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What is This?
A Group Contingency Program to Improve the Behavior of Elementary School Students in a Cafeteria

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Studies of behavior modification interventions for disruptive behavior in schools have generally focused on classroom behavior with less research directed toward child behavior in other school settings (e.g., cafeterias). The present report documents the effect of a group contingency intervention with a random reward component, targeting disruptive cafeteria behavior. An uncontrolled study of the effect of the group contingency program across the school year suggested substantial behavior improvement after the program started. Two natural treatment discontinuations during the same school year provide further support for the intervention. Both sources of information suggest behavioral improvement in rule-following behavior when the program was actively implemented.

**Keywords:** group contingency; disruptive behavior; school intervention

There is a considerable literature on the effectiveness of classroom-based behavioral interventions for reducing disruptive behavior (e.g., Abramowitz & O’Leary, 1992; Pelham & Fabiano, in press; Stage & Quiroz, 1997). However, relatively less is known about the effectiveness of behavioral interventions outside of the academic classroom setting—for
example, in hallways, playgrounds, and on the bus. In contrast to the classroom, these settings provide the opportunity for increased peer interaction and socialization. These settings may also be less structured than a classroom setting, have lower levels of adult supervision, and also may mix children of various developmental levels together (Leff, Power, Costigan, & Manz, 2003; Lewis, Powers, Kelk, & Newcomer, 2002; Lewis, Sugai, & Colvin, 1998; Walker, Colvin, & Ramsey, 1995).

To deal with these situations, schools utilize multiple strategies. For example, hallway behavior has been targeted with school rules and increased adult supervision (e.g., Lewis et al., 1998). Effective interventions have been developed for playgrounds/recess including peer mediation strategies (Cunningham et al., 1998), reward programs (Lewis et al., 1998), and response cost programs (e.g., Holland & McLaughlin, 1982). The school cafeteria has been another setting where behavior management procedures have been utilized. For example, MacPherson, Candee, and Hohman (1974) used individual contingencies (i.e., time out and writing tasks) to reduce the occurrence of loud talking, out-of-seat behavior, and quarrelling. Salzberg, Hopkins, Wheeler, and Taylor (1974) also used individual feedback and contingent playtime to improve the cafeteria behavior of a group of children in kindergarten.

However, in school settings where the staff-to-student ratio is large, such as cafeterias, individually based contingency management approaches are less practical. In these large-group situations, group contingency procedures are more efficient and practical. A group contingency may be defined as a behavior modification strategy wherein consequences for a group are dependent upon the behavior of individuals in that group or the group as a whole (Litow & Pumroy, 1975). A specific type of group contingency, interdependent, provides a group consequence based on overall group behavior. For example, Lewis et al. (1998) reported on an interdependent group contingency program designed to reduce disruptive cafeteria behavior. Cafeteria monitors awarded a point during every 2-minute interval the majority of the students were following cafeteria rules, and students earned an ice cream party after earning points in 80% of the intervals. Results of the intervention indicated beneficial effects of the group contingency on behavior. Similar group-contingent reward programs have been effective in improving rule following in the cafeteria (Samuels, Swerdlik, & Margolis, 1980) and reducing cafeteria noise levels (LaRowe, Tucker, & McGuire, 1980; Michelson, DiLorenzo, Calpin, & Williamson, 1981).

Recent innovative group contingencies have also included random components. For example, Skinner and colleagues have developed procedures
where the targeted behaviors, criteria for earning rewards, and rewards are randomly selected each day (Popkin & Skinner, 2003; Skinner, Williams, & Neddenriep, 2004). Random components to contingencies confer a number of advantages, including maximizing student motivation and promoting excellent behavior (i.e., with explicitly set, known criteria students who know they cannot earn a reward may stop trying; Skinner, Cashwell, & Dunn, 1996). Random components have been successfully employed in classrooms (e.g., Popkin & Skinner, 2003) and during recess in elementary schools (Roderick, Pitchford, & Miller, 1997). However, similar procedures have not been widely employed in elementary school cafeterias.

The present article reports on an interdependent group contingency program to reduce problematic behavior and increase rule-following behavior in an elementary school cafeteria. The program included random components, both for the reward and in the procedures used to monitor target behaviors.

**Method**

**Participants and Setting**

The participants in this study were 700 suburban elementary school students (kindergarten through fifth grade). As a measure of socioeconomic status, 30% of children in the school were eligible for free or reduced-cost lunch.

The setting was an elementary school cafeteria. Thirty-five classes entered the cafeteria beginning with the first kindergarten class at 10:45 a.m. and ending with the last fifth-grade class at 12:40 p.m. Class lunchtimes were staggered to begin 5 minutes apart. Thus, there were up to 16 classes in the cafeteria at one time. Upon entering the cafeteria, students who needed to purchase lunch entered the lunch line, and students who brought their own lunch proceeded to the assigned class lunch tables. Each class was assigned two tables.

**Procedures**

The school utilized a whole-school discipline program that consisted of eight school rules that were enforced across settings (i.e., treat all people with kindness and respect; do all you can to make the school a safe place; ask your teacher for permission to leave the classroom; treat property with care and respect; walk quietly in the hallway; listen to all school
staff; use acceptable school language and voice; and at school work your hardest and do your best). These rules were operationalized and described in a school handbook distributed to all staff and students at the beginning of the school year.

An ongoing problem at the school was the behavior of students in the cafeteria. The school administration reported that a considerable proportion of discipline referrals were due to misbehavior in the cafeteria. To target these behaviors, a group contingency that included reward and response-cost procedures was developed.

Specifically, at the beginning of each lunch period, undergraduates reminded the children of the school rules (e.g., ask permission before leaving your seat) and gave them six lottery tickets (the number of tickets a class started with was adjusted throughout the year based on the group’s current functioning). Throughout the lunch period, a class lost a ticket upon each observed violation of school rules. Undergraduates conducted three, 10-second, random checks during the half-hour period (undergraduates were trained to provide approximately one random check every 10 minutes), and if no children violated rules during these checks, bonus lottery tickets were awarded (these bonus tickets, once earned, could not be lost).

Rewards were provided on a random basis through a daily school lottery. Each morning, two winners were drawn from the previous day’s remaining tickets, and those classes earned a classwide privilege (e.g., a walk outside, extra recess time, etc.). School staff (e.g., the principal, custodial staff, lunchroom staff, teachers) also made a point to congratulate these children in the lunchroom and throughout the school. These procedures were modeled after those used successfully in past studies to improve the behavior of large groups of elementary school students (Holland & McLaughlin, 1982; LaRowe et al., 1980; Lewis et al., 1998; MacPherson et al., 1974; Michelson et al., 1981; Salzberg et al., 1974; Schmidt & Ulrich, 1969; Sherman, 1973).

To implement the program, the cafeteria was staffed by four to six college undergraduates earning course credit and one teacher aide per class each day. The classroom aide remained with the class for the first 15 minutes, and then he or she left for a break during the second 15 minutes. The cafeteria was also staffed by three staff members who helped clean tables and assist students, as well as one to two parent volunteers each day. Undergraduates received a week of training that included didactic instruction, role plays, watching videotapes, and taking quizzes. Teacher aides received a 15-minute in-service during the one time of the day all aides could meet.
Undergraduates were supervised by the first author, and each was observed weekly using a standard treatment integrity checklist. Immediate feedback on compliance with the program was provided to the undergraduates to encourage adherence to the program. In addition, a weekly meeting was held with all staff to review procedures and monitor progress.

Measures

Rule violations were recorded for each class during the lunch period by undergraduate staff. The frequency of rule violations for each class was averaged across the 35 classes, yielding an overall frequency of rule violations in the cafeteria for each day. These daily rates were averaged across each week, resulting in weekly averages of cafeteria rule violations.

Results

Behavioral measures were recorded between September (starting the 2nd week of school) and May (up to the end of the college semester). Figure 1 illustrates the frequency of rule violations throughout the observation period. During the baseline observation week, there was an average of 302.80 ($SD = 67.08$) rule violations in the cafeteria. Although we had planned for a longer baseline period before implementing the intervention, the behavior was sufficiently negative that a decision was made in collaboration with the school discipline committee to intervene immediately after the 1st week.

After the reward and response cost group contingency was implemented, a clear and sustained improvement in behavior was observed (see Figure 1). During the active implementation of the intervention, the instances of rule-violating behavior decreased to 124.39 ($SD = 30.16$). Notably, none of the intervention day averages overlapped with the baseline averages.

Two changes to the program were made during the school year. A modification was made to the reward and response cost group contingency program for the 8th week of implementation. Starting with this week, the three classes with the fewest rule violations earned a social honor—they were awarded a banner that hung above the doorway to their classroom, and teachers as well as school staff made a point to praise the class for the accomplishment. This modification resulted in additional improvement in cafeteria behavior. The average number of rule violations before this contingency was 144.93 ($SD = 19.01$), and after the addition of the social honors,
the number of rule violations further decreased to 87.23 ($SD = 18.73$). Second, a worsening of cafeteria behavior was observed after the winter break. To target this, a modification was made wherein total rule violations were publicly posted at the entrance to the cafeteria. Teachers reviewed the total rule violations for their class as they entered the cafeteria and often compared the class’s current functioning to those of other classes at the same grade level, fostering a “competition to be good.” This modification appeared to improve behavior, as classes averaged 152.22 ($SD = 19.61$) after winter break and 109.49 ($SD = 19.25$) after the program modification.

**Additional Support for the Effectiveness of the Group Contingency Intervention**

During the school year, two natural program withdrawals occurred: The undergraduates left for winter break with 7 school days remaining at the

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**Figure 1**

Daily Frequency of Cafeteria Rule Violations During Baseline, Group Contingency (GC), GC Plus Social Reinforcement (SR), and GC + SR + Public Posting of Daily Rule Violation Frequencies
elementary school, and the university spring break in March occurred during a regular school week at the elementary school. Teacher aides, who were typically in the cafeteria for the first 15 minutes of the lunch period, implemented the program for the first 15 minutes, but no program was implemented for the second 15 minutes of lunch on these days.

Independent observers (i.e., college undergraduates who had not worked in the school previously) recorded the frequency of out-of-seat behavior during the second 15 minutes of a class’s 30-minute lunch period for the week before the intervention withdrawal and during the withdrawal. Out-of-seat behavior was chosen because it was the most common complaint of the cafeteria staff. There were not enough observers to watch every class in the cafeteria, so classes were randomly selected for observation. During lunch, children in each class were distributed across two tables. A time-sampling procedure was used to observe behavior wherein observers watched one table for 60 seconds, then the other table for 60 seconds. Observers continued to rotate between tables for the duration of the lunch period. Because classes in the lunchroom at any given time were of generally the same grade level, and only one class was observed at a time, the classes selected for observation were distributed across grade levels. Reliability information was collected during these observations by having an independent observer (the first author) record out-of-seat behavior along with the observer. Results indicated acceptable reliability ($r = .83$).

In general, out-of-seat behavior was lower when the reward and response cost group contingency was implemented than when it was not. When the reward and response cost group contingency was implemented, classes averaged 2.35 out-of-seat violations per minute ($SD = 0.42$) before the first withdrawal and 5.57 ($SD = 1.16$) rule violations during the first intervention withdrawal. In the week immediately preceding the second withdrawal, classes averaged 2.71 ($SD = 0.68$) out-of-seat rule violations per minute compared to an average of 5.57 ($SD = 1.50$) rule violations when the program was not implemented.

Effect sizes for the actively implemented program were calculated by subtracting the withdrawal mean from the intervention mean and dividing by the standard deviation of the withdrawal mean (Busk & Serlin, 2005; White, Rusch, Kazdin, & Hartman, 1989). Using the no-program mean and standard deviation, effect sizes for the first and second undergraduate administrations were 2.78 and 1.91, respectively, suggesting a considerable effect of the program when implemented.
Discussion

This article presents the outcome of implementing a reward and response cost group contingency program that included random criteria (i.e., “good behavior checks” and random reward administration) to improve the cafeteria behavior of kindergarten through fifth-grade students. Results suggested sustained improvement in rule following during active program implementation. However, these results were not generalized to situations where the program was not actively implemented, such as when the undergraduates were not present. The results, and the implications they have for schoolwide behavioral interventions, will be discussed in turn.

First, these results replicated other studies that have used similar behavioral interventions to reduce disruptive and rule-breaking behavior in school areas outside the classroom setting (e.g., Lewis et al., 1998). The present report extends the previous literature by reported on a reward and response cost group contingency with random rewards—children earned tickets on a random basis for appropriate behavior and received rewards randomly through a whole-school lottery. This procedure, when implemented by the undergraduate staff, appeared to be effective in reducing cafeteria rule violations.

Independent observations of out-of-seat behavior during two natural withdrawals qualified these results. Clearly, when the program was implemented by the college undergraduates, it was effective in reducing problematic behavior. When no program was implemented, however, there was no evidence of generalization of appropriate behavior—frequencies of rule violations increased as soon as the class’s teacher aide left the cafeteria (i.e., during the second 15 minutes of lunch). The children’s behavior in the cafeteria appeared further influenced by the context their activities. During the first 15 minutes of lunch, when lunch was served and children were eating, behavior was relatively better than the second 15 minutes, when children had finished eating and were expected to sit at their table and wait for the teacher to arrive in the lunchroom and dismiss the class. Previous studies have underscored the need to evaluate such contextual variables within a school day (e.g., Fabiano & Pelham, 2003; Walker & Hops, 1976), and the present study illustrates such variables might moderate intervention effects within even a half-hour period.

It is important to view this project in light of its limitations. First, Figure 1 illustrates no intervention reversal, so whether the outcome reported was due to the intervention or was simply the effect of time cannot be determined. However, the magnitude of effects as well as the immediate change
in behavior with the introduction of program components makes it unlikely the results are solely due to elapsed time. One potential limitation in this report is that the number of adults present in the cafeteria is confounded with the natural withdrawals—during the aide-implemented reward and response cost program and the program withdrawal the undergraduate staff was not present in the cafeteria. Others have reported the number of individuals implementing a program is related to outcome (e.g., Cunningham et al., 1998). Notably, however, the undergraduate staff was present during the baseline week in Figure 1, which suggests that adult presence alone did not result in improved behavior, but this explanation cannot be completely ruled out.

Perhaps the most important and concerning limitation of this report is that the reward and response cost group contingency program, though apparently responsible for reductions in cafeteria rule violations, did not generalize to situations where it was withdrawn, and it was not adequately transferred to permanent school staff—it was not continued after the formal participation of the undergraduates in the cafeteria ended. In fact, 2 years later, no remnants of the reward and response cost group contingency continued to be used in the cafeteria, and behavior was casually observed by the first author to be similar to that during the baseline period in Figure 1. Clearly, the 15-minute in-service offered to the aides, as well as the ability to observe the undergraduates implement the program on a daily basis, was insufficient for transferring the program permanently to the school.

The present project did not result in sustained maintenance of an effective program (see Atkins, Graczyk, Frazier, & Abdul-Alil, 2003), perhaps because of a reliance on externally based undergraduates to implement the program rather than indigenous staff. The program was planned for teacher aides, but due to mandated breaks, teacher aides could not supervise the entire lunch period. Our results suggest, however, that it would have been better for aides to break for the first half of lunch, when the children were busy eating, and resume monitoring behavior during the latter half, when discipline problems became more pronounced. Alternatively, as others have cleverly planned (e.g., Cunningham et al., 1998), children from older grades could have monitored the ticket system for the younger grades, thereby implementing the system while at the same time giving the children in the older grades an activity to perform after they were done with their lunch. However, due to scheduling constraints, the school did not combine older and younger grades in the cafeteria. This study does suggest that if effective behavioral interventions will be sustained in schools, clinicians and schools must explicitly address these practical barriers.
Finally, even though overall rule violations improved, interventions such as peer mediation might also be important components of cafeteria-based interventions as many peer problems and bullying may be unobserved by adults like the ones who managed the program in the present intervention (Craig, Pepler, & Atlas, 2000; Pepler & Craig, 1995). In fact, other researchers have suggested unstructured, unsupervised peer interactions like those that occur in grade school cafeterias may become a breeding ground for antisocial, deviant behavior (Dishion, McCord, & Poulin, 1999). Interestingly, the group contingency intervention may have capitalized on the peer interactions that occurred in the cafeteria by shaping the children into reinforcing prosocial, appropriate behavior of classmates in the interest of achieving group goals (e.g., remaining in their seat during lunch) rather than negative or disruptive behaviors (e.g., laughing at a child running around the cafeteria).

In summary, the reward and response cost group contingency resulted in positive behavioral effects in a grade school cafeteria. Future studies are needed to investigate the effectiveness of these programs in well-controlled designs as well as how to sustain such programs in school settings.

References


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Erratum


This article, that also appears in *Behavior Modification* 32(1), was republished due to an error.