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Current Research on Group Contingency Interventions

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Abstract

Behavior management in the classroom is an important aspect of daily life for teachers.

Inefficient management of problematic behavior can detract from learning opportunities

in the classroom. Much research has been done on interventions designed to decrease

disruptive classroom behavior. Of these interventions, group contingencies were found

to have the highest effect sizes. This monograph examines the different types of group

contingencies, their effectiveness and popularity in the classroom setting, and possible

applications and extensions of the intervention itself. Group contingencies and their

specific application to academic behavior and learning are also explored.

Current Research on Group Contingency Interventions

Problematic behaviors identified by teachers in the classroom often include disruptive verbalizations, nonacademic chatter between peers, out-of-seat movement, low completion of assignments, disorganization, and not being prepared (Christ & Christ, 2006). Research has shown that disruptive behavior patterns in the early school years increase the risk for antisocial behavior later in life. Disruptive behavior in the classroom is also predictive of less time engaged in academic activities, lower grades, and lower performance on standardized tests (Stage & Quiroz, 1997). It is clear that there is a need for time-efficient behavior management strategies in the classroom. In a well-known meta-analysis, Stage & Quiroz compared the effectiveness of interventions designed to reduce disruptive behavior in the classroom. They found that overall, group contingencies had the highest effect sizes among interventions aimed at reducing disruptive behaviors in the classroom (Stage & Quiroz, 1997).

A group contingency is a time efficient classroom wide behavior management strategy. In a basic group contingency, students work together towards a common goal and are rewarded based upon their success in working towards that goal. It operates "similarly to token economies and response cost procedures except that group membership parameters determine reinforcement or response cost" (Stage & Quiroz, 1997, p. 334). A group contingency acknowledges students for performing a desired behavior, saves time and resources by designing a program for an entire classroom rather than individual students, and encourages positive social interactions between peers (Murphy et. al, 2007). Research in the area of group contingencies has grown in the past twenty years. Group contingencies, now well-accepted as evidence-based interventions

for behavior and academic problems, often serve as the basis for additional studies. For example, this paper reviews a study that combines a group contingency with other evidence based techniques to provide a classroom management "package," a study that uses an automated feedback device to mediate the group contingency, and a study that attempts to validate the use of a group contingency with a preschool ELL population. Group contingencies can be of great interest to school psychologists. Although school psychologists tend to focus intervention(s) on individual students, it is important to realize that each student is nested within the larger classroom setting. School psychologists can encourage teachers to utilize group contingency strategies, thus establishing "supportive learning environments that prevent and remediate classroom behavior problems early" (Christ & Christ, 2006, p. 78). Group contingencies were first examined as a behavior management technique, and they are now being implemented with the goal of targeting academics as well.

Group contingencies are not a new phenomenon, although they have gained significant acclaim among school psychologists due to the recent Stage & Quiroz meta-analysis findings. Group contingencies have long been used as a method of behavioral control in the classroom. In 1970, Packard conducted a study employing a group contingency to attempt to control "classroom attention" and met success in this. There are three different types of group contingencies: independent, dependent, and interdependent (Litow & Pumroy, 1975 as cited by Murphy et al., 2007). Independent group contingencies utilize the same target behaviors and consequences for all students but the reinforcement for the target behaviors is delivered individually. That is, each student is rewarded or withheld a reward based on his or her own behavior. An example

of this type of contingency is students in a classroom earning grades for their work. In a dependent group contingency, the entire group is reinforced based upon the behavior of a single student or a target group of students. Dependent group contingencies are often seen as unfair and thus are not widely used (Skinner, Williams & Neddenriep, 2004). Interdependent group contingencies reinforce the entire class based on the whole class meeting a shared goal (Theodore, Bray, Kehle, & Jenson, 2001).

Advantages of Interdependent Group Contingencies

The popularity of the interdependent group contingency can be attributed to its specific advantages. In this type of contingency, time is used efficiently, peer jealousy is minimized because the entire class either receives a reward or does not, and social cooperation is facilitated due to working together towards a common goal (Skinner, Williams & Neddenriep, 2004). Murphy et al. (2007) found the following:

> Modifying the behavior of a classroom rather than that of an individual student is a more efficient use of time for both teachers and those who support them (i.e., school psychologists). This type of intervention would seem to be beneficial for teachers who would like to improve the behavior of an entire class (p. 61).

The implications for such an effective intervention are substantial. With less time wasted on managing difficult behavior, teachers can spend more time on teaching. Students that are on task can make better use of their learning potential. An intervention that targets not only the "tough" kids but the entire classroom appears to fit the needs of teachers who are expected to manage behavior as well as adhere to teaching standards and curriculum mandates.

An additional advantage to this type of contingency is that there is no public feedback on individual student performance based on which students received access to the reward, sharing, stealing or teasing is decreased as the entire class is either rewarded or not rewarded, and a broad range of rewards can be delivered, i.e. field trips, free time, pizza parties, or movie time (Skinner, Williams & Neddenriep, 2004).

Group Contingencies and Behavior

One popular application of a group contingency creatively uses the format of a game. One such game, the Good Behavior Game, has been investigated and shown to have promise in increasing student on-task behavior while decreasing disruptive behavior in the classroom. In more recent studies the application of this game to specific populations and settings such as students in Title 1 schools is examined. The implicit question is: Will a group contingency work where it is most needed?

In a 2007 study, Lannie and McCurdy investigated the effects of "the Game" on student on-task behavior and disruptive behavior in an urban classroom. The Game is described as an "interdependent group contingency that is user-friendly and is applied class-wide" (Lannie & McCurdy, 2007, p. 86). The investigation purported to extend research in the area of group contingencies by evaluating the impact of the Game in a school classroom with a high level of poverty. In this case, 92% of the students were reported to be receiving free or reduced lunch (Lannie & McCurdy, 2007). The game was conducted in thirty-minute intervals, with target behaviors observed and recorded in intervals of ten minutes.

The results of the study indicated that the Game was effective in increasing on-task behavior and decreasing disruptive behaviors in the classroom. Importantly, it warranted the use of a group contingency of this type in urban classrooms with high levels of poverty. This particular study also investigated the mediation effects of teacher praise on student levels of on-task and disruptive student behavior and found no link between the two. It appears that the results obtained were due to the group contingency itself rather than to the naturally-varied levels of teacher praise.

Group Contingencies combined with other Evidence-Based intervention strategies

To extend the application of group contingencies, some studies have sought to pair a group contingency with an other evidence-based intervention as a "package deal" for behavior management. One such package linked a group contingency with mystery motivators and examined the impact on the disruptive behaviors of a classroom of preschool students. This study by Murphy et. al. (2007) was important for two reasons. First, it investigated the effects of a group contingency in a preschool classroom, an age group that has a relative dearth of research to validate practices that are widely used in elementary and older age groups. Second, it provided evidence for the use of mystery motivators in addition to a group contingency to decrease negative behaviors in this population.

Mystery motivators employ randomized reinforcers indicated by students to be of value (Kehle, Bray, Theodore, Jenson & Clark, 2000). This reward system delivers unknown but highly valued reinforcers, thus maintaining student interest as well as anticipation, as indicated by Skinner, et. al, 1996 (as cited by Theodore et. al, 2001).

Basic rewards are selected for students to earn, one of those rewards is written on a piece of paper and placed in a sealed envelope, and based upon students' success in meeting the given behavioral criteria, students may color in a space on a chart that either contains "M," indicating they will receive the reward, or a blank space, which means they will try again next time (Jenson, W.R., Rhode, G., & Reavis, H.K, 1994). Because both the rewards themselves and receipt of the reward are random, student interest is kept high.

The Murphy study used a single subject design, with nine participants. The procedure included a baseline, intervention, withdrawal and reinstatement phase. The results indicated that the combination of mystery motivators and group contingency was effective in reducing disruptive behaviors in a Head Start preschool classroom (Murphy et al., 2007). An additional strength of this study was that it validated the use of such procedures with English Language Learner populations, as all of the participants were bilingual and spoke primarily Spanish in the home. The effect sizes ranged from .99 to 7.71 across participants (Murphy et al., 2007). Additionally, the students had varying levels of disruptive behavior during the baseline phase, a condition which is similar to that found in a typical classroom.

Another application of a group contingency combines randomization of reinforcers as well as type of contingency. In the Theodore et. al study (2001), student interest in the intervention was piqued by randomizing both of those components. Four types of interdependent group contingencies (whole group, high, low, and average) as well as an unknown dependent group contingency (the behavior of one randomly selected student) served as possible criteria for reinforcement. Each one of these options was kept written on a piece of paper in a jar on the teacher's desk. The reinforcers were also

randomized. "Unknown" reinforcers have been found to be effective in reducing disruptive behaviors, as indicated by Rhode, Jenson, & Rheavis (as cited in Theodore et. al, 2001). The Theodore et. al study sought to provide a fun, effective intervention that would significantly reduce disruptive classroom behavior in a short amount of time.

Participants in the study were five adolescent males enrolled in a self-contained classroom setting. The study employed an ABAB reversal design. Disruptive behavior was operationally defined by the researchers and the students were informed of their expectations. Possible reinforcers were also made known to the students, and the students were able to give feedback on these choices. The treatment consisted of 2, 45-minute sessions each school day for two weeks. Each student would receive a "check" next to his name if he displayed a negative target behavior. Criteria was based on number of checks and randomized as described previously. At the end of each session, the teacher would pick a card out of the "criteria" jar and a card out of the "reinforcers" jar. Based on the chosen criteria, the group would receive a reward or would be encouraged to try for one the next day.

This relatively simple design yielded high effect sizes for each of the participants. The effect sizes were found in this study to be 5.2, 4.7, 2.6, 3.8, and 4.2, respectively (Theodore et. al, 2001). The authors highlight the fact that the experimental conditions differed drastically in effectiveness from the teacher's usual behavior management strategies, which were primarily based upon individual contingencies. This provides evidence for the use of group contingencies over the use of individual contingencies. This may be especially notable in a self-contained classroom, where managing behavior is of extreme importance.

Group contingencies and technology

Christ & Christ (2006) advocated for the use of technology with a group

contingency as a classroom management strategy. This study used the Digital

Scoreboard in three high school inclusion classrooms to mediate the use of a group

contingency. The progress of the group was measured by the automated feedback device.

This device was developed to "support the use of some basic principles of behavior

management by classroom teachers with minimal effort and maximum efficiency" (Christ

& Christ, 2006, p. 80).

Recognizing that immediate contingent feedback is essential in classroom

management, Christ & Christ implemented a device that automatically gives feedback,

instead of relying on the teacher for effective feedback. This study sought to remediate

the problem posed by the many demands being placed on teachers in the classroom,

demands which essentially limit the amount of positive feedback classroom teachers are

able to provide. The Digital Scoreboard was developed to "support the use of some basic

principles of behavior management by classroom teachers with minimal effort and

maximum efficiency" (Christ & Christ, 2006). Researchers hypothesized that the

intervention would increase academic engagement, reduce disruption rates, and reduce

teacher corrections for negative behaviors.

The intervention itself made use of the digital scoreboard and teacher observation.

The digital scoreboard was set for two-minute intervals. Without interruptions, the

scoreboard would count down to zero. Once zero was reached, the students would

collectively earn a point. After 17 points (which corresponded to 70% of the classroom

time), students earned contingent free time. If the teacher noticed a disruption based on

the criteria of target behaviors, s/he would reset the timer back to two minutes, so that no

points were awarded during that interval. The digital scoreboard application established

a fixed interval schedule of reinforcement within the context of a group contingency. The

intervention was implemented across three settings, in separate classrooms and with three

different teachers.

The intervention was effective and efficient in improving classroom behavior.

Specifically, incidence of "academically engaged behavior" increased and incidence of

disruptive verbalizations as well as teacher correction of disruptive behavior significantly

decreased during the intervention phase. The results of this study supported further

application and study of automated feedback devices for use in classroom management.

Christ & Christ also reported that, with fewer disruptions, teachers seemed to cover more

academic material in less time.

Group contingencies and academics

"Considerable teacher time, at the expense of academic instruction (Stage &

Quiroz, 1997), is allocated in an attempt to control inappropriate and disruptive behavior"

(Theodore et. al, 2001, p. 268). Following widespread success of group contingencies in

reduction of disruptive behaviors in the classroom, researchers began to examine the

effects of group contingencies on academic performance as well. It seems that if group

contingencies reduce disruptive behavior, less time is spent on managing difficult

behavior, and students may increase on-task behavior and, possibly, academic success.

In a 2006 study, Christ & Christ found that when there were fewer disruptions to

instruction, either by students or teachers, more material was covered in less time. In essence, these interventions allow for more learning time in the classroom.

Based on evidence that supports the potential of contingent rewards to enhance the quality and quantity of academic work, Skinner, William & Neddenriep (2004) authored an article describing ways in which interdependent group contingencies can be used to enhance academic performance of students in general education classrooms. The article outlines important considerations when implementing such an intervention with the goal of improving academic behavior or performance. Important are mentions of how to operationally define target behaviors such as "academic engagement." The authors point out that student response is sometimes an overt behavior and is sometimes more covert, such as paying attention or thinking about a question or answer. They point out the importance of recognizing that overt, measurable behaviors exhibited by students that indicate they are on-task tend to be a choice. To increase the likelihood of students choosing to remain academically engaged, teachers can increase the amount and quality of reinforcement for those particular behaviors and decrease any recognition or reinforcement of competing behaviors. The authors reference an important principle of behaviorism, in regards to academics.

Skinner, William & Neddenriep (2004), describe the three different kinds of group-oriented contingencies and rationale behind each. They then provide well-researched advice on selecting target behaviors, defining criteria for reinforcement, and fading. Fading is emphasized due to concerns on the part of many educators on the regarding the reinforcement of academic behavior. The article highlights many of the points already emphasized in the current paper in more detail. It is suggested as a guide

to educators and school psychologists interested in implementing group contingencies to improve academics in the classroom, and for those meeting resistance with the idea of using reinforcement for academics.

It appears that most of the current studies on group contingencies and academics include randomized components. The effects of randomization, described in part above, appear to be salient especially in regards to academic work. In one such study, homework accuracy was targeted as the academic behavior that needed improvement. Reinhardt, Theodore, Bray, & Kehle (2009) noted that interventions aimed at improving homework accuracy often focused on individual contingencies. This presents the same difficulties as individual contingency aimed at changing behavior will, that is, they are time-consuming for teachers and they lack practicality (Reinhardt et. al, 2009).

A recent investigation utilized an interdependent group contingency and randomized components with the goal of improving homework accuracy. Reinhardt et al. (2009) chose homework accuracy as the target behavior due to the fact that homework performance has been found to be positively correlated with academic achievement, even across all levels of ability. The assumption is that improving homework performance will improve academic achievement for students in schools. The intervention produced significantly improved rates of homework accuracy in reading comprehension, math, and spelling. These results were maintained at follow-up, with the exception of spelling, for which one student experienced a slight decline in performance. Meaningful results were obtained in regards to the magnitude of change in homework performance behaviors. The results of this study provide evidence for the use of an interdependent group contingency with randomization of target behaviors, criteria and reinforcers in the area of

homework accuracy. Notably, randomization was found to be a "powerful agent for change in performance" (Reinhardt et al., 487).

Although interdependent group contingencies appear to be the most popular, it is possible that they are not significantly more effective than other types of group contingencies in improving homework and performance. A 2009 study by Lynch et al. compared the differential effect of these contingencies on homework completion and accuracy within a self-contained classroom for students with disabilities. Overall, the researchers found no significant differences between types of group contingencies. However, both the interdependent and dependent group contingencies were found to be superior to independent group contingency in affecting spelling performance and disruptive behavior (Lynch et al., 321).

These results may be especially salient in regards to populations of students who particularly struggle with homework completion, such as students with serious emotional disturbance. Popkin & Skinner (2003) found "educationally valid increases in academic performance as target assignments were added to the program" in their intervention that employed an interdependent group contingency with randomized components.

Use of Rewards with Group Contingencies

Skinner, Williams, & Neddenriep (2004) noted that choosing one reward for a classroom of students can have its drawbacks. The first possible drawback is that while a "reward" as a consequence may serve as a reinforcer for the behavior of some students, it may have no effect or even a negative effect on other students in the same class. In the above mentioned paper, token economies or reward choices were noted as possible

solutions to this problem. For example, if the entire group meets the criteria then each student can earn 10 tokens, which can then be exchanged for a reward of choice.

Another use of rewards is demonstrated in the Theodore et. al (2001) study, as described above. Randomization, of both rewards and criteria for reinforcement, are shown in this study to be an effective way to keep children engaged while still taking advantage of the ease of implementation inherent in the group contingency format.

Ease of implementation

Each of the above studies corresponded with high levels of teacher acceptability, with ratings ranging from "satisfied" to "very satisfied" with the above mentioned studies. This rating serves as a good indication of how likely teachers would be to implement the intervention on their own time in the classroom. Only a limited number of studies included "consumer satisfaction" surveys for the students. Theodore et. al, for example, provided a Likert-type scale that ranged from 1 "hated" to 5 "liked a lot." The students overall rated the intervention a 4, or "liked." It appears likely that students in most of the studies would agree, based upon the effectiveness of the intervention on their behavior as well as anecdotal evidence within some of the papers. FOR EXAMPLE,

Limitations and "side effects"

A common side effect mentioned in the literature is inappropriate peer feedback as peers attempt to control one another's behavior. Specifically, Christ & Christ found that teachers struggled to discourage inappropriate feedback between peers at times. While this may speak to the acceptability of the intervention among students, future

studies may want to include an aspect of student training on socially appropriate ways to encourage peers. An additional social consequence mentioned in the literature is when students who feel they are not aiding in the success of the group reduce the effectiveness of the reward by making fun of it or belittling their harder-working peers. Another side effect, mentioned previously, is the challenge of developing and implementing an interdependent group contingency in which the consequences "may serve as reinforcers across students" (Skinner, Williams, & Neddenriep, 2004, p. 388). This can be solved through token economies, reward choices, polling students beforehand in order to determine rewarding consequences before implementation, or randomly selecting rewards with the use of mystery motivators or similar strategies.

A side effect in many interventions, both academic and behavioral, is the possibility of "sabotage." In the case of interdependent group contingencies, this could occur if a student finds a particular consequence to be aversive, and thus acts out in hopes that the group will not earn it. Randomizing the rewards will aid in solving this. The use of mystery motivators, again, is helpful. Notably, in the Theodore et. al study, sabotage did come up however the other students, rather than engaging in sabotaging behavior, instead made efforts in encouraging the "sabotaging" peer to not ruin their chances at earning a reinforcer (Theodore et. al, 2001). In future research it may be of interest to examine the mediating factors that control for or influence peer cooperation or sabotage within the context of a group contingency intervention.

A positive side effect inherent in this type of intervention in particular is a social effect. Earning a reward as a group is likely to provide occasion for celebration, and reinforcement through positive socialization.

Conclusion

Group contingencies have effectively reduced the amount of teacher effort necessary in managing behavior in the classroom. Stage & Quiroz's meta-analysis found group contingencies to have an effect size greater than 1. When paired with other efficacious interventions, group contingencies significantly reduce disruptive classroom behaviors, increase on-task time and aid academic performance. Some studies have examined the use of group contingencies mediated by technology. More research into use of such technology is warranted, as technology itself is a growing field and is popular among school-aged children.

"Packages" and contingencies with randomized components have been found to be popularly accepted, both by teachers and students. These are easy to implement and reduce the amount of effort needed to manage difficult behaviors in the classroom.

With implementation of a group contingency, specific considerations should be made in regards to the use of rewards. While choosing one "reward" for an entire classroom may be a difficult task, there are ways to control for this such as randomizing the rewards and keeping the rewards unknown until they are doled out.

It appears that the most popular way to implement a group contingency is in an interdependent group contingency format, and to randomize components of the study, either reinforcers, criteria, or both. Further research is warranted in the areas of randomization of components, and whether it makes a difference which components or combination of components are randomized. Another area of possible further research is

examination of the mediating factors involved in peer competition or cooperation in the context of a group contingency.

There appears to be a large number of studies conducted in this area that employ single-subject design format. It may be beneficial in future research to utilize group design as well.

Group contingencies are a growing area of research in the field of psychology. Due to their effectiveness and efficiency, both with academic and behavioral change, their continued use in school settings is expected and encouraged.

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