EARLY INTERVENTION USING FUNCTION-BASED PLANNING FOR CHILDREN AT-RISK FOR EMOTIONAL OR BEHAVIORAL DISORDERS

by

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DEDICATION

To my family, who have patiently stood by, provided encouragement, and believed that this manuscript would be completed. From the bottom of my heart, I thank you.

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ABSTRACT

The purpose of this study was to contribute to the literature by examining a systematic set of methods to assess and treat the problem behavior of young at-risk children. This study examined the use of the *Decision Model* (Umbreit, Ferro, Liaupsin, & Lane, 2007) with two kindergarten students and one first grade student who were exhibiting chronic behavior problems despite implementation of interventions through their school's existing support system. The study was conducted across three phases including: Phase I (Descriptive Functional Assessment), Phase II (Intervention Development/Testing) and Phase III (Intervention Implementation). Interventions in Phase III, were systematically introduced to each student using a Multiple Baseline Design. The *Decision Model* was used to develop interventions that resulted in reductions in each child's disruptive behavior and increases in on-task academic behavior. Social validity was examined using the TARF-R and resulted in high acceptability ratings from each teacher responsible for implementing the intervention for each student. Limitations and directions for future research are discussed.

CHAPTER 1

INTRODUCTION

School personnel have become increasingly concerned about aberrant behavior exhibited by children both with and without disabilities (Eber, Sugai, Smith, & Scott, 2002; Sprague & Walker, 2000). Unfortunately, behavior problems exhibited on school campuses appear to be increasing in both frequency *and* magnitude (Sugai, Sprague, Horner, & Walker, 2000). Targeted behavior problems typically include classes of behavior described as noncompliant (e.g., failure to follow a teacher directive, ignoring the teacher), disruptive (e.g., talking out, property damage, swearing, being out of assigned area), and antisocial (e.g., lying, stealing, cheating, aggressing). These data are particularly significant given the documented poor long-term outcomes for students who exhibit early patterns of maladaptive behavior (Sprague & Walker, 2000). For these children, common outcomes include poor academic performance due to restricted access to instruction, referral for specialized educational placements, social rejection, low self-esteem, referral for special education identification, and increased school drop out (Walker, Ramsey, & Gresham, 2004).

Public policy makers have responded to these concerns in a variety of ways. At the local level, many schools have "Zero Tolerance" policies to respond to the most dangerous behaviors. At the same time, an increasing number of schools are implementing school wide models of discipline and positive behavior support (Eber et al., 2002; Mehas et al., 1998; Stader, 2004; Sugai & Horner, 2002). At the state and federal level, special education law has been reauthorized to include mandates requiring school

staff to conduct a Functional Behavioral Assessment (FBA) and to develop a Behavioral Intervention Plan (BIP) when a student exhibits behavior problems that impede the learning of themselves or others (Individuals with Disabilities Education Act [IDEA], 1997; Individuals with Disabilities Education Improvement Act [IDEIA], 2004).

Unfortunately, these laws preceded the public's ability to effectively utilize the methodology (Conroy, Clark, Fox, & Gable, 1999; Scott et al., 2005, Shellady & Stichter, 1999). Neither current law nor professional literature defines the required steps to be taken for an "official" FBA or BIP (Cone, 1997; Etscheidt, 2006; Scott, Meers, & Nelson, 2000; Stichter & Conroy, 2005; Sugai, Lewis-Palmer, & Hagan, 1998). Furthermore, there are no guidelines that identify whether different methods are more or less effective with different populations (Ervin, Radford, et al., 2001; Gresham, Quinn, & Restori, 1999; Kwak, Ervin, Anderson & Austin, 2004; Sasso, Conroy, Stichter & Fox, 2001; Scott et al., 2000).

What we do know, however, is that the intent of the law is based on sound research that emerged from the applied behavior analysis literature (Carr, 1977; Ervin, Ehrhardt, & Poling, 2001). Behavior analysts have effectively applied FBA methods to a variety of behavior problems including *self-injury* (e.g., Iwata, Dorsey, Slifer, Bauman, & Richman, 1982), *disruptive behavior* (e.g., Clarke et al., 1995), *psychotic speech* (e.g., Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991), and *aggressive behavior* (e.g., Umbreit & Blair, 1997). Furthermore, these studies have been conducted in a variety of settings including *schools* (e.g., Dunlap et al., 1991; Hoff, Ervin, & Friman, 2005; Kern, Childs, Dunlap, Clarke, & Falk, 1994; Umbreit, Lane, & DeJud, 2004), *childcare centers* (Blair,

Umbreit, & Bos, 1999; Umbreit & Blair, 1997) *group homes* (McClean et al., 2005), *clinics* (Iwata et al., 1982), *sheltered workshops* (Carr & Durand, 1985), and *homes* (McNeill, Watson, Henington, & Meeks, 2002; Umbreit, 1996).

The process of conducting FBAs has evolved over time as researchers have demonstrated the efficacy of a continuum of methods, including a variety of both direct and indirect measures of assessment (Kern, Choutka, & Sokol, 2002; Kwak et al., 2004; Shriver, Anderson, & Proctor, 2001). Most importantly, researchers have demonstrated a significant clear advantage to developing and implementing interventions that

- *Are function-based* (Dunlap et al., 1991; Ingram, Lewis-Palmer & Sugai, 2005; Iwata et al., 1982; Lalli, Casey, & Kates, 1995; Sasso et al., 1992; Sugai et al., 1998; Umbreit et al., 2004; Umbreit & Blair, 1997);
- *Include antecedent manipulations* (Conroy & Stichter, 2003; Kern et al., 2002);
- *Are sustained over time* (Kern, Gallagher, Starosta, Hickman, & George, 2006); and
- *Are implemented in the natural context* (Ellingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000; Stichter & Conroy, 2005; Umbreit, 1996; Watson, Ray, Sterling-Turner, & Logan, 1999).

What has not been so clear in the literature is exactly how researchers have used assessment data to develop interventions (McNeill et al., 2002; Scott et al., 2000; Snell, Vorhees, Chen, 2005). As a result, in addition to typical systemic barriers such as lack of time, training, and resources, practitioners also lack specific methods they can use to

develop interventions that are appropriate for school settings (Ervin, Radford, et al., 2001).

These barriers can overwhelm staff who often lose sight of the purpose of the process, which is to identify functional relationships that allow practitioners to predict and control behavior (Gresham et al., 1999; Sasso et al., 2001). With guided practice, practitioners can often learn to correctly identify function (Kamps, Wendland, & Culpepper, 2006; Kern et al., 2006). However, even when they do, they still develop interventions that tend to be punitive, with little regard for the functional relationships that have been identified (Scott, et al., 2005; Sugai et al., 1998; Van Acker, Boreson, Gable, & Potterton, 2005). Further breakdown between function identification and intervention development occurs when

- A behavior is under the control of multiple contingencies (Ellingson, et al., 2000; Hoff et al., 2005);
- The maintaining contingencies are not immediately clear (Kennedy, 2000; Watson, et al., 1999); or
- The functional relations shift over time (Carr et al., 2002).

Conducting a FBA serves no purpose if the results are not linked to an impending intervention (Heckaman, Conroy, Fox, & Chair, 2000; Sasso et al., 2001). Research continues to provide documentation of the importance of and durability of designing and implementing function-based interventions (Ingram et. al. 2005; Kamps et al., 2006; Kern, et al., 2006). Unfortunately, most published work lacks a description of the methods that allow a clear research-to-practice link. In other words, although some researchers may

know how to link assessment data to intervention, that knowledge is not transferred in current published work.

To address this problem, Umbreit et al., (2007) recently developed a decision model and methodology for identifying and developing function-based interventions. The process has been successfully taught in college courses and has been successfully applied in public school settings. Although the methodology has been supported by some recent research (e.g., Blair, Liaupsin, Umbreit, & Kweok, 2006; Lane, Weisenbach, Little, Phillips, & Wehby, 2006; Liaupsin, Umbreit, Ferro, Urso, Upreti, 2006; Stahr, Cushing, Lane, & Fox, 2006; Umbreit et al., 2004), more replications are needed to establish its efficacy with a broad range of students across various functions, behaviors, and settings.

The Model is designed to guide practitioners from function identification through making the link between assessment and intervention. Practitioners use a three-phase process. First, function is identified though a descriptive assessment. Second, the *Decision Model* is used to develop an intervention that is then tested experimentally under natural conditions. Finally, the intervention is fully implemented.

Intervention selection is guided by use of the *Decision Model*, which prompts the practitioner to ask (a) whether or not the student can perform the replacement behavior and (b) whether or not the antecedent conditions represent effective instructional and behavior management practices. Different types of interventions are then selected based on the answers to these questions.

The promising aspects of this Model are that it (a) provides prompts for the person or team conducting the assessment, (b) cues the person or team about what step to

take next, (c) uses methods that allow people to test resulting interventions in the natural setting, (d) emphasizes proactive antecedent manipulations, (e) addresses each component in the three-term contingency, and (f) provides specific methods for linking the intervention to assessment. Finally, the Model may provide a consistent framework for approaching assessment and intervention in a way that the field desperately needs.

Statement of the Problem

Behavior problems are occurring more frequently in the school setting. These problems interrupt instruction, which has a significant negative impact on the learning of all students. Children who exhibit behavior problems at an early age are significantly at-risk for more restrictive placements and school failure. These children are often found to have significant gaps in their academic abilities, which are likely compounded by their limited and disjointed access to instruction. These gaps will continue to grow exponentially, making remediation more difficult as time passes. However, early intervention using function-based intervention methods has the potential to alter this trajectory and allow children to be successful in less restrictive settings.

A sound literature within applied behavior analysis demonstrates several methods for addressing behavior problems. However, no single model has been prescriptive enough for fluid research-to-practice application. If a methodology is to be used in school settings as the law intended and in a way that produces positive sustainable outcomes, research must examine the process of function-based intervention planning.

The purpose of this research is to determine whether the methods described in the *Function-Based Intervention Decision Model* (Umbreit et. al., 2007) will produce meaningful improvements in the behavior of at-risk students in a public school setting.

Specific questions addressed are

1. Will interventions developed using the *Function-Based Intervention Decision Model* improve the behavior of young at-risk children?
2. Will teaching staff who implement the resulting interventions judge them as being socially acceptable?

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter reviews the behavioral research that has studied the effectiveness of improving behavior through the use of function-based intervention methodology.

Social and Academic Impact of Behavior Problems

Children are exhibiting problem behavior in school at alarming rates (Sprague & Walker, 2000). There have been many investigations into the prevalence, demographics, topography, and targeted interventions for problem behavior (Montague, Enders, & Castro, 2005; Sprague & Walker, 2000). What may come as a surprise to some is that the increase in both frequency and magnitude of behavior problems is coming not only from adolescents in junior and senior high school, but also from young elementary school students (Montague et al., 2005; Sprague & Walker, 2000; Walker et al., 2004).

In a recent study, Campbell, Spieker, Burchinal, and Poe (2006) examined the trajectories of aggression from toddlerhood to age nine. They found conclusive evidence that these trajectories predict both social and academic functioning through age 12. Stability of aggression was key in this study, regardless of whether or not the aggression was exhibited at low, moderate, or high levels. Three percent of the children in their sample of 1,195 exhibited aggression in high stable patterns. These children demonstrated poor social skills, higher levels of externalizing behaviors, and more peer-related social problems. Fifteen percent of their population demonstrated a moderate stable trajectory and demonstrated poor emotional regulation and inattention at follow up. Twelve percent of their population initially exhibited moderate levels of aggression, but

the pattern declined, as they grew older. This subgroup did not exhibit difficulties during their later years. Interestingly, their low-level stable aggression group (i.e., 25%) demonstrated unanticipated social and behavioral problems during follow-up.

These data support earlier findings by Crick, Casas, and Mosher (1997) who reported that children who exhibit chronic aberrant behavior starting at an early age are not only impacted academically, but these behaviors result in social problems as well. Specifically, when children exhibit either overt or relational aggression in preschool, they are more likely to be actively rejected by their peers as time goes on, resulting in significant psychosocial maladjustment problems.

When children exhibit aberrant behavior in the classroom, it not only disrupts their own learning, but the learning of each of their classmates (Montague et al., 2005). As teachers take time to address problem behavior, learning is impacted by decreased access to direct instruction, decreased opportunities to respond, and decreased access to performance feedback (i.e., immediate error correction, clarification of directions; Lassen, Steele, & Sailor, 2006; Nelson, Johnson, & Marchand-Martella, 1996; Skinner, Johnson, Larkin, Lessley, & Glowacki, 1995). When this occurs in the early grades, students miss out on important foundational skills that are needed to advance successfully through each of the higher grades (Nelson et. al., 1996). As a result, these students often experience school failure, which frequently leads to placement in special education or in alternative schools, and/or dropping out before graduation (Montague et al., 2005; Walker et al., 2004).

Trends showed that the number of students identified as having an Emotional Disturbance, as defined by the IDEA (1997), peaked around age 15 (Walker, Nikiosha, Zeller, Severson, & Feil, 2000). This peak represents a significant and steady incline from age six, when the lowest reported number of students was identified. Despite the abundance of literature available on early intervention, many of these children are offered services once the trajectory has become set and intervention attempts are likely to have little impact (Walker et al., 2004).

Walker and colleagues (2004) suggested that if antisocial behavior was not remediated by the third grade, interventions should be implemented as if one were treating a chronic condition such as diabetes. This recommendation was supported by ample literature that showed early discipline problems in school were highly predictive of later psychosocial problems (Sprague & Walker, 2000; Walker et al., 2004). Research also has shown that teachers' ratings on standardized behavioral assessment measures such as the *Social Skills Rating System* (Gresham & Elliot, 1990) or the *Behavior Assessment System for Children—Teacher Rating Scales* (Reynolds & Kamphaus, 2004), of students in elementary school are strong predictors for the presence of behavior problems in middle school (Montague et al., 2005). These data supported the belief that early identification of students with behavior problems was paramount, and school was an important setting for providing early intensive intervention.

Importance of Considering Function When Developing Behavior Plans

Although the terms *functional behavioral assessment* and *behavior intervention plan* have become increasingly popular within the last 10 years, the concept of

identifying functional relations dates back to B.F. Skinner's 1953 publication, *Science and Human Behavior*. In his discussion on why humans behave, Skinner stressed the importance of identifying and analyzing events that tend to co-occur in a particular order. This analysis, he suggested, would allow us to not only predict behavior, but also to potentially control behavior. Control could be accomplished by identifying discrete variables (i.e., antecedents and consequences) and manipulating those variables, to the extent possible, in order to produce the desired effect. Skinner referred to this process as a *causal or functional analysis*.

In 1977, Carr extended this idea by examining the literature on treatment of self-injury in persons with severe developmental disabilities. Given the inconsistencies in treatment success, Carr suggested that treatment of self-injury might best be guided by considering motivational variables that might be maintaining the behavior. He presented several hypotheses of motivational variables (i.e., functions) that could be tested experimentally with the idea that treatment would be much more successful if it addressed the contingencies of reinforcement.

Iwata and colleagues (1982) then developed a methodology, based in part on Carr's (1977) analysis, to assess the function of varying degrees of self-injury among nine children with developmental disabilities. Experimental conditions were designed to assess four possible functions of behavior, including access to tangibles, access to social attention, escape from demands, and access to sensory stimulation. Based on these conditions, researchers were able to identify the function of behavior for six of the nine participants.

These methods were refined and applied repeatedly with individuals with developmental disabilities in very controlled settings and resulted in high degrees of positive behavior change (e.g., Day, Horner, & O'Neill, 1994; Sturmey, Carlsen, Crisp, & Newton, 1988; Vollmer, Marcus, Ringdahl, & Roane, 1995). Then researchers started to further refine and apply FBA methods in school settings to address behavior problems exhibited by children in both regular and special education classrooms.

In 1988, Repp, Felce, and Barton built upon Iwata et al.'s, 1982 study but did so within the context of a special education classroom. Participants were three students ages 6, 7, and 7, who were exhibiting high rates of stereotypy and self-injurious behavior. Repp and colleagues implemented brief function-based interventions to test their hypotheses of behavior function. Each of these interventions included (a) a teaching component, (b) an antecedent manipulation, and (c) an extinction procedure. These researchers were among the first to document experimental control within the natural context and to successfully produce positive behavior change with a function-based intervention.

In a literature review on the conceptual and empirical support for conducting functional analyses and developing treatment plans, Mace, Lalli, and Lalli (1991) stressed that "understanding the interface between an individual and his/her environment that results in aberrant behavior can have clear implications for the design of effective intervention procedures" (p. 173). They suggested using a multi-stage functional analysis methodology, which would include a (a) descriptive analysis of natural conditions, (b) formation of a hypothesis of functional relationships, (c) experimental analysis of analog

conditions, (d) intervention development, implementation, and evaluation, and (e) maintenance and generalization of intervention effects. Researchers, then, continued to examine the utility of implementing function-based interventions linked to various components of the assessment data.

Dunlap and colleagues (1991) made an important contribution to the literature by conducting a school-based FBA and linking the results directly to revisions in the student's school curriculum. The target behavior in this study was identified as disruptive behavior (e.g., kicking, hitting, turning over desks, etc.) and was exhibited by an adolescent female with multiple disabilities. The student was also reported to exhibit inappropriate social interactions and psychotic speech. Implementation of a function-based intervention (based on an escape hypothesis) with an emphasis on proactive antecedent manipulations not only reduced her disruptive behavior, but also positively impacted her psychotic speech and inappropriate social interactions.

Sasso et al. (1992) conducted descriptive and experimental analyses in the self-contained classrooms of two children with autism. They then trained the classroom teacher to perform the same analyses. Results indicated agreement of function identification across assessors, suggesting that multiple assessment methods can be used with validity. Furthermore, when the researchers assisted the teachers in designing function-based interventions, positive behavior change was observed. This early study was important because it demonstrated (a) consistency across FBA methods and assessors, (b) the ability to use school-based staff as the change agent, and (c) the

strength with which function-based interventions could be designed and implemented within the natural setting.

Along with these pioneering studies, several other researchers have examined the utility and validity of FBA and function-based intervention design in school settings. Ervin, Radford and colleagues (2001) conducted a review of the empirical literature on school-based FBA published 1980-1999. Results of their review confirmed that FBA was a valuable process to address high frequency behavior problems exhibited by individuals with low incidence disabilities. At that time, however, several gaps in the literature were still present, including studies that addressed (a) low frequency/high magnitude behaviors, (b) behaviors problems exhibited by children without disabilities, (c) school staff implementation of FBA procedures without assistance, (d) social validity, or (e) relative validity of a variety of FBA methods.

Kern and colleagues (2002) also completed a comprehensive literature review of articles published 1980-1999, but focused specifically on the use of assessment-based antecedent interventions in natural settings. Results from their review indicated that the majority of research had been conducted with individuals aged 6-12 (45%) diagnosed with a developmental disability (40%). Only two of the studies reviewed addressed the behaviors of at-risk (1) or nondisabled (1) children. Aggression (62%), disruption (57%), and off-task behaviors (50%) were identified as the most common target behaviors of concern, and most assessments were completed in special education classrooms (36%). The remaining portions of assessments were completed in the home (26%), a specialized school (19%), general education (10%), the community (7%), or daycare (5%).

According to their review, only 10% of the studies to that point were completed in general education classrooms. Intervention design was based on the use of preference assessments in 74% of the studies; schedule/routine changes (19%), pre-activity intervention (17%), contingent attention (17%), choice (14%), and changing the difficulty/length of the task (12%) were used much less frequently. This review identified several gaps that were present in the literature at that time (e.g., at-risk/nondisabled populations, low frequency/high magnitude behaviors, implementation in general education settings, utility of curricular modifications), but it also reinforced the value of using assessment-based antecedent manipulations as key components to sustainable behavior change.

Function-based intervention planning has been documented as an effective method for addressing challenging behavior (Ervin, Ehrhardt, et al., 2001; Ingram et al., 2005; Kern et al., 2006). Time and again, research has supported the durability and sustainability of function-based intervention implementation (e.g., Ingram et al., 2005; Kamps et al., 2006; Kern et al., 2006; Umbreit, 1996). The problem is that, although there is a substantial amount of literature available on assessment methodology, the field has been lacking empirical demonstrations of prescriptive methods to link interventions to assessment data. In other words, it is clear that researchers make a valid intervention-to-assessment link, yet the current literature lacks a descriptive set of methods that field-based practitioners can replicate.

Use of the Decision Model

Given the need to establish a set of prescriptive methods to link intervention to assessment results, several researchers have begun field testing a Decision Model which has been described in detail in Umbreit and colleagues (2007) *Functional Behavioral Assessment and Function-Based Intervention: An Effective, Practical Approach.* In each of the following studies, researchers analyzed FBA data and developed interventions based on assessment of whether or not the student was able to perform the replacement behavior and whether or not the teaching conditions represented effective practices. In other words, researchers considered whether the student could exhibit socially appropriate behavior and whether the environment was conducive to facilitating demonstration of and reinforcement for these socially appropriate behaviors.

Umbreit and colleagues (2004) used the model to develop an intervention for a 10-year-old typically developing student in a fourth grade general education classroom in a public elementary school. The student was referred for intervention due to off-task behaviors, which included talking with other students, kicking his own or classmates' seats, or wandering around the room during instructional activities. Analysis of the data collected during the FBA indicated that the student engaged in these behaviors most often after he had accurately completed his independent seatwork activities. Engaging in the problematic behaviors allowed the student to gain access to preferred activities, which included helping peers with their schoolwork. Intervention design included increasing the task difficulty (i.e., changing antecedent conditions) of both reading and math

assignments, which resulted in significant increases in on-task behavior. Both the student and the teacher viewed the intervention as “fair and effective.”

Blair and colleagues (2006) extended research on the Model to culturally and linguistically diverse populations. They used the methods described in the Decision Model with three children with severe mental retardation who were at-risk of removal from an inclusive kindergarten program in Korea. Behaviors of concern for each of the three students included out-of-seat and aggression toward peers. Additional behaviors included turning over classroom materials, screaming, crying, taking off own clothes, self-injury, and being off-task. Results of the FBA indicated that all three children had significantly better behavior when each had access to preferred activities. The intervention was developed with consideration of the design of the classroom environment. Several changes in both the antecedent and consequent conditions (e.g., embedding IEP goals and objectives into the classroom curriculum, offering high preference activities during center time) were made to facilitate demonstration of and to provide reinforcement for appropriate behaviors. Results indicated that each of the three children had significant reductions in problem behavior and significant increases in appropriate behaviors, allowing each of them to make progress toward their respective educational goals. Teaching staff reported strong support for the function-based interventions.

Lane and colleagues (2006) examined the usefulness of the Decision Model in a collaborative process in which the classroom teacher took the lead role in developing each of the core components of the process. Classroom teachers were given six hours of

staff development training in using the Model. Two typically developing students in first and second grade were targeted for intervention based on identification obtained through a multiple gating screening process. Analysis of the data for Student 1 indicated that her behaviors (i.e., negative social interactions) occurred most often during seatwork and were maintained by access to peer attention. Intervention development, which addressed modifications in classroom practices, resulted in a reduction in problem behavior and increases in prosocial behavior. Analysis of the data for Student 2 indicated that his problem behaviors (i.e., off-task calling out, unsolicited remarking on the behavior of others, being out of seat/assigned area) occurred most during academic instruction and were maintained by access to attention and alternate activities. Intervention development, which concentrated on contingency adjustments, resulted in a 35% decrease in problematic behavior. This study was important because it demonstrated (a) the robustness of the Decision Model in designing effective function-based-interventions and (b) the relatively short amount of time it can take to train a teacher to implement the Decision Model effectively.

Liaupsin and colleagues (2006) used the Decision Model to develop a behavior plan for a 14-year-old typically developing female student who was exhibiting a variety of off-task behaviors (e.g., refusal to complete class assignments, talking out, calling teachers/peers derogatory names). Results of the FBA indicated that the student engaged in these behaviors when an assignment was too difficult and that the behavior was maintained by escaping the activity. Although the antecedents and maintaining consequences were the same across settings (social studies, science, and math),

differences in environmental variables across settings necessitated that different interventions be implemented. Data taken across several weeks in the three settings demonstrated positive response to intervention. This study was important because it addressed (a) the need to differentiate interventions across settings in which environmental variables differ and (b) each component responsible for triggering and maintaining the problem behavior, resulting in positive behavior change across settings. Results of this study clearly demonstrated the value of considering the impact of different environmental variables across multiple settings when developing a BIP.

Stahr and colleagues (2006) used the Decision Model to develop an intervention for a fourth-grade student with Attention Deficit Hyperactivity Disorder (ADHD), internalizing behavioral problems, and speech and language impairment. Information gathered during the FBA phase of the process indicated that the student's disruptive behavior was functioning to both gain access to attention, as well as to escape difficult tasks. Observational data indicated that the student had the replacement behaviors of seeking assistance and staying on-task within his repertoire, but that current classroom conditions did not represent effective practices. The authors and school team collaboratively developed an intervention that involved (a) adjusting the classroom conditions to facilitate use of the replacement behaviors, (b) reinforcing the appropriate demonstration of the replacement behaviors, and (c) removing reinforcement for the disruptive behaviors. Results were positive for intervention implementation across two settings. Social validity measures from the classroom staff and from the student were all positive, indicating that the intervention was both successful and useful.

Wood, Umbreit, Liaupsin, and Gresham (2007) examined the influence of treatment integrity on the effectiveness of an intervention developed using the *Decision Model.* The results of an FBA indicated that an 8-year-old student's off-task behavior was maintained by both gaining access to attention and by escaping specific assignments. A function-based intervention was collaboratively developed with the classroom teacher. Researchers used a whole-interval data collection method to track both on-task behavior and treatment integrity. Results indicated that, when the intervention was implemented as developed, the student's behavior was appropriate approximately 90% of the time. Conversely, when the intervention was not implemented correctly, the student maintained on-task behavior only 9% of the time.

Lane, Smither, Huseman, Guffey, and Fox (2007) used the *Decision Model* to decrease disruptive behavior and increase academic engagement of a 6-year-old kindergarten student in a general education setting. Results of the FBA indicated that attention was maintaining the problem behavior. The problem behavior was identified as a performance problem (i.e., not a skill deficit). and classroom conditions were considered ineffective for managing the behavior appropriately. The researchers and classroom teachers collaboratively developed a function-based intervention that included self-monitoring, differential reinforcement of other behavior, and positive scanning (i.e., acknowledging at least one positive behavior per day in written format to share at home). Like Wood and colleagues (2007), these researchers also tracked treatment integrity and found a strong correlation between treatment implementation and behavioral

improvement. Results indicated that when the intervention was implemented with fidelity, more consistent gains were found.

Lane et al. (2007) used the *Decision Model* to address the needs of students who were not responding to the schoolwide system of behavior supports at the primary or secondary level. Participants were one first-grade student and one eighth-grade student exhibiting nonparticipation and noncompliance, respectively. Researchers used the Decision Model to develop function-based interventions based on the results of each student's FBA. Results indicated significant improvement in both children's behavior when the interventions were put in place.

The *Decision Model* was further validated in a cross-cultural setting when Turton, Umbreit, Liaupsin, and Bartley (in press) applied the methods to successfully intervene with a 16-year-old student with behavioral disorders in a self-contained classroom. Results of the FBA indicated that the student's disruptive behavior was functioning both to gain attention from staff and to avoid doing classwork. A function-based intervention was developed. Results showed the intervention significantly improved her use of socially appropriate responding and decreased her disruptive behavior to acceptable levels. The researchers also examined social validity across several staff members, the student, and a classroom peer. Results for each person delivering treatment, the student herself, and the peer indicated high acceptability of treatment design *and* outcome.

Finally, Underwood, Umbreit, and Liaupsin (in press) examined use of the *Decision Model* with older individuals outside the school setting, i.e., with adults with developmental disabilities in a community based day program. Three adults aged 48-63

participated. An FBA, completed for each participant, guided the development of individualized function-based interventions, which were implemented over an eight-week period. Results showed significant improvement in appropriate social interactions and significant decreases in inappropriate social interactions. Treatment integrity data, which were collected during every session, showed that all interventions were implemented with a high degree of fidelity. As in the previous studies, treatment acceptability data were collected and showed that, not only did the staff members view the treatments as effective, but also that they preferred the function-based interventions to previously used interventions.

Results of these studies indicated that the *Decision Model* appeared to offer an effective set of methods to design robust function-based interventions; however, more research is needed to establish validity of the model across a variety populations, behaviors, and settings. The purpose of this study was to examine the effectiveness of the Decision Model with young (i.e., kindergarten and first grade) students who were at-risk for being labeled with an emotional or behavioral disorder due to display of chronic problematic behavior exhibited in the general education setting on a public school campus.

Summary

The evidence to justify the early treatment of behavior problems exhibited by young children is overwhelming. The outcomes for these children, if left untreated, are not only grim but also highly predictable. We know with a great degree of certainty that children who exhibit stable patterns of maladaptive behavior early on will continue to

exhibit similar patterns of maladaptive behavior, as they get older. Among the unfortunate consequences of this pattern of behavior is that these children will typically have both failing academics and failing social relationships.

Ample evidence suggests that effective and durable treatment plans can be developed for children with a variety of ability levels and in a variety of settings using function-based intervention planning. Support for the use of function-based intervention planning has existed for over 20 years; with the theoretical foundations dating back even further. Unfortunately, the research-to-practice link has been lost in the shuffle. Although research continues to examine the impact of manipulating different variables within function-based interventions (i.e., antecedent manipulations, extinction procedures, specific classroom curricula, etc.), until recently, there has been little focus on developing a prescriptive model that people can easily use.

The *Decision Model* (Umbreit et al., 2007) provides a framework to provide individualized function-based interventions. This study was developed to help fill the gaps in the literature by adding to existing data that already support the utility and durability of the *Decision Model*. Assessing the degree to which this model can address the needs of different populations within different settings is important and necessary as the field reaches for tools that are considered "evidence-based" (Horner et al., 2005).

CHAPTER 3

METHODS

Participants and Setting

This study was conducted on an urban elementary school campus with three students in either kindergarten or first grade who were referred for intervention due to chronic disruptive behavior. The school serves 800 students in grades K-6 and includes a total of 35 classrooms. Each student was randomly selected from a pool of eligible participants who were identified for further intervention based on the school's existing three-tiered model of behavior supports (cf., Lewis & Sugai, 1999). The teachers of each of those students were then also asked to participate. Table 1 presents demographic information for each student and his respective teacher.

Briefly, the school's existing three-tiered model was designed to provide effective practices for positive behavior supports. In Tier 1, a universal, schoolwide discipline model was used to address the behavioral needs of the majority of the students in Grades K-6. Students who continued to exhibit behavioral problems in response to the Tier 1 supports were provided with Tier 2 interventions, also called "targeted" interventions. These may include a parent conference, direct instruction in the desired replacement behaviors, or opportunities to practice behaviors that may be related to a behavioral skill deficit. When students were not responsive to Tier 2 interventions, they were referred to Tier 3, which included a request for a FBA and Individualized BIP. Students were identified as potential participants for the study when they were referred for a Tier 3 intervention. For the purposes of this study, "nonresponsiveness" to Tier 2 was defined as

five or more disciplinary referrals within five or fewer weeks while receiving Tier 2 interventions. Table 2 identifies the frequency and nature of referrals for each student prior to being referred for a Tier 3 intervention.

Table 1

Descriptive Data for the Participants

Students					
Number	Name	Gender	Age	Grade	Ethnicity
1	Josh	M	6	1	Hispanic
2	Zane	M	5	K	Caucasian
3	Ian	M	6	K	Caucasian

Teachers			
Name	Gender	Years Teaching	Total Students in Class
Ms. Gray	F	3	26
Ms. Anderson	F	1	25
Ms. Murray	F	4	30

Table 2

Summary of Discipline Referrals Prior to Systematic Intervention

Josh		
Number	*Month/Year*	*Behavior*
1	8/07	Told another student that he was going to bring a gun to school
2	08/07	Rough play—shoved another student's head down and caused a nose bleed
3	09/07	Using inappropriate language, throwing sand, kicking, took crayons off the art cart without permission
4	09/07	Pushing other students on the playground
5	09/07	Punched another student in the stomach
6	10/07	Slapped a girl in the face while in the bus line
7	10/07	Hit another student in the stomach
8	10/07	Bit another student on the arm during library time

Table 2 *Continued*

Summary of Discipline Referrals Prior to Systematic Intervention

Zane		
Number	*Month/Year*	*Behavior*
1	10/07	Not following directions; throwing a temper tantrum; threw backpack; bothering students
2	10/07	Refused to follow teacher directions; throwing temper tantrum; kicked teacher's desk
3	11/07	Talking about bringing a knife to school while walking in line from recess
4	11/07	Playing with scissors in line; arguing with teacher
5	11/07	Refused to follow directions; knocked a table over, trying to kick and bite

Table 2 *Continued*

Summary of Discipline Referrals Prior to Systematic Intervention

Ian		
Number	*Month/Year*	*Behavior*
1	11/07	Called two students a—hole
2	11/07	Talking off-task; kicking chair; climbing cart; leaving classroom; leaving office; not following adult directions
3	11/07	Hitting/kicking other students; running from the teacher
4	11/07	Stabbed a girl with a pencil because she would not play with him
5	11/07	Purposely tripped another student causing him to fall

Each student was also screened using the *Behavior Assessment System for Children –Second Edition* (Reynolds & Kamphaus, 2004). The *Teacher Rating Scales* (TRS) for children ages 2-5 or 6-11, depending on the age of the child, were used for this study. The BASC-2-TRS is a multidimensional rating scale used to assess the behaviors and self-perceptions of students aged 2-21. It was normed on more than 4,000 students nationwide. The BASC-2-TRS includes approximately 100-140 questions, is completed by the student's teacher, and takes about 15 minutes to complete. Teachers are asked to respond to questions by assessing whether a particular behavior "never", "sometimes",

"often", or "almost always" occurs. Questions addressed such topics as the degree to which a student follows directions, complains of health issues, completes tasks, listens, threatens to hurt others, uses social problem solving, and responds to changes in the environment. Students were considered eligible participants if they had T-Scores in the "at-risk" or "clinically-significant" range on two or more of the following scales: *Attention Problems, Conduct Problems* (Child version only), *Hyperactivity, Social Skills*, or *Adaptability*. These scales were chosen based on their relevance to validating each student's behavior as significantly maladaptive and disruptive (Reynolds & Kamphaus, 2004). The validity scales for each completed BASC-2 TRS were also examined and deemed to be within acceptable limits. Table 3 presents the BASC-2 results for each student.

Participants had to meet criteria for *both* disciplinary referrals and the designated BASC-2 TRS scores. None of the three students selected was identified for special education services at the onset of the study. However, all were considered to be significantly at-risk for emotional/behavioral disorders due to ongoing disruptive behaviors that jeopardized their continued access to the general education curriculum and negatively impacted the development of age appropriate social relationships. At the onset of Phase 3 of the study, Ian was identified as having an emotional disability and speech/language impairment and started receiving special education programming.

Each phase of the study was conducted within the natural context of the classroom activities. Parent permission was obtained for each student. Parents were

informed of the nature of the research and how the results would be used both for the benefit of their child and for the dissemination of research findings.

Dependent Variables: Behavioral Definitions

All students in this study exhibited a class of behaviors that were considered to be disruptive to the learning of themselves and others. The topography of each student's behavior varied slightly from one student to another. "Disruptive Behavior" was defined globally as a behavior or group of behaviors that interfered with a student's access *and* his peers' access to instruction. Table 4 describes the specific topography of disruptive behavior for each student.

Student Replacement Behavior was identified as "on-task" and was defined for each student as engaging in the teacher directed instruction and following teacher led expectations for that instructional segment. *Behavioral Improvement* was defined as a reduction in the disruptive behaviors and increase in use of the replacement behavior with fewer than 25% overlapping data points between phase conditions. *Social Validity* was defined as the degree to which the participants found the process and outcomes to be meaningful, feasible, and appropriate for the environment and student.

Table 3

BASC-2 TRS Results for Each Student

Student	At-Risk	Clinically Significant
Josh	**Adaptability***, Leadership, Study Skills, Adaptive Skills, Withdrawal	**Hyperactivity***, Aggression, **Conduct Problems***, **Attention***, Learning, School Problems, **Social Skills***, Externalizing Problems, Behavioral Symptoms Index
Zane	Aggression, Depression, **Attention***, Behavioral Symptoms Index, **Adaptability***, **Social Skills***, Functional Communication, Adaptive Skills.	**Hyperactivity***, Externalizing Problems
Ian	**Hyperactivity***, Depression, Internalizing Problems, **Attention***, School Problems, Atypicality, **Adaptability***, **Social Skills***, Study Skills, Functional Communication, Adaptive Skills	Aggression, Conduct Problems, Externalizing Problems, Somatization, Withdrawal, Behavioral Symptoms Index

*meets inclusion criteria

Research Design

Single subject design methodology is important in research, as it affords researchers the opportunity to design an intervention specifically for an individual (Skinner, 2004). The purpose of the current study was to examine a specific problem-solving process by which individualized interventions could be developed for individual children. Data were collected across three phases within the context of naturally occurring classroom activities.

In Phase 1, a FBA was completed for each student using the procedures described below. In Phase 2, individualized interventions were collaboratively developed and tested experimentally using a brief reversal (A-B-A-B) design. Using a brief reversal allowed experimental control to be quickly established for each subject individually (Cooper, Heron, & Heward, 2007). Establishing experimental control was both socially and clinically important because it allowed the classroom teacher and the researcher to quickly validate the strength of the intervention for *each* participant. This also allowed the classroom teacher and researcher to be sure that behavioral improvement could be directly attributed to the intervention being implemented rather than improvement for undefined reasons. Sessions and the number of reversals were kept as brief as possible to reduce the undesirable aspects of eliciting disruptive behavior.

Table 4

Topographical Description of Disruptive Behavior

Student	**Behavior**
Josh	Playing with objects at his seat, walking around the room, talking with his neighbors, using the materials incorrectly, and making noises
Zane	Laying on the floor crying, refusing to follow an adult direction, calling out during instruction, talking with his neighbors, talking without raising his hand, playing with objects
Ian	Getting out of his seat, wandering around the room, playing with objects at or near his seat, talking off-topic, destroying property, and refusing to follow an adult direction

In Phase 3, interventions supported in Phase 2 were implemented for each child. A multiple-baseline design (MBD) (Baer, Wolf, & Risley, 1968) across subjects was used in this phase in order to establish experimental control of the process of using the

Decision Model (Umbreit et al., 2007). In other words, the MBD was chosen to validate the *process,* while eliminating the possibility of behavioral change due to other setting variables (Cooper et al., 2007)). Additionally, this method was chosen to avoid having to establish experimental control for each student through continued use of the reversal method, which could have been confusing for the students and disruptive for the entire classroom.

In Phases 2 and 3, visual analysis of the data was conducted to assess trends, stability, and treatment effects (Cooper et al., 2007). Details of the procedures in each Phase of the study follow. Results of the first two phases are presented in this section because they were part of the information gathering process. Phase 1 and 2 results did not directly address the original research questions, but rather directly affected the interventions implemented in Phase 3. Results obtained in Phase 3, along with Social Validity data, are reported in Chapter 4, as they directly address the research questions.

Phase 1: Functional Behavioral Assessment

Procedure

Phase 1 consisted of a descriptive FBA. The purpose of the descriptive assessment was to identify antecedent conditions that set the occasion for the target behavior and the consequences that maintained the target behavior(s). Data were collected via file review, interviews, and direct observation to identify the function of each individual's target behavior(s).

File review. A comprehensive file review was conducted for each student. Specific information reviewed included prior record of discipline referrals, anecdotal

comments from current or prior teachers, school attendance history, and informal and formal academic assessment results. This information was reviewed to identify possible problematic antecedent conditions and potential consequences that may have been occasioning and/or maintaining the target behavior.

Structured staff interviews. Structured staff interviews were completed with the classroom teacher for each student. Interviews were conducted using the *Preliminary Functional Assessment Survey* (Dunlap et al., 1993; see Appendix 1). This 22-item survey was developed to solicit information about the salient antecedent and consequent conditions that appear to trigger or maintain a student target behavior. The survey also solicits information about the frequency of the target behavior, medical conditions that may affect behavioral regulation, the impact of distal antecedent events (e.g., missed breakfast, conflict with family or peer), and rough estimates of the frequency and duration of the behavior. Information is also gained relative to current and prior interventions, current academic and social skills abilities, and the child's strengths and assumed preferences for reinforcers. Additionally, the survey prompts the interviewee to provide insight into what consequence they believe is maintaining the target behavior(s).

Structured student interview. A structured student interview was attempted with each student to gain information, from the student's perspective, on what he believed triggered and maintained his inappropriate behaviors. The results of these interviews were limited in scope due to the developmental level of the students participating in this study.

The *Student Assisted Functional Assessment Interview* (Kern, Dunlap, et al., 1994) was used (see Appendix 2). This tool prompts the student to think about when he has the most and the least problems in school. The student interview encourages the student to identify what he thinks causes these problems, how he thinks the situation could be changed for the better, and what possible rewards he would be willing to work toward for demonstrating appropriate behavior. The interview prompts the child to respond to questions related to preference for specific subjects in school and what he likes or dislikes about those subjects. The child is also asked to evaluate his skill level relative to the work that is assigned. Finally, the child is asked to respond to questions related to environmental conditions such as working conditions, teacher presentation, content, distractions, and interest level in the work.

Structured observations. A-B-C data (Bijou, Peterson, & Ault, 1968) were collected individually for each participant. Several observations (Range 4-8) were conducted for each child. Each observation lasted 10-30 minutes and occurred in the child's classroom during naturally occurring activities. Data were collected on the specific antecedent and consequent conditions that precede and follow occurrences of the identified target behavior. A-B-C data were collected until there was a clear pattern of antecedents and consequences related to the target behavior.

Identification of function. The function(s) of the target behavior for each student were identified by analyzing the data collected through file review, interviews, and direct observation using the *Function Matrix (*Umbreit et al., 2007*).* The *Function Matrix* is a six-celled visual tool that organizes information into two columns identifying positive or

negative reinforcement and three rows identifying specific types of consequences. The tool prompts users first to decide if the student is gaining access to something (positive reinforcement) or escaping/avoiding something (negative reinforcement). The user then identifies more specifically whether the student is gaining or escaping attention, tangibles/activities, or sensory consequences. Multiple functions are possible.

Case Summaries

Josh: Record review, interviews, and direct observation. A review of the file indicated that Josh has average-to-low-average skills for a first-grade student, based on standardized district assessments and report cards. Further review of assessment information indicated Josh did better on tasks that allowed for open-ended completion but struggled with tasks that required speed and precision. In other words, he had not reached full mastery of certain skills, so his fluency was poor. Discipline records, as described earlier, indicated that Josh had several office referrals within a short period of time for aggressive behavior, inappropriate language, and general disruptive behavior.

Initial interviews with Josh's teacher indicated that she perceived his disruptive behavior as occurring all throughout the day, although it didn't always reach the magnitude that would trigger a formal office referral. When asked more specific questions regarding context, she reported that he struggled during playground activities, transitions, small group instruction, independent seatwork, and on the bus. Specifically, she stated that "he does nothing all day." She described Josh as doing everything except his work. She stated that he would engage when given direct instruction on a task and would work for a few minutes but would then quickly lose focus.

Interviews with Josh indicated that he felt his work was challenging and that he had a hard time completing it. Specifically, Josh stated that he did the best in school when he "did his work." He acknowledged having a hard time making good choices when he was mad at another student. He reported that he liked spelling ("it is exciting"), doing projects in science, singing in music, and making projects in art. He went on to say that reading and writing are very hard for him. He stated, "I just can't get it" (reading and writing). He believed that he was given help when he asked for it, but he didn't always remember to ask. He acknowledged that he works better when someone works with him. He also reported that there were things in the classroom that easily distracted him.

Direct observation across a variety of contexts indicated that Josh was engaged during whole group carpet activities including choral responding and peer partner work. Observations also indicated that when Josh was in his seat with an expectation to complete independent seatwork, he engaged in many off-task behaviors that were disruptive to both his and others working. He would hang from his chair, get out of his seat, play with objects in his backpack and at his desk, and he would get up and walk around the room. Josh rarely independently completed in-seat work, thus this was the target area for intervention.

Structured A-B-C observations indicated that Josh was able to maintain appropriate levels of on-task behavior during whole group instruction (e.g., range 85-100%; mean 92.5%), but that when he was asked to complete a task independently his on-task behavior was significantly lower (e.g., range 32-80%; mean 50%). He could begin a task, but he could not sustain attention through task completion. Instead, he

would draw on the wrong side of the paper, have the wrong paper on his desk, search through his desk, walk around the room, talk off-task with other students, clean his backpack, hang from his chair, put his sweatshirt over his head, or play with objects in his seat.

Josh: Statement of function. When Josh was not able to complete a task quickly and easily, he would spend his time engaging in disruptive behavior. Analysis of the data indicated that by engaging in disruptive behavior, he was able to avoid tasks that were unpleasant or somewhat difficult for him. Figure 1 depicts the function of Josh's behavior using the Function Matrix.

	Positive Reinforcement (Gain)	Negative Reinforcement (Escape/Avoid)
Attention		
Object/Activity		**X**
Sensory		

Figure 1. Function Matrix for Josh

Zane: Record review, interviews, and direct observation. File review indicated Zane's academic skills were at grade level for a kindergarten student. He was young for a kindergartener and had just turned five at the start of the school year. Discipline data indicated that he was referred to the office two or three times a week for several weeks. This pattern had been evident since he first entered kindergarten.

The teacher interview indicated that she thought carpet time was the *most* problematic time of the day, even though problems did occur in other areas (e.g., transitions, playground). If Zane did not get a turn right away or did not get a turn at all

during carpet time, he would lie on the carpet and cry. He frequently called out during carpet time and during other children's turns. His answers were frequently correct and he did raise his hand on several occasions. When he did get a turn, he was very excited, and his behavior would generally improve after he had a turn.

The student interview with Zane indicated that he wanted to make good choices. He couldn't elaborate on what was easy or what was hard for him. He stated that he "didn't know" when asked specific questions. When asked what types of things he would like to earn for good behavior, his answers focused mainly on activities with his family.

Direct observation quickly confirmed the classroom teacher's initial observations. Data collected during whole group carpet time indicated that Zane was on-task significantly less than his same age peers. Observations further indicated that the longer the duration between opportunities to respond for Zane, the higher the predictability of poor performance. Zane was on-task an average of 73% of the time (range 67-78%). His behavior significantly interfered with the group and often resulted in extended time away from class due to escalating behavior. Though his behavior initially began by talking out of turn, it gradually increased in magnitude to yelling, crying, and rolling on the floor. In other words, his behavior was not just a high frequency problem; the magnitude of his behavior was also highly problematic because it caused the classroom teacher to have to stop instruction on more than one occasion.

Zane: Statement of function. Direct and indirect methods of data collection indicated that carpet time was the most problematic for Zane. Specifically, Zane exhibited the problem behavior when the number of opportunities to be "chosen" was

few, while maintaining appropriate on-task behavior when he had frequent opportunities to respond. This indicated that his behavior functioned to gain access to social attention, which is indicated in the Function Matrix in Figure 2.

	Positive Reinforcement (Gain)	Negative Reinforcement (Escape/Avoid)
Attention	**X**	
Object/Activity		
Sensory		

Figure 2. Function Matrix for Zane

Ian: Record review, interviews, and direct observation. File review indicated that Ian had a history of behavior problems dating back to preschool, but at the onset of the study had never been referred for a special education evaluation. Ian's academic skills were well below grade level and he appeared to have a great deal of difficulty processing information in general. Discipline records indicated that Ian would quickly escalate from a minor infraction (e.g., talking out, being out of area) to a more serious offense such as running from the teacher or office staff. He was highly noncompliant and argumentative when confronted or asked to acknowledge a poor choice in school. Ian also had a great deal of difficulty with peer relationships during unstructured settings and would frequently become aggressive when confronted with a conflict or feedback that was unpleasant to him. Data were initially very difficult to collect for Ian as his behavior was erratic and highly disruptive for much of the school day. It was common for him to engage in severe disruptive, aggressive, or defiant behavior, which resulted in his parent being called to take him home.

Ian's teacher was initially not able to identify specific activities that were challenging for him, but she was able to identify times of the day that were consistently problematic. She identified that late morning and afternoon times were highly difficult. She also indicated that Ian seemed to be more disruptive when other students were receiving individual attention. She also indicated that independent seatwork was a high-risk area and that he completed little to no work in the classroom.

A student interview was attempted with Ian but was not completed. Ian's responses to most questions were "I don't know," "be good," or "just make good choices." The interview was discontinued because it seemed to be frustrating for Ian.

Direct observation during these time periods indicated that each of the times the teacher described were in fact times of the day when independent responding was typically required. Specifically, the students were required to engage in independent journal writing activities. Further analysis of Ian's academic skills indicated that he did not know any of his letter sounds and could consistently identify only three to five letters of the alphabet. These skills were significantly different from his same age peers. Ian's teacher also indicated that the more help she provided Ian, the more help he seemed to solicit. Direct observation data indicated that Ian's on-task levels ranged from not at all (i.e., never began the activity) to a high of 68%. Conversely, his behavior during large group instruction on the carpet ranged from 71-100% (M = 90%).

Ian: Statement of function. When the data were organized on the Function Matrix (Figure 3), it was clear that Ian's behavior functioned both to escape a difficult task but also to gain access to adult attention. Adult attention served two purposes: first, it

provided positive social praise; second, it also resulted in making the assignment easier because the teacher would assist Ian in task completion.

	Positive Reinforcement (Gain)	Negative Reinforcement (Escape/Avoid)
Attention	**X**	
Object/Activity		**X**
Sensory		

Figure 3. Function Matrix for Ian

Phase 2: Intervention Development and Testing

Procedure

Phase 2 involved developing function-based interventions using the *Function-Based Intervention Decision Model* (Umbreit et al., 2007; Figure 4) and then testing those interventions experimentally through brief reversal conditions. The function-based interventions were developed by first selecting a socially acceptable replacement behavior and then asking two key questions: (1) "*Can the student perform the replacement behavior?"* and (2) "*Do the antecedent conditions represent effective practice?"*

The answers to these questions led to four possible outcomes. Each outcome identified which of three intervention methods (see Table 5), individually or in combination, was appropriate for a given situation. Each intervention method had common components: Antecedents were adjusted to increase the likelihood the replacement behavior would occur, and reinforcement was provided when the replacement behavior occurred and withheld (extinction) when the target behavior

occurred. The intervention methods differ in the ways specific antecedent and consequent variables are manipulated.

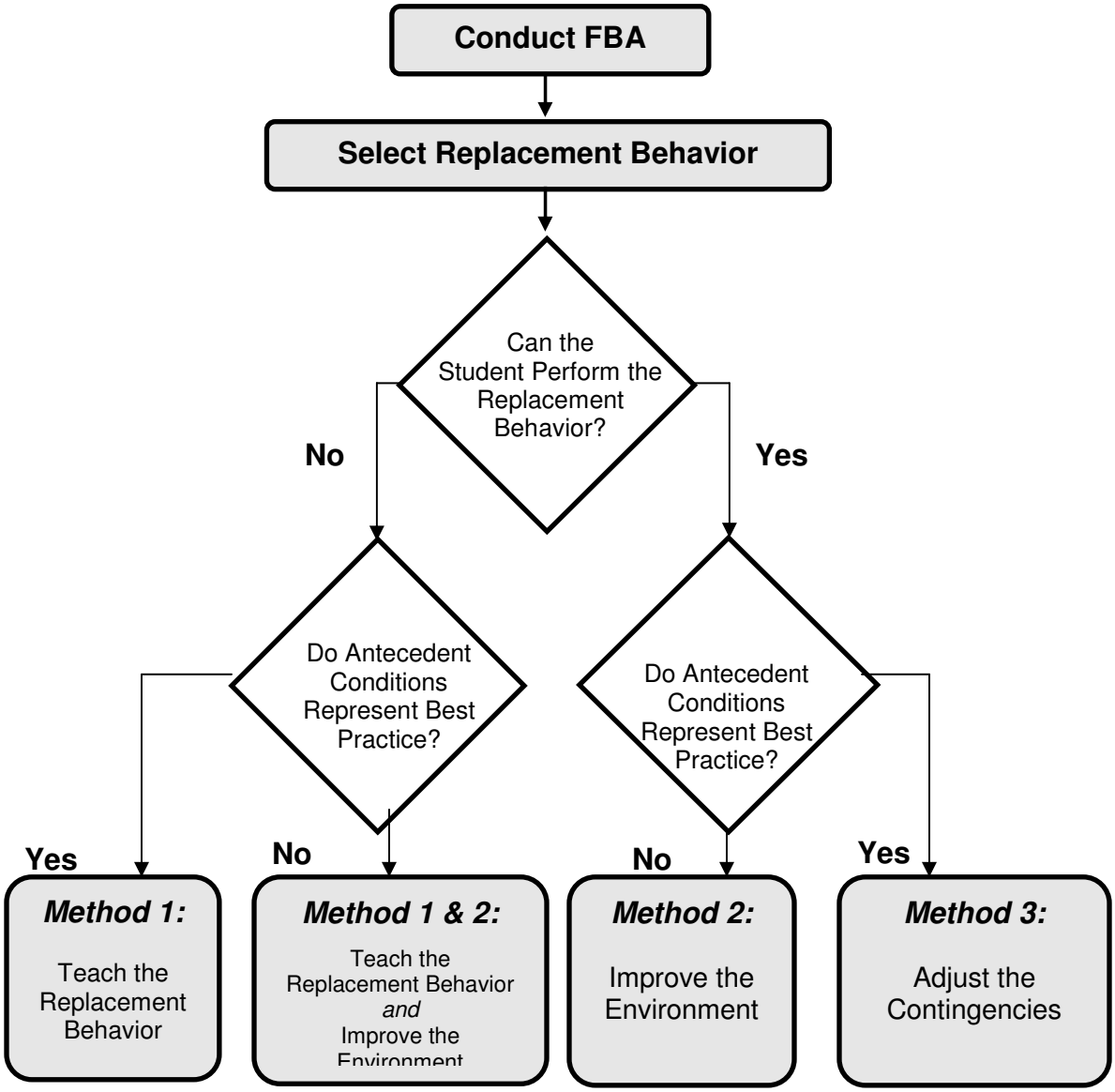

Figure 4. Function-Based Intervention Decision Model

Table 5

Intervention Methods

Method 1: Teach the Replacement Behavior	
Key Elements	• Adjust antecedent conditions so new behaviors are learned and aversive conditions avoided. • Provide appropriate reinforcement for replacement behavior • Withhold the consequence that previously reinforced the target behavior
Method 2: Improve the Environment	
Key Elements	• Adjust antecedent variables so the conditions that set the occasion for the target behavior are eliminated and new conditions are established in which the replacement behavior is more likely to occur. • Provide appropriate positive reinforcement for replacement behavior • Withhold the consequence that previously reinforced the target behavior

Table 5 *Continued*

Intervention Methods

Method 3: Adjust the Contingencies	
Key Elements	• The consequence that previously reinforced the target behavior is provided for the replacement behavior; • The consequence that previously reinforced the target behavior is withheld when the target behavior occurs (extinction); and • The antecedent conditions are adjusted to make it more likely that the replacement behavior will occur.

If the student *could not* perform the replacement behavior *and* the antecedent conditions *did* represent effective practice, then Method 1 of the *Decision Model* was implemented. Method 1 involved using direct strategies to teach the replacement behavior. These strategies specifically addressed deficit areas such as communication skills, academic skills, social skills, motor skills, or self-management skills. Briefly, this intervention method promoted the acquisition of a new skill by adjusting antecedent conditions so the new skill could be learned, providing reinforcement for the new skill, and withholding reinforcement if the target behavior occurred.

If the student *could* perform the replacement behavior, but the antecedent conditions *did not* represent effective practice, then Method 2 was implemented. Method

2 involved implementing strategies to improve the environment. Several research-based interventions may be implemented, including improving instructional delivery (e.g., providing differentiated instruction, providing high interest materials), improving structure and organization of the environment (e.g., posting class schedules, reducing wait time, warning students before transitions), and/or improving behavior management strategies (e.g., providing clear behavioral expectations, teaching expected behaviors, establishing a small number of positively stated rules). Within Method 2, practitioners may also address social or physiological factors such as sleep deprivation, tardiness, or hunger.

If the student *could not* perform the replacement behavior *and* the antecedent conditions *did* represent effective practice, then *both* Methods 1 and 2 were implemented. With this combination of intervention methods, two variables were addressed including specific teaching of the replacement behavior *and* improving the environment.

Finally, if the student *could* perform the replacement behavior and the antecedent conditions *did* represent best practice, then Method 3 should be implemented. Method 3 involved using strategies to adjust the contingencies of reinforcement for the target behavior. Specifically, the reinforcement that was originally provided for the target behavior was now provided for the replacement behavior. In addition, reinforcement for the target behavior was withheld. Finally, antecedent conditions are adjusted to increase the likelihood that the replacement behavior will occur.

Josh: Intervention design. When the intervention was developed for Josh, the Principal Investigator (PI) and the classroom teacher identified the replacement behavior

as being "on-task" (i.e., engaging in the teacher led expectations for the task). They then collaboratively answered each of the two questions in the *Decision Model.* The answer to the first question, *Can the student perform the replacement behavior?*, was "Yes." Josh *could* maintain attention to task when it was a task that he could engage in quickly and easily. His academic skills were sufficient to complete most of the work that was given to him. The answer to the second question, *Do antecedent conditions represent best practice?,* was "No". Current instructional practices were not designed to address Josh's limited attention span or to clarify directions for items that he struggled with. This information indicated that Method 2 was most appropriate to address Josh's disruptive behavior. Table 6 lists the intervention components developed for Josh.

Zane: Intervention design. When the intervention was developed for Zane, the Principal Investigator (PI) and the classroom teacher identified the replacement behavior as being "on-task." They then collaboratively answered each of the two questions in the *Decision Model.* The answer to the first question, *Can the student perform the replacement behavior?*, was "Yes". Zane could stay on-task and was able to demonstrate that skill in a variety of settings. The answer to the second question, *Do antecedent conditions represent best practice?,* was also "Yes". Current instructional practices were appropriate for a typical kindergarten classroom. There was adequate pacing for the concepts taught and information was supplied in an interactive format that included a fair amount of music and movement. The other children in the classroom responded well to the degree of opportunities to respond given to each student. The schedule of

reinforcement, however, was not dense enough to maintain appropriate levels of on-task behavior for Zane. This information indicated that Method 3 was most appropriate to address Zane's disruptive behavior. Table 7 lists the intervention components developed for Zane.

Ian: Intervention design. When the intervention was developed for Ian, the Principal Investigator (PI) and the classroom teacher identified the replacement behavior as being "on-task". They then collaboratively answered each of the two questions in the *Decision Model.* The answer to the first question, *Can the student perform the replacement behavior?*, was "No". Ian did not have the skills to complete most kindergarten tasks as they were presented to him. He was not able to fluently exhibit hand raising when he needed help, and was not able to self-regulate when he became frustrated. The answer to the second question, *Do antecedent conditions represent best practice?,* was "No". Current instructional practices were not designed to address Ian's limited academic skills, lack of self-regulation, or the use of effective feedback when Ian began to become disruptive. Thus, Methods 1 and 2 were needed. Table 8 lists the intervention components developed for Ian.

Table 6

Josh Intervention Elements: Method 2

Method Elements	Resulting Intervention Components
Adjust antecedent variables so the conditions that set the occasion for the target behavior are eliminated and the replacement behavior is more likely to occur	• Break down Josh's work into small units (i.e. 2-4 per worksheet) • Provide a timer and set it at 5-minute intervals—when the timer beeps, have him bring his work to you for feedback.
Provide appropriate reinforcement for the replacement behavior	• If Josh stays on task during the designated timeline, he will have access to free time (i.e. 3 minutes) prior to moving on to the next activity. • Josh's teacher will provide instructional support contingent upon Josh bringing the work to her
Withhold the consequence that previously reinforced the target behavior when it occurs	• When Josh is off-task for longer than 1 minute, provide brief redirection to maintain task or ask for help

Table 7

Zane Intervention Elements: Method 3

Method Elements	Resulting Intervention Components
Adjust antecedent conditions to make it more likely the replacement behavior will occur	• Remind the entire class at the beginning of instruction that in order to be called on they need to sit quietly, raise their hand and wait to be called on. • Use whole group reminders of expectations as needed throughout the lesson.
Provide the consequence that previously reinforced the target behavior, but only for the replacement behavior	• Call on Zane the ***first time*** he raises his hand, sits quietly, and waits. • Call on him *1-3 additional times* when he raises his hand, sits quietly and waits during carpet time
Withhold the consequence when the target behavior occurs	• *Ignore all talking out during intervention conditions.*

Table 8

Ian Intervention Elements: Methods 1 and 2

Method Elements	Resulting Intervention Elements
The antecedent conditions are adjusted so new behaviors are learned and aversive conditions are avoided. (Method 1)	• Modify the instructional expectations so that Ian's work is at his fluency level. • Begin each lesson with a brief description/instruction of what he should do.
Adjust antecedent variables so the conditions that set the occasion for the target behavior are eliminated and new conditions are established in which the replacement behavior is more likely to occur (Method 2)	• Provide a statement of expectations to the class. • Repeat the behavioral expectation to Ian. (Ian will need to stay in his seat and raise his hand when he is ready for feedback).
Provide appropriate reinforcement for the replacement behavior.	• When Ian is engaged in the task asked of him, the teacher will do a frequent brief walk by and provide a short "Nice job working" and will keep moving.

Table 8 *Continued*

Ian Intervention Elements: Methods 1 and 2

Provide appropriate reinforcement for the replacement behavior.	• When Ian raises his hand, the teacher will go over and soon as possible and provide positive social reinforcement and will give the next direction. This will continue until Ian has completed the assignment. • When Ian has completed the assignment, he will be able to engage in a free time activity either within or outside of the classroom.
Withhold the consequence that previously reinforced the behavior.	• If Ian gets out of seat or is talking out, provide brief redirection. • Maintain current task

For each student, the function-based interventions presented in Tables 6-8 were tested through brief reversal conditions using an A-B-A-B design. Sessions included brief probes lasting 10-20 minutes each.

Data collection and analysis. Data on the replacement behaviors were collected during each condition. “On-task” behaviors were measured using a 30-s whole-interval

recording method. An interval was coded as "on-task" only if the student was on-task throughout the entire 30-s. If the student engaged in disruptive behavior at any time during that 30-s, the interval was coded as "disruptive." Treatment integrity data were also collected for every interval in every session using the same 30-s whole-interval procedure. Specifically, at the end of each interval, each observer scored a "+" if *all* of the required intervention components were correctly implemented throughout the entire interval. If staff failed to implement any part of the intervention at any point during the interval, it was scored as a "-."

IOA data were collected during all intervention testing conditions. IOA for the replacement behaviors and treatment integrity were calculated using an interval-by-interval method (Kazdin, 1982). Each interval scored identically was considered an agreement. IOA was calculated by dividing the number of agreements by the total number of intervals and multiplying by 100%. IOA for the replacement behaviors averaged 97.5% (range = 95-100%). IOA for treatment integrity averaged 96% (range = 92-100%).

An interrater reliability analysis using the Kappa statistic was also performed to determine consistency among raters for both replacement behaviors and treatment integrity. The interrater reliability for replacements behaviors ranged from Kappa .89-1.0 (M = .945). The interrater reliability for treatment integrity ranged from Kappa .753-1.0 (M = .877).

Intervention testing for each student is presented below in Figures 5-7.

Across intervention testing conditions, Josh's level of on-task behavior (Figure 5) increased from 70% (Baseline 1) to 100% in the first intervention session, then returned to 70% after two baseline sessions. During the final intervention session, it returned to 90%. Two reversal sessions were conducted because of a suspected carryover from the first intervention session to the first reversal session. Treatment integrity was measured at 100% for each intervention condition, compared to 1%, 0% and 0% during the baseline conditions.

Across intervention testing conditions, Zane's level of on-task behavior (Figure 6) increased from 68% (Baseline 1) to 78% in the first intervention session. Zane's behavior continued to improve during the first reversal, resulting in on-task behavior of 85%. A second reversal session was conducted because of a suspected carryover from the first intervention session to the first reversal session. During the second reversal session, Zane's level of on-task behavior returned to 58%, which was far below the initial baseline level. During the final intervention session, Zane's behavior improved to 85%. Treatment integrity was measured at 100% for each intervention session, compared to 0%, 1%, and 15% during the baseline sessions.

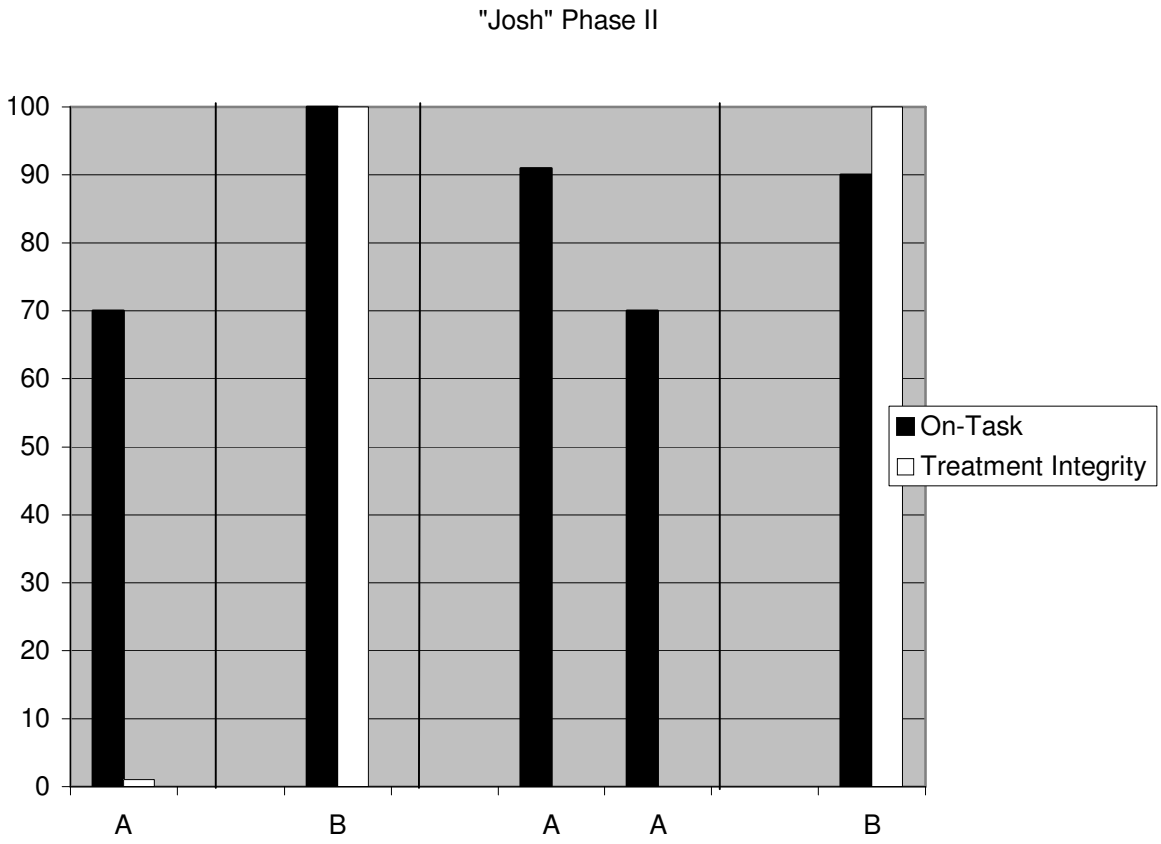

Figure 5. Intervention Testing Results for Josh

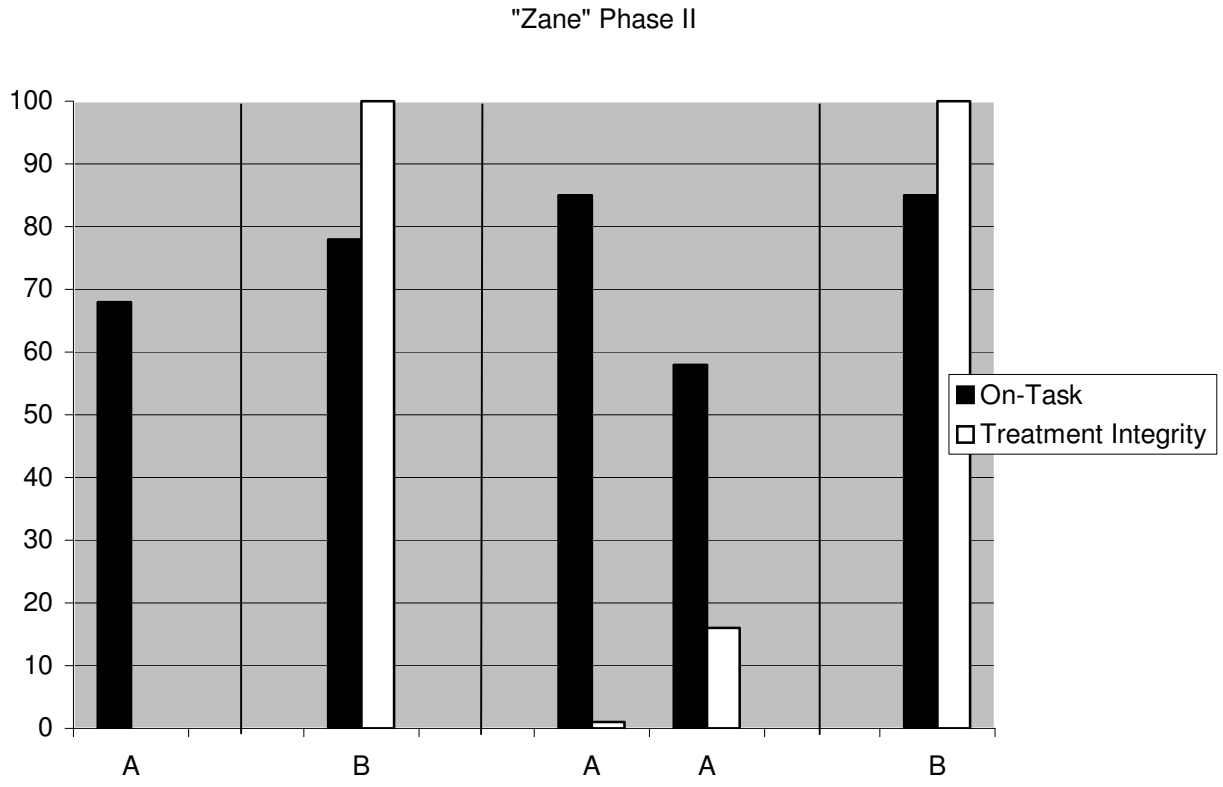

Figure 6. Intervention Testing Results for Zane

Intervention testing conditions for Ian resulted in an increase from 65% (Baseline 1) to 78% in the first intervention session. Ian then returned to 38% during the next baseline condition and increased to 78% on-task during the next intervention phase. Treatment integrity was measured at 100% for each intervention session, while baseline sessions were 0% and 11% respectively.

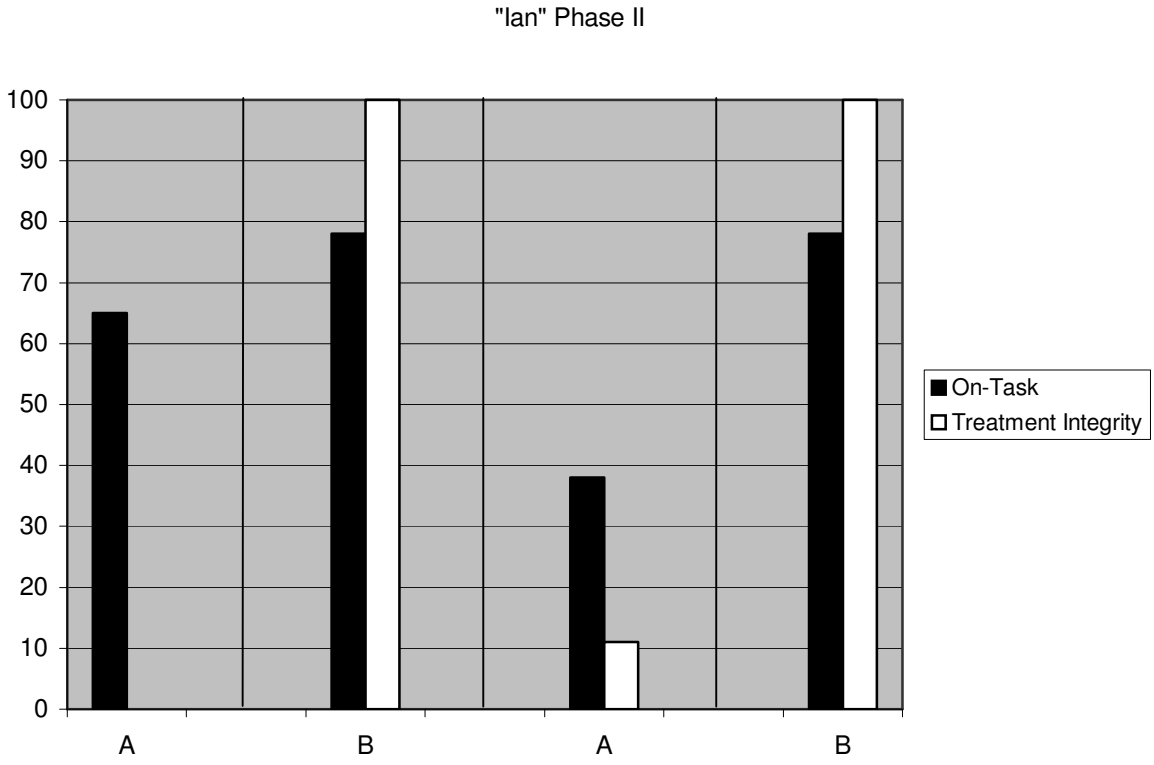

Figure 7. Intervention Testing Results for Ian

Phase 3: Function-Based Intervention Implementation

Procedure

Phase 3 consisted of implementing the function-based intervention for each student that was supported in Phase 2. Interventions were implemented within the context of naturally occurring classroom activities and routines. Each session lasted 10-25 minutes, depending on the natural length of the activity.

A multiple baseline design across students was used. At the completion of Phase 2, all three students returned to baseline conditions. For each student, the function-based intervention was then introduced sequentially, at different points in time. Specifically,

intervention was introduced for Josh on Day 5, for Zane on Day 9, and for Ian on Day 12. No reversal conditions were used in Phase 3. Phase 3 included a total of 22 sessions.

Data collection and analysis. Data on the replacement behaviors and implementation were recorded as in Phase 2. IOA was also calculated as in Phase 2. IOA data were collected on both on-task behavior and treatment integrity throughout Phase 3. IOA for Josh, collected during 29% of his sessions, ranged from 96-100% with a mean of 97.6%. IOA, collected for Zane during 25% of his sessions, ranged from 95-100% with a mean of 97.4%. IOA for Ian, collected during 29% of his sessions, ranged from 94-100% with a mean of 96.2%.

An interrater reliability analysis using the Kappa statistic was also performed to determine consistency among raters for both replacement behaviors and treatment integrity. Kappa statistics were calculated for 29% of Josh's sessions and ranged from .65-1 (M = .85). Kappa statistics were calculated for 25% of Zane's sessions and ranged from .65-1 (M = .87). Kappa statistics were calculated for 29% of Ian's sessions and ranged from .63-1 (M = .85).

Treatment Integrity

As shown in Figure 8, Josh's teacher did not implement any components of the intervention during baseline conditions. Her implementation during intervention conditions ranged from 97-100% and averaged 99.8%. IOA for treatment integrity was 100% for all occurrences. Kappa statistics were also completed with results = 1.0.

Zane's teacher did not implement any part of the intervention during baseline conditions. During intervention conditions, her treatment integrity ranged from 90-100%

implementation (M = 98%). IOA for treatment integrity ranged from 97-100% (M = 99.4). Kappa statistics were also completed with results ranging from .83-1.0 (M = .97).

Ian's teacher did not implement any part of the intervention during baseline conditions. Her implementation during intervention conditions ranged from 61-100%, with an average of 93%. IOA for treatment integrity ranged from 95-100% (M = 98.2). Kappa statistics were also completed with results ranging = 1.0.

Social validity

The *Treatment Acceptability Rating Form—Revised* (TARF-R; Reimers & Wacker, 1988) was completed by each student's classroom teacher at the end of baseline conditions (to assess social validity of the baseline condition practices) and again at the end of the study (to assess the social validity of function-based intervention).

The TARF-R (Reimers & Wacker, 1988) assesses the degree to which each participant finds intervention practices to be socially meaningful. Responses are indicated on a seven-point Likert-type rating allowing the participant to identify a continuum of answers such as "not at all," "neutral," and "very" as it relates to each question. There are 17 questions on the TARF-R that address the areas of treatment acceptability, appropriateness of the intervention, potential negative outcomes of treatment, feasibility of treatment implementation, confidence in the effectiveness of treatment, attractiveness of the treatment, and willingness to carry out the treatment. Research on the TARF-R has reported strong internal consistency and a connection with implementation. Statistical analyses of the internal consistency of the TARF-R items have consistently resulted in correlation coefficients above .90 (Reimers, Wacker, Cooper, & DeRaad, 1992). In

addition, positive ratings have been connected with higher probability of implementing and sustaining an intervention (Petersen & Ellison, 2005).

CHAPTER 4

RESULTS

The data presented here depict the behavioral improvement for each student during Phase 3 of the study. This phase included a brief return to baseline conditions for each student, followed by sequential introduction of the intervention for each student. Breaks in the data (indicated by dashes) for each student occurred when the student was absent or when significant changes in the instructional schedule prevented intervention implementation. Treatment Integrity data are graphed along with the behavioral data. This was done to show the relationship between student performance and actual intervention implementation.

Behavioral Improvement

As shown in Figure 8, Josh remained in baseline conditions (i.e., no intervention) for four sessions. His on-task behavior during baseline ranged from 20-57% with a mean of 33%. When his function-based intervention was implemented, his behavior significantly improved with on-task behavior ranging from 74-100% (M= 92%) for the remainder of the sessions. There were no overlapping data points between the baseline and intervention conditions for Josh.

Zane was in baseline for seven sessions. Intervention was implemented for him on the ninth session. His on-task behavior during baseline ranged from 55-74% (M = 65%). When the function-based intervention was implemented, his behavior consistently improved with on-task behavior ranging from 80-98% (M = 87%). There were no overlapping data points between the baseline and intervention conditions for Zane.

Ian was in baseline for seven sessions as well, though his sessions were spread out over a greater period of time than Zane's. His intervention was implemented on the 12th session. Baseline conditions represent several gaps for Ian. These were days that he had already been removed from class due to escalating behavior. During baseline sessions, he was on-task 35-62% (M = 53%). When the function-based intervention was implemented, his behavior showed marked improvement, with on-task behavior ranging from 65-100% (M = 86%). There was only one overlapping data point between the baseline and intervention for Ian. That occurred in Session 20, the only day in which the teacher's level of treatment integrity also dropped (to a record low of 61%). Subsequent sessions showed high levels of both on-task behavior and implementation.

Social Validity

The TARF-R (Reimers & Wacker, 1988) was given to each of the teachers both prior to intervention design and at the conclusion of Phase 3 intervention implementation. The TARF-R includes 17 questions with Likert-type ratings. A total of 119 points are possible, with higher scores indicating a higher level of satisfaction. Each response is scored on a 1-7 scale, with a 4 being neutral. These outcomes are summarized in Figure 9.

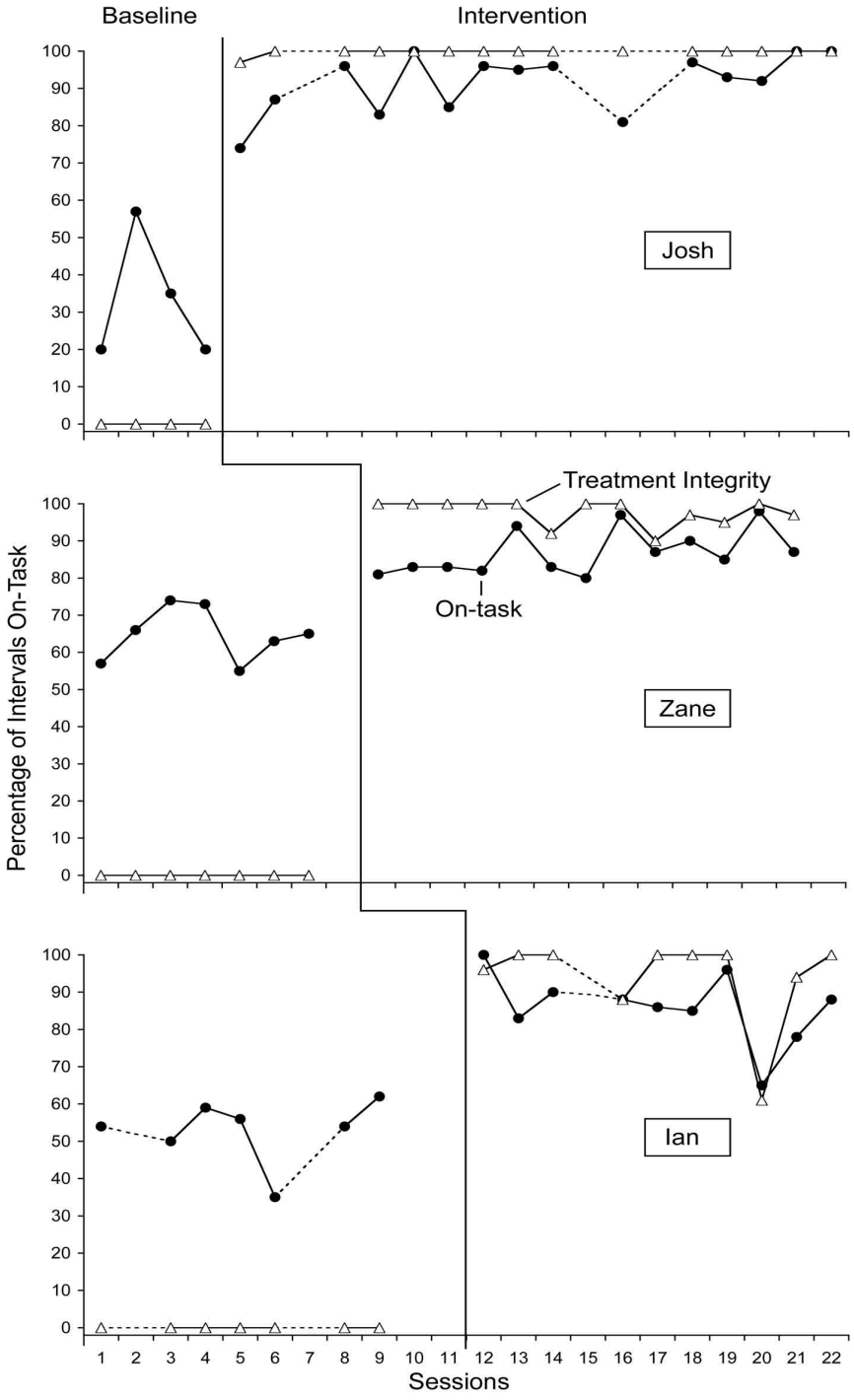

Figure 8. Percentage of On-Task Behavior and Treatment Integrity

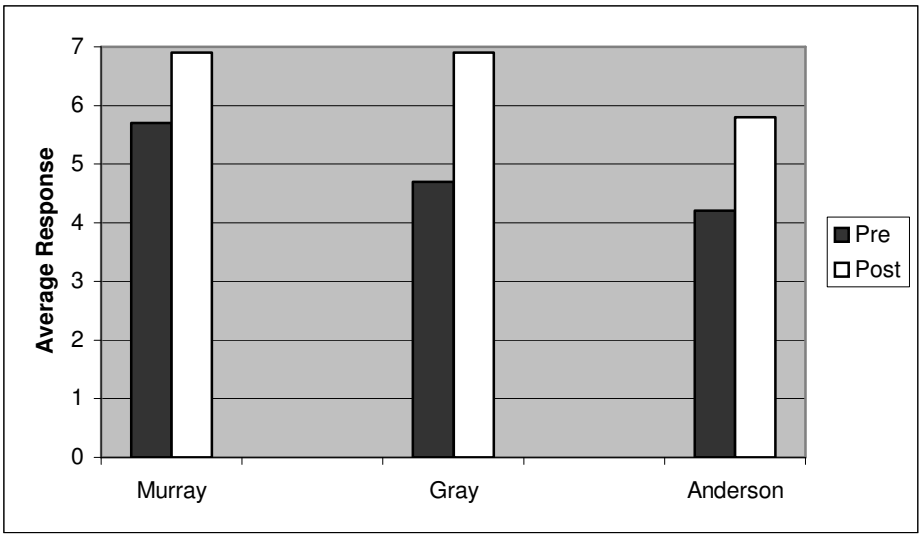

Figure 9. TARF-R Results for Each Teacher

Results indicated significant increases in acceptability of intervention elements by all raters. Ms. Murray had rated the interventions that she was implementing prior to intervention development with the *Decision Model* as moderately acceptable, with a score of 97 (for a mean response per item of 5.7 out of 7). Following full implementation of the collaboratively developed function-based intervention, her ratings increased by 20 points to a nearly perfect score of 117 (i.e., 6.9 out of 7). Ms. Gray rated the intervention strategies in place prior to the function-based intervention as an 80 (i.e., 4.7 per item). After full implementation of the collaboratively developed function-based intervention, her satisfaction scores increased by 35 points to a 115 (i.e., 6.9 per item). These results reflected increases of 17% and 30%, respectively. These data indicated that both Ms. Murray and Ms. Gray viewed the interventions as appropriate for the student, easy to implement, worth the time, effective for the student, and as something other staff members would probably find reasonable to implement.

Ms. Anderson rated her baseline practices as “neutral” with an overall score of 71 (i.e., an average of 4.2 per item). Following implementation of the function-based intervention, the score increased by 27 points to 98 (i.e., an average of 5.8 per item). This increase indicated that she was more comfortable with the effectiveness of the intervention, its appropriateness for the student, and her willingness to use the intervention. Though she felt the intervention was effective and was easy to implement, she was unsure whether it would create lasting effects and found that it took a fair amount of time to implement with integrity.

CHAPTER 5

DISCUSSION

The present study examined whether a systematic process for assessing and treating the disruptive behaviors of three young at-risk children would improve their behavior and be socially acceptable to their teachers (i.e., the intervention implementers). Results with these children, who were identified as "at-risk" for developing an emotional or behavioral disorder, showed that function-based interventions produced stable, significant behavioral improvements for each student. Analysis of the TARF-R (Reimers & Wacker, 1988) pre and post data showed improvements in social validity, i.e., the design, appropriateness, and feasibility of the function-based interventions were more acceptable to each teacher than the original (baseline period) interventions they had used.

Treatment integrity data, collected daily, confirmed that the interventions were implemented with high degrees of fidelity, which allowed clear functional relationships to be shown. With one exception (i.e., Ian in Session 20), there were no occurrences of overlapping data points between the baseline and intervention conditions. This lone occurrence coincided directly to the only day of poor implementation by any of the teachers. Taken together, these data support the use of the *Decision Model* (Umbreit et al., 2007) as a valid systematic process to improve the problem behavior of young children who are at-risk for an emotional or behavioral disorder.

High levels of agreement were found during each session when IOA was collected. The Kappa statistic exceeded the .60 minimum recommended by Horner and colleagues (2005). The range of agreement during the data collection for replacement

behaviors is considered to have "substantial agreement" to "almost perfect agreement". Additionally, the range of agreement during data collection for treatment integrity is considered to have "almost perfect agreement" (Viera & Garett, 2005).

Data on office discipline referrals were collected for at least five weeks prior to the study, and for approximately six weeks as the study was conducted. Two of the three children (Josh and Zane) showed substantial reductions in their rates of referrals to the office, from approximately once per week prior to the study, to approximately once per month during the study. In addition, many of the pre-intervention referrals were for behavioral problems that occurred in the classroom; during intervention, none occurred in the classroom setting.

Ian's level of office referrals remained unchanged. He continued to have difficulties, at least once per week, with behaviors in settings in which a function-based intervention was absent. Ian had problems in both the academic *and* social settings. Ian's change of status from "at-risk" to "identified," and the subsequent addition of special education services, did not appear to impact his behavior the same way as the function-based intervention. Although resource services had begun around Session 1 of Phase 3, his disruptive behavior remained stable until the introduction of the function-based intervention in Session 12. At that point, dramatic improvements occurred. This provided further support for the use of function-based interventions as a change agent and countered the often preconceived belief that "special education" can fix the problems of children with disabilities. In contrast, these data suggested the focus needed to be on the

content and structure of the intervention, regardless of whether it is delivered in general or special education.

The results of the current study were consistent with previous research using function-based intervention planning (e.g., Ingram et al., 2005; Kern et al., 2006; Umbreit 1996) and with previous studies that have examined the efficacy of the *Decision Model* (e.g., Lane et al., 2007; Liaupsin et al., 2006; Turton et al., in press; Umbreit, et. al. 2004; Underwood et al., in press). For each student, a functional relationship was clearly established, and all positive behavior change can be directly attributed to the function-based intervention that was implemented for each student.

Treatment integrity results also paralleled prior research with the *Decision Model* (Lane et al., 2007; Wood et al., 2007). The data reported here showed a strong positive correlation between appropriate implementation and degree of behavior change. Measurement of treatment integrity is important when evaluating the outcomes of intervention implementation for children because it allows the practitioner to evaluate both the internal and external consistency of the intervention (Gresham, Gansle, & Noell, 1993). Measuring treatment integrity as a second level of analysis is not only justified by the strength that it provides to assessing and validating functional relationships, but also by the ease in which the data can be collected (Umbreit et al., 2007).

The results of the present study also speak directly to the need for intervention to address the aberrant behavior of young children who are at-risk for emotional and behavioral disorders (Nelson et. al, 1996; Walker et al., 2004). It is possible that intervening in each of the high-risk settings for these young children can alter predictable

patterns of maladaptive behavior, thus producing more positive long-term outcomes (Campbell et al., 2006; Crick et al., 1997; Walker et al., 2004).

This study, which adds to the existing literature on function-based intervention, also meets the criteria for "credible single subject research," as recommended by Horner and colleagues (2005). This study (a) operationally defined a practice, (b) defined the context in which the practice was to be used, (c) was implemented with fidelity, and (d) produced documented changes in the dependent variables. Additionally, this study adds to the growing literature supporting the efficacy of the *Decision Model* as an evidence-based practice, thereby addressing the recommendation that research *demonstrate experimental control across a sufficient range of studies, researchers, and participants to allow confidence in the effect.*

Certain limitations should be noted. First, no post measures of global functioning were collected. Although a change in global functioning was not a goal of the study, it may have been helpful to collect such data for each student. Participants were each initially screened with the *BASC-2* (Reynolds & Kamphaus, 2004) as part of the selection process to validate the status of each as an at-risk child. The *BASC-2* is a standardized measure of social-emotional functioning that has been normed nationally on children aged 3-21. The use of this instrument provided important baseline levels of global functioning. It would have been helpful to use this instrument at follow-up to assess whether students also improved in a broader sense.

A second limitation, which is also related to global functioning, was that the interventions were implemented during only one activity. Behavioral improvement was

evident for all three children during the particular activity in which the intervention was implemented. Restricted data collection periods were a limitation in the current study, and in function-based intervention research in general. Although treatment success is typically high within treatment settings, interventions need to be tailored to multiple specific environments and sets of contingencies in order for behavioral improvement to be seen in a variety of contexts. This demand creates the need for ongoing dialogue and planning among staff members, which can be a barrier to using a systematic process in a setting in which planning time may be scarce.

A final limitation of the study was the small sample size. The nature of behavior problems at such young ages spans a large continuum. Although these children shared many common characteristics (i.e., age, gender, similar response class), each was unique. It is unknown what types of subject variables would make the process unsuccessful.

Nearly 40 years ago, Sidney Bijou (1970) wrote "What Psychology Has To Offer Education—Now." In it, he described the variety of theoretical approaches that psychologists were taking at the time and what each offered education. He referenced "the small minority" of psychologists who practiced from a behavior analytic perspective. This group, he suggested, had much to offer education including

> (1) a set of concepts and principles derived entirely from the experimental analysis of behavior, (2) a methodology with practical application of these concepts and principles, (3) a research method that deals with changes in individual behavior, and (4) a philosophy of science that says: "Look carefully to

the relationships between observable environmental and behavioral events and their changes." (p. 70)

In the decades since this article was published, the field has promoted the relevance of assessing and treating problem behavior using a scientific model. Still, much work remains to be done to enable educators to use these principles in an efficient, easy to understand manner.

The current direction in education is to use and promote evidence-based practices. In that vein, it will be important to continue conducting studies such as this one, utilizing a single-subject design, so that practitioners will have access to effective interventions. Additional research on the *Decision Model* will help to establish it as an evidence-based, systematic way to approach problem behavior.

The present study focused specifically on disruptive behavior; it did not address any of the other problematic behaviors that the children exhibited (e.g., aggression). Aggression was particularly problematic for at least one child in the current study. Future studies may want to examine the effectiveness of the *Decision Model* with young children who exhibit aggressive behavior. Researchers would want to carefully consider an alternative experimental method to show experimental effect when testing the intervention (i.e., perhaps not using a withdrawal design for ethical reasons).

Children who have significant emotional disabilities and require intensive medical management for emotional and behavioral problems may be a group that stretches the *Model's* capacity. Research with this group might provide significant feedback to researchers so that the process could be adjusted, if needed, to effectively address this

population. It would be interesting for future studies to explore the use of the *Decision Model* while also tracking medication administration (i.e. time/dose) along with data collection on behavioral improvement and treatment integrity. This added piece of data may help to clarify any unusual patterns in behavior and allow the team to adjust the contingencies or make recommendations for adjustments in medical management.

The *Decision Model* was used as part of a gated process to identify young children who were exhibiting disruptive behaviors at a rate significantly higher than the general population. If used across grades K-6, this process would have identified several more children at each grade level who would likely have benefited from such intervention. Further, if these methods were applied system-wide, it would be anticipated that greater sustainability in improvements would be observed. Future studies should examine the utility of applying this methodology to entire systems as part of a tertiary intervention procedure to address the needs of youth exhibiting significant maladaptive behavior in the school setting.

Researchers should continue to look at applications of the *Decision Model* across ethnicity, age groups, and ability levels. This might be done by conducting single subject research using similar methods in a variety of settings with a variety of research participants. In addition, it would be interesting to extend the *Decision Model* to the home setting and to conduct parallel FBAs across these different contexts. More research is needed to identify the conditions under which this process can be recommended as an evidence-based practice, and those under which it may not be appropriate.

It will be equally important to examine the degree to which positive intervention results can be sustained over time. Prior research has suggested that, without expert support, practitioners typically return to the types of assessment and intervention methods with which they are most comfortable. Future studies should explore the type, quality, and quantity of training that most effectively creates sustained practice with high fidelity. It would be interesting to track the relationship between teacher variables (e.g., experience, efficacy prior to training) and the degree of fidelity of implementation and sustainability of practices. It may be helpful to extend the work of Scott et al. (2005) by looking at how teams can best learn to identify function-based interventions following training. The outcome of such studies could drive the manner in which researchers promote the research-to-practice link. Above all, it cannot be acceptable to allow children to follow predictable trajectories of school and social failure. Educators, clinicians, and researchers need to continue to find effective, efficient ways to address problem behavior in applied settings.

APPENDIX A

PRELIMINARY FUNCTIONAL ASSESSMENT SURVEY[1]

Student: _____ Age: _____ Sex: M F Date: _____

Interviewer: _____ Respondent(s) _____

1. List and describe the behavior(s) of concern.

   A.

   B.

   C.

2. Prioritize the behavior(s) of concern.

   A.

   B.

   C.

3. What procedures have you followed when the behavior has occurred?

   A.

   B.

   C.

4. What do you think causes (or motivates) the behavior?

   A.

   B.

   C.

---

[1]Developed by Dunlap et al. (1991).

5. When do these behaviors occur?

A.

B.

C.

6. How often so these behaviors occur?

A.

B.

C.

7. How long has this/these behavior(s) been occurring?

A.

B.

C.

8. Is there any circumstance under which the behavior does not occur?

A.

B.

C.

9. Is there any circumstances under which the behavior always occurs?

A.

B.

C.

10. Does the behavior occur more often during certain times of the day?

    A.

    B.

    C.

11. Does the behavior occur in response to the number of people in the immediate environment?

    A.

    B.

    C.

12. Does the behavior occur only with certain people?

    A.

    B.

    C.

13. Does the behavior occur only during certain subjects?

    A.

    B.

    C.

14. Could the behavior be related to any skill deficits?

    A.

    B.

    C.

15. What are identified reinforcers for this student?

    A.

    B.

    C.

16. Is the student taking any medications that might affect his/her behavior?

    A.

    B.

    C.

17. Could the student's behavior be signaling some deprivation conditions (e.g., thirst, hunger, lack of rest?

    A.

    B.

    C.

18. Could the behavior be the result of any form of discomfort (e.g., headaches, stomachaches, blurred vision, ear infection)?

    A.

    B.

    C.

19. Could the behavior be caused by allergies (e.g., food, materials in certain environments)?

    A.

    B.

    C.

20. Do any other behaviors occur along with this behavior?

    A.

    B.

    C.

21. Are there any observable events that signal the behavior of concern is about to occur?

    A.

    B.

    C.

22. What are the consequences when the behavior(s) occur?

    A.

    B.

    C.

APPENDIX B

STUDENT ASSISTED FUNCTIONAL ASSESSMENT INTERVIEW.[1]

Student:

Date

Administration Time: _____

Target Behavior:

_____

1. When do you think you have the fewest problems with _____(target behavior) in school?

   Why do you not have problems during this/these time(s)?

2. When do you think you have the most problems with _____(target behavior) in school?

   Why do you have problems during this/these time(s)?

3. What causes you to have problems with _____(target behavior)?

4. What changes could be made so you would have fewer problems with _____ (target behavior)?

5. What kinds of rewards would you like to earn for good behavior or good school work?

[1]Developed by Kern, Dunlap, et al., (1994).

Rate how much you like the following subjects:

	Don't like at all		Fair		Like very much
Reading	1	2	3	4	5
Math	1	2	3	4	5
Spelling	1	2	3	4	5
Handwriting	1	2	3	4	5
Science	1	2	3	4	5
Social Studies	1	2	3	4	5
English	1	2	3	4	5
Music	1	2	3	4	5
P.E.	1	2	3	4	5
Art	1	2	3	4	5

What do you like about _____?

What do you like about _____?

What do you like about _____?

What do you like about _____?

What do you like about _____?

What do you like about _____?

What don't you like about _____?

Is there any type of_____you have ever done that you've liked?

What could be done to improve _____?

What do you like about _____?

What do you like about _____?

What do you like about _____?

What don't you like about _____?

Is there any type of _____ you have ever done that you've liked?

What could be done to improve _____?

What do you like about _____?

What do you like about _____?

What do you like about _____?

What don't you like about _____?

Is there any type of _____ you have ever done that you've liked?

What could be done to improve _____?

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