention.

Figure 3. Results of Derrick’s Brief Functional Analysis.

Marcus

During the FAIR-T P II interview, the teacher indicated that Marcus engaged in frequent inappropriate vocalizations that resulted in escaping task demands (i.e., delay of presentation) and accessing teacher attention in the form of redirections and interruptions. Results obtained from the functional analysis for Marcus are shown in Figure 4. During the free play (control) condition, Marcus engaged in inappropriate vocalizations during 11.67% of the observed intervals. During the attention condition, Marcus engaged in
inappropriate vocalizations during 53.33% of the observed intervals. During the tangible condition, Marcus engaged in inappropriate vocalizations during 31.67% of the observed intervals. During the escape condition, Marcus engaged in inappropriate vocalizations during 25% of the observed intervals. To verify that access to teacher attention was the maintaining function of Marcus’s inappropriate vocalizations, a contingency reversal was implemented during which he engaged in inappropriate vocalizations in 11.67% of the observed intervals for the first implementation and 16.67% of intervals during the second contingency reversal. When the original attention condition was re-implemented, Marcus engaged in inappropriate vocalizations during 68.33% of observed intervals. Based on the results of the analysis, it was determined that Marcus’s inappropriate vocalizations were maintained by access to teacher attention.

![Figure 4](image)

**Figure 4.** Results of Marcus’s Brief Functional Analysis.

**Intervention**

**Appropriate engagement**

The data regarding occurrence of appropriate engagement for all four participants are found in Figure 5. For Jackson, appropriate engagement was relatively stable and low under the control and Mystery Motivator conditions. Specifically, Jackson was
appropriately engaged during an average of 43.34% of observed intervals (range = 40-46.67%) during the control condition and an average of 30% of observed intervals (range = 25-35%) under the Mystery Motivator intervention. Jackson’s appropriate engagement under the function-based intervention averaged 85% during the observed intervals (range = 68.33-95%) and remained relatively stable and high throughout the alternations of treatments after an initial increase. During the verification phase with the function-based intervention, Jackson’s appropriate engagement averaged 86.33% (range = 76.67-93.3%), with a stable level of performance. This level of performance was maintained at a four week follow-up (86.67%).

For Percy, the Mystery Motivator intervention and the control condition resulted in similar levels of appropriate engagement. Specifically, Percy was appropriately engaged during an average of 53.34% (range = 35-66.67%) under the Mystery Motivator intervention and 43.53% (range = 37.35-55%) under the control condition. Percy’s appropriate engagement under the function-based intervention averaged 91.66% (range = 86.67-95%) and remained stable and high throughout the alternations of treatments. During the verification phase with the function-based intervention, Percy’s appropriate engagement remained high and stable, averaging 94.33% (range = 91.67-100%). This level of performance was maintained at a six week follow-up (95%).
Figure 5. Appropriate engagement, measured as percent of intervals during which appropriate engagement occurred. In the first panel, two interventions (i.e., function-based [Fx-based] and Mystery Motivator [MM]) are compared with a control condition. The second panel shows the verification phase with the most effective intervention, and the third panel shows a follow-up data point for three of the four participants.
For Derrick, the control condition resulted in the lowest average level of appropriate engagement at 16.67% of observed intervals (range = 11.67-21.67%). Under the Mystery Motivator intervention, appropriate engagement was widely variable, averaging 31.67% of observed intervals (range = 6.67-50%). Under the function-based intervention, appropriate engagement was relatively stable and high, averaging 89.58% of observed intervals (range = 76.67-100%). During the verification phase with the function-based intervention, Derrick’s appropriate engagement remained high and stable after an initial increase, averaging 89% of observed intervals (range = 73.33-95%). This level of performance was maintained at a six week follow-up (88%).

For Marcus, the control condition resulted in the lowest and most variable level of appropriate engagement, averaging 13.89% of observed intervals (range = 5-25%). Under the Mystery Motivator intervention, appropriate engagement was more stable but remained at a relatively low level, averaging 46.75% of observed intervals (range = 40-56.67%). Under the function-based intervention, appropriate engagement was relatively stable and high, averaging 79.77% of observed intervals (range = 75-84.31%). During the verification phase with the function-based intervention, Marcus’s appropriate engagement averaged 83.89% of observed intervals (range = 78.33-88.33%). Unfortunately, the school year ended before follow-up data could be collected for Marcus.

**Problem behavior**

The data regarding occurrence of problem behaviors for all four participants are found in Figure 6. For Jackson, out of seat behavior was observed during an average of 36.65% of intervals (range = 28.33-45%) under the control condition. Under the Mystery Motivator intervention, Jackson left his assigned area during an average of 27.53% of
observed intervals (range = 8.33-46%), with an increasing trend. Under the function-based intervention, Jackson left his assigned area during an average of 9.99% of observed intervals (range = 0-23.33%). During the verification phase with the function-based intervention, Jackson left his assigned area during an average of 10.32% (range = 1.67-28.3%) of observed intervals. At a four week follow-up observation, Jackson never left his assigned area.

For Percy, the highest level of problem behavior was observed under the Mystery Motivator intervention, during which inappropriate vocalizations occurred during an average of 23.34% of intervals (range = 11.67-35%). Under the control condition, inappropriate vocalizations occurred during an average of 15.33% of observed intervals (range = 10-18.33%). Under the function-based intervention, inappropriate vocalizations occurred during an average of 6.67% of observed intervals (range = 5-10%). During the verification phase with the function-based intervention, Percy’s level of inappropriate vocalizations remained low and stable, averaging 3.33% of observed intervals (range = 0-6.67%). This low level of problem behavior was maintained at the six week follow-up (3.33%).

For Derrick, the highest level of problem behavior occurred under the control condition, during which off-task behavior occurred during an average of 77.78% of observed intervals (range = 71.67-80%) and was stable. Under the Mystery Motivator intervention, off-task behavior occurred during an average of 51.1% of observed intervals (range = 16.67-93.33%), with a steep increasing trend. Under the function-based
Figure 6. Problem behavior, measured as percent of intervals during which the target problem behavior occurred. In the first panel, two interventions (i.e., function-based [Fx-based] and Mystery Motivator [MM]) are compared with a control condition. The second panel shows the verification phase with the most effective intervention, and the third panel shows a follow-up data point for three of the four participants.
intervention, off-task behavior occurred during an average of 10.42\% of observed intervals (range = 0-20\%). During the verification phase with the function-based intervention, Derrick’s level of off-task behavior was slightly variable but remained low relative to the other conditions, averaging 13.67\% of observed intervals (range = 3.33-30\%). This level of off-task behavior was maintained at a six week follow-up (12\%).

For Marcus, inappropriate vocalizations were observed during an average of 41.39\% of intervals (range = 28.33-54.17\%) under the control condition. Under the Mystery Motivator intervention, inappropriate vocalizations occurred during an average of 22.22\% of observed intervals (range = 13.33-33.33\%). Under the function-based intervention, inappropriate vocalizations occurred during an average of 9.93\% of intervals (range = 8.33-11.67\%) and demonstrated the most stability. Follow-up data were not collected due to the end of the year.

Acceptability

*ARP-R*

In order to measure the acceptability of using functional assessment procedures in the classroom, each teacher or assistant teacher who was involved in implementing the functional analyses was asked to complete the ARP-R following data collection. In cases where the assistant teacher conducted the analyses, the main classroom teacher was also asked to complete the ARP-R because she was considered a major stakeholder (i.e., initial source of the referral). Scores on the ARP-R can range from 12 to 72. Across all raters, the use of functional assessment methods was found to be acceptable, with an average rating of 51.8 (range = 40-65). Specifically, for Jackson, the teacher provided a rating of 46 and the assistant teacher (primary interventionist) provided a rating of 40. For Percy, the teacher (primary interventionist) provided a rating of 59. For Derrick, the
teacher provided a rating of 65, and the assistant teacher (primary interventionist) provided a rating of 49. For Marcus, the teacher provided a rating of 41, and the assistant teacher (primary interventionist) provided a rating of 47. This range of scores indicates that the majority of teachers at least agreed slightly to statements supporting the effectiveness, utility, and applicability of functional assessment procedures in the classroom.

IRP-15

In order to assess acceptability of the intervention procedures, each teacher and/or assistant teacher completed the IRP-15 for both interventions following the end of data collection sessions. For Percy, only the teacher provided ratings, as she was the source of the referral and the sole interventionist. For Marcus, the teacher stated that she did not wish to rate the interventions because the assistant teacher was the sole interventionist. On the IRP-15, a reported total score above 52.5 demonstrates an acceptable rating (Von Brock & Elliott, 1987). According to the obtained score profiles, the results were largely consistent, with all teachers but one rating both interventions as acceptable. The average rating for the function-based intervention was 69.17 (range = 59-75), indicating that all teachers and assistant teachers found contingent praise and extinction to be acceptable, beneficial, and appropriate with no negative consequences. The average rating for the Mystery Motivator intervention was 59.33 (range = 22-78). See Table 1 below for specific ratings.
Table 1

Scores Obtained on the Intervention Rating Profile-15

<table>
<thead>
<tr>
<th>Participant</th>
<th>Function-Based: Teacher</th>
<th>Function-Based: Assistant Teacher</th>
<th>Mystery Motivator: Teacher</th>
<th>Mystery Motivator: Assist. Teacher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson</td>
<td>75</td>
<td>71</td>
<td>65</td>
<td>22</td>
</tr>
<tr>
<td>Percy</td>
<td>75</td>
<td>--</td>
<td>75</td>
<td>--</td>
</tr>
<tr>
<td>Derrick</td>
<td>67</td>
<td>68</td>
<td>56</td>
<td>78</td>
</tr>
<tr>
<td>Marcus</td>
<td>--</td>
<td>59</td>
<td>--</td>
<td>60</td>
</tr>
</tbody>
</table>

Intervention Efficiency

*Cost*

In order to compare the efficiency of both interventions with regard to resources, the monetary cost of implementing each intervention was tracked throughout the current project. For the function-based intervention, no monetary resources were required as the intervention only required verbal praise and acknowledgment of appropriate behavior. For the Mystery Motivator intervention, approximately $30 across all four classrooms was required to implement the intervention due to the need for a stocked treasure box (i.e., an opaque 12 in x 8 in box filled with a variety of small toys and stickers) and printed charts on which checks were made.

*Time*

In order to compare the efficiency of both interventions with regard to practitioner time, the time (in minutes) required to facilitate and supervise the implementation of each intervention was tracked throughout data collection. For the function-based intervention, an average of 156 minutes per participant (range = 145-170 minutes) was required to conduct the teacher interviews, facilitate the functional analyses, and supervise the implementation of the intervention. For the Mystery Motivator intervention, an average
of 42 minutes per participant (range = 36-48 minutes) was required to supervise the implementation of the intervention. Drawing from research on efficiency of academic interventions (Skinner, 2010), a similar calculation of intervention efficiency can be used to compare rates of behavior change per minute of intervention. As discussed in Skinner (2010), “learning rate = amount of behavior change/time spent engaged in learning experience” (p. 167). Thus, for the current study, the change in occurrence of problem behavior or appropriate engagement from the control condition was calculated by subtracting the average occurrences. Then, the average change was divided by the number of minutes required for each intervention for each participant in order to yield a behavioral “learning rate.” The data on rate of behavioral change for problem behavior and appropriate engagement are presented in Tables 2 and 3, respectively. When interpreting these data, a negative score indicates a behavioral reduction and a positive score indicates an increase in behavioral occurrence.

Table 2

Rates of Change in Problem Behavior

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mystery Motivator</th>
<th>Function-Based Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson</td>
<td>-0.19 percent per min</td>
<td>-0.16 percent per min</td>
</tr>
<tr>
<td>Percy</td>
<td>+0.17 percent per min</td>
<td>-0.06 percent per min</td>
</tr>
<tr>
<td>Derrick</td>
<td>-0.74 percent per min</td>
<td>-0.42 percent per min</td>
</tr>
<tr>
<td>Marcus</td>
<td>-0.53 percent per min</td>
<td>-0.22 percent per min</td>
</tr>
</tbody>
</table>

Note. Presented as change in percent occurrence of problem behavior per minute of intervention implementation. The sign indicates whether the change was an increase (+) or decrease (-) in occurrence.
Table 3  
Rates of Change in Appropriate Engagement

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mystery Motivator</th>
<th>Function-Based Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson</td>
<td>-0.27 percent per min</td>
<td>+0.25 percent per min</td>
</tr>
<tr>
<td>Percy</td>
<td>+0.20 percent per min</td>
<td>+0.33 percent per min</td>
</tr>
<tr>
<td>Derrick</td>
<td>+0.42 percent per min</td>
<td>+0.45 percent per min</td>
</tr>
<tr>
<td>Marcus</td>
<td>+0.91 percent per min</td>
<td>+0.45 percent per min</td>
</tr>
</tbody>
</table>

Note. Presented as change in percent occurrence of appropriate engagement per minute of intervention implementation. The sign indicates whether the change was an increase (+) or decrease (-) in occurrence.
CHAPTER IV
DISCUSSION

The current study sought to evaluate the effectiveness of two interventions, a functional assessment-based behavioral intervention and a non-function-based evidence-based practice, the Mystery Motivator. The function-based intervention involved a differential reinforcement of alternative behavior (DRA) procedure in which teachers provided participants with contingent praise when the children were appropriately engaged and there was extinction for the problem behavior. For the Mystery Motivator intervention, teachers made checkmarks on a chart when the participants were observed to be appropriately engaged and the children had the opportunity to earn a tangible prize if they met a criterion. The impact of each intervention on occurrence of appropriate engagement and a specific problem behavior was tracked to determine whether differences existed in the child’s response to intervention. By gaining a better understanding of the differential effectiveness and efficiency of these two types of interventions, researchers might gain a better understanding of the treatment utility of functional assessment.

Research Question One

When considering the first research question, whether there are differences in occurrence of problem behavior when a function-based intervention is used versus a non-function-based intervention, the data indicate that for all four participants, the function-based intervention was more effective in reducing problem behaviors. The function-based intervention resulted in a lower mean percentage of intervals in which problem
behavior occurred for all four participants when compared to the Mystery Motivator, with minimal overlapping data between intervention conditions for two of the four participants and no overlap for the other two participants.

The finding that reduction of problem behavior was more effective under a function-based intervention is consistent with several previous research studies (e.g., Ingram et al., 2005; Newcomer & Lewis, 2004; VanDerHeyden et al., 2001). However, the results of the current investigation are in opposition to those reported in the meta-analysis by Gresham et al. (2004). Specifically, Gresham et al. (2004) reported that school-implemented behavioral interventions based on a variety of functional assessment methodologies, including functional analysis, were no more effective than non-function based-interventions. As previously discussed, the authors cited statistical reasons why their analyses need to be interpreted with caution, but it also seems that one must remember the nature of behavioral response and the many factors that can contribute to an intervention’s effectiveness (e.g., integrity of intervention implementation, intensity of intervention, age of client/behavioral history). In collapsing results across 150 different studies, as occurred in the Gresham et al. (2004) analysis, it is possible that much information was lost, and despite admirable efforts to summarize the data in a variety of ways, it is challenging to interpret meaningfulness of the results in terms of individual-level outcomes. Therefore, conducting single-case studies of function-based versus non-function-based interventions may be more helpful in judging differential effectiveness for individual children.

Regarding the current finding that the function-based intervention was more effective in reducing problem behaviors in all four children, there are several possible explanations that can be offered. First, it is possible that teacher-delivered praise was a
more salient reinforcer than the Mystery Motivator intervention. In other words, because the children’s attention may have been better captured by the direct verbal statements than by the adult making a check on the chart, the behavioral response may have been stronger. While this manipulation was purposeful in order to minimize the attention provided in the non-function-based condition, anecdotally, the children always seemed to make direct eye contact during the marking of the check and to verbalize the presence of the treasure box. Therefore, it seems that saliency of the reinforcer was not a major factor in the behavioral response.

Another possible explanation for the larger reduction of problem behaviors across participants under the function-based intervention as opposed to the non-function-based intervention is the explicit inclusion of an extinction component with the function-based intervention. Under the function-based intervention, adults were told to actively ignore all occurrences of the problem behavior. While consequences were withheld in the non-function-based intervention condition contingent on occurrence of problem behaviors, for a child whose behavior is maintained by attention, a lack of positive response may not be enough to suppress occurrences of the problem behavior, as opposed to removal of a desired event. As described in Gresham et al. (2001), one of the mechanisms by which function-based interventions improve behavior is the weakening of the relationship between the maintaining variable and the maladaptive response. Therefore, it seems that the individualized nature of the function-based intervention may also serve to explain the differential response to the two interventions.

Research Question Two

When considering the second research question, whether there are differences in occurrences of appropriate behavior when a function-based intervention is used versus a
non-function-based intervention, the data indicate that for all four participants, the function-based intervention was more effective in increasing appropriate engagement than the Mystery Motivator intervention. The function-based intervention resulted in a substantially higher percentage of intervals during which appropriate engagement occurred when compared to the Mystery Motivator intervention for each participant. Additionally, there were no overlapping data points between intervention conditions across participants.

Regarding behavioral improvement, the results of the current study are consistent with previous research demonstrating that function-based interventions may be more effective than non-function based interventions to address problem behaviors (e.g., Ellingson et al., 2000; Ingram et al., 2005; Newcomer & Lewis, 2004). However, much of this previous research only includes reduction of problem behavior occurrence as the primary indicator of intervention effectiveness, rather than also measuring occurrence of an alternative replacement behavior under both interventions. The current results most closely support the results of a previously conducted study (Bellone, 2011), which included measurement of both problem behavior and appropriate behavior. The current study presents a stronger demonstration of the effectiveness of function-based interventions over non-function-based interventions than that provided in Bellone (2011) due to obtaining consistent results across children, whereas the aforementioned study discussed consistent results for two of the three participants.

Several explanations can be offered as to why the function-based intervention resulted in more appropriately engaged behavior across children than the non-function-based intervention. In considering the chief mechanisms of change within the function-based intervention, there was an extinction component to weaken the relationship
between the maintaining variable and the problem behavior and a reinforcement component to strengthen the relationship between the maintaining variable and an alternative replacement behavior. In particular, the reinforcement component of the function-based intervention depended on a differential reinforcement of alternative behavior (DRA) paradigm in which children gained access to attention only when they were appropriately engaged. Therefore, it stands to reason that this may explain the clear difference in appropriate engagement across the two interventions. Though the non-function-based intervention was also based on a DRA procedure, it seems that for these four children, receiving a reinforcer tied to the behavioral function when engaging in appropriate behavior was more meaningful than merely receiving an arbitrarily chosen reinforcer (i.e., tangible items in this study).

Research Question Three

When considering the third research question of how teachers rate the use of functional assessment procedures in the classroom when they are actively involved in implementation, the current study found that the majority of teachers reported functional assessment procedures to be acceptable and useful in developing a behavioral intervention, as measured by the ARP-R. These results are consistent with previous research (Doggett et al., 2001; Dufrene et al., 2007; Skinner et al., 2009; Wright-Gallo et al., 2006), indicating that teachers found functional assessment to be acceptable when they actively participated in the process. Specifically, in Doggett et al. (2001), teachers rated participation in a brief functional analysis during ongoing instruction as acceptable. Similarly, in Skinner et al. (2009) and Wright-Gallo et al. (2006), the authors had teachers report on perceived acceptability of functional analysis methodologies conducted during ongoing instruction in terms of utility, intrusiveness, and efficiency.
Here again, five of the seven teachers who completed the rating scale indicated that functional analysis procedures were useful, effective, and not overly time-consuming or intrusive. As cited in Ervin et al. (2001), school-based studies using functional assessment methodologies rarely report acceptability data. Therefore, the current study’s data, suggesting that most teachers found the use of functional analysis in the classroom during ongoing instruction acceptable and useful, are important in that they provide additional support for the use of functional assessment in classrooms with active teacher involvement.

Research Question Four

When considering the question of whether there are differences in teacher ratings of acceptability between a function-based intervention and one that is non-function-based, the current study found that, overall, teachers rated both interventions as acceptable on the IRP-15, though the average rating for the function-based intervention was slightly higher than that of the Mystery Motivator intervention. Additionally, teacher ratings of the Mystery Motivator varied more widely than ratings of the function-based intervention, with one teacher rating the Mystery Motivator as completely unacceptable (scoring it 22). This rating of very low acceptability was given by the assistant teacher who implemented all of the intervention sessions in Jackson’s classroom. In Jackson’s case, the Mystery Motivator condition resulted in the worst level of performance as compared to the control and function-based intervention conditions, indicating that despite not seeing the graphed results of the study until after completing the IRP-15, the assistant teacher’s rating may have been tied heavily to perceived effectiveness.

While this explanation addresses only the results for Jackson, the overall average ratings across all teachers also favored the function-based intervention, even in cases
without such marked differences in effectiveness. Thus, other reasons that the teachers and assistant teachers preferred the function-based intervention to the non-function-based Mystery Motivator should be considered. First, the function-based intervention may have been perceived as having a lower response effort in that teachers were cued at times that they should be directing verbal comments toward the children, comments that they presumably may have made regardless of the cue, but at an inappropriate time. In other words, the teachers and assistant teachers involved in the study were already providing the referred children with frequent negative attention prior to receiving services, often contingent on occurrence of problem behavior. Thus, perhaps providing high frequency attention for appropriate behavior was perceived as easier than using a Mystery Motivator intervention, which none of the teachers had used prior to involvement in the study. A second possibility is that there is an issue of teacher preference. Based on anecdotal reports and observations by the primary researcher, teachers did not seem to approve of using tangible items as reinforcers based on their beliefs that children should not be rewarded for behaviors that they, as one teacher explained, “just ought to do.” It may be that, to these teachers, a tangible item seemed more of an explicit *reward* than providing a few praise statements and was, thus, considered less appropriate.

Research Question Five

Finally, when considering how intervention efficiency differs with regard to time and cost between a function-based intervention and a non-function-based intervention, there are several considerations. Regarding cost, the Mystery Motivator intervention was obviously more resource-expensive due to the nature of the function-based intervention (i.e., contingent verbal praise). While teacher praise is a free, readily-available resource, a treasure box is not. Therefore, a moderate amount of money (i.e., $30) was spent to
stock the treasure box with toys and trinkets that would be desirable to preschool children (e.g., toy cars, bubbles, card games). Though this may not seem a large expense, the amount supplied the resources needed for only four students across data collection that lasted approximately two months per student. If this amount was extrapolated to cover all students that may be referred to Tier 2 for long-term behavioral interventions within a Response to Intervention framework in a mid-sized district (National Center on Response to Intervention), this could easily come to cost hundreds or thousands of dollars of district resources that could be spent elsewhere, or worse, be left for teachers to supply out-of-pocket. Certainly, other types of less expensive or no-cost reinforcers could have been included in the treasure box (e.g., a token for extra recess time); however, the particular items were chosen to ensure that the only function being addressed with the treasure box was access to tangibles.

Regarding time required to implement the interventions, results are mixed. When only considering the overall time required by both, the Mystery Motivator intervention is more time-efficient due to the additional time required to conduct a functional analysis (i.e., seven extra sessions at 10 minutes per session). However, when considering the time required by the amount of improvement made, the interventions are much more similar in terms of efficiency. Thus, when choosing an intervention, consultants may wish to consider overall time available for the intervention and monetary resources available. If there are school or district monetary funds to support behavioral interventions, an evidence-based intervention such as the Mystery Motivator may be more desirable due to the lower overall time investment. However, if the consultant has approximately an hour more to devote to a referred child, designing a function-based
intervention may be the most appropriate route due to the possibility of greater behavioral improvement with no associated monetary cost for the intervention.

Limitations

Though the results of the current investigation support the effectiveness of function-based interventions as compared to a Mystery Motivator intervention, several limitations must be noted. First, in every participating classroom, there were always two instructional agents present (i.e., one teacher and one assistant teacher) due to the structure of the Head Start centers. This allowed one adult to focus solely on the referred child for the data collection sessions, while the other adult conducted instruction with the other children. Therefore, it is unknown whether it is feasible to conduct a functional analysis and implement individualized interventions in a classroom with only one adult. Future research should continue to evaluate efficient and effective ways of developing and implementing behavioral interventions across various educational settings.

A second limitation is that access to peer attention was not experimentally manipulated during the functional analyses even though it was often indicated as a consequence of problem behavior for the current participants. Because peer attention was not manipulated, access to peer attention cannot be ruled out as a possible function of the participants’ problem behaviors. However, it can be argued that peer attention was present in all four experimental conditions as a constant and, therefore, the obtained results represent effects robust to the effects of access to peer attention. Given the need to provide individualized intervention to referred children with minimal interruption to the classroom environment, future research should investigate non-invasive methods of including peers in functional intervention planning.
Similarly, a third limitation is that all participants were found to have problem behavior that was maintained by the same function (i.e., access to teacher attention). Therefore, it is unknown if the same results regarding differential intervention effectiveness would have been obtained with other function-based interventions, such as escape from task demands. Additionally, for Marcus, although there was separation between the attention and tangible conditions, the tangible condition was elevated such that one might interpret the brief functional analysis to suggest a behavior maintained by both access to tangibles and attention. Therefore, the intervention analysis is further limited in that a function-based intervention that included both access to attention and tangibles may have resulted in even greater differences between the function based and non-function based interventions. Future research should continue to compare effectiveness of behavioral interventions that address a variety of functions, in addition to multiply-maintained behaviors, to inform service-delivery.

Fourth, unfortunately, this study lacks long-term follow-up data. The current study was not designed as a longitudinal study in intervention effectiveness. Thus, measures were not taken to gather long-term follow-up data for each participant. Instead, the major focus was on the immediate behavioral response of preschool children under two intervention conditions to determine the utility of functional assessment procedures. As such, it is unclear whether the intervention effects lasted beyond the research study and resulted in meaningful changes in the children’s outcomes (e.g., diagnosis of an externalizing disorder, improved academic outcomes). It is also unclear whether the magnitude of differential response between the two interventions results in a clinically significant difference over time. Future research on behavioral interventions in preschool
classrooms should include long-term monitoring in order to determine whether behavioral trajectories are improved as intended and under what conditions.

**Implications for School-Based Practice**

In evaluating the current results in terms of application to school-based practice, it is important to consider the available resources possessed by a specific school or district. If a district employs school psychologists or other trained personnel who are familiar with functional assessment methodologies, the use of function-based interventions for those children who are referred for tertiary levels of behavioral intervention due to continued difficulty (e.g., Tier 3 within a Response to Intervention framework) should be considered. Because function-based interventions can be tailored to the individualized needs of the child, the current research suggests that these have a greater likelihood of resulting in improvements over other evidence-based practices. However, if individuals who are able to perform functional assessments are unavailable, the current study suggests that evidence-based practices not tied to behavioral function, such as the Mystery Motivator, can result in increased engagement and reduced problem behavior to a level that approximates that of an individualized intervention. However, further research is needed to determine the degree to which these results generalize to other student populations and school settings before more firm applied recommendations can be made.

When discussing a school’s resources, one critical element must not be overlooked—the teachers and assistant teachers already employed and in each classroom. For all participants in the current study, the classroom teachers or assistant teachers, who had limited to no previous knowledge or experience with functional assessment methodology, implemented all of the functional analysis conditions with fidelity. This is
important for several reasons. First, by having the teacher/assistant teacher implement the functional analyses, a more ecologically-valid assessment (i.e., more naturalistic, involving people who have daily contact with the referred child) was conducted rather than involving an outside consultant. Second, teachers were able to implement conditions with high procedural integrity following minimal training and limited consultant involvement, conserving district resources. Additionally, previous research that has included consultant-conducted functional analyses (e.g., Bellone, 2011) found that functional analyses with preschool children were often undifferentiated and necessitated the use of extended analyses. However, it is possible that by having a person with whom a child has a significant behavioral history implement functional analyses, a clearer understanding of behavioral function using brief functional analysis methodologies can be achieved, as was the case in the current study. Thus, it is possible that with proper training and supervision, teachers themselves could come to play a larger role in conducting functional assessments in their own classrooms, which may result in more ecologically valid functional assessment results that are then linked to highly effective function-based interventions.

In conclusion, despite the discussed limitations, the current study presents evidence that supports the use of functional assessment procedures to develop behavioral interventions in traditional educational settings with typically-developing preschool children. For the four participants in the current study, an intervention based on the results of a teacher-implemented functional analysis resulted in more behavioral improvement, in terms of reducing problem behavior and increasing appropriate engagement, as compared to a non-functional evidence-based practice, the Mystery Motivator intervention. Beyond superior effectiveness, the current data suggest that the
function-based intervention also had similar efficiency to that of the Mystery Motivator intervention when considering time required by possible improvement and, in fact, more efficiency when considering monetary resources. Taken together, these data suggest that service-delivery models focused on evidence-based practice should not overlook the ultimate evidence-based practice: an individualized behavioral intervention tied to the function of the problem.
APPENDIX A

IRB APPROVAL LETTER

THE UNIVERSITY OF SOUTHERN MISSISSIPPI
INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

NOTICE OF COMMITTEE ACTION

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

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

PROTOCOL NUMBER: 11080801
PROJECT TITLE: Effectiveness of Teacher-Implemented Function-Based Interventions as Compared to Non-Function-Based Interventions to Address Problem Behaviors in Preschoolers
PROJECT TYPE: Dissertation
RESEARCHER/S: Katherine Bellone
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY: N/A
IRB COMMITTEE ACTION: Exempt Approval
PERIOD OF PROJECT APPROVAL: 08/15/2011 to 08/14/2012

[Signature]
Lawrence A. Hosman, Ph.D.
Institutional Review Board Chair

8-14-2011
Date
APPENDIX B
CONSENT FORMS

Parent Consent Form
Title of Study: Effectiveness Of Teacher-Implemented Function-Based Interventions as Compared to Non-Function-Based Interventions to Address Problem Behaviors in Preschoolers
Study Sites: P.A.C.E. Head Start
Hattiesburg Public School District

Name of Researcher & University affiliation: Katherine M. Bellone, B.S.
The University of Southern Mississippi

Dear Parent,

We are conducting a research study to look at different methods for helping students with behavior problems at school. The methods we will use include designing a specific intervention for your child and observing your child in the classroom. We will use the information from teachers and observations to develop a behavior intervention plan to help your child behave appropriately in class.

As a participant, your child will receive a comprehensive behavioral assessment and positive behavioral intervention. The study would take place in your child’s classroom during various classroom activities. Sessions will last about 20 minutes and will take place 2 – 5 times per week for the next month or two. The methods being used are all effective and acceptable in school settings. We are asking your permission for your child to be included in this study. Participants in the study may show improvements in classroom behavior by showing decreases in inappropriate behavior and increases in appropriate behavior. There are minimal risks involved with participation in this study outside what normally occurs in a classroom (for example, a temporary increase in disruptive behavior). If you decline participation for your child, it will not affect the services provided to your child at school.

Will this information be kept confidential?
Your child’s name and behavior information will be kept confidential. To protect your child’s privacy, he or she will be assigned a number. This number will be placed on all paper work. At no time will any paperwork contain your child’s name. Please note that these records will be held by a state entity and therefore are subject to disclosure if required by law.

Who do I contact with research questions? If you should have any questions about this research project, please feel free to contact Katherine Bellone at 601-266-5255 or Dr. Brad A. Dufrene at 601-266-5256. For additional information regarding your rights as a research participant, please feel free to contact the USM Institutional Review Board at 601-266-5509.

What if I do not want to participate?
Please understand that your participation is voluntary, your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled, and you may discontinue you and your child’s participation at any time without penalty or loss of benefits.

What if I DO want my child to participate? If you would like your child to participate, please sign the bottom of this sheet. You may keep the second copy for your records.

________________________________________
Your Child’s Name

________________________________________
Parent Signature

________________________________________
Date

________________________________________
Investigator Signature

________________________________________
Date
Teacher Consent Form

Title of Study: Effectiveness of Teacher-Implemented Function-Based Interventions as Compared to Non-Function-Based Interventions to Address Problem Behaviors in Preschoolers

Study Site: P.A.C.E. Head Start
Hattiesburg Public School District

Name of Researcher & University affiliation: Katherine M. Bellone, B.S.
The University of Southern Mississippi

Dear Teacher,

We are conducting a research study to examine how various assessment and observation procedures affect the development of effective interventions for children who exhibit behavior problems at school. We will conduct teacher interviews, record reviews, and observe child behavior during alterations of classroom conditions (e.g., teacher attention, peer attention, access to preferred activities).

As a participant, you will receive assistance with regard to a comprehensive behavioral assessment and positive behavioral support plan for a student referred for behavior problems in the classroom. The study would take place in your classroom during various classroom activities. Sessions will last about 20 minutes and will take place 2 – 5 times per week for the next month or two. The procedures being used are all effective and acceptable in school settings. We are asking your permission to include information from your involvement in the assessment and intervention process for this study. Students in the study may show improvements in classroom behavior as evidenced by decreased disruptive behavior and increased appropriate behavior as a result of a comprehensive assessment and implementation of a positive behavioral support plan. There are minimal risks for students involved with participation in this study outside typical response to intervention in young children (e.g., temporary increase in disruptive behavior). If you decline participation it will not affect the services provided to you or the referred child at your school.

Will this information be kept confidential?
Your name and behavior information will be kept confidential. To protect your and the student’s privacy, you will be assigned a number. This number will be placed on all paperwork. At no time will any paperwork contain your name. Please note that these records will be held by a state entity and therefore are subject to disclosure if required by law.

Who do I contact with research questions? If you should have any questions about this research project, please feel free to contact Katherine Bellone at 601-266-5255 or Dr. Brad A. Dufrene at 601-266-5256. For additional information regarding your rights as a research participant, please feel free to contact the USM Institutional Review Board at 601-255-5509.

What if I do not want to participate?
Please understand that your participation is voluntary, your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled, and you may discontinue your participation at any time without penalty or loss of benefits.

What if I DO want to participate? If you would like to participate, please sign the bottom of this sheet. You may keep the second copy for your records.

__________________________________________
Participant Signature
Date

__________________________________________
Investigator Signature
Date
### APPENDIX C

#### FUNCTIONAL ASSESSMENT INFORMANT RECORD FOR TEACHERS - PRESCHOOL VERSION II

| Teacher Information | Teacher Name: ___________________ | School: ___________________
<table>
<thead>
<tr>
<th></th>
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</tr>
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<tbody>
<tr>
<td>Please Circle One:</td>
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</tr>
<tr>
<td>Gender:</td>
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<td>Female</td>
</tr>
<tr>
<td>Race/Ethnicity:</td>
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<td>Asian</td>
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<tr>
<td>Years Teaching:</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Grade Level/Age You Are Teaching (If you teach more than one grade, please circle all that apply):</td>
<td>2 y/o</td>
<td>3 y/o</td>
</tr>
<tr>
<td>Highest Degree:</td>
<td>High School</td>
<td>Bachelors</td>
</tr>
<tr>
<td>Experience with Functional Behavior Assessment:</td>
<td>1 = No experience</td>
<td>5 = Very Experienced</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Experience with Classroom Consultants:</td>
<td>1 = No Experience</td>
<td>5 = Very Experienced</td>
</tr>
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<td></td>
<td>1</td>
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### Child Information

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</table>

Please indicate good days and times to observe. (At least two observations are needed.)

<table>
<thead>
<tr>
<th>Observation #1</th>
<th>Observation #2</th>
<th>Observation #3 (Back-up)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>Date:</td>
<td>Date:</td>
</tr>
<tr>
<td>Time:</td>
<td>Time:</td>
<td>Time:</td>
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</tbody>
</table>
Please do not reference the child by name. Please put "he" or "she" or the student's initials.

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

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

3. a. Is the child's developmental age consistent with their chronological age? 
   b. What is your estimate of the student's developmental age?

4. a. Are the child's social skills age appropriate?
   b. If there are social skills problems, are there behavioral excesses, deficits, or both?

5. a. What percentage of requests will the child comply with the first time asked?
   b. What percentage of requests will the student eventually comply with?
   c. When compliant, how accurately does the child complete the request (0% - 100%)?

6. Does the child receive any regular medications? 
   _____ Yes _____ No _____ If yes, briefly explain:

7. Does the child have any specific medical concerns? 
   _____ Yes _____ No _____ If yes, briefly explain:

8. Please describe the child's strengths.

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

10. Have previous procedures been successful? Why? Why not?

11. Describe your current classwide behavior management plan.
**Problem Behaviors**

Please circle 1 to 3 problem behaviors and rank the behaviors in order of severity with 1 being the most severe and 3 being the least severe.

**Potential Problem Behaviors (only circle 3; rank in order of severity 1= most; 3 = least )**

- Aggressive Behavior (e.g., hitting, kicking, pushing others) 1 2 3
- Non-compliance (e.g., not following teacher instructions) 1 2 3
- Inappropriate Vocalizations (e.g., talking out of turn, inappropriate volume) 1 2 3
- Out of seat/area (e.g., out of designated area) 1 2 3
- Playing with objects (e.g., playing with non-task related objects) 1 2 3
- Disrespectful to adults (e.g., sassing, arguing with adults) 1 2 3
- Tantrum (e.g., falling to floor screaming) 1 2 3
- Off-task behavior (e.g., not attending to instruction) 1 2 3
- Eloping (e.g., leaving the classroom) 1 2 3
- Verbal aggression (e.g., verbal threats/insults toward others) 1 2 3
- Stereotypy (e.g., hand-flapping, body rocking) 1 2 3
- Self-injurious behavior (e.g., head banging, skin picking) 1 2 3
- Other

---

1. **Rate how manageable** the behavior is:
   - **a. Problem Behavior 1**
     - Manageable
     - 1 2 3
     - Unmanageable
     - 4 5

2. **Rate how disruptive** the behavior is:
   - **a. Problem Behavior 1**
     - Mildly
     - 1 2 3
     - Very
     - 4 5

3. **How often does the behavior occur per day** (please circle)?
   - **a. Problem Behavior 1**
     - 1 - 3
     - 4 - 6
     - 7 - 9
     - 10 - 12
     - > 13
   - **a. Problem Behavior 2**
     - 1 - 4
     - 5 - 6
     - 8 - 9
     - 11 - 12
     - > 14
   - **a. Problem Behavior 3**
     - 1 - 5
     - 6 - 6
     - 9 - 9
     - 12 - 12
     - > 15
4. **How long does the problem behavior last?**
   
   a. Problem Behavior 1  
   < 1 min  1 - 5 min  6 - 10 min  > 10 min  
   
   a. Problem Behavior 2  
   < 1 min  1 - 5 min  6 - 10 min  > 10 min  
   
   a. Problem Behavior 3  
   < 1 min  1 - 5 min  6 - 10 min  > 10 min  

5. **How many months has the behavior been present?**
   
   a. Problem Behavior 1  
   < 1  1 - 2  3 - 4  entire school year  
   
   a. Problem Behavior 2  
   < 1  1 - 2  3 - 4  entire school year  
   
   a. Problem Behavior 3  
   < 1  1 - 2  3 - 4  entire school year  

6. **For each problem behavior, provide an appropriate replacement behavior that you would like the child to exhibit instead of the problem behavior.**
   
   a. Problem Behavior 1  
   
   a. Problem Behavior 2  
   
   a. Problem Behavior 3  
   
   (Blank lines for replacement behaviors)
Antecedents:

<table>
<thead>
<tr>
<th>Behavior 1</th>
<th>Behavior 2</th>
<th>Behavior 3</th>
</tr>
</thead>
</table>

0 = never happens | 1 = happens a little | 2 = happens some | 3 = happens very often

Please circle the corresponding number for each of the three behaviors listed.

I. Academic Task Demands
   1. Does the behavior occur more often during a certain type or activity? 0 1 2 3 0 1 2 3 0 1 2 3
   2. Does the behavior occur more often during the same task? 0 1 2 3 0 1 2 3 0 1 2 3
   3. Does the behavior occur more often during difficult activities? 0 1 2 3 0 1 2 3
   4. Does the behavior occur more often during same activities? 0 1 2 3 0 1 2 3 0 1 2 3

II. Transitions
   5. Does the behavior occur more often when a request is made to stop an activity? 0 1 2 3 0 1 2 3 0 1 2 3
   6. Does the behavior occur more often at transitions? 0 1 2 3 0 1 2 3 0 1 2 3
   7. Does the behavior occur more often during transition periods? 0 1 2 3 0 1 2 3

III. Person
   8. Does the behavior occur more often with a specific person present? 0 1 2 3 0 1 2 3 0 1 2 3
   9. Does the behavior occur more often when a specific person is not there? 0 1 2 3 0 1 2 3

IV. Academic Settings
   10. Does the behavior occur more often in the classroom? 0 1 2 3 0 1 2 3 0 1 2 3
   11. Does the behavior occur more often in small group? 0 1 2 3 0 1 2 3 0 1 2 3
   12. Does the behavior occur more often in large group? 0 1 2 3 0 1 2 3 0 1 2 3
   13. Does the behavior occur more often in one-to-one activities? 0 1 2 3 0 1 2 3 0 1 2 3

V. Non-Classroom Settings
   14. Does the behavior occur more often in the playground? 0 1 2 3 0 1 2 3
   15. Does the behavior occur more often on the playground? 0 1 2 3
   16. Does the behavior occur more often in the bathroom? 0 1 2 3
   17. Does the behavior occur more often on the bus? 0 1 2 3
   18. Does the behavior occur more often outdoors? 0 1 2 3

VI. Presentation Style
   19. Does the behavior occur more often when instructions/tasks are presented verbally? 0 1 2 3 0 1 2 3 0 1 2 3
   20. Does the behavior occur more often when instructions/tasks are presented visually? 0 1 2 3 0 1 2 3
   21. Does the behavior occur more often when instructions/tasks are presented auditorially? 0 1 2 3 0 1 2 3

VII. Time of Day
   22. Does the behavior occur more often during nap time? 0 1 2 3 0 1 2 3 0 1 2 3
   23. Does the behavior occur more during mealtime? 0 1 2 3 0 1 2 3 0 1 2 3
<table>
<thead>
<tr>
<th>Consequences:</th>
<th>Behavior 1</th>
<th>Behavior 2</th>
<th>Behavior 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child’s name:</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavior 1:</th>
<th>Behavior 2:</th>
<th>Behavior 3:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: never happens</td>
<td>1: happens a little</td>
<td>2: happens some</td>
</tr>
<tr>
<td>3: happens very often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please circle the corresponding number for each of the three behaviors listed.

**I. Positive Reinforcement: Access to Activities and Items**

1. **Does someone provide the child with access to an activity after the behavior has occurred?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

2. **Does the child take possession of a toy or item during or after the behavior occurs?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

3. **Negative Reinforcement: Escape, Delay, Reduction or Avoidance of Demands**

4. **Does the child receive negative attention from peers during or after the behavior is exhibited?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

5. **Is the child restrained by an adult during or after the behavior has occurred?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

6. **Negative reinforcement: Access to Attention**

7. **Does the teacher interrupt the child while the behavior is exhibited?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

8. **Automatic Reinforcement**

9. **Are there any events occurring in the child’s home that seem to precede the occurrence of the behavior at school?**
   - 0: does not happen
   - 1: happens a little
   - 2: happens some
   - 3: happens very often

10. **Are there any other problem behaviors that often occur after the behavior is exhibited?**
    - If yes, describe: ______________________________

11. **Are there any other problems that the child has?**
    - If yes, describe: ______________________________
The purpose of this questionnaire is to obtain information that will aid in the evaluation of the intervention for ______. Please circle the number which best describes your agreement or disagreement with each statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This was an acceptable procedure for the child's problem behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Most teachers would find this procedure appropriate for problem behaviors.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>This procedure was effective in changing the child's problem behavior.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>4</td>
<td>I would suggest the use of this procedure to other teachers.</td>
<td>1</td>
<td>2</td>
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<tr>
<td>5</td>
<td>The child's problem behavior was severe enough to warrant use of this procedure.</td>
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<tr>
<td>6</td>
<td>Most teachers would find this procedure suitable for dealing with the child's problem behaviors.</td>
<td>1</td>
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<tr>
<td>7</td>
<td>I would be willing to use this procedure again.</td>
<td>1</td>
<td>2</td>
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<tr>
<td>8</td>
<td>This procedure did <strong>NOT</strong> result in any negative side-effects for the child.</td>
<td>1</td>
<td>2</td>
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</table>
9. This procedure would be appropriate for a variety of children.

10. This procedure was consistent with those I have used in the past.

11. This procedure was a fair way to deal with the child's problem behavior.

12. This was reasonable for the child's problem behavior.

13. I liked the procedure.

14. This procedure was beneficial in understanding this child's problem behavior.

15. Overall, this procedure was beneficial for the child.

Adapted from Martens, Witt, Elliott, & Darveaux, 1985.
APPENDIX E

ASSESSMENT RATING PROFILE-REVISED (ARP-R)

Please circle the number that best describes your agreement or disagreement with each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This was an acceptable assessment strategy for the child’s problems</td>
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<td>2</td>
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<tr>
<td>2. Most teachers would find this approach to assessment appropriate for problems in addition to this child’s current problems</td>
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<td>3. This assessment proved effective in identifying the child’s problems</td>
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<td>4. I would suggest the use of this assessment to other teachers</td>
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<td>6</td>
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<td>5. I would be willing to receive assessment results such as those described with a student transferring into my school</td>
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<tr>
<td>6. The assessment would be appropriate for a variety of children</td>
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<tr>
<td>7. The assessment was a fair way to identify the child’s problems</td>
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<tr>
<td>8. This assessment was reasonable for the problems described</td>
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<tr>
<td>9. I liked the assessment procedures used in this assessment</td>
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<td>6</td>
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<tr>
<td>10. This assessment was a good way to handle the child’s problems</td>
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<tr>
<td>11. Overall, this assessment was beneficial for the child</td>
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<tr>
<td>12. This assessment was helpful in the development of intervention strategies</td>
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Adapted from Eckert, Hintze, & Shapiro, 1999
APPENDIX F

FUNCTIONAL ANALYSIS PROTOCOL: TANGIBLE

Student Name: _______________  Teacher: ___________
Session: _______________  Date: ___________
Condition: TANGIBLE

Operational Definition and Measurement of Target Behaviors

Target Behavior: Determined based on collaboration with teacher
Definition: Developed based on behavioral topography
Dependent Measure: Determined based on topography

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme determined based on topography
   Session Duration: 10 min
   Setting: Classroom
   Type of activity: Group Instruction
   Materials: Student’s preferred items/toys (Free access).
   Procedures:
   1) Teacher will say, “[Student’s name], would you like to play with this toy?”
   2) Teach will interact with target student for 2 min or until he/she is engaged with
      the preferred item.
   3) After the child has engaged with the preferred item, teacher will take the item
      away and place it in the child’s view but out of reach.
   4) Student will go to designated area and teacher will present class activity that in
      the past has been related to the occurrence of the target behavior.
   5) Teacher will say “[Name], it’s time to join the group” and begin group instruction.
   6) Contingent on occurrence of the target behavior, the experimenter will cue the
      teacher using an index card & teacher will present child with preferred item for a
      period of 30 s
   7) No other behavior will receive any consequences from either the teacher or
      experimenter.
APPENDIX G

FUNCTIONAL ANALYSIS PROTOCOL: CONTROL

Student Name: _______________  Teacher: _______________
Session: ____________________  Date: _______________
Condition: CONTROL

Operational Definition and Measurement of Target Behaviors

Target Behavior: Determined based on collaboration with teacher
Definition: Developed based on behavioral topography
Dependent Measure: Determined based on topography

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme determined based on topography
2. Session Duration: 10 min
3. Setting: Classroom
4. Type of activity: Preferred toy play (e.g., magazines, blocks, books)
5. Materials: Student’s preferred materials/toys (Allow the student free access). Have all preferred items present.

Procedures:

1. Teacher will say, “[Name], would you like to play with these toys?”
2. Teacher will seat student in designated area away from other children.
3. Teacher will interact with the student by providing a neutral comment every 30s or by responding to each appropriate response from the student.
4. Teacher will provide descriptive praise for appropriate toy play and any assistance necessary using a least-to-most prompt for appropriate toy play if requested or needed.
5. Teacher and experimenter will not respond to any problem behaviors.
APPENDIX H

FUNCTIONAL ANALYSIS PROTOCOL: ATTENTION

Student Name: ____________
Teacher: ____________
Session: ____________
Date: ____________
Condition: ATTENTION

Operational Definition and Measurement of Target Behaviors

Target Behavior: Determined based on collaboration with teacher
Definition: Developed based on behavioral topography
Dependent Measure: Determined based on topography

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme determined based on topography
Session Duration: 10 minutes
Setting: Classroom
Type of activity: Group Instruction
Materials: Task related items

Procedures:
1. Prior to beginning session, the teacher will interact with the student for 2 min by providing positive attention (e.g., conversation, praise).
2. Seat student in designated area.
3. Teacher will present class activity that in the past has been related to the occurrence of the target behavior.

2. Teacher will say “[Name], it’s time to join the group.”
3. Teacher will divert attention from the student to the group instruction.
4. Contingent on each occurrence of target behavior:
   • Teacher will provide three disapproving comments or reprimands (interacting with the student for 30 s). For example, “Stop talking! You know you are not supposed to be talking! Be quiet!”
   • Then, the teacher will divert attention back to other work.
5. Teacher and experimenter will not respond to any other problem behavior.
APPENDIX I

FUNCTIONAL ANALYSIS PROTOCOL: ESCAPE

Student Name: _______________  Teacher: ___________
Session: ___________________  Date: _____________
Condition: ESCAPE

Operational Definition and Measurement of Target Behaviors

Target Behavior: Determined based on collaboration with teacher
Definition: Developed based on behavioral topography
Dependent Measure: Determined based on toponography

Data Collection Procedures and Other Behavioral Definitions

1. Target Behavior = Recording scheme determined based on topography
   Session Duration: 10 minutes
   Setting: Classroom
   Type of activity: Group Instruction
   Materials: Any Work Related Materials
   Procedures:
   1. Seat student in designated area [Teacher will present class activity that in the past has been related to the occurrence of the target behavior].
   2. Teacher will say “[Name], it’s time to join the group” and begin group instruction.
   3. Teacher will wait 5 s for independent initiation of activity
      • If student independently initiates task, teacher will provide a brief praise statement (e.g., Good job!) and deliver next command as needed.
      • If student does not initiate within 5 s, teacher will use a verbal and gestural prompt (for example, say “[student, answer the question and will point to the task.]” and wait another 5 s for initiation.
         o If student complies with the verbal/gestural prompt within 5 s, teacher will provide praise and move to the next command as needed.
         o If the student does not comply within 5 s, teacher will use physical guidance to have student comply (e.g., Say, “student, answer the question,” while using hand-over-hand guidance to assist in writing.)
            ▪ DO NOT PRAISE IF PHYSICAL GUIDANCE IS NEEDED.
   4. Contingent on each occurrence of target behavior:
      • Teacher will remove work-related materials and provide a 30s break.
      • Repeat the instruction after the 30s break.
      • Teacher will NOT provide attention during the break.
   5. Do not respond to any other problem behavior.
APPENDIX J

FUNCTION-BASED INTERVENTION PROTOCOL

Student Name: ___________  Teacher: ___________
Session: _____________  Date: _____________

Operational Definition and Measurement of Target Behaviors

Target Behavior: Determined in collaboration with teacher
Definition: Developed in collaboration with teacher
Dependent Measure: Determined based on topography of behavior
Replacement Behavior: Appropriate Engagement
Definition: Student’s body is oriented towards task or teacher, with eyes on academic materials or looking at teacher, and responds to academic demands when individually requested or whole-group requested (i.e., verbal response or gestural response).
Dependent Measure: Determined based on topography of behavior

Procedures:

1. Prior to presenting any task demands, the teacher will deliver a statement to the student related to the identified function of the behavior (e.g., for attention-maintained behavior, “If you are good today, I will tell you “you did a good job.” or for escape-maintained behavior, “If you are good today, I will give you a break.”).
2. Exact intervention procedures will be identified based on the identified function. On a fixed-interval schedule of 30s, the student will receive the identified reinforcer (e.g., attention, break) for the first occurrence of Appropriate Engagement that occurs after a 30s period.
3. Following the appropriate behavior, the researcher will cue the teacher to provide the identified reinforcer using an index card (either 3 praise statements or a brief break from task demands).
4. The teacher will provide the reinforcer every time the cue occurs.
5. Teacher will not respond to any other behaviors.
APPENDIX K

NON-FUNCTION BASED INTERVENTION PROTOCOL

Student Name: ___________  Teacher: ___________
Session: ________________  Date: ______________

Operator Definition and Measurement of Target Behaviors

Target Behavior: Determined in collaboration with the teacher
Definition: Developed in collaboration with teacher
Dependent Measure: Determined based on topography of the behavior

Replacement Behavior: Appropriate Engagement
Definition: Student’s body is oriented towards task or teacher, with eyes on academic materials or looking at teacher, and responds to academic demands when individually requested or whole-group requested (i.e., verbal response or gestural response).
Dependent Measure: Determined based on topography of the behavior

Procedures:
1. Prior to presenting any task demands, teacher will tell participant, “If you are good today, you will earn checks. If you get ___ checks, you might get to pick a mystery prize.”

2. Teacher will present a blank mystery motivator chart to participant and place in view.

3. Contingent on occurrence of appropriate behavior, the researcher will cue the teacher using an index card, who will then make a check on the chart.

4. If the participant earns criterion number of checks by the end of the observation period, participant is allowed to draw a slip out of an envelope (either an X or a picture of a prize).

   a. If an X is drawn, the child will be told, “You don’t get a prize today, but maybe you will tomorrow!”

   b. If a picture of a prize is drawn, the child will be allowed to draw one item from the “mystery motivator box.”
APPENDIX L

PROCEDURAL INTEGRITY FOR TANGIBLE CONDITION

Student: _________________  Session: _________________
Teacher: _________________  Date: _________________
Observer: _________________  Condition: TANGIBLE

This form is used to assess the level of procedural integrity for each implemented functional analysis tangible condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA control condition.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
</table>

1. Participant is allowed 2 min access with preferred item before session begins

2. Preferred item is removed to begin instruction.

3. Participant is seated in designated area

4. Teacher presents the student with identified activity

5. Contingent on problem behavior, teacher presents participant with preferred item for 30s

6. Teacher does not respond to other problem behavior

- Repeated steps 4-6 for each 30 s interval
APPENDIX M

PROCEDURAL INTEGRITY FOR CONTROL CONDITION

Student: _________________  Session: _________________

Teacher: _________________  Date: _________________

Observer: _________________  Condition: **CONTROL**

This form is used to assess the level of procedural integrity for each implemented functional analysis control condition. Record if the researcher behaviors were implemented as planned (*Yes*) or not implemented as planned (*No*) during each FA control condition.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>N/A</th>
</tr>
</thead>
</table>

1. Participant is within designated area of target activity

2. Teacher provided student with access to preferred materials available in the classroom

3. Teacher provides interactive play and attention every 30 s

4. Teacher does not respond to problem behavior

5. Teacher does not present academic demands to the student

*Repeated steps 3-5 for each 30 s interval*
APPENDIX N

PROCEDURAL INTEGRITY FOR ATTENTION CONDITION

Student: _______________  Session: _______________
Teacher: _______________  Date: _______________
Observer: _______________  Condition: ATTENTION

This form is used to assess the level of procedural integrity for implemented functional analysis attention condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA attention condition.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
</table>

1. Teacher interacts with student for 2 minutes prior to beginning session.

|     |     |     |

2. Participant is within designated area of target activity

|     |     |     |

2. Teacher presents task related items to child

|     |     |     |

4. Teacher interacts with student until student engages in task

|     |     |     |

5. Teacher says, “I have to do my work now, it's time for work”

|     |     |     |

6. Teacher diverts attention to instruction materials

|     |     |     |

7. Contingent on participant exhibiting target behavior teacher provides three disapproving comments

|     |     |     |

8. Following 30 s of interaction, teacher diverts attention back to the work materials

|     |     |     |

8. Teacher does not respond to any other problem behaviors

|     |     |     |

* Repeated steps 7-8 for each occurrence of target behavior

|     |     |     |
APPENDIX O

PROCEDURAL INTEGRITY FOR ESCAPE CONDITION

Student: _________________  Session: _________________  
Teacher: _________________  Date: _________________  
Observer: _________________  Condition: ESCAPE

This form is used to assess the level of procedural integrity for each implemented functional analysis escape condition. Record if the researcher behaviors were implemented as planned (Yes) or not implemented as planned (No) during each FA demand condition.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participant is within designated area of target activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Teacher presents student with identified task demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Teacher provides verbal instructions to student to complete the identified task</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Teacher waits 5 s for compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. If the participant complies,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Teacher provides descriptive praise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. Teacher moves to the next demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. If the student does not comply with 5 s,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Teacher restates instructions with verbal/gestural prompts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. Teacher waits 5 s for compliance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Participant complies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Provide descriptive praise</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Teacher moves to next demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Participant does not comply</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Teacher restates instructions and provides hand-over-hand guidance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Teacher does not respond to any other problem behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. When student exhibits problem behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Teacher removes task demand for 30 s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. After 30 s, teacher re-presents the task demand</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Repeat steps 3-6 for each demand sequence

---

A. Participant complies
   1. Provide descriptive praise
   2. Teacher moves to next demand
B. Participant does not comply
   1. Teacher restates instructions and provides hand-over-hand guidance

5. Teacher does not respond to any other problem behavior

6. When student exhibits problem behavior
   a. Teacher removes task demand for 30 s
   b. After 30 s, teacher re-presents the task demand

* Repeat steps 3-6 for each demand sequence
APPENDIX P

TREATMENT INTEGRITY CHECKLIST FOR FUNCTION-BASED INTERVENTION

Student: _______________  Session: _______________
Teacher: _______________  Date: _______________
Observer: _______________

This form is used to assess the level of treatment integrity for each session of the function-based intervention. Record if the teacher implemented as planned (Yes) or not implemented as planned (No) during each session.

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Participant is within designated area of target activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Prior to presenting any task demands, teacher delivers reinforcer-specific statement to participant.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>3. Teacher presents task demands as normal.</td>
<td></td>
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<tr>
<td>4. Following the researcher’s cue (index card):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. The teacher delivers function-based reinforcer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Teacher provides the reinforcer each time cue occurs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Teacher does not respond to any other behaviors.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX Q
TREATMENT INTEGRITY CHECKLIST FOR NON-FUNCTION BASED INTERVENTION: MYSTERY MOTIVATOR

Student: _________________    Session: _________________
Teacher: _________________    Date: _________________
Observer: _________________

This form is used to assess the level of treatment integrity for each session of the non-function-based intervention. Record if the teacher implemented as planned (Yes) or not implemented as planned (No) during each session.

5. Prior to presenting any task demands, teacher told participant, ____  ____  ____
   “If you are good today, you will earn checks. If you get ___ checks, you might get to pick a mystery prize.”

6. Teacher presents blank chart to participant and places in view. ____  ____  ____

7. Contingent on occurrence of appropriate behavior
   a. Teacher makes a check on the chart  ____  ____  ____
   b. No other attention is provided.  ____  ____  ____

8. If participant earns criterion number of checks by the end of the observation period,
   participant is allowed to draw one slip from the envelope
   a. If an X- Child is told “You don’t get a prize today but maybe you will tomorrow!”  ____  ____  ____
   b. If a picture of a prize, Child is allowed to draw one item from the “mystery motivator box.”  ____  ____  ___

Participant met criterion:  Y     N
Number of checks earned: ______
Mystery Motivator earned:  Y     N
Prize: _________________
### APPENDIX R

**TREATMENT INTEGRITY CHECKLIST FOR CONTROL CONDITION**

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Session:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observer:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This form is used to assess the level of treatment integrity for each session of the control condition. Record if the teacher implemented as planned (*Yes*) or not implemented as planned (*No*) during each session.

1. Participant is within designated area of target activity.       ___  ___  ___
2. Teacher does not make any statement to the participant before regular instruction begins. ___  ___  ___
3. Teacher presents task demands as normal.                      ___  ___  ___
4. Teacher does not provide any research-specific consequences for the participant’s appropriate behavior. ___  ___  ___
REFERENCES


doi:10.1177/1098300706008004030


