

THE EFFECT OF FUNCTION-BASED SUPPORTS ON TREATMENT INTEGRITY
OF FUNCTION-BASED INTERVENTIONS

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ABSTRACT

Function-based assessments and interventions are routinely used in school settings as an effective method to address problem behaviors that impede the learning of the student or others. When function-based interventions are not successful, it is often due to problems with treatment integrity (TI). Using an ABCBC single subject design, this study examined whether function-based teacher supports could improve TI. The results demonstrated that the function-based supports provided to the teacher resulted in higher levels of TI and improvements in student behavioral outcomes. Using function-based intervention concepts to develop teacher intervention support, limitations to the study, and directions for future research are discussed.

CHAPTER 1

INTRODUCTION

The use of school-based functional behavioral assessments (FBA) is increasingly visible since the 1997 authorization of the Individuals with Disabilities Act (IDEA) and subsequent 2004 reauthorization of the federal special education law, Individuals with Disabilities Improvement Act (IDEIA). These laws require that local education agencies develop a behavior intervention plan (BIP) based on the results of a functional behavioral assessment (FBA) for any student whose behavior impedes their learning or the learning of others. (IDEA, 1997; IDEIA, 2004). Lewis and Sugai (1999) define FBA as a systematic process that allows practitioners to identify problem behaviors and the circumstances under which these behaviors are likely to occur. Specifically, following the FBA process allows practitioners to make reliable predictions of when the problem behavior will or will not occur (antecedent) and what reinforces the problem behavior (consequence).

An FBA is useful in developing interventions because it provides a systematic way to predict which intervention strategies should work and why (Hanley, Iwata, & McCord, 2003). A function-based intervention (FBI) is the set of strategies developed utilizing the results of the FBA (Umbreit, Ferro, Liaupsin, & Lane, 2007) to increase the chances of a student performing a more socially acceptable behavior, while at the same time serving the purpose or ‘function’ of the previous less socially accepted behavior (Sugai et al., 2000). FBIs have been demonstrated to be an effective tool to address problem behavior for students in a variety of educational settings (e.g., Carr, Levin, McConnachie, Carlson, Kemp, & Smith, 1994; Durand, 1990, 1999; Durand & Carr,

1991; Foster-Johnson, & Dunlap, 1993; Kern, Delaney, Clark, Dunlap, & Childs, 2001; Koegel, Koegel, & Smith, 1997; Lewis & Sugai, 1996; Umbreit, 1995, 1996).

Statement of the Problem

Even when researchers and practitioners use a function-based approach to the design of an intervention, the FBI does not always yield successful outcomes. Umbreit and Ferro (2015) propose that function-based interventions fail for any of three reasons which are: (a) the function of the behavior was either not satisfactorily identified or adequately addressed, (b) the function-based intervention may have been inadequately based on the assessment or fail to include a component, or (c) the function-based intervention plan is not being implemented with fidelity. This last issue, treatment integrity (TI), is identified as under reported and utilized in both experimental interventions and school-based practices. (Cochrane & Laux, 2008; Greenwood, 2009; Lane, Bocian, MacMillan, & Gresham, 2004; Sanetti, Doby, & Gallucci, 2014; Sanetti, Gritter, & Doby, 2011; Sanetti, Doby, & Gritter, 2012).

TI, sometimes referred to as fidelity, is the extent to which the intervention is implemented the way it was intended and is considered a necessary condition to effectively and consistently improve behavior outcomes (Gresham 1989; Wickstrom, Kones, LaFleur, & Witt, 1998). In research, TI is important in demonstrating that the change in dependent variables (e.g., student behavior) is directly correlated to the manipulation of the independent variable (e.g., the function-based intervention; Lane et al., 2004). This is also known as internal validity. In school-based practices, TI is important for Individual Education Plan (IEP) teams determining the needs of a student. When a FBI fails to address the target behavior adequately, the IEP team must consider

how to address the continuing problem. In some instances, the IEP team might place a student in a more restrictive environment (LRE), which may not actually be warranted if the intervention had been implemented with integrity.

Researchers (Axelrod, Moyer, & Berry, 1990; Carr, Taylor, & Robinson, 1991; Jolivett, Barton-Arwood, & Scott, 2000; Sanetti & DiGennaro Reed, 2012; Skinner & Hales, 1992) have identified multiple reasons that teachers have failed to implement interventions with high level of TI, some of which are lack of guidelines, lack of general knowledge, and lack of resources. However, Umbreit and Ferro (2015) and Liaupsin (2015) propose another reason: All staff behaviors operate under the same principles as student behaviors. Given this assumption, they propose that one might improve treatment integrity by applying a function-based approach to support teacher implementation of intervention plans.

The purpose of this study was to examine whether function-based intervention concepts and strategies can be applied to teachers in order to improve TI. The specific question addressed is: Can a function-based intervention that incorporates function-based teacher supports result in increased treatment integrity?

CHAPTER 2

REVIEW OF THE LITERATURE

Functional Based Interventions

The origin of the use of FBAs and FBIs was not in schools, but rather in clinical settings. Researchers in the field of Applied Behavior Analysis (ABA) created and utilized the process in order to develop behavioral interventions, particularly for those persons with significant cognitive and/or developmental disabilities (Payne, Scott, & Conroy, 2007). Early contributors in the field, Skinner (1953), Carr (1977) and Iwata, Dorsey, Slifer, Bauman, and Richman (1982) developed much of the core concepts that continue to be utilized in order to address problem behaviors through a FBA and FBI. While there are different methods of creating an FBI, current best practices incorporate the following components: (a) teach or promote the replacement behavior, (b) improve the environment, and (c) adjust the contingencies. Umbreit et al. (2007) developed the Function-Based Intervention Decision Model, a tool developed in response to the need to have a systematic method in which to create an FBI from the FBA findings.

There is an abundant amount of evidence supporting that FBAs and FBIs are effective across settings (e.g., Wood, Ferro, Umbreit, & Liaupsin, 2011; McLaren & Nelson, 2009; Lane, Weisenbach, Little, Phillips, & Wehby, 2006; Lane, Thompson, Reske, Gable, & Barton-Arwood, 2006; Turton, Umbreit, & Mathur, 2010; Blair et al., 2011), with different student populations (e.g., Dunlap, Kern-Dunlap, Clarke & Robbins, 1991; Brooks, Todd, Tofflemoyer, & Horner, 2003; Mancil & Boman, 2010; Ervin, DuPaul, Kern, & Friman, 1998; Stahr, Cushing, Lane, & Fox, 2006; Smith & Sugai, 2000; Hagan-Burke, Burke, & Sugai, 2007; McLaren & Nelson, 2009; Preciado, Horner,

& Baker, 2009), and various behaviors (Umbreit & Blair, 1997; Smith & Sugai, 2000; Umbreit, Lane, & Dejud, 2004; Brooks et al., 2003), and since 1997, has been a requirement of public school agencies in working with students whose behaviors significantly impact their own learning or the learning of others (IDEA, 1997; IDEIA, 2004).

Treatment Integrity of Function-based Interventions

TI, also referred to as fidelity of implementation (e.g., Horner, Carr, Halle, McGee, Odom, & Woery, 2005) or treatment fidelity (e.g., Conroy, Dunlap, Clarke, & Alter, 2005) is the extent to which the intervention is implemented the way it was intended. It is important to have TI both in research and school-based intervention in order to determine if the intervention, rather than other factors, is responsible for the changes in student behavior.

Researchers state that TI is important for the internal and external validity of the process in a study (Horner et al, 2005; Lane et al., 2004; Moncher & Prinz, 1991). However, in a 2012 review of treatment integrity data in experimental interventions between the years 1999 and 2009 that appeared in *The Journal of Positive Behavior Interventions*, Sanetti, Dobey, and Gritter found that of the 72 studies that met the criteria of (a) being published between the years 1999-2009, (b) included interventions about youth 19 years or younger, and (c) being experimental, 41.7% included quantitative TI data, 6.9% had a statement regarding TI but did not include any quantitative data, and 51.4% did not include any information regarding the monitoring or assessment of TI. In a similar review of treatment integrity data of experiments that were published in *School Psychology International* between 1995 and 2010 with the same inclusion criteria,

Sanetti, Doby, and Gallucci (2014) found that of the 26 studies included in the review, 7.7% reported quantitative data on TI, 11.5% included information regarding the monitoring and data on TI, and 80.8% did not include information regarding the assessment or monitoring of for TI. They concluded that this low percentage of TI data is troubling as researchers could be making invalid conclusions regarding the relationship between the interventions and student outcomes.

For this same reason, TI is also important in practice. Case law has demonstrated that when a FBI is not followed, it can be synonymous with failing to provide a free and appropriate public education (FAPE; e.g., Drasgow, Yell, Shriner & Bradley, 1999; Etschdeit, 2006). Courts have found that students may be subject to discipline, changes in LRE, or other injustices that are a result of failure to implement an intervention with TI. Furthermore, research has supported a link between low level of TI and poor student outcomes (e.g., DiGennaro et al., 2007; Noell, Gresham, & Gansle, 2002; Wilder, Atwell, & Wine, 2006)

Function of Teacher Behavior in the Implementation of Interventions

While researchers have indicated teacher behavior may be conditional on the same principles of student behavior (Lentz & Daly, 1996; Liaupsin, 2015; Martens & Witt, 1988, Tharp & Wetzel, 1969; Umbreit & Ferro, 2015), research in this area has been limited mostly to TI interventions (e.g., DiGennaro, Martens & McIntye, 2005; Noell et al., 2005; Noell, Gansle, Meyers, Knowx, Mintz, & Dahir, 2014; Collier-Meek, Fallon, Sanetti, & Maggin, 2013) which primarily focus on what the consultant or coach deems necessary for the intervention to be implemented as intended, and not the individual needs of the implementer. Recently, the question has been asked whether an

answer to low rates of TI may be in considering the function of the behavior of the implementer the same way in which we consider the function of the behavior for the student (Liaupsin, 2015; Umbreit & Ferro, 2015).

CHAPTER 3

METHOD

Participants and Setting

The study was conducted in a large school district in central Arizona. The primary participant was a general education teacher certified in elementary education. The secondary participant was an elementary school student receiving special education services whose IEP team determined that his challenging behaviors warranted the need for more supports in the form of a FBA and BIP. The elementary school serves students in preschool through the eighth grade. The classroom contained 22 students. The names of both participants were changed to protect confidentiality.

The secondary (student) participant, Jacob, was a six-year-old Caucasian male who qualified for special education services under the eligibility of Developmental Delay, in the areas of Social/Emotional Development and Adaptive Development. Standardized assessment results revealed that his overall cognitive abilities were in the average range, but that he demonstrated significant concerns in the areas of learning problems, hyperactivity/impulsivity, and executive functioning. A developmental pediatrician diagnosed Jacob with Attention Deficit Hyperactive Disorder (ADHD), combined type. The pediatrician made a recommendation of a stimulant medication to help with Jacob's difficulty sustaining attention. Parents sought a second opinion and a naturopathic doctor determined that Jacob had vitamin deficiencies due to his body having difficulty processing foods and recommended a very strict diet. Parents opted to follow the recommendation of the naturopath, and at the time of the study, he had been

on a diet extremely limited in consumption of sugar, gluten, and any processed foods. Jacob received at least 79% of his daily instruction in the general education setting.

The primary (teacher) participant, Ms. Watson, was Jacob's general education kindergarten teacher. Ms. Watson had six years of experience teaching kindergarten, all of which were at the current elementary school. She previously taught first and second grades in a private Christian school for four years. She was 42 years old, Caucasian, and has a Bachelor of Arts Education in Elementary Education with an emphasis in Early Childhood.

Eligibility requirements for the primary participant were the general education teacher must have been identified by the school psychologist or behavioral interventionist as having a student in the classroom in need of a FBA, and the general education teacher must have wanted/have asked for additional support to address the student's problem behavior. The eligibility requirements for the secondary participant were: (a) the student was currently receiving special education services through an IEP, and (b) the student exhibited off-task behavior that impedes his/her learning or the learning of others.

Behavioral Definitions

The target behavior was defined as off-task behavior. Off-task behaviors included talking or yelling out, making noises with his mouth, playing with objects not relevant to the task, and leaving the assigned area. The replacement behavior was on-task behavior, defined as engagement in assigned tasks and staying in assigned area.

Research Overview

The purpose of the study was to examine the effect of function-based supports on the treatment integrity of function-based behavioral interventions. Data were collected

across four phases. Phase 1 consisted of the FBA on the secondary participant. In phase 2, the results of the FBA were used to create a function-based intervention. In Phase 3, data from the treatment integrity checklist, direct observations, and teacher interviews were used to determine the function of the teacher (primary participant) behavior. Finally, in Phase 4, the data from Phase 3 was used to identify and implement supports for the teacher in her implementation of the the student's FBI.

Phase 1: Functional Behavioral Assessment (Secondary Participant)

Phase 1 consisted of the FBA to identify the antecedents and consequences that occur and maintain the secondary participant's target behaviors. The assessment process included (a) interviews with the teacher and student and (b) direct observations in the general education classroom. The data was then used to determine the hypothesized function of the student's target behavior and an appropriate replacement behavior.

Structured Staff Interviews

A structured interview was completed with teacher. This researcher and a school psychologist who has been trained and has experience completing FBAs conducted the interview. The interview occurred using the *Preliminary Functional Assessment Survey* (Dunlap et al., 1993; Appendix A). This survey was developed by Dunlap et al. to access information about the conditions under which the target behavior is present and not present. The survey also makes inquiries about frequency and duration of the target behavior, specific events which might make for higher probability of the behavior to occur (e.g., missed breakfast, conflict with family or peer), and medical aspects of the student that might contribute to the presence of the target behavior. There are also

questions formulated to address past or current interventions that are in place or have been attempted. Social skills are addressed, as are possible strengths and weaknesses.

A set of pre-intervention questions created by Liaupsin (adapted from Kern, Dunlap, Clarke, & Childs, 1994) was also asked to help understand the teacher's prior experiences with receiving support in her classroom from a behavior consultant. The teacher interview process took approximately 17 minutes.

Structured Student Interview

A student interview was used to elicit the same information, only from the student's perspective. The same school psychologist who conducted the structured staff interview with the student's respective teacher conducted the interview with the student. The *Student Assisted Functional Assessment Interview* (Kern et al., 1994; Appendix A) asks a series of questions structured with opportunities for open ended and rating scale responses regarding the conditions under which the student engages in the problem behavior, content preferences, and ideas regarding how to correct the problem behavior. The interview took approximately 21 minutes.

Structured Observations

Antecedent-Behavior-Consequence (A-B-C) data was collected for the secondary participant (Bijou, Peterson, & Ault, 1968; Appendix A). Each observation occurred in the participant's elementary classroom setting during the typically scheduled activities for 30 minutes. During the observations, the author and the school psychologist independently recorded the antecedents and consequences each time the secondary participant engaged in his target behavior.

Identification of the Function

The function(s) of the target behavior was identified using the data collected from the interviews and direct observations using the *Function Matrix* (Umbreit et al., 2007; see Figure 1). This six-celled visual tool is used to assist the interventionist in determining the function of the target behavior using the data from the interviews and A-B-C data. The cells are divided into two columns identifying the reinforcers (positive or negative) and three rows identifying the consequence (attention, tangibles/activity, or sensory). While multiple functions of a behavior are possible, typically there are one or two functions that are primary.

	Positive Reinforcement (Access Something)	Negative Reinforcement (Avoid Something)
Attention		
Tangible/Activities		
Sensory		

Figure 1. Function matrix.

In the teacher interview, Ms. Watson reported that Jacob was off task throughout the entire academic day, and that the problem behavior typically occurred six times or more in a 15-minute time frame. She described him as very impulsive and having a tendency to “zone out”. She felt that his off-task behavior sometimes turned into disruptive behavior which was more disruptive to the learning environment. Ms. Watson

also described Jacob as unable to complete the tasks/assignments assigned regardless of whether the class was working as a whole group or as a small group/individuals. Previous interventions that Ms. Watson had tried included visual cues such as color cards (green, yellow, red), cubes, which were earned by appropriate on-task behavior (but not then used for a tangible item), ignoring, and redirection.

Jacob enjoyed the individualized attention given to him throughout the student interview, though it was apparent that he did not understand all of the questions. The interviewer needed to redirect him multiple times in each section of the interview. Jacob shared that he felt that work is always too difficult, rating math, English Language Arts, and science as subjects he does not like at all. He indicated that he feels sad at school, that he does best with an adult right next to him, and that he likes to earn tangibles (food/drink items, time on electronics/preferred people).

ABC data were collected over three, 30-minute observations. Jacob engaged in 43 off-task behaviors during these observations. Behaviors primarily resulted in accessing teacher attention and a preferred activity or tangible item. However, there were some instances where he was able to avoid doing the classwork that he was assigned *and* access a preferred activity or item. Behaviors from each of the observations were coded using the observations session (1, 2, or 3) as the first number recorded, followed by a decimal point and a number related to the observed problem behavior. All of the information collected from the ABC observation sessions were entered into the *Function Matrix* (Figure 2) to determine the function of Jacob's behavior. The data analysis indicates that there are two primary functions of his off-task behavior: to obtain attention

and to access tangibles/activities. However, there was also enough data to suggest that Jacob engages in some of his off-task behavior in order to avoid the assigned task; the teacher hypothesizes that this occurs when the work is too difficult.

	Positive Reinforcement (Access Something)	Negative Reinforcement (Avoid Something)
Attention	<p><u>ABC</u>: 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.4, 2.5, 2.6, 2.7, 2.10, 2.11, 2.13, 3.2, 3.3., 3.6, 3.8, 3.9, 3.10, 3.12, 3.13, 3.14</p> <p><u>TI</u>: He loves adult attention, particularly from females; he does best with individualized support;</p>	
Tangible/Activities	<p><u>ABC</u>: 1.10, 1.11, 1.13, 1.14, 2.3, 2.4, 2.5, 2.5, 2.7, 2.8, 3.1, 3.4, 3.5, 3.7, 3.11, 3.15, 3.16</p> <p><u>TI</u>: He asks multiple times a day to be able to have snacks, computer time, or game time with specific individuals. He is very motivated by edibles he is not allowed to have at home (chips, soda, etc)</p>	<p><u>ABC</u>: 1.10, 1.13, 1.14, 2.5, 2.6, 2.7, 2.8, 3.1, 3.4, 3.5, 3.15., 3.16</p> <p><u>TI</u>: It often appears as though the work is too hard for him and so he is more likely to be off task and try to play or talk to someone when it's a purely academic task (especially written)</p>
Sensory		<u>ABC</u> : 1.9

Figure 2. Jacob's Function Matrix results.

On the Pre-Intervention Development Interview, Ms. Watson stated that what she most likes about teaching is the relationships she forms with the students and the families. She shared that she feels most valued when parents and administration share their happiness with her regarding student growth. When asked what types of interventions and supports that she has had in the past and liked, she indicated that behavior charts that follow the time-line of the day and individualized support in the form of training for her were both things she had liked in the past.

Phase 2: Function-based Intervention Development and Implementation (Secondary Participant)

In Phase 2, a function-based intervention was designed for the secondary participant. The intervention was then implemented within the context of his general education classroom environment and activities.

Procedure

The intervention was designed using the *Function-Based Intervention Decision Model* (Umbreit et al., 2007; see Figure 3). This problem-solving based model for developing a function-based intervention begins by determining if the student has a skills deficit and/or there are problematic antecedent conditions within the classroom. Specifically, the interventionist answers two questions: (a) “*Can the student perform the replacement behavior?*” and (b) “*Do the antecedent conditions represent effective practice?*” Using the responses, the *Decision Model’s* flow chart is utilized to choose a method (or combination of method one and two) that addresses the concern, thereby increasing the likelihood of including appropriate design elements in the intervention. Regardless of the intervention method needed to address an individual’s individualized needs, each method has three components: Antecedent conditions must represent best practice, reinforcement must be provided when the replacement behavior is present, and reinforcement must be withheld when the target behavior occurs.

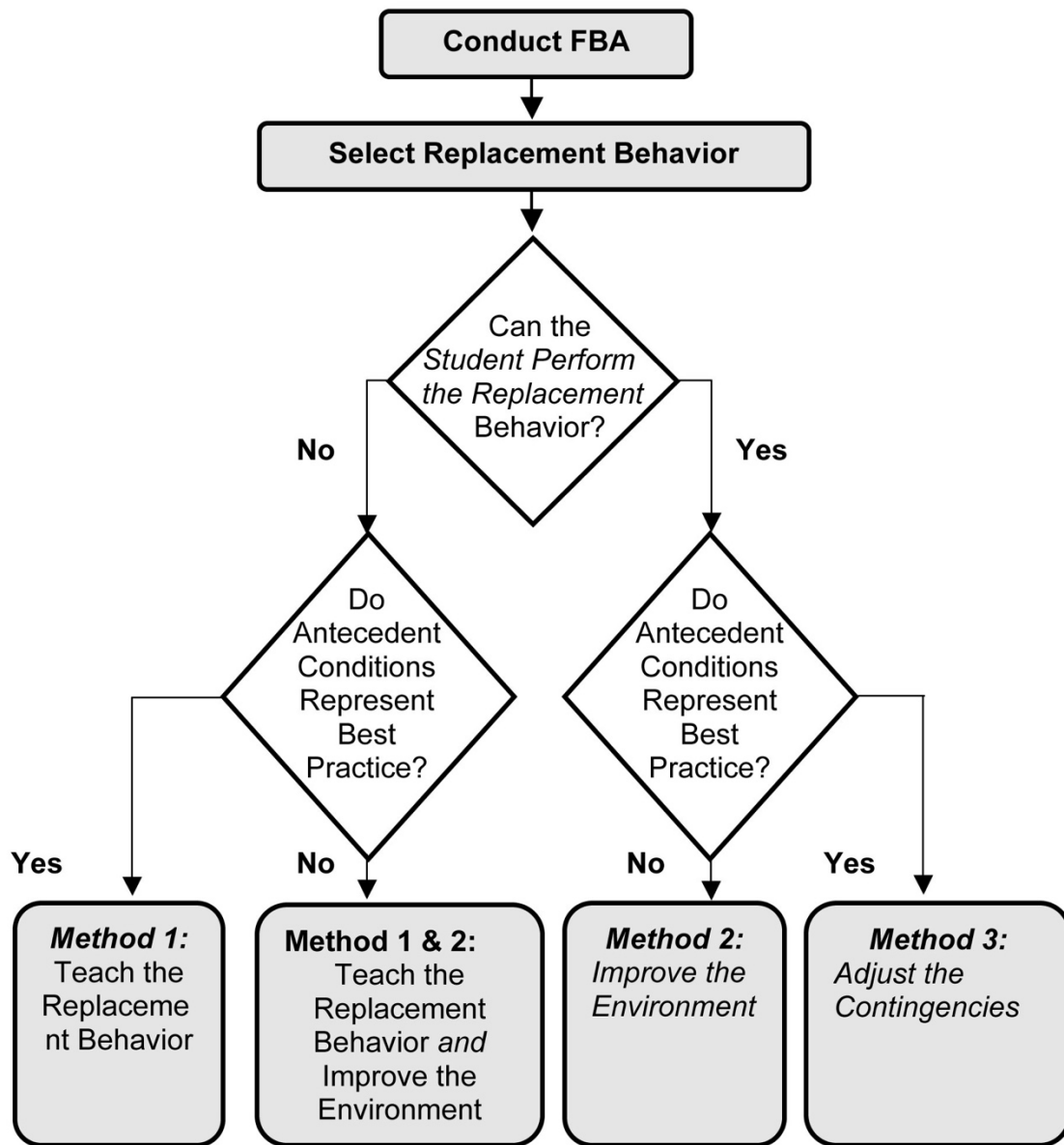


Figure 3. Function-Based Intervention Decision Model.

Based on the data that was collected and analyzed from the ABC observations and the interviews, it was determined that Jacob was not able to perform the replacement behavior (on-task) and that the classroom environment did not represent best practice.

While routines were established, there were not visual supports for them, and behavior expectations were not clearly identified. When referencing the *Decision Model*, both questions were answered no, and so *Method 1* and *Method 2* were used when designing the intervention. Explicit instruction on-task behavior and self-monitoring (using visual cues) were used to teach the replacement behavior and adjust the antecedent conditions. Explicit instruction in academic deficiencies was also added to Jacob's FBI, but was delivered in a different classroom environment with a special education teacher. Modifying academic assignments to the student's ability level, clearly identifying the expected behavior for any given task both verbally and with a visual chart, as well as providing ample opportunities to get positive attention were implemented in order to address the environment. A token economy was introduced to provide reinforcement for the replacement behavior, with opportunities to use earned points twice daily. The list of the specific intervention components can be found in Table 1.

Table 1

Jacob Intervention: Method 1 and 2

Method Elements	Intervention Components
<p>Adjust the antecedent conditions so that new behaviors are learned and aversive conditions are avoided (Method 1).</p>	<p>Provide instruction on identifying on-task behavior, self-monitoring for on-task behavior (using a visual chart), and adjusting behavior based on the monitoring.</p> <p>Provide instruction in academic deficiencies (phonemic awareness, phonics, site words, and basic addition and subtraction).</p> <p>Modify academic assignments and activities to Jacob's instructional level.</p>
<p>Adjust the antecedent conditions so the new conditions that set the occasion for the target behavior are eliminated and the replacement behavior is more likely to occur (Method 2).</p>	<p>Provide a visual chart for self-monitoring on task behavior that can be changed dependent on the task/activity.</p> <p>Provide frequent opportunities to gain teacher/staff attention appropriately (i.e. call on Jacob when he raises his hand).</p>
<p>Provide appropriate reinforcement for the replacement behavior.</p>	<p>Provide frequent teacher/staff praise for on-task behavior as (as much as every minute to begin).</p> <p>Provide token reinforcement for expected behavior on Jacob's visual chart at the same rate as teacher/staff praise.</p>
<p>Withhold the consequence that previously reinforced the behavior.</p>	<p>Limit redirection to only when Jacob is disruptive, and be brief.</p> <p>Prompt peers to ignore disruptive behaviors.</p> <p>Withhold center time at the end of the day to complete any assignment/task that he did not complete in the time allotted</p> <p>Assign Jacob to complete at home, any assignment/task that he did not complete by the end of the day.</p>

Phase 3: Functional Behavioral Assessment (Primary Participants)

Phase 3 consists of determining the teacher target behavior and identifying the function of the target behavior. The assessment process included (a) use of data from the FBI component checklists from direct observations and (b) teacher interviews.

Component Checklist

Data from a component checklist utilized during direct observation in Phase 2 was used to identify the aspects of the intervention that were being implemented with fidelity. The component checklist has each component of the intervention with a possible rating scale of 0, 1, or 2. Scores of 2 indicate that the teacher is mostly or always implementing the component. Scores of 1 indicate the component that the teacher is implementing inconsistently, and scores of 0 indicate the components that the teacher is failing to implement. Scores of 0 and 1 were identified as the “target behavior(s)” that needed to be addressed in order to increase treatment integrity.

Teacher Interview

The teacher was interviewed using a set of Post-Intervention Interview Questions developed by Liaupsin (2015) to illicit feedback with regard to which aspects of the intervention the teacher feels need to be adjusted, or if there are any supports the teacher feel they need to be able or more willing to implement each component of the intervention. Teacher response data from the Pre-Intervention Interview Questions were also used in determining what might be appropriate function-based supports for Ms. Watson. The interview took approximately 23 minutes.

Identification of the Target Behavior

Based on classroom observations that included TI data as the teacher interviews, there were multiple components of the intervention that were most often not followed or not followed with consistency. The teacher could not identify any one element that she felt needed adjustment (other than the frequency of providing praise/reinforcement, which was scheduled to be adjusted). Therefore, it was determined that the target behavior was TI to the intervention as a whole, and not any specific component(s).

Identification of the Function-Based Support

In analyzing the data from the Pre-Intervention and Post-Intervention Interviews, it became evident that Ms. Watson was willing and wanting to follow Jacob's intervention, and that her primary motivator was positive reinforcement. Specifically, written and verbal praise from the author, the student's parent, and school administration. Ms. Watson explicitly asked that a component of the support developed was feedback regarding what she was doing well.

Phase 4: Function-Based Support Development and Implementation

In Phase 4, function-based supports were designed for the primary participant, the teacher, using the data from the component checklist and the teacher interviews. The supports were then implemented within the context of the student intervention and the teacher's classroom environments and activities.

Several supports to the primary participant were developed, though all the supports were functionally-based on the positive attention that the classroom observation data and teacher interviews revealed to be reinforcing for Ms. Watson. At the start of Phase 4, several lines identified as a place for parent feedback were added to the bottom

of Jacob's daily behavior chart. Parents were trained on how to give specific praise to Ms. Watson, and were asked to do so daily. Additionally, the school principal and assistant principal alternated daily, giving specific positive praise regarding Ms. Watson's fidelity to Jacob's intervention plan as well as Jacob's behavior. Finally, the author met with and gave verbal praise only when TI was at 87% or higher.

Research Design, Data Collection, and Analysis

An A-B-C-B-C reversal design was used to determine whether there was a function relationship between the independent variable (function-based support) and the dependent variable (TI). A minimum of five data points were collected for each phase for both the primary and secondary participants. During condition A, existing classroom instruction and classroom management strategies were in place. Once the minimum data points were collected in each condition, the next condition was introduced. Throughout baseline and intervention conditions, the replacement behavior was measured using 30-s whole-interval recording for 20 minutes per data collection session.

Interobserver agreement (IOA) of direction observations of the student replacement behavior as well as the TI was obtained by having a second trained observer independently collect data simultaneously. The second observer was trained over three data collection sessions where IOA percentages met or exceeded 85% agreement. The percentage of IOA was calculated by dividing the number of agreements by the total number of intervals/components, then multiplying the result by 100% (Kazdin, 1982). IOA was collected for a minimum of 33% of sessions per phase for both on-task behavior and TI. IOA data for on-task behavior averaged 99.4% (range = 95-100%) and IOA data for TI averaged 98% (range = 87.5-100%).

Treatment Integrity

Treatment integrity data were collected during all the direct observations of replacement behavior in each of the intervention conditions using a component checklist. As described in Phase 3, the component checklist lists each of the elements of the intervention and has a corresponding rating scale of 0 (the element was not observed), 1 (the element was sometimes in place), or 2 (the element was in mostly or entirely in place) during the entirety of the observation period.

Social Validity

At the end of the second intervention conditions of B and C, the teacher responded to an Intervention Rating Profile (IRP-15; Martens & Witt, 1985). The IRP-15 consists of 15 questions rated on a 6 point Likert scale. Scores on this instrument can range from 15 to 90, with the higher score meaning higher acceptability.

CHAPTER 4

RESULTS

Jacob (Secondary Participant)

Jacob's on-task behavior during the baseline averaged 47.5% (range = 42.5-52.5%) and was on a slight increasing trend. Though it would have been preferable to extend the baseline phase until the data was stable or decreasing, it was determined that it was suitable to move on to the first intervention condition due to time constraints and the fact that the study was focused on *teacher* behavior. On-task behavior increased to 60% (range = 52.5-65%) and was somewhat variable during the first condition when the intervention was introduced, and then improved to 80% (range 72.5-82.5%) and increasing during the first phase where the functional supports for the teacher were implemented in addition to the intervention. Upon return to the intervention only, Jacob's levels of on-task behavior dropped to 65% (range = 62.5-70%) and began to decrease. When intervention and functional supports were reintroduced in the final phase, Jacob's levels of on-task behavior improved to 77.4% (range of 60-82.5%), and had an increasing trend. The percentage of non-overlapping data points was calculated between adjacent experimental conditions by counting the number of overlapping data points in the adjacent conditions, dividing by the total data points in the adjacent conditions, and multiplying by 100 (Gast & Ledford, 2014). There was one overlapping data point, occurring at the last data point of the second condition with FBI only, and the first data point in the second condition of FBI with supports; 80% of data points did not overlap across these two conditions.

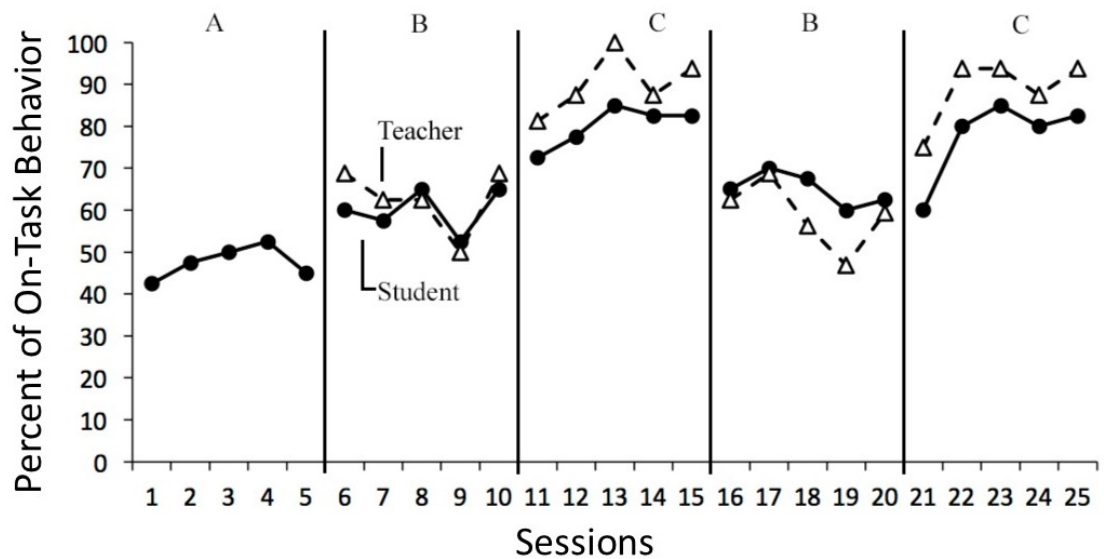


Figure 4. Effect of function-based intervention and support.

Ms. Watson (Primary Participant)

Ms. Watson followed the intervention as written averaging TI of 62.5% (range = 50-68.75%) with a variable trend during the initial phase of the intervention. When function-based supports were added to assist Ms. Watson in adhering to the intervention, TI levels rose to an average of 90% (range = 81.25-100%), and demonstrated an increasing trend. When the supports were withdrawn, TI dropped to an average of 58.75% (range = 46.875-68.75%) and again showed a variable trend. When the supports were reinstated in the final intervention condition, TI increased to 88.75% (range = 75-93.75%) and presented an increasing trend. There were no overlapping data points for TI.

Social Validity

The IRP-15 (Martens & Witt, 1985) was given at the end of second implementation of intervention conditions B and C. A total of 90 points were possible, with higher scores indicating higher rates of social validity.

Ms. Watson's initial rating score on the IRP after implementing the second intervention condition was a 74. After the second intervention condition that included functional supports, Ms. Watson completed the rating scale and scored an 80. On both questionnaire forms she made note that she felt that the student needed to be allowed medical intervention in addition to the behavior intervention; she orally stated that she would have been able to score the intervention higher had she thought it was "all" that Jacob needed in order to be successful.

CHAPTER 5

DISCUSSION

This study examined whether function-based intervention concepts and strategies can be applied to teachers in order to improve TI. The specific question addressed was: Can a function-based intervention that incorporates function-based teacher supports result in increased treatment integrity? Results of the study support that providing the teacher function-based supports increased the level of treatment integrity. Results indicate 100% of TI data points were not overlapping between adjacent experimental conditions. Furthermore, with the increase in TI, there was also increased on-task behavior. While the focus of the study was on increasing TI, data reflects improved student outcomes as well, with only one overlapping data point which occurred between the last session of the second baseline condition and the start of the second intervention condition. This overlap is likely because the student hadn't yet discriminated the change in the contingencies from the previous condition. Once he did, the behavior immediately changed as evidenced by the second data point in the intervention condition.

When function-based supports were provided to the teacher, it did not have any change on the intervention itself, however TI increased in both of the conditions in which the supports were applied. This result supports Liaupsin's (2015) proposal that teacher behavior can be understood in the same way student behavior can be understood: that by creating supports that meet the teacher's needs, the desired behavior can be maintained. For this teacher in particular, the support needed was minimal and cost-effective. Parent, administration, and consultant verbal and/or written praise was enough support for the teacher and as a result of it, higher levels of TI were achieved. The participant was aware

that the purpose of the study was to increase the supports to the teacher and gave more specific feedback at the conclusion of the study with regard to what she needed and what felt rewarding. This information helped to explain two spikes in the data, one during the first condition in which functional supports were in place, and one during the second condition in which they were in place. On both occasions, Ms. Watson received verbal praise from the author to her administration in her presence in her classroom prior to the observation. For her, this public praise from a consultant (this author) to her supervisors validated her work, and motivated her to do better.

A second outcome of the study was higher levels of on-task behavior from the student during the intervention conditions where the teacher received function-based support. This result was predicted, given that past research results suggest that higher levels of TI are correlated with higher levels of positive student outcomes (e.g., DiGennaro, Marens, & Kleinmann, 2007; DiGennaro et al., 2005; Lane et al., 2004). In fact, the TI data and student on-task behavior data mirror each other on the graph, which demonstrates a link between TI and student behavior. This result is consistent with that found by Wood, Ferro, Umbreit, & Liaupsin (2011).

Limitations

There are multiple limitations to this study. Though the research was conducted in the context of the general education classroom during typical activities, the data relate to only one student and one teacher. Additional research is needed across a number of variables such as the type of functional support for the teacher, teacher level of experience, setting, student age and ability level, as well as type and function of student problem behavior. Another limitation to the study is that TI data was not gathered during

the baseline condition. Having TI during baseline has been used in some function-based intervention studies (e.g. Janney, Umbreit, Ferro, Liaupsin, & Lane, 2013) to demonstrate the degree to which the teacher may have already been using some of the components of the intervention. Because there is no TI data from baseline in this study, it is impossible to know the degree to which the components used by the teacher in the first implementation phase were new to her practice or just a continuation of normal activities. The structure of this study made it difficult for TI to be collected during baseline due to time constraints and the fact that the intervention had not yet been designed at the time of baseline data collection. This drawback could be rectified by allowing for a longer data collection period and creation of the intervention prior to beginning the baseline data collection. A further limitation is that no support was needed in this study that directly related to the intervention. For example, the teacher did not indicate that any specific component was too timely or that she didn't like it. Therefore, no conclusion can be made about the efficacy of supports within the components of the intervention. Lastly, the pre and post intervention interview questions developed by Liaupsin (2015) that were used to determine what functional supports would help to increase teacher TI are new, and the tools may need to be adjusted based on continued research using them.

Future Research

Future research should assess how effective function-based supports can be with varying teacher functions. The use of function-based support in this study suggested that teacher implementation would be increased by promoting “access to attention” for the teacher. Liaupsin (2015) suggests that improved TI might also be linked to access to activities or escape from attention or activities. Further, student behavior has often been

determined to be maintained by multiple functions (Umbreit, etal 2007). It is possible the same is true in the case of teacher intervention behavior. Research that demonstrates these connections would further support the idea of function-based support. Another area for future research should center around the pre and post intervention questions as well as the manner in which that data is used to develop the function-based supports. During the teacher interviews, some of the pre and post interview questions needed to be explained further to the teacher in order for her to understand what was being asked (e.g. type of intervention, kind of support) and therefore may need more of a narrative for the interviewer that provides examples in order for the teacher to be able to give the most accurate responses that will assist in providing the most fitting supports. Another potential improvement to this study would be to code the teacher data from interviews and observations using Umbreit et al.'s (2007) Function Matrix in the same manner student responses and data are coded to determine the function(s) of the teacher behavior. Exploring further the possibility that considering teacher function as a part of the FBI process could potentially help to increase TI and in turn, student behavior outcomes.

APPENDIX A

FUNCTIONAL BEHAVIOR ASSESSMENT FORMS

Antecedent-Behavior-Consequence Data Collection

Behavior Number	Antecedent	Behavior	Consequence	Function

Function-Based Support Pre-Intervention Development Interview

1. What subjects do you like teaching the most?
2. What do you like about teaching?
3. When do you feel most valued as a teacher?
 - a. Why?
4. When do you feel most successful?
 - a. Why?
5. What do you find most challenging currently? (Related to your classroom/teaching but not necessarily related to the student.)
6. Is there any type of intervention you have used before that you liked?
7. In the past, what kind of support have you had that you liked?
8. What kinds of things do you want to happen as a result of the intervention implementation?

Note. Adapted from: "Student-Assisted Functional Assessment Interview," by L. Kern, G. Dunlap, S. Clarke, and K. E. Childs, in *Diagnostique* (now *Assessment for Effective Intervention*), 19, pp. 37, 38. Copyright 1994 by the Council for Educational Diagnostic Services.

Function-Based Support Post-Intervention Development Interview

1. What do you like about the intervention?
2. Are there any components to this intervention that would be easy to implement?
3. Are there any components to this intervention that would be more difficult to implement?
 - a. What parts?
 - b. What would cause you to have problems with the intervention?
4. When do you think you would have the fewest difficulties implementing the intervention?
 - a. Why do you think you would not have difficulties during that time?
5. When do you think you would have the most difficulties with the intervention implementation?
 - a. Why do you think you would have difficulties during that time?
6. What changes could be made so that you would have fewer difficulties with the intervention implementation?
7. What else could be done to improve the intervention?

Preliminary Functional Assessment Survey

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.

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.

Student-Assisted Functional Assessment Interview¹

Student: _____

Date: _____

Interviewer: _____

Section 1			
1. In general, is your work too hard for you?	Always	Sometimes	Never
2. In general, is your work too easy for you?	Always	Sometimes	Never
3. When you ask for help appropriately, do you get it?	Always	Sometimes	Never
4. Do you think work periods for each subject are too long?	Always	Sometimes	Never
5. Do you think work periods for each subject are too short?	Always	Sometimes	Never
6. When you do seatwork, do you do better when someone works with you?	Always	Sometimes	Never
7. Do you think people notice when you do a good job?	Always	Sometimes	Never
8. Do you think you get the points or rewards you deserve when you do good work?	Always	Sometimes	Never
9. Do you think you would do better in school if you received more rewards?	Always	Sometimes	Never
10. In general, do you find your work interesting?	Always	Sometimes	Never
11. Are there things in the classroom that distract you?	Always	Sometimes	Never
12. Is your work challenging enough for you?	Always	Sometimes	Never

¹ Developed by Kern, L., Dunlap, G., Clarke, S., & Childs, K. (1994)

Section 2

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

Why do you have problems during this/these times?

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

Why do you have problems during this/these times?

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

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

5. What are your favorite activities at school?

6. What are your hobbies or interests?

7. If you had the chance, what activities would you like to do that you don't have the opportunity to do now?

Section 3					
Rate how much you like the following subjects:					
	not at all		fair		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
Computers	1	2	3	4	5
Art	1	2	3	4	5

Section 4

1. What do you like about Reading?
2. What don't you like about Reading?
3. What do you like about Math?
4. What don't you like about Math?
5. What do you like about Spelling?
6. What don't you like about Spelling?
7. What do you like about Handwriting?
8. What don't you like about Handwriting?
9. What do you like about Science??
10. What don't you like about Science?

11. What do you like about Social Studies?
12. What don't you like about Social Studies?

13. What do you like about English?
14. What don't you like about English?

15. What do you like about Music?
16. What don't you like about Music?

17. What do you like about P. E.?
18. What don't you like about P. E.?

20. What don't you like about Computers?

21. What do you like about Art?
22. What don't you like about Art?

APPENDIX B

INTERVAL RECORDING DATA COLLECTION FORM

Student: _____ Observer: _____ Date: _____ Setting: _____

Behavior: _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
									Antecedent Modifications										
									Positive Reinforcement										
									Extinction										

21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
									Antecedent Modifications										
									Positive Reinforcement										
									Extinction										

41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
									Antecedent Modifications										
									Positive Reinforcement										
									Extinction										

61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
									Antecedent Modifications										
									Positive Reinforcement										
									Extinction										

+ = occurrence
- = nonoccurrence

Summary: _____

APPENDIX C

TREATMENT INTEGRITY FORM

Component Checklist for Treatment Integrity Jacob

Date _____

	0 (Never)	1 (Sometimes)	2 (Always)
Provide a visual chart for self-monitoring on task behavior that is changed dependent on the task/activity			
Provide frequent opportunities to gain teacher/staff attention appropriately (i.e. call on Jacob when he raises his hand).			
Modify academic assignments and activities to Jacob's instructional level.			
Provide frequent teacher/staff praise for on-task behavior as (as much as every minute to begin)			
Provide token reinforcement for expected behavior on Jacob's visual chart at the same rate as teacher/staff praise.			
Limit redirection to only when Jacob is disruptive (and be brief).			
Withhold center time at the end of the day to complete any assignment/task that he did not complete in the time allotted			
Assign Jacob to complete at home, any assignment/task that he did not complete by the end of the day.			

APPENDIX D

INTERVENTION RATING PROFILE 15

Intervention Rating Profile-15

The purpose of this questionnaire is to obtain information that will aid in the selection of classroom interventions. These interventions will be used by teachers of children with behavior problems. Please circle the number which best describes your agreement or disagreement with each statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This would be an acceptable intervention for the child's problem behavior.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for behavior problems in addition to the ones described.	1	2	3	4	5	6
3. This intervention should prove effective in changing the child's problem behavior.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The child's behavior problem is severe enough to warrant use of this intervention.	1	2	3	4	5	6
6. Most teachers would find this intervention suitable for the behavior problem described.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom setting.	1	2	3	4	5	6
8. This intervention would not result in negative side effects for the child.	1	2	3	4	5	6
9. This intervention would be appropriate with a variety of children.	1	2	3	4	5	6
10. This intervention is consistent with those I have used in classroom settings.	1	2	3	4	5	6
11. This intervention was a fair way to handle the child's problem behavior.	1	2	3	4	5	6
12. This intervention is reasonable for the behavior problem described.	1	2	3	4	5	6
13. I liked the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention was a good way to handle this child's behavior problem.	1	2	3	4	5	6
15. Overall, this intervention would be beneficial for the child.	1	2	3	4	5	6

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