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Escape-to-Attention as a Potential Variable for Maintaining Problem Behavior in the School Setting

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Abstract. Mueller, Sterling-Turner, and Moore (2005) reported a novel escape-to-attention (ETA) functional analysis condition in a school setting with one child. The current study replicates Mueller et al.'s functional analysis procedures with three elementary school-age boys referred for problem behavior. Functional analysis verified the participant's problem behavior was maintained by escape from academic demands. Follow-up functional analyses in which target behaviors in escape versus ETA conditions were compared resulted in higher levels of target behavior in the ETA condition for 2 of the 3 participants. The current study also extended previous research by including a treatment analysis. Treatments designed to address escape and attention functions were more effective at reducing the target behaviors than treatments designed to target escape alone for all 3 participants. Results and implications for future research are discussed.

Incorporating experimental analyses into a functional behavioral assessment is an effective and time-efficient approach for the assessment and treatment of problem behavior (Hanley, Iwata, & McCord, 2003; Mueller, Sterling-Turner, & Moore, 2005; Mueller, Nkosi, & Hine, in press). The functional analysis methodology developed by Iwata, Dorsey, Slifer, Bauman, and Richman (1982) is an analogue evaluation of problem behavior in which purported reinforcers are withheld and then delivered contingent upon target behavior. In their original work, Iwata and colleagues measured levels of target behaviors during experimental conditions (i.e., attention, escape, alone) and compared the data to levels of target behavior in a control condition in which the reinforcers were available noncontingently. Iwata et al.'s methodology has been used extensively to identify the behavioral function of self-injurious behavior in clinical settings and has been used with a variety of behaviors and in other nonclinical settings. Although use of functional analysis proce-

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dures is reported less commonly in school settings (Hanley et al., 2003), studies have been reported with examples of disruptive school-based behaviors reinforced by peer attention (e.g., Broussard & Northup, 1997), teacher attention, (e.g., Gunter, Jack, Shores, Carrell, & Flowers, 1993), access to tangible items (e.g., Moore, Mueller, Dubard, Roberts, & Sterling-Turner, 2002), and escape from academic demands (e.g., Broussard & Northup, 1995).

Although a functional behavioral assessment, including experimental analysis, may not be necessary to address all disruptive behaviors in school settings (Gresham et al., 2004), additional research on the effect of idiosyncratic variables is needed. In school settings, as in other nonclinical settings, unique environmental variables (e.g., setting, personnel, physical) could require modifications to the standard functional analysis conditions typically reported. For example, in school settings, tasks in the form of academic demands (e.g., ongoing instruction, independent practice worksheets) are, at least theoretically, present throughout the majority of the day. Likewise, concurrent and potentially competing reinforcers in the form of peer attention, teacher attention, or preferred activities (e.g., reading a more desirable book) or items (e.g., playing with a toy hidden in a desk) for inappropriate behavior may be present. Thus, students may be provided with escape from academic demands, while subsequently being provided with an additional reinforcer for problem behavior. Because student behavior can be under the discriminative control of multiple antecedent events or reinforced by multiple variables (e.g., teacher and peer attention, access to preferred materials, breaks from work), it is important to examine a combination of factors that may be maintaining problem behavior in the classroom.

Over the past few years, investigations of the effects of multiple variables have begun in and out of the classroom. For example, Hoff, Ervin, and Friman (2005) examined the separate and combined effects of escape and peer attention on disruptive behavior in the general education classroom. Following a descriptive assessment, including interviews and direct observations, Hoff and colleagues formulated three hypotheses to test in an alternating treatments design: access to peer attention, escape from a nonpreferred activity, and access to peer attention *and* escape from a nonpreferred activity. Treatment analysis data verified the initial hypothesis of access to peer attention and escape from academic demands. In addition, a combined intervention targeting both attention and escape decreased problem behaviors to near zero levels.

Moore, Mueller et al. (2002) investigated the influence of the simultaneous delivery of therapist attention on self-injurious behavior in a tangible condition. Following the initial functional analysis, attention in the tangible condition was evaluated using a reversal design. In one phase, juice and brief attention were delivered contingent on self-injurious behavior. In the second phase, the delivery of the preferred stimulus (juice) was returned contingent on problem behavior and attention was withheld. The results of the follow-up analysis demonstrated that self-injurious behavior occurred at higher rates when the juice and attention were delivered concurrently than when the juice was presented alone.

By incorporating procedural variations in the functional analysis methodology, Moore, Mueller et al. (2002) demonstrated that the presence of attention could confound the outcomes of functional analysis conditions. Moore and colleagues hypothesized that "practical solutions for the tangible condition might be to restrict attention as much as possible or to weaken the dependency between problem behavior and therapist attention by delivering attention on a response-independent schedule" (p. 284). However, Moore, Mueller et al. did not present treatment data to support their hypothesis. It is conceivable, though, as the authors suggested, that the influence of attention might affect other consequent analysis conditions.

In Mann and Mueller (2009), the functional analysis results of a girl's aggression appeared to be maintained by attention. The results of the functional analysis of her behavior showed high levels of aggression in the attention condition and low levels in an escape from academic demand, access to tangibles, and a toy play control. When she failed to acquire a functional communicative response to replace aggression for attention, a follow-up functional analysis was used to evaluate whether access to attention was part of a chain of reinforcers maintaining aggression. In the follow-up analysis, attention-to-tangibles, attention-to-escape, and attention alone as a control condition were each used. Aggression was high in the attention-to-tangibles condition and low in the attention-to-escape and the attention-only control. When functional communication training was used to address the attention-to-tangibles (i.e., manding for access to tangibles and attention, rather than attention only), the response was acquired and the aggression decreased. These results highlight two issues relevant for school-based functional analysis. First, Iwata et al.'s (1982) methodology is useful, even if structural variants to assess multiple reinforcers are required. Second, for behaviors maintained by multiple reinforcers, matching treatments to both reinforcers may be required to reduce target behaviors substantially.

Mueller et al. (2005) provided pilot data for an ETA condition used in a school setting. For one child, a functional analysis with an escape, attention, and toy play conditions was conducted using the procedures described by Iwata et al. (1982). Results of initial functional analysis showed that problem behavior only occurred in the escape from academic demand condition, however, lower than that typically was observed in the classroom setting. After escape was identified by the initial functional analysis, the researchers assessed a combination of variables to determine whether differential levels of problem behavior would occur with the addition of attention during the break from academic demands, as this was observed in the direct behavioral observation prior to the initial functional analysis. In the follow-up functional analysis, the escape-only, ETA, and control conditions were presented. A substantially higher level of tantrums was demonstrated in the ETA condition than in the escape-alone condition or the control conditions.

Mueller et al. (2005) hypothesized that without the information derived from the follow-up analysis, an intervention based on the escape-only hypothesis would have failed. Although the results of Mann and Mueller (2009) provide some support for this hypothesis, Mueller et al. (2005) did not provide any intervention data. Other limitations should be addressed as well. First, the investigation was a pilot study of the ETA condition and involved only one participant. Another limitation was that the consultant collected all data and, because of staffing issues, no interobserver agreement data (IOA) were collected.

Given the limitations of Mueller et al. (2005), the current study was undertaken with two primary goals. First, we replicated Mueller et al.'s ETA investigation with additional participants and in a more controlled manner, including IOA data and multiple behavioral observers, to determine whether the ETA function would emerge in additional participants. The second goal was to extend Mueller et al. by evaluating two different behavioral interventions, one that presented an escape-only treatment and one that was matched to both functions (escape and teacher attention). We predicted that differential treatment results would emerge for students who showed higher levels of problem behavior in the ETA condition, with stronger treatment effects favoring the combined treatment for children with an ETA function when compared to children with escape-maintained problem only.

Method

Participants and Setting

Three elementary school-age boys referred for problem classroom behavior participated. All students were enrolled in public schools and were placed in general education classrooms in a rural Southeastern school district. Teacher and parental consent were secured for participation; participant names used hereafter are pseudonyms. Brandon was a 6-year-old Caucasian male enrolled in a general education first-grade classroom. Brandon was diagnosed with attention deficit hyperactivity disorder (combined type) when he was 5-years-old and was prescribed a 10-mg dose patch of methylphenidate (Daytrana). Franklin and J'Marcus were 5-year-old African American males enrolled in separate general education kindergarten classrooms. J'Marcus and Franklin had no medical diagnoses and were prescribed no medications.

All sessions were conducted in the participants' classrooms during typically scheduled activities that corresponded to teacher-reported times when problem behaviors were most frequent. The students' classroom teachers implemented all functional analyses and treatment evaluation sessions.

Measures

Functional Assessment Informant Record for Teachers (FAIR-T). The FAIR-T is an instrument administered to teachers to generate hypotheses concerning the function of problem behavior (Edwards, 2002). The FAIR-T is designed with four components to achieve this purpose: (a) general referral information, (b) identification and description of problem behavior, (c) potential antecedents for problem behavior, and (d) potential consequences that follow the problem behavior most frequently. Researchers have demonstrated that the hypotheses generated from information gathered via the FAIR-T correspond with behavioral function identified in experimental analyses (e.g., Doggett, Edwards, Moore, Tingstrom, & Wilczynski, 2001; Dufrene, Doggett, Henington, & Watson, 2007).

Intervention Rating Profile-15 (IRP-15). The Intervention Rating Profile-15 (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985) was used as a social validity measure of the treatment conditions. The IRP-15 is composed of 15 questions that the respondent rates on a Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Ratings range from a total score of 15–90, where a total score above 52.50 represents a rating of "acceptable" (Von Brock & Elliott, 1987). The IRP-15 has high reported internal consistency (Cronbach $\alpha = .98$), and all items load on a General Acceptability Factor (ranging from 0.82 to 0.95; Martens et al., 1985).

Problem behavior. Child *problem behavior* served as the primary dependent variable and was reported as the percentage of intervals in which the behavior occurred. Problem behavior included: *inappropriate vocalizations* (Brandon, J'Marcus, Franklin), which was defined as talking or yelling without teacher permission; *elopement* (J'Marcus), which was defined as any movement 1 m away from the teacher or teacher-designated area without permission; and *banging on surfaces* (Franklin), which was defined as throwing academic materials in a downward motion to the desk, and/or floor so that it made an audible sound on impact. Additional data were also collected for task engagement during the treatment evaluation phases. *Task engagement* was defined as the student's eyes directed at work materials and/or manipulating objects associated with the teacher command. Task engagement is presented as the percentage of intervals in which behavior was observed during a session. A 10-s partial interval recording system was used for all observations. All sessions were 10 min in length.

Procedures

First, functional behavioral assessments that included teacher interview and direct classroom observations were conducted to generate hypotheses of behavioral function. Second, functional analyses were used to verify escape from task demands as the maintaining variable for referred behaviors. Third, follow-up functional analyses were used to investigate the additive effects of attention delivered during the break from academic demands (i.e., ETA). Finally, two different treatments were compared to examine the effects on target behavior when an escape-only treatment was alternated with an intervention package that targeted escape and attention.

Functional behavior assessment. Each teacher was administered the FAIR-T as a semistructured interview in order to define target behaviors and their immediate antecedent and consequent events. Next, direct behavioral observations were conducted in the students' classrooms. The information obtained from the functional assessment was used to form hypotheses about potential behavior-reinforcer relationships. Conditional probabilities (VanDerHeyden, Witt, & Gatti, 2001) were also calculated from the observational data to determine the temporal proximity of specific consequences and target behaviors. Conditional probabilities for each participant were as follows: Brandon—escape = 74%, teacher attention = 24%, peer attention = 0%; Franklin—escape = 66%, teacher attention = 25%; peer attention = 5%; J'Marcus—escape = 59%, teacher attention = 29%, peer attention = 9%. Descriptive data suggested escape from academic demands or teacher attention in the form of reprimands and redirection to work might be reinforcing the target behaviors identified for each child. Thus, each child proceeded to the experimental phases of the study reported below.

Functional analysis. A hypothesis-driven (Repp, Felce, & Barton, 1988) functional analysis was used to identify the reinforcers for problem behaviors. For each participant, escape from academic demands and teacher attention were tested. A play condition was included as an experimental control. Conditions were presented in a random order and results were evaluated using a multi-element design. All conditions were 10 min in duration. A 2-min break was given between conditions. During the break, the student and teacher continued with the naturally occurring classroom activities (e.g., read a book, transitioned between activities). Students were not informed of changes in contingencies across sessions and different stimuli were used were used across conditions (e.g., academic worksheets during demand conditions; leisure items during attention conditions). Each participant's teacher implemented the functional analysis and conducted between 2 and 4 sessions per day.

Control (play) condition. The student was provided free access to attention and preferred play materials available in the classroom. The teacher engaged in interactive play with the student and delivered attention at least every 30 s. No programmed consequences or demands were delivered for target behaviors.

Attention condition. The student was allowed unrestricted access to activities/items typically available in the classroom. The teacher interacted with the student until he was engaged in an activity. Next, the teacher removed herself from the activity, saying she needed to do work at her desk. Contingent on target behavior(s), the teacher delivered verbal attention in the form of reprimands or redirection to work, consistent with verbalizations noted in the descriptive observations. Following the delivery of attention, the teacher returned to work and the student continued to have free access to preferred items.

Escape from academic demand condition. During the escape condition, the student was presented with work materials identified by the teacher as associated with problem behavior in the past. A graduated prompting (i.e., verbal, gestural, physical) sequence was used to deliver academic demands. If problem behavior occurred, the teacher removed the academic demand and walked away from the student. No attention was provided to the student. Following the 30-s break period, the teacher returned to the student and delivered another demand and repeated the procedure described above.

Follow-up functional analysis. Following the initial functional analysis, a follow-up functional analysis was conducted to investigate the additive effects of attention during the escape condition. All conditions were 10 min in duration, and 2-min breaks were given between conditions. The teacher implemented between 2 and 4 experimental conditions per day. The escape from academic demands and control/play conditions were implemented in an identical manner as in the initial functional analysis.

Escape-to-attention condition. During the ETA condition, the student was presented with work materials identified by the teacher as associated with problem behavior in the past. A graduated prompting (i.e., verbal, gestural, physical) sequence was used to deliver academic demands. Contingent on target behavior, the teacher removed the task materials *and* provided verbal attention during the 30-s break. The quality of teacher attention during the escape break and the nature of teacher attention were based on information obtained in the descriptive assessment (i.e., reprimands, redirections, physical attention). During the 30-s break, the teacher continued to deliver attention to the student in the typical manner for that classroom (e.g., "You need to get back to work", "I told you no screaming, you have to work."). Following the 30-s break, the teacher represented the task and the prompting sequence continued.

Treatment evaluations. A treatment comparison was employed to evaluate the target behavior under two different treatment types. One treatment, Escape Extinction, targeted escape only. The other treatment (Escape Extinction + Differential Reinforcement of Alternative Behaviors), targeted escape and teacher attention. The ETA treatment conditions were evaluated using a B/C/B/C design for Brandon and C/B/C designs for Franklin and J'Marcus.

Escape extinction (EE). The EE condition was identical to the escape condition from the functional analysis with the exception that no break was delivered for target behavior. Difficult academic materials were presented using a graduated prompting sequence. No attention was delivered for target behaviors.

Escape extinction + differential reinforcement of alternative behaviors (EE+DRA). The EE+DRA condition was implemented identical to the EE condition with one exception. During EE+DRA phase, the schedule of attention was based on the descriptive data obtained during baseline observations. For Brandon and J'Marcus, attention was delivered every 30 s contingent on demonstrating appropriate behavior. For Franklin, teacher attention was delivered every 15 s. In this phase, teacher attention consisted of descriptive praise for appropriate behavior (i.e., task engagement; "Great job working.") and/or physical attention (e.g., pats on the back). If problem behavior occurred when the interval elapsed, the interval was reset and the teacher did not deliver attention to the student. That is, problem behavior did not result in the delivery of teacher attention.

Interobserver Agreement

Two observers were assigned to one student: one observer served as the primary data collector and the other for IOA. Agreement coefficients were calculated by dividing the total number of agreements by the number of agreements plus disagreements and multiplying by 100. IOA data were collected across a minimum of 30% of sessions during all phases of the study. IOA data during the initial functional analysis were: Brandon, M = 95% (range = 85%–100%); Franklin, M = 96% (range = 92%–100%); and J'Marcus, M = 95% (range = 90%–100%). IOA data during the follow-up functional analysis were: Brandon, M = 98% (range = 90%–100%); Franklin, M = 91% (range = 85%–100%); and J'Marcus, M = 98% (range = 95%–100%). IOA data during the treatment sessions were: Brandon, M = 96% (range = 90%–100%); Franklin, M = 92% (range = 84%–100%); and J'Marcus, M = 93% (range = 90%–97%).

Procedural and Treatment Integrity

All teachers were trained to implement to implement the functional analysis and treatment evaluation conditions, based on procedures outlined by Moore, Edwards et al. (2002). For all activities for which teachers were trained, a series of steps was created. Procedural integrity was calculated each session and by dividing the number of correctly implemented steps by the total number of steps for that condition. Procedural integrity data (see Appendix A) were collected during each functional analysis session and ranged from 90% to 100% across all teachers.

Procedural integrity for individual components of each treatment condition was calculated for a minimum of 50% of the treatment evaluation sessions. During the EE condition, treatment integrity averaged 98% (range = 96%–100%) for Brandon's teacher, 80% (range = 65%–91%) for Franklin's teacher, and 89% (range = 86%–92%) for J'Marcus's teacher. During the EE + DRA treatment, treatment integrity averaged 98% (range = 92%–100%), 86% (range = 58%–100%), and 95% (range = 92%–100%) for Brandon's, Franklin's, and J'Marcus's teachers, respectively.

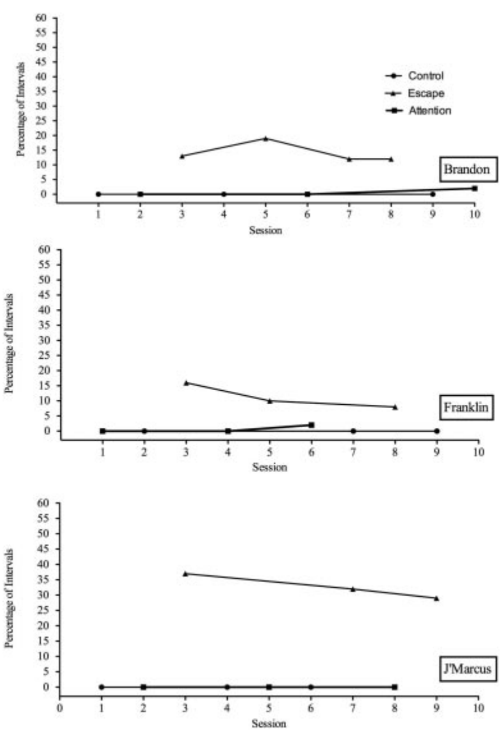

Figure 1. Percentage of intervals containing problem behavior during the initial functional analysis for Brandon (top panel), Franklin (middle panel), and J'Marcus (bottom panel).

Results

Initial Functional Analysis

Initial functional analysis results are depicted in Figure 1. Data supported the hypothesis that each participant's behavior was reinforced by escape from academic demands. Brandon (top panel) exhibited problem behavior in an average of 14% (range = 12%–19%) of the observed intervals during the escape condition. The mean percentage of intervals with problem behavior during the teacher attention condition was 0.67% (range = 0%–2%). No problem behavior was observed during the control sessions. Franklin's (middle panel) mean percentage of intervals with problem behavior during the escape condition was 11.33% (range = 8%–16%) and less than 1% during the attention sessions (range = 0%–2%). No problem behavior was observed during control sessions. The bottom panel of Figure 1 depicts the results of the initial functional analysis for J'Marcus. The mean percentage of intervals containing problem behavior during the escape condition was 32.67% (range = 29%–37%). No problem behavior was observed during control and attention conditions.

Follow-up Functional Analysis

The top panel of Figure 2 depicts the results of Brandon's follow-up functional analysis. The mean percentage of intervals containing problem behavior during the escape condition was 10.5% (range = 7%–15%), and no problem behavior occurred during the control condition. The mean percentage of intervals with problem behavior in the ETA condition was 11.5% (range = 7%–14%). The ETA condition resulted in slightly more problem behavior than the escape condition. However, given the substantial overlap of the level of behavior between the escape and ETA conditions, the addition of teacher attention during the escape interval did not produce differential levels of responding behavior for Brandon across the two conditions.

As shown in the middle panel of Figure 2, Franklin's mean percentage of intervals with problem behavior during the escape condition was 11.33% (range = 7%–17%). Low levels of problem behavior occurred during the control condition (range = 0%–3%). Problem behavior in the ETA condition occurred in an average of 36.67% (range = 31%–44%) of intervals. The high level of behavior in the ETA and low level of behavior in the other two conditions suggests that Franklin's problem behavior was reinforced by attention during the escape period.

The results of the follow-up functional analysis for J'Marcus are depicted in the bottom panel of Figure 2. The mean percentage of intervals with problem behavior during the escape condition was 23.33% (range = 22%–25%), and no problem behavior occurred during the control condition. A substantial increase in problem behavior was observed during the ETA condition, (*M* = 46.67%; range = 40%–58%), suggesting that J'Marcus's problem behavior was reinforced by attention delivered during breaks from work.

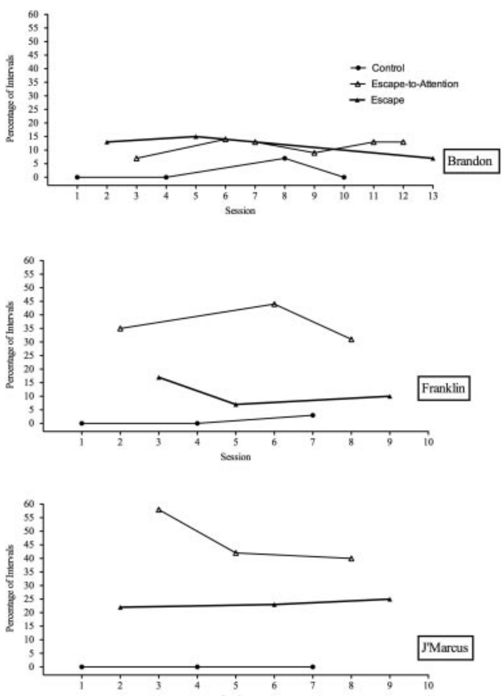

Figure 2. Percentage of intervals containing problem behavior during the modified functional analysis for Brandon (top panel), Franklin (middle panel), and J'Marcus (bottom panel).

ETA Treatment Evaluations

Brandon. The top panel of Figure 3 depicts the percentage of intervals with problem behavior and task engagement observed during Brandon's treatment evaluation. During the first EE treatment phase, an increasing trend in Brandon's problem behavior was observed. (*M* = 38.4%; range = 17%–60%). Following the implementation of the EE+DRA treatment condition, an immediate decrease was observed in Brandon's problem behavior. The mean percentage of intervals with problem behavior was 11.8% (range =

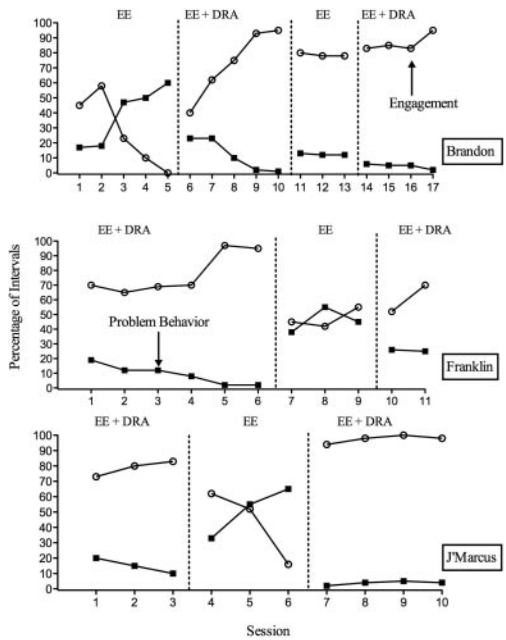

Figure 3. Percentage of intervals with problem behavior and task engagement for Brandon, (top panel), Franklin (middle panel), and J'Marcus (bottom panel) during the escape-to-attention treatment evaluations with escape extinction (EE) and escape extinction + differential reinforcement of alternative behaviors (DRA).

1%–23%) of intervals. When the EE treatment was reintroduced, Brandon's problem behavior increased slightly to a mean percentage of intervals of 12.33% (range = 12%–13%). The level of problem behavior observed in the second EE phase was relatively stable but did not reach the levels observed in the first EE phase. Finally, the reintroduction of the combined treatment of EE+DRA produced stable, low levels of problem behavior (*M* = 4.5%; range = 2%–6%).

The top panel of Figure 3 also depicts Brandon's task engagement data during the ETA treatment evaluation sessions. During the first EE treatment phase, Brandon's task engagement had a decreasing trend as problem behavior increased. Brandon was engaged with task materials, on average, during 27.2% (range = 0%–58%) of the intervals. When the combined EE+DRA treatment was implemented, Brandon's level of task engagement increased immediately and continued on an upward trend over the phase (*M* = 73%; range = 40%–95%). Following the reintroduction of the EE treatment, Brandon's mean task engagement was stabilized at 78.67% (range = 78%–80%) of the intervals. In the final EE+DRA treatment phase, Brandon's task engagement increased slightly to a mean of 86.5% (range = 83%–95%).

Franklin. The results for Franklin's ETA treatment evaluations are depicted in the middle panel of Figure 3. During the first EE+DRA treatment phase, Franklin's problem behavior decreased slightly across the phase (*M* = 9.17%; range = 2%–19%). When the EE treatment was implemented, a large and immediate increase in problem behavior was observed, averaging 46% (range = 38%–45%) of the intervals. When the EE+DRA treatment was reintroduced, a large and immediate decrease was observed in Franklin's problem behavior (*M* = 25.5%; range = 25%–26%).

Franklin engaged with academic materials during an average of 77.67% (range = 65%–95%) of intervals during the first EE+DRA treatment evaluation phase. With the implementation of the EE treatment, a large and immediate decrease was observed in Franklin's task engagement (*M* = 47.33%; range = 42%–55%) of observed intervals. Finally with the reintroduction of the EE+DRA, Franklin's task engagement increased slightly to a mean of 61% (range = 52%–70%) of the observed intervals.

J'Marcus. The bottom panel of Figure 3 depicts J'Marcus's ETA treatment evaluation results for problem behavior and task engagement. During the initial EE+DRA treatment phase, J'Marcus exhibited low levels (*M* = 15%; range = 10%–20%) of problem behavior with a decreasing trend across the phase. Following the implementation of the EE treatment phase, problem behavior showed an immediate increase and continued trending upward (*M* = 51%; range = 33%–65%). Finally, after the reimplementation of the EE+DRA treatment, an immediate and large decrease was observed in J'Marcus's problem behavior. Low and stable levels of problem behavior were observed in the final EE+DRA treatment condition, with a mean level of 3.75% (range = 2%–5%).

During the EE+DRA treatment phase, J'Marcus was appropriately engaged with academic work materials during a mean of 78.67% (range = 73%–83%) of the intervals. During the EE treatment phase, J'Marcus's task engagement decreased sharply over the phase with a mean percentage of 33.33% (range = 16%–62%) of intervals coded with problem behavior. When the EE+DRA treatment was reimplemented, an immediate increase in J'Marcus's task engagement was observed, and behavior levels were stable throughout the phase (*M* = 97.5%; range = 94%–100%).

Treatment Acceptability

Each classroom teacher completed the IRP-15 at the conclusion of each treatment phase. Overall, all teachers rated the EE+DRA treatment condition as more acceptable than the EE treatment condition. For the EE+DRA condition, the total scores were 89 for all participants. For the EE condition, the following total scores were obtained: 71, 30, and 16 for Brandon, Franklin, and J'Marcus's teachers, respectively. Thus, two of the three teachers responded that the EE treatment was an "unacceptable" treatment evidenced by total scores substantially lower than the traditionally used cutoff score of 52.50.

Discussion

The purpose of the current investigation was to replicate and extend Mueller et al.'s (2005) case study of a novel functional analysis condition designed to assess the additive effects of attention as a reinforcer during breaks from academic tasks. That is, the present study sought to determine whether the addition of teacher attention to an escape interval (i.e., ETA) would result in elevated levels of problem behavior when compared to a standard escape condition for 3 children. The second purpose of the study was to evaluate whether a treatment package that targeted escape and attention functions would reduce target behavior better than a treatment targeting only escape.

The descriptive data from the functional assessment suggested that problem behavior led to escape from task demands for all participants. Classroom observations revealed that teachers also provided attention (e.g., reprimands, requests to return to work) when the students were not engaged in work; low levels of peer attention for problem behavior were observed. The results of the initial functional analyses verified that all three participant's problem behavior was maintained by escape from task demands. The first research question evaluated whether the addition of teacher attention during the escape interval would produce elevated levels of problem behavior when compared to an escape-only condition. The results supported Mueller et al.'s (2005) findings, as the follow-up functional analysis showed increases in problem behavior in the ETA condition for 2 of the 3 participants relative to the escape-only and play/control condition. Responding during the escape-only and ETA functional analyses was similar for Brandon.

As hypothesized by Mueller et al. (2005), the findings that attention can reinforce problem behavior during a work task suggest that the presentation of task demands may motivate problem behavior reinforced by escape from an aversive task *and* by teacher attention. In the conditions described by Iwata et al. (1982), the only establishing operation for the assessment of attention as a reinforcer was the deprivation of attention. As seen in the current analyses, attention functioned as a reinforcer in contexts other than those in which a child was being ignored.

The second research question investigated treatment implications for ETA-maintained problem behavior. A treatment program designed to match the escape function only (i.e., EE) versus a treatment targeting escape with the addition of teacher attention (i.e., EE+DRA) were evaluated. Problem behavior decreased for all participants during the EE+DRA treatment, and a general increasing trend in problem behavior was found during the standard EE treatment. Likewise, concomitant increases in task engagement and decreases in problem behavior were observed across all participants. Thus, differential responsiveness to treatment based on behavioral function was observed, although differences for Brandon were minimal by the end of treatment.

The present study adds to a growing literature base of studies investigating the effect of multiple reinforcing variables delivered together (compound reinforcers) or in sequential arrangement (chained reinforcers). Golonka et al. (2000) described the additive effects of escape to an enriched environment contingent upon appropriate behavior as treatment for problem behavior in a classroom. Although a compound or chained reinforcer was not used in their functional analysis, the treatment results supported the reductive effects of contingent escape to an enriched environment as more effective than contingent escape alone. Mueller et al. (2005) used Golonka et al.'s (2000) findings as the basis for their ETA condition. However, no treatment data were described in their one-participant case study. The present results add to

Mueller et al.'s (2005) findings by replicating effects across additional participants. In addition, preliminary treatment findings showed that when a behavior is reinforced by ETA, providing attention combined with EE intervention was more effective than escape extinction alone.

Although treatment phases were truncated for some participants, the treatment comparisons data provide some intriguing information for future study. Immediate changes of a substantial magnitude were observed for all participants' problem behavior during the initial EE+DRA condition, regardless of the ordering of treatments. In subsequent iterations of the treatment comparisons, problem behavior levels for J'Marcus and Franklin continued to show differential responding, with substantially lower levels observed in the combined treatment phase. Brandon, who did not exhibit differential responding during the modified ETA functional analysis, showed less substantial treatment differences across the treatment conditions in the latter treatment phase comparisons. It is possible that the initial differences between the EE and EE+DRA treatments could reflect an extinction burst associated with the EE treatment, rather than an actual difference between the two treatments. It is also possible that the inclusion of prompts in the EE condition may have provided students with preferred attention, therefore making the condition functionally similar to the EE+DRA condition. However, given the observed differences between the two treatment conditions, the effects of prompts were likely minimal. Additional treatment comparisons may provide additional support for matching treatment programs to behavioral function, the ultimate goal behind conducting a functional behavioral assessment.

The simplest explanation of the current treatment results is that the EE+DRA treatment worked better than EE for Franklin and J'Marcus because EE+DRA addressed both the escape and the attention aspects of the compound function. For Brandon, although EE initially produced higher level of problem behavior, each treatment reduced the behavior to similar levels by the end of the treatment evaluation. The explanation of Brandon's outcomes is also straightforward, but different from the reasons why the EE+DRA worked so well with Franklin and J'Marcus. That is, the addition of a positive reinforcer into Brandon's demand context most likely reduced the aversiveness of the task and therefore reduced the motivation to demonstrate escape-maintained behavior.

The benefits of using positive reinforcement techniques to reduce behaviors maintained by escape have been used successfully for over 30 years. Carr, Newsom, and Binkoff (1980) first demonstrated that attenuating the aversiveness of task demand situations through the delivery of highly preferred edibles during work tasks reduced escape-maintained problem behavior. Several studies followed replicating and supporting the aversiveness-attenuating benefits of introducing preferred tangibles or food items into demand contexts (e.g., Fischer, Iwata, & Mazaleski, 1997; Mazaleski, Iwata, Vollmer, Zarcone, & Smith, 1993; Mueller, Edwards, & Trahant, 2003). Adding preferred tangibles to a demand context makes use of reinforcers not identified during the functional assessment. That is, the addition of positive reinforcers into demand contexts can reduce escape-maintained behavior by using noncontingent reinforcement with a functional or arbitrary reinforcer, or by positively reinforcing behaviors such as task engagement or compliance through differential reinforcement of alternative behavior (DRA). The results of the present study apply this well-known concept to a treatment in which escape and attention functions required support. By interjecting positive reinforcers into the demand context using DRA procedures, the aversiveness of the task was reduced through the provision of a functional reinforcer.

Data also were collected for treatment acceptability, which has not been commonly reported in previous FBA research (Ervin et al., 2001). In the present study, all three teachers rated the EE+DRA treatment as more acceptable treatment than the EE alone. Surprisingly, two of the three teachers responded that the EE treatment was an "unacceptable" treatment; as such, low ratings of treatment acceptability are often not reported in the published literature. Teachers specifically reported that they strongly disagreed that the EE treatment was effective for changing problem behavior, acceptable to use in the classroom, and consistent with interventions they had used in the past. These ratings may have been influenced by the fact that teachers completed acceptability ratings post-treatment use, after they had experience implementing the two interventions and had seen graphed data supporting the relative effectiveness of the EE+DRA treatment to the EE treatment alone, a finding reported in analogue treatment acceptability research (e.g., Tingstrom, 1989; Tingstrom, McPhail, & Bolton, 1989; Von-Brock & Elliott, 1987). Likewise, the higher ratings for the combined treatment may have been influenced by the addition of differential reinforcement for task engagement (i.e., praise), as previous researchers have reported that reinforcement-based interventions are generally rated as more acceptable than punishment-based interventions (e.g., Blampied & Kahan, 1992; Elliott, Witt, Galvin, & Peterson, 1984). Although extinction-based procedures are not technically classified as punishment in the behavioral literature, the teachers may have perceived the treatment as such, and thus rated it less favorably vis-à-vis a treatment that included a richer schedule of reinforcement.

A few limitations in the current study are worth noting. Data collection was discontinued early for Franklin because of a 9-day suspension from school for fighting at end of the school year. Thus, only two data points were collected during the final treatment phase. As such, definitive information about the long-term effects of the EE+DRA treatment is unknown. Additional replications of treatment phases, counterbalancing treatment order across students with escape-only and ETA functions, extended data collection within phases, and follow-up data would strengthen the experimental design of such studies and add information about long-term treatment effects. Next, the current treatment comparisons, although successful in reducing target behavior, did not allow for a full analysis of the mechanisms underlying the change. As described above, multiple theoretical postulates are reasonable and plausible. Future studies may seek to determine exactly which mechanisms of behavior change are at play to reduce the behaviors. For example, a study might compare the reductive effects of EE with those of noncontingent reinforcement with an arbitrary reinforcer such as preferred tangible items to discover whether the addition of the attention in the current study reduced target behavior because it was functionally related to the target behavior or whether it simply reduced the aversiveness of the tasks presented.

Notwithstanding the limitations, the present study provides additional support for translating FBA research into practice in the schools. One criticism of previous FBA research is that individuals with specialized training (e.g., researchers, behavior specialists) conducted the functional analysis conditions. In the current investigation, the students' teachers implemented all assessment and treatment conditions, albeit with supervision and feedback. Another strength is that the functional analysis occurred during standard classroom activities, rather than an analogue setting. In addition, all participants were general education students, unlike the majority of FBA studies conducted with participants with disabilities (Ervin et al., 2001; Hanley et al., 2003; Hoff et al., 2005).

The present study is in line with previous research documenting the importance of identifying idiosyncratic variables during FBAs, in an effort to develop the most effective treatment plan (Hoff et al., 2005). The results also add to a growing literature of school-based studies investigating the effect of idiosyncratic variables on problem behavior. The findings provide a heuristic and experimental example for incorporating descriptive assessment information into the development of functional analysis conditions in the school setting. Similar to previous studies, the results show descriptive assessment information was vital to the precise identification of behavioral function (Galiatsatos & Graff, 2003; Lalli & Casey, 1996; Mueller et al., 2005; Richman &

Hagopian, 1999; Tiger, Hanley, & Bessette, 2006). The ETA condition was designed specifically to assess the relative contributions of escape from academic demands and the additive effects of teacher attention following problem behavior, a consequent frequently observed in classroom settings (Kurtz et al., 2003; McKerchar & Thompson, 2004). The results suggest the ETA condition may have utility for FBAs and treatment planning in the school setting. In future research, researchers may wish to investigate other sources of reinforcement that may occur during the escape interval (i.e., peer attention, access to preferred activities/items). Also, researchers should focus on additional ETA-based treatment options. Future researchers may wish to investigate the addition of teacher attention with other escape-maintained treatment options.

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APPENDIX A
PROCEDURAL INTEGRITY FOR ETA CONDITION

Student:	Session:
Teacher:	Date:
Observer:	Condition: **ETA**

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

	YES	NO	N/A
1. Seats student at his/her desk or table			
2. Teacher places academic materials on the student's desk			
3. Teacher provides verbal instructions to student to complete the academic work			
4. Teacher waits 5 seconds for compliance			
a. The student complies			
i. Teacher provides descriptive praise			
ii. Teacher moves to the next demand			
b. The student does not comply			
i. Teacher restates the instructions with verbal and gestural prompts			
ii. Teacher waits 5 seconds for compliance			
A. Student complies			
1. Teacher provides descriptive praise			
2. Teacher moves to the next demand			
B. Student does not comply			
1. Teacher restates the instructions and provides hand-over-hand guidance			
5. Teacher does not respond to any other problem behavior			
6. Contingent on problem behavior			
a. Teacher removes task demand for 30 s			
b. Teacher provides attention during escape period			
Repeat steps 3–6 for each demand sequence			