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The Effects of Function-Based Self-Management Interventions on Student Behavior

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Abstract

Children with emotional and behavioral disorders (E/BD) struggle to achieve social and academic outcomes. Many studies have demonstrated self-management interventions to be effective at reducing problem behavior and increasing positive social and academic behaviors. Functional behavior assessment (FBA) information may be used in designing effective self-management interventions. The purpose of this study was to link self-management procedures to hypothesized behavior function in three children with E/BD. Results demonstrated that self-monitoring (SM) alone could be enhanced using information derived from FBA and that consequences delivered by teachers were less effective than a self-management treatment package.

Keywords

self-management, function-based interventions

Introduction

Children with emotional and behavioral disorders (E/BD) represent a small but challenging portion of the total school population. Currently in the United States, the special education system serves approximately 450,000 students with E/BD under the *emotional disturbance* (ED) label (Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). Problem behaviors typically exhibited by this population include disruptive behavior, off-task behavior, noncompliance, property destruction, and physical aggression. These behavioral problems lead to teacher dissatisfaction (George & George, 1995), poor social and emotional outcomes for children (Greenbaum & Dedrick, 1996), and crime and delinquency (Katsiyannis, Zhang, Barrett, & Flaska, 2004).

To avoid such negative outcomes, interventions have been developed that target the underlying problems, often with positive results. Interventions can be enhanced by assessing the environmental contingencies prior to implementing self-management interventions. In particular, assessments such as functional behavior assessment (FBA) allow practitioners to design effective interventions that combine rewards for appropriate behaviors with strategies to decrease problem behaviors.

School-Based Self-Management Interventions

Evidence supports self-management interventions as a way to improve the classroom behavior and social skills of children with E/BD (Cancio, West, & Young, 2004; Hoff & DuPaul, 1998; Kern, Dunlap, Childs, & Clarke, 1994; Nelson, Smith, Young, & Dodd, 1991; Peterson, Young, Salzberg, West, & Hill, 2006). Multiple reviews support the notion that interventions based on self-management and self-instruction improve academic and social behaviors in school settings (Fantuzzo & Polite, 1990; McDougall, 1998; Mooney, Ryan, Uhing, Reid, & Epstein, 2005; O'Leary & Dubey, 1979; Panagopoulou-Stamatelatou, 1990; Rosenbaum & Drabman, 1979; Stage & Quiroz, 1997). For example, Stage and Quiroz (1997) conducted a meta-analysis of interventions targeting reduction of disruptive

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classroom behaviors and found that the effect size of self-management interventions was second only to group contingencies (−0.97 and −1.02, respectively). The most common self-management interventions include self-monitoring (SM), self-evaluation, and self-management treatment packages.

SM, by which a child observes and records his or her own behavior, is the school-based self-management intervention most commonly described in literature (McDougall, 1998). Self-evaluation has the child compare his or her performance to a criterion set by someone else. SM and self-evaluation are frequently combined (packaged) with rewards, feedback, and goal setting. A review by McDougall (1998) found that approximately half of all self-management interventions included external rewards.

Several studies have addressed the practice of combining rewards or feedback with some form of self-management intervention. Broden, Hall, and Mitts (1971) found a small improvement in on-task behavior when praise was added to self-recording (80% increased to 88% on average). In addition, they found that when self-recording was removed, on-task behavior decreased to 77%. Lalli and Shapiro (1990) found that external rewards may not produce substantial effects. These researchers compared effects of SM alone to SM combined with a contingent reward on the number of sessions children needed to reach mastery on a list of sight words. With SM alone, children required 8.25 sessions on average to reach criterion. When the SM was combined with a contingent reward, the students reached criterion in 6.75 sessions. However, in a second group, three out of four students required more sessions to master sight words with contingent reward than with SM alone.

Kern et al. (1995) conducted a component analysis of a video self-evaluation program for improving peer interactions for students with E/BD. Following sessions, students evaluated their own behavior while watching a videotape of themselves in their classrooms. The researchers assessed the effects of rewards alone, rewards combined with a post-session discussion, and self-evaluation combined with rewards. Neither rewards alone nor rewards with discussion were effective. The combination of self-evaluation and rewards was most effective for increasing appropriate interactions and decreasing inappropriate interactions across all participants. Although Kern and colleagues (1995) did not utilize preassessment procedures, some authors have since preassessed interventions with functional behavioral assessment methods.

Function-Based Intervention

FBA is considered in some special education contexts as a legal requirement and in others as a best practice. Self-management interventions may be enhanced by the use of FBA (Brooks, Todd, Tofflemoyer, & Horner, 2003; Frea & Hughes, 1997; Ingram, Lewis-Palmer, & Sugai, 2005; Kern, Ringdahl, Hilt, & Sterling-Turner, 2001). For example, Ingram and colleagues (2005) compared a self-management intervention treatment package with function-based components to an intervention that was not based on the function of children's behavior. Results demonstrated a clear positive difference in favor of the function-based intervention. The results of this study are consistent with those of other research studies that involved a similar comparison (Ellingson, Miltenberger, Stricker, Galensky, & Garlinghouse, 2000; Filter & Horner, 2009; Newcomer & Lewis, 2004; Payne, Scott, & Conroy, 2007).

Purpose and Research Questions

Several issues emerge from the available research on this topic. First, even though SM and self-evaluation can be effective without additional consequences (Lalli & Shapiro, 1990), studies on function-based interventions frequently include examples of rewards for the self-managed behavior. Thus, the added effect of consequences derived from FBA to SM is unclear. Second, teachers can effectively change problem behavior by delivering consequences on varying reinforcement schedules to reward the student for using replacement or alternative behaviors (Hall, Lund, & Jackson, 1968). If schedules of reinforcement for a given behavior are too lean, that behavior may remain unchanged. Thus, the rewards may be the ultimate reason for change within self-management interventions. To address these issues, the current study was undertaken to answer the following questions:

Research Question 1: What are the additive effects of rewards to a self-management treatment package?
Research Question 2: What are the effects of removing SM from a self-management treatment package?

Method

Participants and Setting

Teachers. Participants in this study were three fully certified teachers who had varying amounts of experience, ranging from 3 to 15 years. All of them had participated in their students' most recent Individualized Education Program (IEP) meetings. Teacher 1 was the special education teacher who managed the students' IEP documentation, designed behavior interventions, and coordinated extra services for each student. Teachers 2 and 3 were general education teachers who taught and facilitated inclusion for students from Teacher 1's self-contained special education class.

Students. Study participants were three students who received instruction and supports from a school-based

self-contained program for children with serious E/BD. These individuals had been nominated for this study by their classroom teacher and been confirmed by baseline data to have high levels of disruptive behaviors. All students functioned at or below grade level in academic skills. All students and their parents spoke English as their native language.

Isaac. Isaac was a 12-year-old Caucasian male in sixth grade at the time of the study. He had been served in self-contained special education under the ED category since first grade. He now spent the entire day in special education due to the amount of intensive behavior support required. Previous testing showed that Isaac was at least three grades below his age level in all academic areas. Cognitive assessment placed him in the mild intellectual disability range (full scale IQ = 67), but the psychologist urged caution due to the boy's noncompliance during testing.

Jeremiah. Jeremiah was a 7-year-old Caucasian male in second grade at the time of the study. He had been served in self-contained special education under the category of other health impairment (OHI) since kindergarten. Jeremiah was able to participate in grade-level academic instruction, although testing showed slight deficits in all academic areas. Jeremiah's IEP reported that his cognitive skills were "average," but an exact score was not located. The majority of Jeremiah's day was spent in general education classes with supports from his special education teacher and from paraprofessionals.

Ben. Ben was a 9-year-old Caucasian male in third grade at the time of the study. He had been served in self-contained special education under the category of developmental delay (DD) since first grade. After the current study was completed, he was changed to the ED category. Ben participated in grade-level academic instruction in a general education classroom with special education supports for the majority of the school day. His cognitive assessment showed an average full scale IQ (94). Although academic assessments showed some discrepancy, he participated in the general curriculum without many academic supports.

Setting. This study took place in a school in a large urban area in the Midwest. At that time, the school had more than 460 students in Grades 1 through 6: 54.5% were Caucasian, 18.8% were Hispanic, 15.8% were African American, and 11.0% were other ethnic minorities. More than 72% of the students at the school were economically disadvantaged.

Isaac received all instruction in a special education classroom with either one or two adults (teacher and paraprofessional). For more than 50% of the day, Isaac was the only student in the classroom. Jeremiah and Ben received instruction in general education classes with paraprofessional support from the self-contained classroom. Jeremiah's and Ben's classes included approximately 20 other students, and the classrooms were arranged with tables of 3-5 students each.

Prior to baseline data collection, each teacher was asked which time of day the target child engaged in problem behavior most frequently, and observations were conducted to confirm the teacher's assessment. Both baseline and intervention sessions were scheduled during the times that the teachers reported the highest rates of problem behavior—during math lessons for Isaac and Ben and during writing lessons for Jeremiah.

Dependent Measures and Interobserver Agreement (IA)

Multiple methods of data collection were used throughout the study. The *Multiple Option Observation System for Experimental Studies* (MOOSES; Tapp, Wehby, & Ellis, 1995) was used for event recording of the behavioral measures. All observers for the study were trained on the observation system using practice videos and live opportunities until they reached a minimum of 85% agreement across all measures prior to observing. All practice observations were for a total of 15 min per session. All observers were reliable following live practice opportunities.

Data collection took place in the students' classrooms during the same time of day across all conditions. Generally the class periods in which the observations occurred ranged between 15 and 30 min, but school schedules necessitated varying lengths of instructional time during these periods. All sessions began at the same time each day for each student. Observation sessions lasted 5 min, and multiple sessions could be held each day during the designated content time. If more than one observation session was held in a day, 2- to 5-min breaks were held between them to ensure time for the child to receive earned rewards, take a short break, or score his SM sheet. On the days when data were collected, an average of three sessions were held per day per child during all phases (range = 2.94 to 3.64).

On-task behavior. *On task* was defined as the student attending to the material and the task (e.g., answering/asking questions related to the assignment, reading, writing, etc.), requesting assistance in an acceptable manner, making appropriate motor responses such as hand-raising, remaining seated, or waiting appropriately for the teacher to begin or continue with instruction. On-task behavior was recorded as a duration code: The code was entered only after the behavior had occurred for at least 3 s. The *MOOSES* program enables observers to toggle between on-task and off-task behavior. The two behaviors were considered mutually exclusive, and each had to occur for 3 s for toggling to be recorded. At the end of each observation, on-task behavior

was summarized as a percentage of total session time that the child was on task.

Disruptive behavior. *Disruptive behavior* was defined as behavior such as talking to adults or peers when not appropriate, making noises with mouth or materials, or making motor movements that generate noise in the classroom. Disruptive behavior was recorded as a frequency code: A cessation of 3 s was required for disruptions to be considered as separate occurrences. Talking to peers and other vocal behaviors were counted with specific starts and stops in an interchange when a 3-s interval occurred in between interchanges. At the end of the observation, disruptive behavior was summarized as rate of occurrences per minute.

IA. A second observer recorded behavior simultaneously during all phases of the study to ensure that observations were reliable and accurate. During the entire study, interobserver–observer agreement (IOA) data were collected for 25.58% of all sessions, with at least one two-observer session per phase for each child. IOA was calculated using the *MOOSES* computer-based software, which used time window analysis, separating the total observation time into 3-s intervals. An agreement was indicated if both observers recorded an occurrence of a behavior in the same interval. The *MOOSES* software divided the number of agreements by the sum of agreements and disagreements and converted the resulting ratio to a percentage. Agreement was 94.91% (range = 55.23% to 100%) for on-task behavior, 84.94% (range = 77.11% to 93.18%) for disruptive behavior, and thus 89.92% across the variables.

FBA

Three types of FBA were used for the present study. First, structured interviews based on the Functional Assessment Interview (FAI; O'Neill et al., 1997) were conducted with the students' teachers. Following the interviews, direct observations of the antecedents and consequences of the students' behaviors were conducted in the classrooms. Finally, brief experimental functional analyses were conducted in the classrooms with the teachers implementing the various conditions according to protocols utilized in a recent study (Bessette & Wills, 2007). The FBA for each student was conducted following baseline and initial SM phases to ensure accuracy of function prior to proceeding with the function-based self-management (FBSM) intervention.

Functional analyses included three major conditions: (a) a control condition, during which no academic demands were made and teacher attention was delivered on a fixed time (30-s) noncontingent basis; (b) an attention condition, during which adult or peer attention was delivered contingent on the target problem behavior; and (c) an escape condition, during which academic demands were made frequently and escape opportunities (i.e., short breaks) were provided contingent on target problem behavior. Teachers were trained on the functional analysis procedures, the purpose of which was to provide confirmation of the behavioral function hypothesized from the interview and observations. Table 1 includes a summary of functional behavioral assessment and functional analysis results.

Table 1. Functional Behavioral Assessment Results.

			Functional analysis		
Student	Interview	Observation	Attention	Escape	Control
Isaac	Escape	Escape and attention	0.2/min	1.5/min	0.2/min
Jeremiah	Peer attention	Peer attention	3.3/min	0.4/min	0.6/min
Ben	Escape and attention	Escape and attention	1.0/min	5.0/min	0.0/min

Isaac's FBA. Isaac's disruptive behavior occurred most frequently during core academic instruction. According to his teacher, if academic demands persisted after Isaac became disruptive, his behavior would escalate to the point of physical aggression, self-injury, or property destruction. Therefore, all observations and experimental conditions would terminate if Isaac engaged in any of the severe problem behaviors listed. The interview, direct observations, and functional analyses indicated that Isaac's disruptive behaviors were maintained by escape from academic demands. The teacher hypothesized that her certainty of this hypothesis was at or greater than 90%.

Jeremiah's FBA. Jeremiah's disruptive behavior occurred most frequently during independent seat work and instructional activities utilizing group work. When peers were present, Jeremiah's levels of disruptive behavior were generally higher. When interviewed, the teacher hypothesized at greater than 90% certainty that Jeremiah was disruptive to obtain peer attention. Observations indicated that he most frequently received attention from his peers when he engaged in problem behaviors. A functional analysis condition was designed that allowed peers to provide attention to Jeremiah's disruptive behaviors. These tests indicated that Jeremiah was more disruptive when peers were present than when they were not. In this case, both direct observations and the functional analysis conditions supported the teacher's hypothesis from the interview.

Ben's FBA. Ben's teacher expressed concern regarding elopement. During the interview, the teacher explained that elopement was preceded with disruptive behaviors and threats. It was hypothesized that Ben's behavior was

Table 2. Components During Sessions.

Variables in effect during each condition	Student	Baseline	SM	FBSM	FBC
Skill review and reminder	All		✓	✓	✓
SM form used by student	All		✓	✓	
Timer used by student	All		✓	✓	
Timer used by teacher	All		✓	✓	✓
Goal setting	All		✓	✓	
Break alone or break with peer tickets	All			✓	✓
Opportunities to respond per session (average)	Isaac	1.0	3.3	2.1	1.7
	Jeremiah	0.8	1.3	0.9	2.3
	Ben	0.8	1.6	1.7	1.7
Praise per session (average)	Isaac	0.5	0.8	1.0	0.6
	Jeremiah	0.2	0.1	0.1	0.5
	Ben	0.1	0.0	0.1	0.0
Reprimand per session (average)	Isaac	0.4	0.2	0.1	0.3
	Jeremiah	2.1	2.2	0.6	0.2
	Ben	0.7	0.9	0.1	0.0

Note. SM = self-monitoring; FBSM = function-based self-management; FBC = function-based consequences. Response opportunities, praise, and reprimands were not considered components of the interventions. While there are discrepancies between conditions, the measures are reported as means and combined across the same conditions (e.g., means were calculated for all FBSM conditions).

maintained primarily by escape from math tasks, but the teacher suggested only a 50% likelihood that escape was the primary motivator for his problem behavior. A brief functional analysis was conducted, and two trials that tested for escape yielded much higher levels of disruptive behaviors than trials for attention. Thus, it was determined that Ben's behavior was primarily escape maintained.

Intervention Procedures

The current study consisted of four conditions. Baseline was an assessment of naturally occurring contingencies for on-task and problem behavior. SM assessed the effects of SM without function-based interventions. FBSM was an assessment of the combination of function-based reinforcers and SM. Finally, the function-based rewards were tested in isolation, without a SM component. Table 2 includes a description of the variables in effect during each condition. In addition, Table 2 includes natural rates of opportunities to respond, praise (i.e., attention to appropriate behaviors), and reprimand (attention to inappropriate behaviors) during each condition, as these were not manipulated as components of the interventions.

Materials. Materials used for this study were a silent timer, SM sheet, and reinforcer tickets. The silent (kitchen) timer could emit a "beep" noise or vibrate. Throughout the study, Isaac was the only student in his classroom, so he could choose to use the beep or the vibration. Jeremiah and Ben had their timers set to vibrate so that the classroom was not disturbed. The SM sheet was the same for all participants. It listed on-task skills, including (a) follow directions the first time, (b) ignore others' inappropriate behavior, (c) stay in your seat, and (d) raise your hand to get the teacher's attention. Below the skills was a row of boxes where the children could record their on-task behaviors when the timer went off. Reinforcer tickets were provided to the students during the FBSM package phase. Tickets were exchanged for 1 min of break time (either with peers or without depending on identified behavioral function). Contingent and noncontingent breaks are frequently found in the function-based intervention literature (Kodak, Miltenberger, & Romaniuk, 2003; Vollmer, Marcus, & Ringdahl, 1995).

Baseline condition. Prior to the intervention procedures, baseline data were collected under the conditions in which the interventions would eventually take place. During baseline, all variables were naturally occurring; that is, the teachers were instructed to conduct "business as usual" in their classroom routines. Observers recorded teacher praise and reprimands, along with opportunities to respond, as these are common variables that influence children to respond. Observations were in 5-min segments with 3 to 5 min between observations. New observations began when new activities or trials began.

SM training. Before the SM phase, the teacher was taught the steps of the procedure and the researcher set up a time to

observe the intervention and assist with its implementation. Students learned about the SM process in the setting in which it would take place. They were taught how to set a goal (i.e., how to divide the 5-min session according to their goal), how to mark the form, and how to show the teacher the completed form.

During initial training sessions, the students were prompted to set a goal for 3 points to be earned during the 5-min session. The students were then prompted to set the timer for 1 min. Doing so provided them with opportunities to reach their goal with possibilities for mistakes. After several sessions, the students determined their own goals. Teachers assisted the students to ensure that the timer intervals would provide enough opportunities to reach the goals.

After initial training, all three students frequently set goals of four and then set 1-min intervals on their timers. The skills for on-task behavior were also taught to the students during this phase, using examples and nonexamples of following rules. As soon as the children reached at least 80% accuracy on SM, the SM sessions began.

SM. During SM sessions, each child was given the SM sheet, a timer, and a pencil. The teacher reviewed with the child the skills that constituted on-task behavior, then the child was asked to set a goal for the next 5 min. The child set the timer, and the teacher began normal instruction. When the timer vibrated or emitted a beeping sound, the child determined whether he was on task—recording *1* in the appropriate box if he was on task or *0* if he was not. At the end of the session, the child determined whether he had met his goal based on the total number of *1* marks in the boxes. Isaac's and Ben's teachers could prompt on-task behavior. All three teachers were required to minimize attention to appropriate behavior so researchers could discern whether under all treatment conditions the function-based contingencies would maintain the desired behavior changes. When stability was established in both level and trend for on-task and disruptive behavior, a FBA was conducted.

FBSM. After the functional behavioral assessment was completed, treatment packages containing SM and consequences for appropriate and disruptive behavior were created for each participant. The SM procedures were the same as the SM condition. Disruptive behaviors of Isaac and Ben were found to be maintained by escape from demands. For Jeremiah, peer attention maintained problem behaviors. Thus, consequences for appropriate behavior contingent on reaching the children's goals included "break tickets" to be turned in for 1-min breaks from instruction or a 1-min break to be spent with a friend. Consequences for disruptive behavior were prompts for getting back on task. A protocol was distributed, reviewed, and practiced with the teachers prior to implementing the intervention.

Function-based consequences (FBC). After a demonstration of the effects of the FBSM package, the SM component was removed and the ticket consequences retained. During this intervention, the teacher controlled the distribution of the tickets. After 5 min, the teacher judged whether the student had been on task and gave him a ticket if appropriate. During each session, the teacher and child reviewed the on-task skills, and the student was reminded that if he was on task, he would receive a ticket. After receiving the ticket, the child was told he could use it for a break or time with a friend at that moment (as in other conditions) or later. This phase was conducted until stable levels and trends were determined.

Implementation Quality Measures

Treatment fidelity. Fidelity was measured before, during, and after sessions by using a five-item questionnaire addressing variables before the session (goal setting, skill review), during the session (use of timer and SM form), and afterward (delivery of reward). Fidelity was summarized as a percentage of total items on the fidelity form delivered with fidelity. Although the SM-only and FBC phases had fewer components, fidelity was measured using the same form as the FBSM treatment package. The only fidelity item needed during the function-based consequence phase was whether the teacher provided the reinforcer at the end of the session, which was 20% throughout this phase. Fidelity during the SM averaged 50% (range = 40% to 60%) across all SM phases for all participants. Fidelity during the FBSM package intervention was consistently 100% across all teachers and across phases of the study for all participants. Observers were trained on completing the fidelity measure, including the specifics of each item. For instance, observers would score the reward delivery item only if the reward was delivered immediately and was contingent on appropriate behaviors.

Social validity. A nine-question social validity questionnaire was created using a 7-point Likert-type scale. Questions asked were about (a) the goals of the proposed intervention, (b) acceptability of the intervention, and (c) effectiveness of the intervention. Teachers were provided the students' graphs along with the social validity questionnaire and told to refer to the graphs as they answered the questions.

Research Design and Analysis

A single-case ABCBCDC reversal design was used to demonstrate experimental control. Conditions were the baseline (A), effects of the SM component alone (B), the FBSM package (C), and the FBC component alone (D). This allowed the effects of the function-based SM package to be compared with SM alone and consequences alone. Visual analysis was conducted by observing within- and between-phase patterns, which include level, trend, and variability.

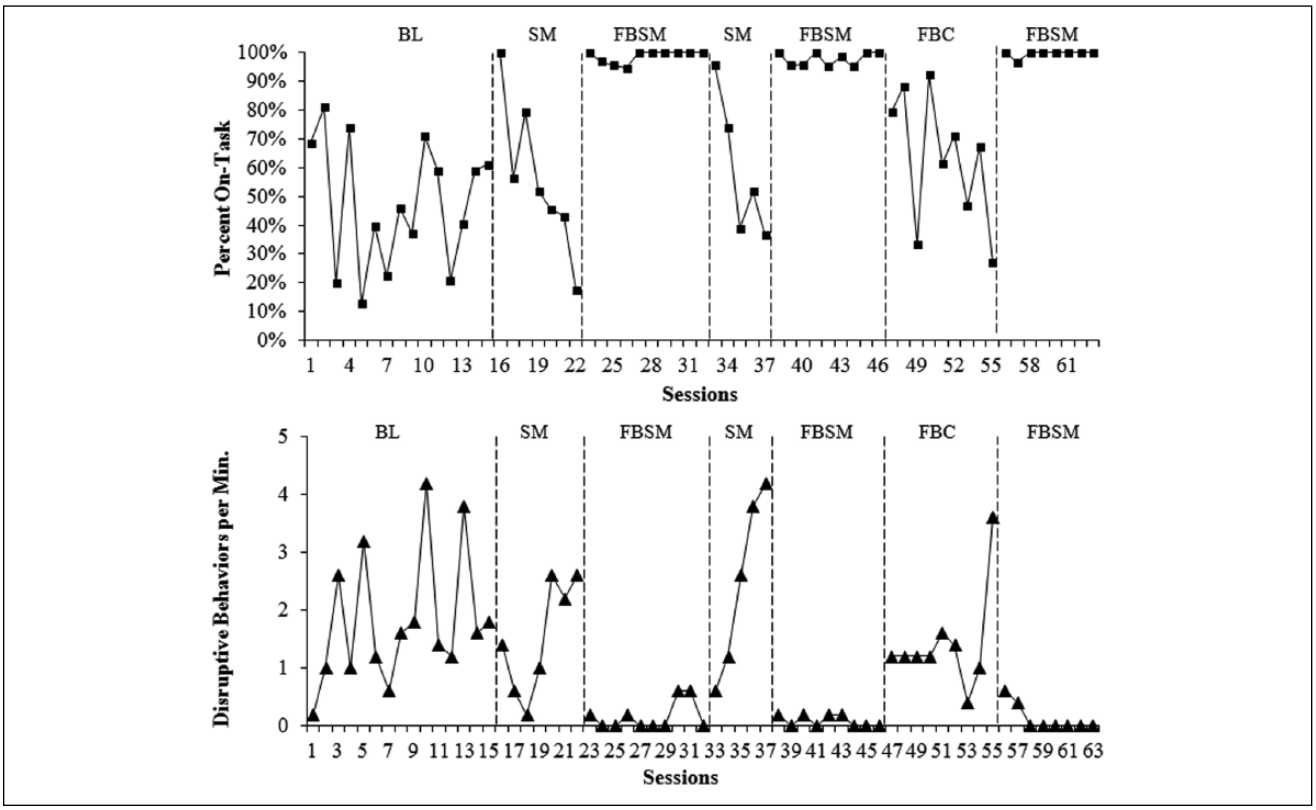

Figure 1. Isaac's data for BL, SM, FBSM, and FBC.
Note. BL = baseline; SM = self-monitoring; FBSM = function-based self-management; FBC = function-based consequences.

Results

Graphic representations of results are included in Figures 1 through 3. Overall, results showed a functional relationship between the FBSM intervention and increases in on-task behavior with reductions in disruptive behavior.

Visual Analysis

The three students' on-task and disruptive behaviors showed similar patterns. During baseline, all three students' behavior was variable. When the SM intervention was implemented, all students' on-task behaviors increased and disruptive behaviors decreased. However, immediate decreases in trends for on-task behavior and increases in trends for disruptive behaviors occurred. Once a detectable trend was identified, the FBSM package was implemented. During the first and subsequent self-management phases using packaged intervention, the level was uniformly high for on-task behavior and the data varied only slightly. During the packaged intervention phases, disruptive behaviors showed only slight variability, and the levels were uniformly low across all three students. A second SM-only phase showed a similar trend to the first for both on-task and disruptive behaviors. When consequences were implemented without the SM, the level was generally lower, yet the data were variable. Few data points during the consequences only phase overlapped any data points in the packaged intervention phase for each measure.

Social Validity

Results from the social validity questionnaire are displayed in Table 3. A few discrepancies were found among the three teachers. On Item 5, for example, Teacher 2 indicated being less likely to use a self-management intervention than the other two teachers. Overall, each teacher considered the goals, acceptability, and effectiveness of the interventions to be socially valid.

Discussion

Overall Findings

The questions addressed by the present study dealt with the effects of adding and removing components of a FBSM intervention. These questions were answered with a reversal design, and results were uniform across three students with

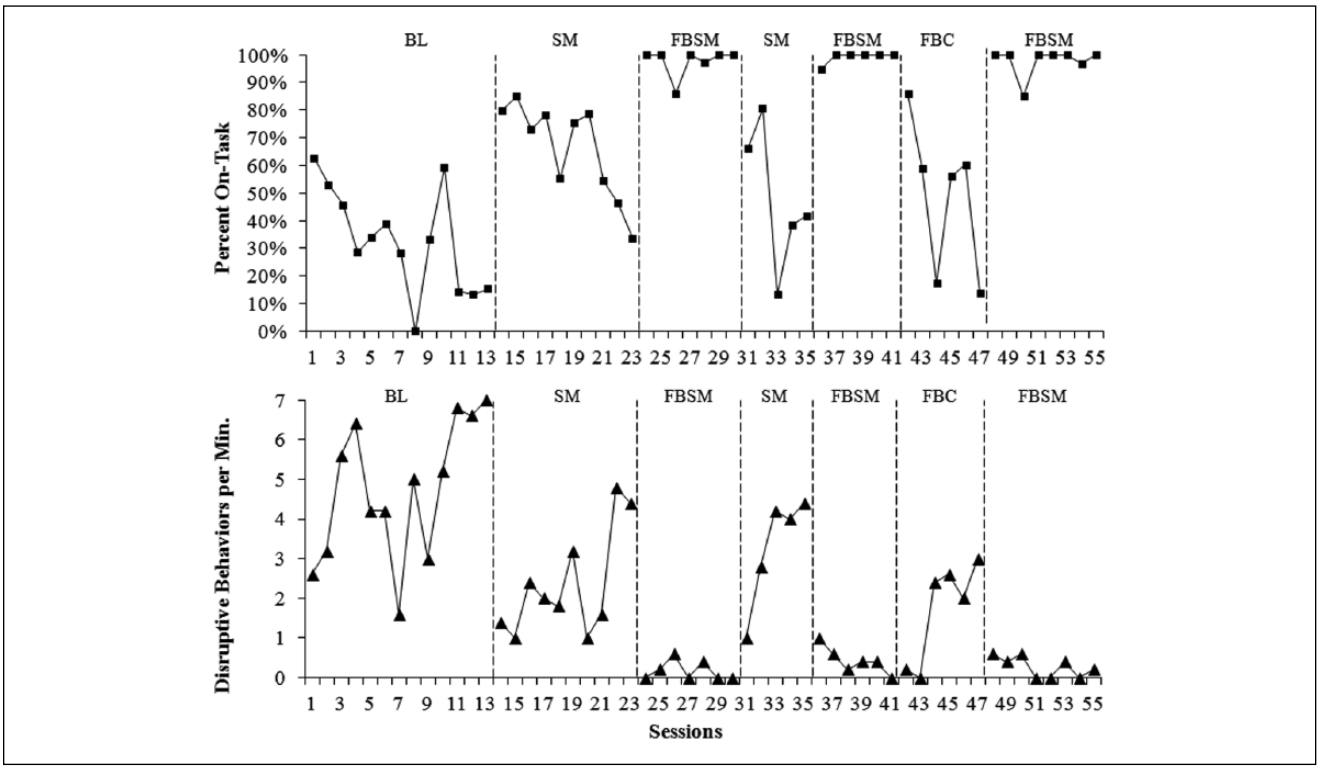

Figure 2. Jeremiah's data for BL, SM, FBSM, and FBC.
Note. BL = baseline; SM = self-monitoring; FBSM = function-based self-management; FBC = function-based consequences.

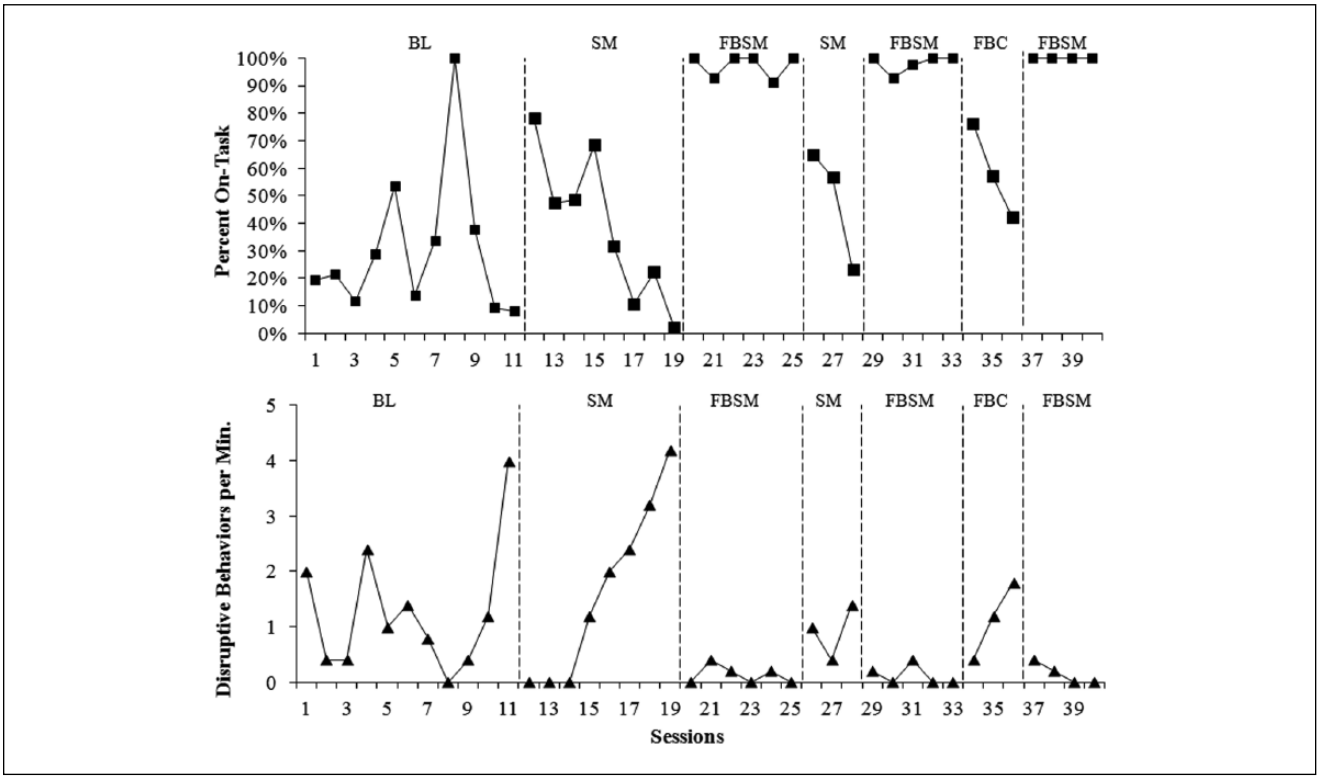

Figure 3. Ben's data for BL, SM, FBSM, and FBC.
Note. BL = baseline; SM = self-monitoring; FBSM = function-based self-management; FBC = function-based consequences.

Table 3. Item-by-Item Responses to the Social Validity Questionnaire.

	Teacher 1	Teacher 2	Teacher 3	Average
1. How important is it to increase the target student's academic engagement in your classroom?	7	7	7	7.0
2. How important is it for your target student to learn to manage his own behavior?	6	7	7	6.7
3. How important is it to reduce your target student's disruptive behavior in your classroom?	7	7	7	7.0
4. How much effort is required to implement the self-management intervention compared with other interventions?	5	5	3	4.3
5. If you are faced with a similar problem in the future, would you use a self-management intervention similar to this one?	7	4	6	5.7
6. Given the student's behavior problems, how well did this intervention address the student's overall problems during the intervention?	7	5	5	5.7
7. Compared with baseline, how effective do you rate the self-management intervention?	7	5	6	6.0
8. Compared with self-monitoring only, how effective is the self-management intervention?	6	4	6	5.3
9. Compared with positive consequences only, how effective is the self-management intervention?	7	5	6	6.0

E/BD. Results from this study demonstrated that FBSM interventions were effective in improving socially important behaviors and were acceptable to practitioners. Kern et al. (2001) noted how these interventions have generally been simple to implement, especially when the effort is compared with the results that can occur. The findings from the present study were similar, in that teachers were able to implement these interventions in their classes with limited researcher assistance. Though similar to other studies, the present study extended the work of Kern and colleagues (2001) by implementing the intervention in a public school setting, including two general education classes with more than 20 students in addition to the participant.

The primary purpose was to analyze the intervention components by implementing SM and function-based rewards separately and together. Findings from this study indicated that the purposes were accomplished in several ways. First, the FBSM intervention resulted in substantial decreases in problem behavior and substantial increases in on-task behavior during the sessions for all three participants. Second, intervention components were implemented separately and together, and neither SM of on-task behavior or contingent reward for on-task behavior maintained the same levels of appropriate behaviors alone as combined.

Had consequences alone been sufficient to maintain appropriate behavior, an alternative reason for using a SM component would have been required to justify its use. Consequences would likely have produced higher levels of on-task behaviors had they been delivered at shorter intervals, but it is apparent that SM helped the students in this study bridge the delay between the beginning of the session and the delivery of the positive consequences.

FBA to Design Intervention

This study adds to the research evidence that FBC can and should be added to SM interventions. While SM initially increased on-task behavior and decreased disruptive behavior for all participants, both behaviors returned to baseline levels within several sessions. Adding FBC to SM and creating a treatment package increased on-task behavior and reduced disruptive behavior for all participants. These effects were replicated across two additional phases and all three participants. When the SM component was withdrawn, the levels returned to points similar to baseline and SM alone.

Limitations

Several limitations to the present study are acknowledged. This study was conducted during a brief focused time period: on average about 15 min per day, a small portion of the day for these students. In spite of this limitation, teachers were pleased with the results they observed. The functional analyses also were brief. A brief assessment was selected to support the findings of the descriptive and observational functional assessments.

During the function-based consequence condition, the teacher determined whether the child had been on task for the majority of the session. Research by Tiger, Fisher, and Bouxsein (2009) compared therapist-administered consequences by having the therapist monitor self-injury using the same materials as the participant. A potential limitation to the present study was that the teacher did not monitor the children's behaviors with timer

intervals like the children monitored themselves. A phase comparing teacher-monitored to child-monitored behaviors would have reduced the likelihood that poor student response was a function of longer intervals without cues or reinforcers. In addition, it is possible that the order in which the intervention components occurred produced the effects demonstrated in this study. FBC might have improved behavior without SM had they been tested immediately after baseline, but including consequences in the function-based intervention could have created dependence on cues and points, especially because the tickets would have been novel after baseline. Another limitation was that the FBC condition was only implemented once, while the SM condition was implemented twice.

Future Research

Future research should address the effects of FBSM interventions on generalization of appropriate behavior to additional situations, settings, times of day, and so on. As the overarching goal of a self-management intervention is to increase individuals' ability to manage the contingencies that influence their behavior, future research should address the extent to which elementary-aged children with E/BD can identify the contingencies that prompt and reinforce their own behavior and can use this information to create self-management strategies for themselves.

Conclusion

Teachers, school psychologists, and other practitioners can benefit by applying the approach to self-management provided in this study. By conducting FBA prior to implementing self-management, they can enhance the effects of their intervention by linking assessment to the chosen replacement behaviors, the selected consequences, and the procedures. With such a program, teachers and school personnel have research-based methods for dealing with classroom management challenges. Most important, of course, children with E/BD are able to develop new skills and to better manage their own behavior.

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