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THE EFFECTS OF FIXED-TIME ESCAPE ON INAPPROPRIATE AND APPROPRIATE CLASSROOM BEHAVIOR

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Few studies have explored the effects of fixed-time (FT) reinforcement on escape-maintained behavior of students in a classroom setting. We measured the effects of an FT schedule on the disruptive and appropriate academic behaviors of 2 junior high students in a public school setting. Results demonstrated that FT escape from tasks resulted in a substantial decrease in disruptive behavior and an increase in time engaged in tasks for both participants.

Key words: escape-maintained behavior, fixed-time reinforcement schedules, function-based interventions, noncontingent reinforcement

The delivery of reinforcement on a fixed-time (FT) schedule (sometimes referred to as noncontingent reinforcement or NCR) has been shown to reduce rates of disruption, aggression, and self-injury, primarily with individuals with significant cognitive impairments (Carr et al., 2000). Kodak, Miltenberger, and Romaniuk (2003), for example, compared the effects of an FT schedule and differential negative reinforcement of other behavior (DNRO) on the escape-maintained behavior and compliance of 2 4-year-old boys during instructional sessions in a home setting. They found that an FT schedule of escape from tasks that was faded to 2 min decreased disruptive behavior and increased compliance to instructions. Recently, Austin and Soeda (2008) extended this line of research by demonstrating the effectiveness of FT reinforcement in a public school setting. After functional assessments identified social attention as the maintaining variable for participants' off-task behavior, they delivered FT attention on a 4-min schedule, which the teacher selected. The results indicated that the off-task behavior of both participants decreased and remained low in comparison to baseline.

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Although the results of these studies are encouraging, additional research is necessary to determine the utility of FT procedures in classroom settings. We sought to build on and extend this work in several ways. First, we examined the effectiveness of FT reinforcement schedules on disruptive behavior maintained by negative reinforcement. Second, we collected data on the appropriate academic behavior of participants to determine whether appropriate behavior would increase as a result of the FT escape intervention. Finally, we evaluated the practical utility of thin FT procedures in a classroom setting.

METHOD

Participants and Setting

Teachers at the school identified 2 students who displayed highly disruptive behavior and referred them for participation in the study. Brent (13 years old) and David (14 years old) attended the eighth grade in a self-contained classroom in a public junior high school. Brent was classified with emotional disturbance. David was classified with a specific learning disability.

We conducted all sessions of the treatment evaluation during math class. The classroom was staffed by one special education teacher and a paraprofessional. Brent's and David's classes contained a total of 10 and 12 students,

respectively. An additional special education paraprofessional employed by the school district conducted all sessions. The first author trained her to conduct the functional analysis and treatment sessions through modeling, practice, and feedback.

Response Measurement and Interobserver Agreement

We defined *disruption* as talking out without permission, inappropriate hand gestures, making noises (i.e., singing, humming, tapping), playing with or throwing objects, or getting out of the seat without permission. We defined *appropriate academic behavior* as writing on the worksheet, operating the calculator, and raising the hand and asking questions related to the assignment. We used 10-s partial-interval recording to measure both dependent variables.

A second observer independently scored disruptive behavior during 42% and 49% of sessions and appropriate academic behavior during 40% and 49% of sessions for Brent and David, respectively. We calculated interobserver agreement by dividing the number of intervals with agreements by the number of intervals with agreements plus disagreements and converting this ratio to a percentage. Mean agreement for both participants was above 95%.

Procedure

We conducted a functional analysis according to procedures described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994) with two procedural modifications. The paraprofessional instructed participants to complete math worksheets at the beginning of all sessions (except control) because teachers reported that problem behavior mainly occurred during independent seatwork time in math class. The second modification involved the inclusion of a peer attention condition in which two peer confederates provided social interaction via brief verbal statements (e.g., ''You need to get back to work'') each time disruption occurred. Sessions took place in a common area outside the classroom except for the peer attention condition, which occurred in the classroom. The escape condition was associated with the highest levels of problem behavior for both participants.

We evaluated the effects of the FT schedule on problem and appropriate behavior in the classroom using a reversal design. The regular classroom management system (i.e., intermittent reprimands and reminders to stay on task) was in place during all sessions. During baseline, the paraprofessional gave the participant independent math tasks and a verbal instruction to begin working. The classroom teacher behaved as usual, giving instructions, answering students' questions, and providing intermittent reprimands and reminders to keep working. We determined the initial FT schedule by measuring the mean latency to the first disruptive behavior during baseline sessions (Lalli, Casey, & Kates, 1997). The mean latency to the first target behavior was 23 s for Brent and 106 s for David. Initially, breaks were 1 min in duration and were later faded to 30 s.

At the beginning of each FT escape session, the paraprofessional placed two small (5 cm by 7 cm) sticky notes on the participant's desk, which were labeled ''work'' (yellow note) and ''break'' (orange note). At the beginning of each session, the paraprofessional walked by the participant's desk and pointed to the note labeled ''work'' as the prompt to begin working. At predetermined FT intervals, the paraprofessional walked by the participant's desk and pointed to the note labeled ''break'' to cue the participant to take an in-seat break from instruction. The paraprofessional used one silent vibrating timer to cue the delivery of escape on the appropriate reinforcement schedule and a second silent vibrating timer to measure the duration of the breaks. At the end of the break, the paraprofessional approached the participant's desk and pointed to the note labeled ''work'' as a prompt to return to working on the assigned task.

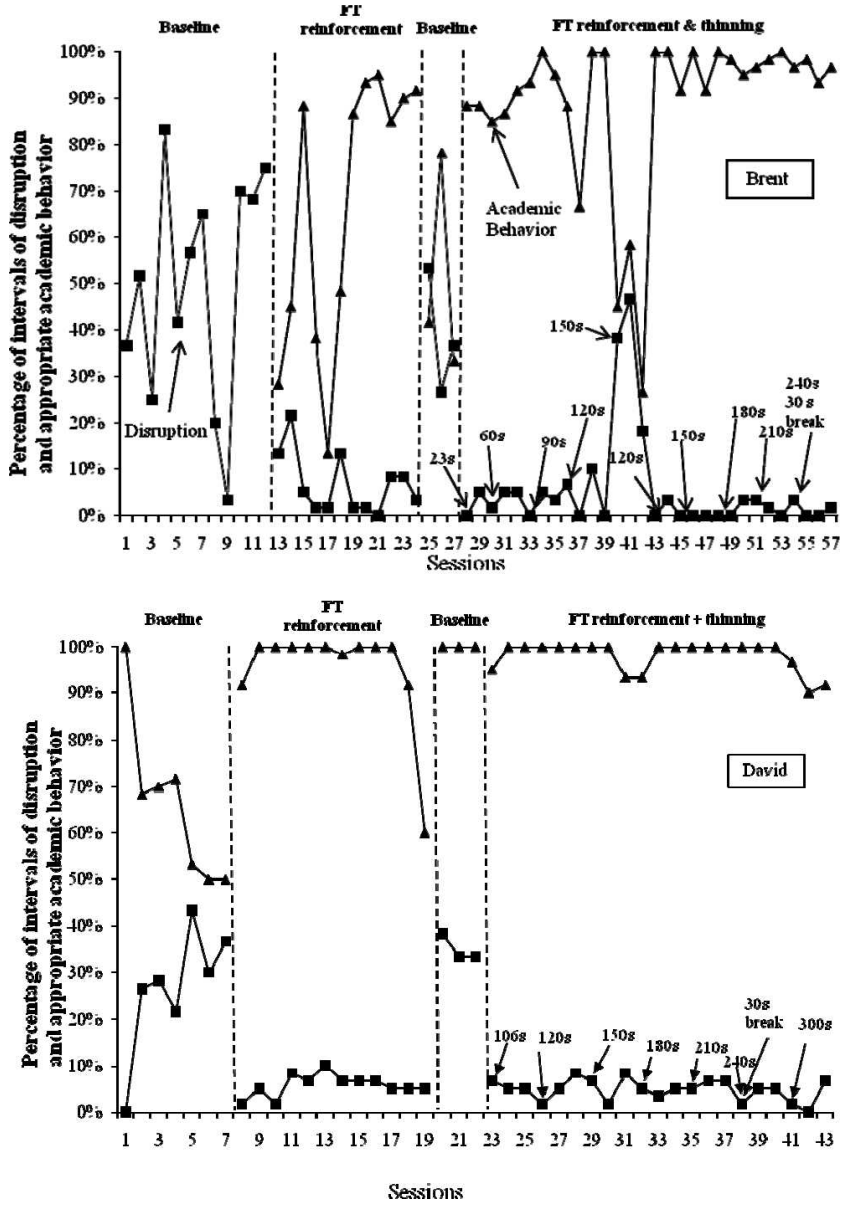

Figure 1. The percentage of intervals of disruption and appropriate academic behavior for Brent (top) and David (bottom) during the fixed-time (FT) reinforcement evaluation.

After a brief return to baseline, we reinstated conditions identical to those in the first FT phase. We increased the FT schedule when the rate of disruptive behavior remained under 10% for three consecutive sessions. The duration of the break decreased to 30 s when the FT schedule reached 240 s for both participants. If disruptive behavior occurred during more than 10% of the intervals for three consecutive sessions, we decreased the FT schedule by 30 s until the disruptive behavior remained below

10% of the intervals for three consecutive sessions.

RESULTS AND DISCUSSION

Figure 1 shows the effects of FT escape on the disruption and appropriate academic behavior of both participants. Brent's disruption rapidly decreased when treatment was introduced, and the mean percentage of appropriate academic behavior was 67%. This effect was replicated following the reversal to baseline. Disruption occurred during less than 10% of intervals as the schedule was thinned to 300 s.

David's disruption decreased to low levels, and appropriate academic behavior increased to nearly 100% of intervals during treatment. During the reversal to baseline, disruption increased and appropriate academic behavior remained high. In the second FT phase, disruption decreased and appropriate academic behavior remained high.

These findings provide further evidence for the effectiveness of relatively thin FT reinforcement schedules for treating problem behavior in classroom settings using school staff as behavior-change agents (Austin & Soeda, 2008). These results also extend those of Kodak et al. (2003) by showing that the provision of FT reinforcement for escape-maintained behavior can effectively reduce disruption while increasing appropriate behavior. One limitation of the study was the initial schedule of reinforcement (i.e., 23 s). This schedule may not be practical to implement in a classroom setting without additional staff assistance. Also, due to time restrictions, we were not able to thin the FT schedule beyond 300 s, which may still be impractical to implement in classrooms. Second, we measured appropriate academic behavior using partial-interval recording, which may have overestimated the level of appropriate behavior. Academic behavior may have been evaluated more accurately by measuring the quantity of assignments completed during sessions. Third, David's appropriate behavior did not decrease when treatment was withdrawn, perhaps because the behavior was controlled by contingencies other than the FT reinforcement schedule. Alternatively, the partial-interval data may not have been sensitive enough to detect small changes in behavior. Furthermore, we did not collect data on appropriate behavior during Brent's initial baseline, and levels of appropriate behavior were somewhat similar across the initial FT schedule treatment and the second baseline. As such, any conclusions regarding increases in appropriate behavior as a result of treatment implementation should be interpreted with caution. Finally, although the teachers were asked to select students with high levels of disruptive behavior for participation in the study, they were not asked to identify an acceptable level of disruption. Thus, the social validity of the outcomes remains in question. One novel aspect of this study was the visual cuing system using sticky notes. The notes served as a visual yet unobtrusive prompt to take a break or work. Discreet prompting procedures are necessary to minimize disruption to ongoing classroom activities and were more age appropriate for these 2 participants. In addition, discreet prompting procedures, such as the notes used in the current study, may minimize negative attention from peers (e.g., teasing), which can be important when working with adolescent populations.

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