Applying Group-Oriented Contingencies in the Classroom

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Classrooms are complex environments and students can choose to engage in a plethora of behaviors including desired academic and social behaviors, and undesired disruptive and passive (e.g., staring out the window) behaviors. Contingencies applied to student behavior in classroom environments have been shown to impact students' allocation of time to these competing behaviors (e.g., Heering & Wilder, 2006). These contingencies include both individual and group-oriented contingencies. In this chapter contingency components are described; strengths and weakness of different types of contingencies are analyzed; and recommendations for classroom applications of group-oriented contingencies are provided.

Contingency Components

Contingencies describe an if-then environment-behavior relationship. *If*, under certain environmental conditions (antecedent conditions or stimuli) the student exhibits a behavior (target behavior) to criterion (goal), *then* the environment (e.g., a teacher, peer, computer) will respond with another stimuli (consequent stimuli). For example, when given a math assignment containing 20 items (antecedent stimulus), if a student completes 18 or more items accurately within 20 minutes (target behavior and criterion) then the student will receive a letter grade of *A* (consequence). Likely there are other consequences associated with this behavior. When the student finishes the assignment before the allotted time, he/she may be allowed to choose to engage in a higher probability behavior (reading a novel) without the possibility of punishment. The student's parents may praise her/his academic performance and the student may receive a

high report card grade that is based partially on this assignment (Skinner, Williams, &

Neddenriep, 2004).

The previous example can be used to analyze contingency components. Contingencies

typically contain two types of stimuli, antecedent and consequent stimuli. In our example the

obvious antecedent stimuli are the math assignment and the teacher's directions to complete the

assignment. Other antecedent stimuli include the classroom setting, teacher presence, and

classmates who become quiet and begin working on the assignment. Additionally, there are both

immediate and delayed consequent stimuli delivered contingent upon the student's behavior. The

opportunity to engage in a higher probability behavior (read the novel) after completing the

assignment may serve as immediate reinforcement. The letter grade that is received the next day

after the teacher scores the assignment may serve as a delayed reinforcer. The A in mathematics

the student receives on his quarterly report (i.e., report card) and the praise from parents for

making the A also may reinforce this behavior.

While both antecedent and consequent stimuli influence student behavior, the contingent

relationship between these stimuli and the student behavior is critical and typically includes a

target behavior and criteria. In our example, the target behavior is working on the math problems

and consequences are delivered based on several criteria. The opportunity to read a novel is

delivered contingent upon finishing the assignment before the allotted 20 minutes. If this were

the only reinforcement available, the student could quickly write down any answer, regardless of

accuracy, so that more time would be available for engaging in the preferred behavior. However,

because the delayed reinforcement (e.g., assignment grades, report card grade, praise from

parents) is delivered contingent upon completion and accuracy, the student is more likely to

attempt to complete the problems accurately.

Schedules of consequences and the target students are also contingency components. With respect to schedules, parental praise for earning an *A* is not going to occur consistently. Thus, the consequences delivered intermittently based on a variable schedule. Finally, the student(s) who receives access to consequent stimuli contingent upon the target behavior meeting or exceeding a criterion serves as one basis for discriminating contingencies.

Individual Contingencies

Contingency contracts are good examples of individual contingencies. These contracts describe in writing an if-then relationship indicating the target student, the student's behavior, and the criterion needed in order for the student to receive access to a consequence. In most instances, contracts describe individual contingencies because the consequence is delivered only to the target student and the student's success with meeting the criteria is based solely on her/his performance (Hall & Hall, 1998).

The primary advantage of individual contingencies is that all aspects of the contingency can be tailored to meet idiosyncratic needs, preferences, and skills. Thus, for John the contingency may target reduced levels of fighting, but for Jane the contingency may target increasing assignment completion. Similarly, the criterion may vary across students. Thus, Cindy may be required to completed all assignments at 90% accuracy or higher each day. However, for Carl the criteria may be adjusted to provide more time to complete the work (i.e., 90% accuracy or higher and the assignment can be completed for homework). The antecedent also can vary so that Craig must complete 4th-grade level assignments, but Billy is required to complete 2nd-grade level assignments. The ability to manipulate the target behaviors and criteria across students in a classroom allows educators to address individual student needs and skill development levels. Additionally, within students educators can alter the target behaviors and

criteria as their needs change and skills develop. For example, John may initially receive access to consequences contingent upon improvements in staying in his seat. After John's in-seat behavior improves the contingency can be altered so that reinforcement is delivered contingent upon staying in his seat and completing more of his academic assignments.

It has been said that one man's meat is another's poison. The value of consequences (e.g., reinforcers) often is based on an individual's idiosyncratic learning history (ontogeny). Thus, for one student a consequence may serve as a high quality reinforcer, but the same consequence may serve as a low quality reinforcer for another student and as a punisher for a third student. The ability to select reinforcers based on idiosyncratic preferences enhances the probability that contingencies will be effective.

<div align="center">Independent Group-Oriented Contingencies</div>

With independent group-oriented contingencies, the term group-oriented refers to each contingency component (i.e., antecedent, target behavior, criteria, and consequence) being held constant across all students in a group (i.e., classroom, school). Independent refers to access to the consequence being delivered to each student after their own behavior (independently) meeting the criteria (Litow, & Pumroy, 1975). Given the numerous advantages associated with individual contingencies, many may be surprised to learn that educators and others (e.g., our legal system) rely on independent group-oriented contingencies. Typically, grades are delivered using independent group-oriented contingencies. Other examples of independent group-oriented contingencies include requirements for promotion to the next grade level, prerequisite requirements to take advanced-level courses, and requirements for awards such as honor role. Most classroom and school discipline procedures are independent group-oriented contingencies. For example, a school, or entire county could attempt to establish a policy where any student

caught bringing firearms to school would be suspended for a year. Teachers may establish rules and consequences (punishment) for breaking classroom rules.

There are several reasons why educators use independent group-oriented contingencies. Because the target behavior, criterion, and consequences are the same for all students (group characteristic), and each student's access to consequences is contingent upon their own behavior (independent characteristic), educators, administrators, parents, and students rate them as fair (Skinner, Skinner, Skinner, & Cashwell, 1999). When all contingency components (i.e., target students, antecedents, target behaviors and criteria, consequences) are held constant it is often easier and more efficient for educators to implement contingency procedures with integrity (consistency).

When rewards are offered contingent upon specific behaviors the effectiveness of those rewards is dependent upon several factors including reward quality, rate, and immediacy; and the time and effort to complete the target behavior to criterion (Neef, Shade, & Miller, 1994). Because all contingency components are held constant across each student, the effectiveness of independent group-oriented contingencies will vary across students and within students. For example, Consider Martha Math who has strong math skills but weak reading skills. A contingency may be established where children who perform at 90% or higher on their homework receive a letter grade of *A*. Assuming an *A* serves as a moderate reinforcer for Martha, this contingency may increase the probability that Martha does her math homework, but not her reading homework. One reason is because the math takes little effort, thus the reinforcement is powerful enough to warrant such effort. The time required to complete the work also influences the contingency. Martha may need only 15 minutes to complete her math but the reading may require 60 minutes. Thus, the rate of reinforcement (i.e., one letter grade *A* per 15 minutes for

Math versus one letter grade *A* for 60 minutes for reading) is stronger for the math than reading (Skinner, Pappas, & Davis, 2005).

There are social side effects associated with these independent group-oriented contingencies. When the contingency is held constant across students and consequences are public, students acquire information about their classmates' performance by observing who receives access to rewards. For example, if students are required to perform at 80% or higher to gain access to a consequence, then peers know that those who did not get the consequence performed poorly on the academic task (Cashwell, Skinner, Dunn, & Lewis, 1998).

<div align="center">Interdependent Group-Oriented Contingencies</div>

With interdependent group-oriented contingencies all members of the group (e.g., class, school) receive access to a consequence based on some aspect of the group's behavior meeting a group-oriented criterion (Litow, & Pumroy, 1975). Thus, all members of a class may receive a pizza if the class averages 90% on an exam or sells 200 raffle tickets. Such contingencies are said to be interdependent because each student's access to consequences is not merely dependent on their own behavior, but also their peers' behavior.

Because all-or-none of the group receives access to consequences, interdependent group-oriented contingencies often are easier to manage (easier to deliver rewards to all than to some and not others). When all-or-none receive access, teachers may not have to be as concerned with students who did not earn tangible rewards gaining access to them by purchasing them on their own, stealing them from peers, or classmates sharing. Finally, using such contingencies allow educators to use inexpensive activity rewards that are often difficult to deliver to some and not others (i.e., difficult to apply individual or independent group-oriented contingencies). For example, the class may earn listening to music during independent seat work or extra recess. In

addition to these procedural advantages associated with reinforcement delivery, interdependent group-oriented contingencies may cause peers to encourage each other's desired target behaviors. Finally, when all-or-none receive access to consequences students are not provided information regarding their peers' performance and all students, as opposed to only a portion, are able to celebrate successes (Skinner et al., 2005).

Despite these advantages, interdependent group-oriented contingencies rarely are part of educational contingencies primarily because they are not "fair." Specific concerns involve students who performed/behaved poorly gaining access to rewards, and those who performed/behaved appropirately being punished for their peers' behavior. Additionally, students may threaten or aggress against those who caused the group to lose access to rewards or be punished. These negative side effects are more likely to occur with public behaviors or when public feedback is provided that allow students to identify those who behaved in such a manner to cause the group to lose access to rewards. Another concern with these contingencies is that all students receive access to the same consequence. If a consequence is desired by most of the group, but aversive to a small number of students, those students may sabotage the contingency so that they can avoid the aversive consequence (Skinner, Cashwell, & Dunn, 1996). These saboteurs are actually merely responding to a contingency known as negative reinforcement (e.g., avoid aversive consequence by engaging in inappropriate behaviors).

<center>Dependent Group-Oriented Contingencies</center>

A dependent group-oriented contingency is applied when all-or-none of a group (group-oriented aspect) receives access to consequences contingent upon the behavior of one (dependent aspect) or just several students. Procedurally, dependent group-oriented contingencies have many advantages. With respect to consequences, the all-or-none aspect reduces the probability of

reinforcement stealing, sharing, or belittling weakening the contingency and allows educators to use activity rewards that are often resource efficient, but difficult to deliver to some and not others. An additional procedural advantage is related to determining if the target student met the criterion. With dependent group-oriented contingencies educators only have to evaluate one or a few students' performance(s) to determine if the group gains access to the consequence (Gresham & Gresham, 1982; Heering & Wilder, 2006).

Despite these procedural advantages, there are several undesirable outcomes that may occur with such contingencies. Dependent group-oriented contingencies may place a tremendous amount of pressure on the target student. When the target student earns the reward for the group, peers may praise the student. However, when the student fails to earn a reward for the group, the group may punish the student. Second, such contingencies often cause peers to monitor and evaluate the target student's behavior. Thus these contingencies may draw additional peer attention to a student's different, undesirable, or underdeveloped social and/or academic skills. When those target behaviors are academic, peers may help the target student succeed. This help may be appropriate or inappropriate. For example, suppose the entire class receives access to a reward contingent upon Steve scoring 80% or higher in spelling. To help Steve succeed, classmates may a) practice spelling words with Steve while on the bus to school, b) threaten Steve with aversive consequence if he does not make 80% or higher on the test, and/or c) teach Steve how to cheat on the spelling test. Disruptive inappropriate social behaviors are public (i.e., if they disrupt others they must be public) and often controlled with punishment. Therefore, peers may be more likely to threaten target students when dependent group-oriented contingencies target decreasing disruptive behaviors (Pigott & Heggie, 1985).

Classroom Applicatons: Dos and Don't

As educators attempt to apply group-oriented contingencies they may occasion both desired and undesired changes in student behavior. In this section we summarize some strategies and procedures designed to increase the probability of the group-oriented contingency effecting target behaviors and increasing other desired behaviors in the classroom, while reducing the probability of negative-side effects.

No Punishing Consequences

Don't use interdependent or dependent group-oriented contingencies with punishment and/or high-stakes consequences as access to consequence is based partially on peer's behavior. Students who are punished based on their peer's behaviors may be placed in a situation where they have little or no control over whether they are punished. This model may cause a plethora of side effects including learned helplessness and/or avoiding the environment where they are punished based on another's behavior (Repp & Singh, 1990). Additionally, students may try to control peers behavior, and this can result in peer's threatening and aggressing against each other.

Pitfalls of Academic Grades as Consequences

While some forms of cooperative learning encourage delivering academic credit (grades) based on peers' performance (Lew, Mesch, Johnson, & Johnson, 1986; Slavin, 1991) there are several reasons to avoid doing this. First, grades are more than consequences; they also are symbols or ratings that provide information regarding a student's level of achievement or learning. This information is used to make various educational decisions. For example, if a student who learns little receives a letter grade of *A* because the rest of his/her group learned much, that student may be placed in advanced courses. Unfortunately, this student may lack the pre-requisite skills to succeed in those courses. Another concern is related to other contingencies linked to grades. For example, admission to college or access to scholarships may be contingent

upon grades. Thus, students who learn much but receive weaker grades because of their group's performance may suffer some very high stakes consequences.

Allow Choice, Random Selection, or Exchangeable Rewards

Some consequences are reinforcing to some students and not others. Thus, when attempting to construct a group-oriented contingency where all students can or do receive access to the same consequence, educators may have difficulty developing consequences that are reinforcing to all students and have sufficient strength to cause students to choose to engage in high-effort behaviors. When using independent group-oriented reinforcement one solution is to allow students to choose their rewards. Almost all token economies employ such procedures and are designed to allow students to earn more powerful rewards for stronger performance. Another solution is to allow students to randomly select rewards.

Random selection of rewards is particularly useful when implementing interdependent and dependent group-oriented rewards (Kelshaw, Sterling-Turner, Henry, & Skinner, 2000). Thus, when the entire group earns a reward the teacher could merely pull a slip of paper out of a container. The slip of paper indicates the consequence the group earned. This procedure is valuable for several reasons. First, as long as there is a powerful reward for each student in the reward pool, but not necessarily the same reward, each student may be highly motivated to "do their best" (Popkin & Skinner, 2003). Additionally, when using random selection, educators are employing variable schedules of reinforcement (variable quality). Variable schedules have been shown to be more effective than fixed schedules for maintaining behavior (Skinner et al., 2004).

In order to randomly select rewards, educators need a pool of rewards. The easiest way to develop the pool may be to ask the students. Educators should provide students with guidelines for their suggestions including rewards that a) are free or inexpensive, b) most students like, c)

are legal and moral, and d) are easy to deliver. Additionally, educators may want to provide examples of acceptable rewards and include tangibles, activities, exchangeables, recognition, and embarrassing behaviors. While students and educators have little trouble generating tangible reinforcers, one of the biggest procedural advantages of interdependent and dependent group-oriented contingencies is that resource efficient (free) activity rewards can be used. Such activities can include playing a game (e.g., silent ball), extra time for recess, and even going on a field trip. One particularly powerful reinforcer we used was for the class to be able to listen to music during independent seatwork. Of course we then had to select the music, but that was easy as we just randomly selected from a pool of tapes/CDs that students brought to school (Skinner et al., 2004).

Exchangeable rewards are often easy to add when teachers have a token economy in place. Thus, when an interdependent or dependent group goal is met, all students could earn 1, 5, or even 50 extra tokens. While U.S. currency is a practical exchangeable, we do not recommend giving the student money as many parents want to monitor their children's money supply and purchases. Recognition often is a powerful reinforcer. For example, sending a note home that informs each student's parents how well the group did can serve as a powerful reinforcer that may occasion more reinforcement delivery at home. Finally, embarrassing behaviors can serve as strong reinforcers (Skinner et al., 1999). The first author once had to sing the students a song. While this would surely be a punisher to most, for these students this appeared to be a potent reinforcer.

Students provide suggestions, but teachers decide which suggestions go into the rewards pool. If a suggestion box is used to solicit possible group rewards, educators should not read these suggestions in front of the class as many inappropriate suggestions can cause teachers to

laugh. Instead educators should read suggestions when students are not observing (they may want to share some with fellow teachers who also need a good laugh) and then announce only appropriate suggestions when they are added to the pool of potential rewards. Once drawn, some consequences can and should be added back to the pool while others should be discarded.

Incidental Target Behaviors

One of the primary advantages to having a pool of group rewards available is that teachers can react to unplanned events by reinforcing the group. For example, suppose a student who is not very popular observes a small child fall and begin crying on the playground. This unpopular student helps the small child up and calms him down. The teacher who observed this behavior may reward the unpopular student (individual reward); however, this is unlikely to cause a reaction from peers. Alternatively the teacher could announce this event at the end of the day and randomly select a group reward. By rewarding the group contingent upon this unpopular student's behavior, the teacher may increase the probability of peer's praising this unpopular student and increase the probability of all students engaging in similar behaviors in the future.

Social Target Behaviors

While we discourage delivering any type of punishment to the entire group based on inappropriate behaviors of peers, interdependent and even dependent group-oriented contingencies can be delivered contingent upon desired behavior. For example, researchers taught students to do the opposite of tattling, by teaching them to report instances of classmates engaging in incidental prosocial behaviors (tootles). The entire class then earned a group reward when they reached a total number of tootles (cumulative criteria). Thus, students were encouraged to engage in prosocial behaviors and report each others' prosocial, as opposed to antisocial behaviors (Cashwell, Skinner, & Smith, 2001; Skinner, Cashwell, & Skinner, 2000).

Academic Target Behaviors.

Although grades should not be delivered based on peers' performance, we want to encourage educators to supplement grades (independent group-oriented contingencies) with interdependent and even dependent group-oriented contingencies. In fact, such contingencies may prove extremely valuable in motivating those who require much effort to perform well. Again consider Martha Math, the student with strong math, but weak reading skills. The typical reinforcement for math (e.g., grades, gold stars, praise) may be sufficient to cause her to put the time and effort into her math assignments, but insufficient to cause her to allocate the larger amount of time and effort required to earn the same rewards for reading. However, in order for Martha to develop her reading skills it is essential that she put forth this effort (Skinner et al., 2004).

Several researchers have shown how interdependent group-oriented contingencies can be layered on top of independent group-oriented contingencies and enhance students' performance and learning. For example, Sharp and Skinner (2004) increased the number of books read and performance on comprehension tests by supplementing an independent group-oriented contingency with a dependent group-oriented contingency. Specifically, when students earned a small toy for passing an exam (independent group-oriented contingency), over a 3-week period only three exams were passed. However, when interdependent group-oriented contingencies were added all students began passing these exams and the class average increased more than 350%.

Varying Criteria Across Students

When using independent group-oriented contingencies, educators who make exceptions (i.e., reduce the criteria for a particular student or provide an easier but more appropriate

assignment for a particular student) often face complaints from peers ("it's not fair"). However, with interdependent group-oriented contingencies all students benefit when classmates succeed. Thus, educators who are required by law (special education teachers) to vary target behaviors across students are likely to find interdependent group-oriented contingencies highly acceptable to students. For example, Popkin and Skinner (2003) implemented interdependent group contingencies in a self-contained classroom for students with emotional/behavioral disorders targeting spelling, math, and language arts. Each student was placed in a different level of the curriculum and had different tasks each day. Thus, on any given day one student may have been doing very advanced academic work (e.g., taking a pre-algebra exam) and a peer may have been doing basic but appropriate math work for their skill development level. The students with the higher-level material did not complain about his classmate having easier work, because if his classmate succeeded, he was more likely to be reinforced.

Random Selection of Group Criteria

While considerable work has established the effectiveness of group contingencies, there is no science that allows us to set the most appropriate criteria for an individual student, let alone a group of students. For example**,** Campbell and Skinner (2004) wanted to decrease room-to-room transition time in a second-grade classroom. Baseline data showed average transition time taking approximately 300 seconds. Because the class moved through the hallway as a group, an interdependent group-oriented contingency appeared to be the most obvious contingency to apply. However, the researchers did not know how to set the criteria. While some have suggested setting small improvement (e.g., 10%) and then gradually altering the requirements (shaping), the researchers randomly selected both the criteria and the specific transition (e.g., to recess, back from recess, to lunch, back from lunch). Thus, while the group knew the goal (reduced

transition time), they did not know which specific transition would serve as the criterion or what the specific criteria was. The group's average transition times immediately decreased over 400%.

Random Selection of Target Students

While dependent group-oriented contingencies can put much pressure on target students and draw classmate's attention to target students' underdeveloped skills or inappropriate target behaviors, randomly selecting target students reduce these side effects (Gresham & Gresham; 1982). For example, Heering and Wilder (2006) rewarded the entire class contingent upon a few students' behavior. Specifically, the teacher collected on-task data on students on a row-by-row basis. The teacher then rewarded the entire class based on the performance of a specific row. However, the class did not know which students' (i.e., row) performance was targeted. Thus, all students were potentially targeted. In these situations it is acceptable for the teacher to announce the randomly selected students (row) who earned to reward for the class. However, if the group did not earn the reward the teacher should not reveal which randomly selected group failed to meet the target criterion, as peers may aggress against this group (Pigott, & Heggie, 1985).

Maintaining Desired Behaviors

One concern with reinforcement is maintenance after reinforcement is withdrawn. We have already discussed how randomly selecting rewards may enhance maintenance because the schedule is variable. Other researchers have faded reinforcement by altering the group criteria for earning reinforcement. For example, as students demonstrated proficiency in tootling, (students reporting of classmates' incidental prosocial, as opposed to antisocial behaviors), Skinner et al. (2000) increased the number of tootles required for the class to earn the group reward. Others have delivered letters based on the group meeting a criterion. These the letters spelled out the reward (Yarbrough, Skinner, Lee, & Lemmons, 2004). Thus initially the group may earn a party

(five letters), then recess (six letters), then popcorn (seven letters). When randomly selected criteria are used, educators can alter the criteria pool to enhance requirements as students' behavior improves (Skinner et al., 2004)

Finally, educators can add target behaviors. For example, Popkin and Skinner (2003) began their interdependent group-oriented contingency targeting spelling and randomly selected the criterion (class average percent correct) each day. After several weeks, the teacher randomly selected the criteria and the target behavior (spelling or math). After several weeks language arts was added. Thus, in the beginning the group was working hard on their spelling to earn the group reward. However, by the end they were working on all three curricula areas to earn the same reward. Thus, students were putting forth more effort to earn the same rewards; a method of fading that enhances and maintains more behaviors, without removing pleasant stimuli (rewards).

Conclusion: Fairness and Philosophy

Educators may not feel comfortable when a student works hard, does well, but does not earn a group reward because of his/her peers' behavior. It is important for educators to continue to implement other contingencies (e.g., independent group-oriented contingencies) designed to reinforce this student's behavior (grades, praise, and gold stars), as interdependent and dependent group-oriented contingencies are designed to supplement, not replace the other contingencies. When the first author added interdependent group-oriented rewards to the classroom he dealt with complaints from students who did well but did not get access to the group reward by simply offering to withdraw the program. No students took him up on it.

A related concern with interdependent and dependent group-oriented rewards is that some students who did not earn the reward get them anyway. We have no answer to this

limitation except to offer the alternative. Some students go to school everyday with dread, hoping to avoid negative events. These students have little hope of earning rewards because the criteria and target behaviors are set the same for everyone, but perhaps too high for these students. By adding these group-oriented rewards, these students who have given up may now go to school thinking; *I am going to do my best and something wonderful could happen today, my group could earn a reward.*

References

Campbell, S., & Skinner, C. H. (2004).Combining explicit timing with interdependent group

    contingency program to decrease transition times: An investigation of the timely

    transitions game. *Journal of Applied School Psychology*, *20*(2), 11-28.

Cashwell, C. S., Skinner, C. H., Dunn, M., & Lewis, J. C. (1998). Group reward programs: A

    humanistic approach. *The Journal of Humanistic Education and Development, 37*,

    47-53.

Cashwell, T. C., Skinner, C. H., & Smith, E. S. (2001). Increasing second-grade students' reports

    of peers prosocial behaviors via direct instruction, group reinforcement, and progress

    feedback: A replication and extensions. *Education and Treatment of Children, 24*,

    161-175.

Gresham, F. M., & Gresham, G. N. (1982). Interdependent, dependent, and independent group

    contingencies for controlling disruptive behavior. *Journal of Special Education, 16*,

    101-110.

Hall, R. V., & Hall, M. L. (1998). *How to negotiate a behavioral contract* (2nd ed.). Austin, TX:

    Pro-Ed.

Heering, P. W., & Wilder, D. A. (2006). The use of dependent group contingencies to increase

    on-task behavior in two general education classrooms. *Education and Treatment of*

    Children, 29, 459-467.

Kelshaw, K., Sterling-Turner, H. E., Henry, J. & Skinner, C. H. (2000). Randomized

    interdependent group contingencies: Group reinforcement with a twist. *Psychology in the*

    Schools, 37, 523-533.

Lew, M., Mesch, D., Johnson, D. W., & Johnson, R. (1986). Components of cooperative learning: Effects of collaborative skills and academic group contingencies on achievement and mainstreaming. *Contemporary Educational Psychology, 11*, 229-239.

Litow, L., & Pumroy, D. K. (1975). A brief review of classroom group-oriented contingencies. *Journal of Applied Behavior Analysis, 8*, 341-347.

Neef, N. A., Shade, D., & Miller, M. S. (1994). Assessing influential dimensions of reinforcers on choice in students with serious emotional disturbance. *Journal of Applied Behavior Analysis, 27*, 575-583.

Pigott, H. E., & Heggie, D. L. (1985). Interpreting the conflicting results of individual versus group contingencies in classrooms: The targeted behavior as a mediating variable. *Child and Family Behavioral Therapy, 7*, 1-15.

Popkin, J., & Skinner, C. H. (2003). Enhancing academic performance in a classroom serving students with serious emotional disturbance: Interdependent group contingencies with randomly selected components. *School Psychology Review, 32*, 271-284.

Repp, A. C., & Singh, N. N. (1990). *Perspectives on the use of nonaversive and aversive interventions for persons with developmental disabilities*. Sycamore, IL: Sycamore.

Sharp, S., & Skinner, C. H. (2004). Using interdependent group contingencies with randomly selected criteria and paired reading to enhance class-wide reading performance. *Journal of Applied School Psychology*, *20*(2), 29-46.

Skinner, C. H., Cashwell, C., & Dunn, M. (1996). Independent and interdependent group contingencies: Smoothing the rough waters. *Special Services in the Schools, 12,* 61-78.

Skinner, C. H., Cashwell, T. H., & Skinner, A. L. (2000). Increasing tootling: The effects of a
    peer monitored interdependent group contingencies on students' reports of peers'
    prosocial behaviors. *Psychology in the Schools, 37,* 263-270.

Skinner, C. H., Pappas, D. N., & Davis, K. A. (2005). Enhancing academic engagement:
    Providing opportunities for responding and influencing students to choose to respond.
    Psychology in the Schools, *42,* 389-403.

Skinner, C. H., Skinner, C. F., Skinner, A. L., & Cashwell, T. C. (1999). Using interdependent
    contingencies with groups of students: Why the principal kissed a pig at assembly.
    Educational Administration Quarterly, 35, 806-820.

Skinner, C. H., Williams, R. L., & Neddenriep, C. E. (2004). Using interdependent group-
    oriented reinforcement to enhance academic performance in general education
    classrooms. *School Psychology Review*, *33*, 384-397.

Slavin, R. E. (1991). Cooperative learning and group contingencies. *Journal of Behavioral
    Education, 1*, 105-116.

Yarbrough, J. L., Skinner, C. H., Lee, Y. J., & Lemmons, C. (2004). Decreasing transition times
    in a second grade classroom: Scientific support for the timely transitions game. *Journal
    of Applied School Psychology*, *20*(2), 85-108.