

2014

# Examination of the differential effectiveness of interdependent and dependent group contingencies in reducing disruptive behavior in the classroom

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EXAMINATION OF THE DIFFERENTIAL EFFECTIVENESS OF  
INTERDEPENDENT AND DEPENDENT GROUP CONTINGENCIES IN REDUCING  
DISRUPTIVE BEHAVIOR IN THE CLASSROOM

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Arts

in

The Department of Psychology

by  
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B.A., Goshen College, 2008  
May 2014

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## ABSTRACT

Disruptive behavior in the classroom negatively affects all students' academic engagement, achievement, and behavior. Group contingencies have been proven effective in reducing disruptive behavior as part of behavior interventions in the classroom. The Good Behavior Game is a classwide intervention that employs an interdependent group contingency to diminish disruptive behavior. Previous research comparing the effects of the different group contingencies has been inconclusive, inconsistent or unable to rule out sequence effects. This study employed an alternating treatments design across 3 elementary classrooms to compare the effectiveness of interdependent and dependent group contingencies in decreasing disruptive behavior. Results showed that the Good Behavior Game was effective overall in reducing disruptive behavior, and teachers found the intervention to be acceptable and effective. Additionally, improvements in teachers' global ratings of students' social skills and academic behaviors were associated with the intervention. Effects of the group contingencies varied across classrooms. In 2 third-grade classrooms, superior effects were found for the interdependent group contingency over time, while in a kindergarten classroom, the group contingencies were similarly effective. In summary, both interdependent and dependent group contingencies may reduce disruptive behavior in the classroom, and their selection for use by educators may depend upon preference, goals for behavior change, student characteristics, and practical considerations.

## CHAPTER 1 REVIEW OF LITERATURE

Research has consistently found that students' disruptive behavior has adverse effects on educational outcomes for all students in the classroom (e.g., Clunies-Ross, Little, & Kienhuis, 2008; Shinn, Ramsey, Walker, Stieber, & O'Neill, 1987). In general, high rates of disruptive behavior in the classroom are associated with less on-task student behavior and less instructional time for the teacher (Oliver, Wehby, & Reschly, 2011; Stage & Quiroz, 1997). Furthermore, students in these classrooms are more likely to have poorer grades and lower standardized test scores (Shinn et al., 1987). Given the importance of academic engagement, frequent disruptive behavior in the classroom may be detrimental to all students.

Effective classroom management practices have been linked to reductions in off-task behavior and disruptive behavior (Johnson, Stoner, & Green, 1996). Despite the importance of teacher prevention of and intervention in disruptive behavior, Siebert (2005) found that teachers reported that they did not feel adequately prepared to manage the problem behavior of their students. Gresham (1989) also reported that teachers are less likely to accurately implement an intervention that is complex, time-consuming, and resource-consuming. Classwide interventions that require little training, time, and resources are therefore ideal for reducing disruptive behavior.

Group contingencies consist of the delivery of a reinforcer contingent on the behavior of a member of the group, a portion of the group, or the whole group (Cooper, Heron, & Heward, 2006). Target behaviors, reinforcers, and criteria for reinforcement are common across the group (Litow & Pumroy, 1975). Individual contingencies, on the other hand, are distinguishable from group contingencies by unique target behaviors, reinforcers, and criteria for reinforcement for a given individual. Individual contingencies require more time and resources, so teachers may be

less likely to use them, especially when there are multiple students engaging in disruptive behavior (Hall, 1991). Group contingencies are more efficient and simpler to implement than individual contingencies (Skinner, Cashwell, & Dunn, 1996). Additionally group contingencies have been found to be at least as effective (Solomon & Tyne, 1979), if not more effective than individual contingencies (Stage & Quiroz, 1997). A solid foundation of research has shown that group contingencies are effective in reducing disruptive behavior (Barrish, Saunders, & Wolf, 1969; Harris & Sherman, 1973; Litow & Pumroy, 1975; Medland & Stachnik, 1972). Therefore a group contingency may be a practical intervention for teachers to employ in order to reduce disruptive behavior.

Litow and Pumroy (1975) identified three types of group contingencies: independent, dependent, and interdependent. In an independent group contingency, an individual in a group may earn a reinforcer if the individual's behavioral performance meets the criterion; the behavior of the other members in the group does not affect that individual's opportunity for reward. In a dependent group contingency, all members in the group may receive the reinforcer if a selected individual or a small portion of the group meets the behavioral performance criterion. An interdependent group contingency requires the group as a whole to meet the criterion for behavioral performance in order for all members of the group to receive the reinforcer.

In addition to the efficacy of group contingencies in general, research has found several advantageous effects associated with interdependent and dependent group contingencies. Interdependent and dependent group contingencies require less teacher time spent tracking data (Gresham & Gresham, 1982) and delivering reinforcement (Axelrod, 1973; Gresham & Gresham, 1982). Gresham and Gresham (1982) suggested that interdependent and dependent group contingencies positively influence cooperation and peer interaction because they occasion

peers to verbally encourage and reinforce each other. Both contingencies also allow for a more diverse selection of reinforcers (Skinner et al., 1996). Because reinforcement is delivered to all or none of the group members, activity reinforcers are more easily delivered, such as extra recess time (Skinner et al., 1996). In an independent group contingency, extra recess may not be practical to provide when only one or several students meet the performance criterion. Furthermore students may enjoy reinforcing activities more when all students participate in the activity (Skinner et al., 1996).

Numerous studies have shown the efficacy of group contingencies in affecting change in a wide variety of target behaviors, including academic achievement, behavior and social outcomes. In a study of the application of group contingencies to academics, Hopkins, Schutte, and Garton (1971) found that an independent group contingency resulted in increased speed of assignment completion and increased accuracy of the assignment. Another study employed an interdependent group contingency to improve math and English performance (Baer & Richards, 1980).

One of the most well-known and empirically-supported group contingencies applied to behavior is the Good Behavior Game (Barrish et al., 1969; Harris & Sherman, 1973; Medland & Stachnik, 1972). In the original application of the Good Behavior Game (GBG), Barrish et al. (1969) utilized an interdependent group contingency to reduce disruptive behavior in a fourth-grade classroom. The teacher divided the students into two teams, explained the classroom rules (e.g., no talking out) and told the students that they would earn a mark on the board for their team if they broke a rule. The team with the fewest marks, or both teams if both had fewer than five marks, at the end of the game would earn a special privilege.

The effects of the GBG on disruptive behavior have been replicated, and the components of the intervention have been analyzed (Harris & Sherman, 1973; Medland & Stachnik, 1972). Medland and Stachnik (1972) replicated the findings of the original GBG study (Barrish et al., 1969) in a fifth-grade classroom. Harris and Sherman (1973) replicated the results of the Barrish et al. (1969) study in one fifth-grade and one sixth-grade classroom. Furthermore, they found that eliminating the reward for winning the game did not decrease disruptive behavior as greatly as when the reward was delivered for winning. When the criterion for winning was altered (e.g., from five marks to eight marks), students' disruptive behavior altered to meet the criterion. That is, students engaged in more disruptive behavior when the criterion was higher. When feedback was eliminated via not recording marks on the board, reductions in disruptive behavior were maintained. Finally, Harris and Sherman (1973) found inconsistent results when the two teams of students were combined to form one whole-class team; some sessions showed higher rates of disruptive behavior in the whole-class condition, while some sessions showed equal rates.

Subsequent to the first study of the Good Behavior Game (Barrish et al., 1969), researchers have examined and manipulated its components. However, most studies utilize similar procedures (Tankersley, 1995; Tingstrom, Sterling-Turner, & Wilczynski, 2006). Generally, teachers begin by dividing students into several teams, selecting several target behaviors or rules, and determining a time of day when the GBG will be played. At the start of the GBG each day, the teacher reviews the behavioral rules, reminds them of the criterion for reward, and tells the students that the GBG is beginning. When a student violates a rule during the game, the teacher puts a mark for that student's team on the board. At the end of the selected time interval, the team with either the fewest marks earns the reward, or both teams may earn the reward if they accumulate fewer than the criterion number of marks.



The Good Behavior Game has been applied to a variety of populations, behaviors, and settings (Tingstrom et al., 2006). In the Tingstrom et al. (2006) review of the GBG from 1969 to 2002, most studies implemented the GBG with first through sixth grades, although successful effects were found with participants from preschool to adolescence and adulthood. Furthermore, most studies took place in general education classrooms and/or with students with a history of behavior problems. Some studies analyzed the effects of the GBG on the disruptive behavior of students with disabilities and concluded that the GBG was also effective for these students (e.g., Gresham & Gresham, 1982). Several studies replicated the effects of the GBG in other countries (Tingstrom et al., 2006), such as Germany (Huber, 1979) and Sudan (Saigh & Umar, 1983).

Additionally Tingstrom et al. (2006) found that most GBG studies implemented the intervention for the purpose of reducing disruptive behavior (e.g., Barrish et al., 1969; Harris & Sherman, 1973). On the other hand, a variety of GBG investigations studied the impacts of the intervention on academic achievement, social behavior and daily living skills. The GBG had incidental effects on math achievement in a Harris and Sherman (1973) study on disruptive behavior. Darveaux (1984) found that adding an additional contingency to the GBG for academic performance improved math accuracy as well as behavior. In a direct application of the Good Behavior Game to academic performance, Maloney and Hopkins (1973) developed the “Good Writing Game,” which resulted in increased completion and accuracy of writing assignments. In a daily living skills application, Swain et al. (1982) found that the GBG could be used to improve oral hygiene skills.

Tingstrom et al. (2006) reported that several GBG studies found positive effects on prosocial behavior, including cooperation, even when prosocial behavior was not the behavior targeted for intervention. Reductions in aggressive behavior among aggressive children and in

shy behavior by shy children were reported after implementation of the GBG (Dolan et al., 1993). Because of the substantial foundation of empirical support for the GBG and the long-term effectiveness of it, the GBG has been called a “behavioral vaccine” (Embry, 2002, p. 276). That is, participants in the GBG in elementary school have shown persistent reductions in disruptive behavior and long-term correlations with decreased likelihood of substance abuse (Embry, 2002). Specifically, Johnson, Turner, and Konarski (1978) found that reductions in disruptive behavior persisted for 2 months after the intervention was discontinued, though they subsequently faded. A randomized control study followed up with students who had participated in the GBG in first and second grades and found that 6 years after the intervention, teacher-reported student aggression had declined over 30% (Kellam et al., 1998). When the participants reached their early teens, follow-up teacher ratings indicated that boys engaged in less disruptive behavior than boys in the control condition (Kellam & Anthony, 1998). Furthermore, boys who had participated in the GBG were 50% less likely to start smoking tobacco by ages 13-14 years (Kellam & Anthony, 1998).

The demonstrated effectiveness of the Good Behavior Game supports the effectiveness of an interdependent group contingency in influencing behavior change. Further studies have investigated the differential effects of the three types of group contingencies to determine which group contingency may be most effective in producing change.

Numerous studies have investigated and compared the effects of two types of group contingencies. A study of independent and interdependent group contingencies investigated differential effects on disruptive behavior by implementing an academic performance criterion (Page & Edwards, 1978). In this study of five classrooms of students from sixth to eighth grades, researchers found that both group contingencies reduced disruptive behavior, but the

interdependent group contingency resulted in greater reductions in disruptive behavior than the independent group contingency (Page & Edwards, 1978). McReynolds, Gange, and Speltz (1981) compared the effects of interdependent and dependent group contingencies on off-task behavior in children. Both group contingencies resulted in similar reductions in off-task behavior.

The first 3-way comparison of the differential effects of the three types of group contingencies was conducted by Gresham and Gresham (1982). Using a modified reversal design, the authors compared the three group contingencies within the Good Behavior Game with 12 students diagnosed with mental retardation in a self-contained classroom. The authors found that all group contingencies were successful in reducing disruptive behavior. The interdependent and dependent group contingencies were associated with the lowest rates of disruptive behavior as compared to the independent group contingency. However differences in the effects of the two most effective group contingencies could not be determined because sequencing of the contingencies may have resulted in carryover effects.

In the second 3-way comparison of the effects of the three types of group contingencies, Shapiro and Goldberg (1986) utilized an alternating treatments design to examine the effects of implementation of the GBG on spelling performance in two sixth-grade, general education classrooms. In the dependent group contingency condition, the student whose behavior would determine reinforcer delivery was only known to teachers until the end of the intervention daily. The results demonstrated that all three group contingencies resulted in improved spelling performance. While the independent group contingency initially showed superior effects, the discrepancy faded throughout the duration of the intervention. Therefore no one group

contingency was deemed most effective in improving spelling performance, although students reported that the independent contingency was most acceptable.

In another 3-way comparison of the differential effectiveness of group contingencies in reducing disruptive behavior, researchers again attempted to eliminate the potential confound of carryover effects in the Gresham and Gresham (1982) study by employing an alternating treatments design (Theodore, Bray, & Kehle, 2004). An intervention similar to the Good Behavior Game was implemented in a special education classroom with three 17-year-old students to study the group contingencies; it differed in that the reinforcers were randomized and unknown to the students until delivery. In addition, the implementation of the dependent group contingency differed from traditional dependent group contingencies. The student whose behavioral performance would determine whether the group received the reinforcer was not selected by the teacher until the time of reinforcer delivery. Results indicated that the dependent group contingency was slightly more effective overall than the other two group contingencies; however the difference was not substantial. Theodore et al. (2004) concluded that there was no clear differentiation among the three group contingencies.

The Good Behavior Game is time-efficient, easy to implement, and requires few resources (Embry, 2002; Tingstrom et al., 2006). Teachers and students have reported that they find the intervention acceptable (Barrish et al., 1969; Theodore et al., 2004). Most importantly a substantial number of studies have replicated the GBG's effectiveness in reducing disruptive behavior. The current study intended to replicate these findings. Furthermore, previous researchers have hypothesized that implementation of the GBG is related to improvements in prosocial behavior, especially in cooperation (Dolan et al., 1993; Gresham & Gresham, 1982) and academic performance (Harris & Sherman, 1973). Consequently, teachers' global ratings of

students' social skills and academic behaviors were examined pre- and post-GBG to determine whether improvements in social skills and academic performance are associated with the GBG.

Finally, although the results of studies comparing the effects of the three types of group contingencies have been inconsistent and inconclusive, the dependent and interdependent group contingencies have been found more often to be slightly more effective than the independent group contingency (Gresham & Gresham, 1982; Page & Edwards, 1978; Theodore et al., 2004). Dependent and interdependent group contingencies also make tracking behavior easier for teachers, support peer cooperation, facilitate the delivery of diverse reinforcers (e.g., activities, recess), and may be more effective in decreasing disruptive behavior. Even though one study found the independent group contingency was most acceptable to students (e.g., Shapiro & Goldberg, 1986), practical advantages may lead teachers to prefer dependent and interdependent group contingencies, since all group contingencies have been found effective. Because interdependent and dependent group contingencies share similar advantages and disadvantages to their use, determination of the more effective group contingency could aid educators in selecting between them for intervention. The purpose of the current study is to compare the effects of interdependent and dependent group contingencies.

## CHAPTER 2 METHOD

### Participants and Setting

Three general education classrooms in two elementary schools in southeastern Louisiana were selected to participate. One kindergarten and two third-grade classrooms were chosen for inclusion upon teacher request for classwide intervention to reduce disruptive behavior and an informal observation by the researcher to confirm the presence of disruptive behavior in the classroom. Verbal consent was obtained for all teachers, and parental consent and child assent were obtained for students. There were 17 student participants in Ms. Green's kindergarten class, 22 student participants in Ms. Grey's third-grade class, and 16 student participants in Ms. Brown's third-grade class.

### Experimental Design and Data Analysis

The effects of interdependent and dependent group contingencies on disruptive behavior were compared using an alternating treatments design (ATD). An ATD design allows for comparison of the effectiveness of multiple interventions on a single, dependent variable. By rapidly alternating and counterbalancing the order of the interventions, the possible problematic effects of a reversal design are controlled for, including sequential ordering effects, carryover effects, and history effects (Barlow & Hayes, 1979). An initial baseline followed by the alternating treatments phase was implemented, so as to prevent multiple treatment interference possible with a no-treatment control condition during the alternating treatments phase (Barlow & Hayes, 1979).

Visual analysis was used to examine the effectiveness of the Good Behavior Game and compare the effects of the interdependent and dependent group contingency conditions in reducing disruptive behavior. The primary dependent measure was the rate of rule violations, an

indication of the frequency of disruptive behavior per minute. To determine the effects of the Good Behavior Game on the dependent variable compared to baseline, data were displayed in a graph by class and visually analyzed for trend, overlap, level, variability, and immediacy of effect (Cooper et al., 2006; Kratochwill et al., 2010). To compare the effects of the two group contingency conditions, data from the two conditions were analyzed for overlap, stable levels or counter-trends, and vertical distance (Cooper et al., 2006).

## Measures

### Rule Violation Tracking Sheet

The teacher recorded rule violations (e.g., disruptive behaviors) as they occurred during the time period selected for intervention by tallying them on the board separated by team during the interdependent condition or by tallying them on paper in the dependent condition, and by clicking the tally counter. At the end of the chosen time period daily, the teacher recorded the total rule violations on a rule violation tracking sheet to report a frequency count of disruptive behavior. Teachers also recorded the approximate start and end time of each implementation of the GBG. The total number of rule violations was divided by the number of minutes of intervention to produce a rate of rule violations per minute. During 42% of intervention sessions, an observer also tracked the frequency of disruptive behavior in order to measure inter-observer agreement (IOA) with the teacher.

Disruptive behavior included “talking out,” “out of seat or area,” and “touching or taking.” Talking out was operationally defined as talking without raising a hand and waiting for teacher permission during an activity when the teacher indicated that silence was expected. Out of seat or area consisted of the body not touching the seat and/or walking around the room when students were told to be in a specific area. Touching or taking was defined as touching or taking

other students' items (e.g. desk, papers) or touching other students with hands, feet, or objects without permission.

### **Treatment Integrity Form**

The required components for implementation of the Good Behavior Game in both conditions were listed in a “yes” or “no” response format on the treatment integrity form, which the teacher completed upon conclusion of baseline and intervention sessions daily. Examples of items included were: reminding the students of the game’s rules and consequences, informing them of the contingency condition, physically tracking rule violations, praising acceptable behavior, and providing rewards for the winning team(s). For each component completed, the teacher circled “yes”; for components not completed, the teacher circled “no.” A percentage of the intervention implemented was computed by dividing the total “yes” responses by the total number of items. The treatment integrity form was also completed by an observer during IOA observations.

### **Social Skills Improvement System – Performance Screening Guide**

The *Social Skills Improvement System – Performance Screening Guide* (SSIS-PSG; Gresham & Elliott, 2008) is a universal screener completed by teachers on all students. Teachers rate students on a 5-point Likert scale corresponding to performance levels on student behaviors related to social and academic skills that are critical for educational success. The four skill areas that are rated include: pro-social behavior, motivation to learn, reading skills, and math skills. A rating of 4 or 5 for an area indicates average or above-average functioning in the area; a rating of 3 indicates occasional difficulty; a rating of 2 indicates frequent difficulty; and a rating of 1 indicates extreme difficulty or at-risk behavior. The screener identifies students with skill deficits who may benefit from instruction, and it can be used to assess their improvement after



instruction. The SSIS-PSG was administered pre- and post-intervention to assess for global changes in social skills and academic areas. The SSIS-PSG has substantial test-retest reliability and moderate interrater reliability for elementary-aged students (Gresham & Elliott, 2008).

### **Intervention Rating Profile – 15**

To evaluate teacher acceptability of the intervention, teachers completed the *Intervention Rating Profile – 15* (IRP-15; Witt & Elliot, 1985). The IRP-15 consists of 15 items rated on a 6-point Likert scale from *Strongly Disagree* to *Strongly Agree*. Teachers rated both conditions of the intervention on items, including “I would suggest this intervention to other teachers” and “I liked the procedures used in this intervention.” An acceptability score may be figured by averaging the 15 item ratings. Strong acceptability is represented by average ratings of 5-6, while low acceptability is represented by average ratings of 1-2. The IRP-15 has demonstrated high internal consistency (Cronbach’s  $\alpha = .91$ ; Martens, Witt, Elliot, & Darveaux, 1985). The IRP-15 was administered to each teacher before and after the intervention to gain a measure of intervention acceptability.

### **Procedure**

#### **Baseline**

Prior to baseline, teachers selected a time of day (e.g., Math from 8:00-9:00), during which they perceived to experience the most disruptive behavior. During this time period only, baseline and then intervention data were collected. During baseline, teachers tracked the frequency of disruptive behavior using a tally counter attached to a lanyard worn around the neck and recorded the total frequency on the rule violation tracking sheet. A rate of rule violations per minute was computed by dividing the total number of rule violations by the number of minutes in the class period. The number of sessions in baseline was determined by stability in the rate of

rule violations, indicated by low variability and the absence of a trend (Cooper et al., 2006), or by the presence of an upward trend. Teachers were instructed by the researcher to continue implementation of their typical classroom management procedures and that they should not begin to respond to rule violations using components of the GBG. Teachers completed the treatment integrity form during baseline to ensure that they did not begin implementing components of the intervention.

Prior to intervention training, teachers completed the SSIS-PSG on all students. The researcher then divided students into two teams for the GBG, comparable on SSIS-PSG scores, though team assignments were slightly adjusted during the study in one classroom when it became apparent that one group was earning substantially more rule violations than the other. The two teams constituted the groups for the interdependent group contingency, and the same two teams were employed during the dependent group contingency.

Teachers administered a reinforcer preference assessment to all students. The preference assessment consisted of a list of possible activities (i.e., extra recess, free time, class games), tangibles (i.e., candy, stickers, stamps), and privileges (i.e., lining up first, taking off shoes during classwork) that students could earn by winning the GBG and were acceptable to the teacher. Students indicated their top two most desired rewards of each type by circling them on a list of possible rewards separated by categories (e.g., tangibles). The researcher determined the most desired rewards overall based on all students' responses. A list of possible reinforcers was produced for the intervention, of which the teacher verbally informed the students during student training on the GBG. The actual reinforcer on any given day of the intervention was selected by the teacher each day, written on a piece of paper, and put in an envelope labeled "mystery

reward” on the board. The chosen reinforcer was not revealed to the students until the end of the GBG each day to ensure that students did not selectively perform for desired reinforcers.

### **Good Behavior Game Training**

Upon completion of baseline, teachers were trained on implementation of the Good Behavior Game (GBG). The researcher provided teachers with instructions on the procedure, the group contingency conditions, and the criteria for reinforcement. All necessary materials, such as tangible reinforcers and rules posters, were provided to teachers.

Next the teacher trained the students on the GBG. On the first day of intervention, the teacher told them that they would be playing a game to improve behavior. The teacher explained the game, including the rules (e.g., the target behaviors), consequences, criterion for earning the reward, and possible rewards. The teacher reported the students’ team assignments and explained the interdependent and dependent group contingencies.

### **Good Behavior Game Intervention**

The teacher announced the beginning of the GBG daily. The teacher reminded the students of the rules by reviewing them and referring to the rules poster. The team assignments and scoreboard were posted on the board next to the rules poster. She explained the consequences of rule violations (e.g., when a student breaks a rule, their team earns a mark). The teacher verbally informed the students of the particular group contingency for that day, which was also visually indicated on the board by a sign with a picture and the word “team” or “captain.” Further, the teacher reminded her students that the reinforcer was a mystery, which would be delivered when the team or the team captain, depending on the particular group contingency, earned five or fewer marks for rule violations in the kindergarten classroom, or ten or fewer marks in the third-grade classrooms. The criterion was set slightly higher for the third-

grade classrooms in order to be reasonably achievable given their high rates of disruptive behavior during baseline.

During the GBG, the teacher verbally acknowledged rule violations by briefly informing the student of the rule that was broken. She physically tracked the violations by making a mark for the student's team on the board as she observed them (or on paper in the dependent group contingency), and she resumed teaching immediately after the violation. At the end of the GBG, the teacher summed the rule violations for each team and announced the winning team(s). Any team whose behavior met the criterion received the mystery reinforcer.

A schedule of counterbalanced and randomized interdependent and dependent group contingency conditions employed during the intervention was provided by the researcher to the teacher prior to the initiation of the GBG intervention. The teacher continued to follow the schedule of counterbalanced and randomized group contingencies until the data were stable, at which point the researcher instructed the teacher to conclude the intervention.

### **Dependent Group Contingency**

Students were randomly selected and assigned to be "captains" (one captain per team) on dependent group contingency condition days by the researcher. The researcher provided the teacher with a schedule of captain assignments for each dependent group contingency day at the start of the GBG. The particular students' identities remained a mystery to students during the GBG, requiring the teacher to record the captain's rule violations with paper and pencil, while continuing to track total rule violations using the tally counter. The identity of the team captain was only reported to the students at the end of the GBG when their team won.

## CHAPTER 3 RESULTS

### Dependent Measure

The primary dependent measure was the total frequency of rule violations as recorded daily by the teacher on the rule violation tracking sheet. The total number of rule violations was divided by the number of minutes in each session to produce a rate of disruptive behavior per minute, which facilitated comparison of behavior change across classes with variable session durations. These data were examined for improvements in the classes' behavior.

Implementation of the Good Behavior Game was expected to reduce the rate of disruptive behavior given its strong empirical support; therefore a high rate of disruptive behavior was anticipated during baseline, while a lower rate was expected during the intervention. The rate of disruptive behavior for each class across baseline and the intervention is displayed in Figure 1. During implementation of the Good Behavior Game, teachers rewarded students for either the groups' collective performance or based on a single student's performance relative to the criterion. Data were examined for differential effects between the interdependent and dependent group contingency conditions.

Behavioral improvement during implementation of the Good Behavior Game was variable across classes. Ms. Grey's and Ms. Brown's third-grade classes showed high, increasing rates of disruptive behavior during baseline sessions. The students' behavior in Ms. Grey's class immediately improved with the introduction of the Good Behavior Game, but the reduction in disruptive behavior only occurred and stabilized with the interdependent group contingency. Ms. Grey's class had 91 rule violations on average in approximately 55 minutes of instruction, which decreased by 80% with introduction of the interdependent group contingency condition to 22 average rule violations in approximately 80 minutes of instructions. In the

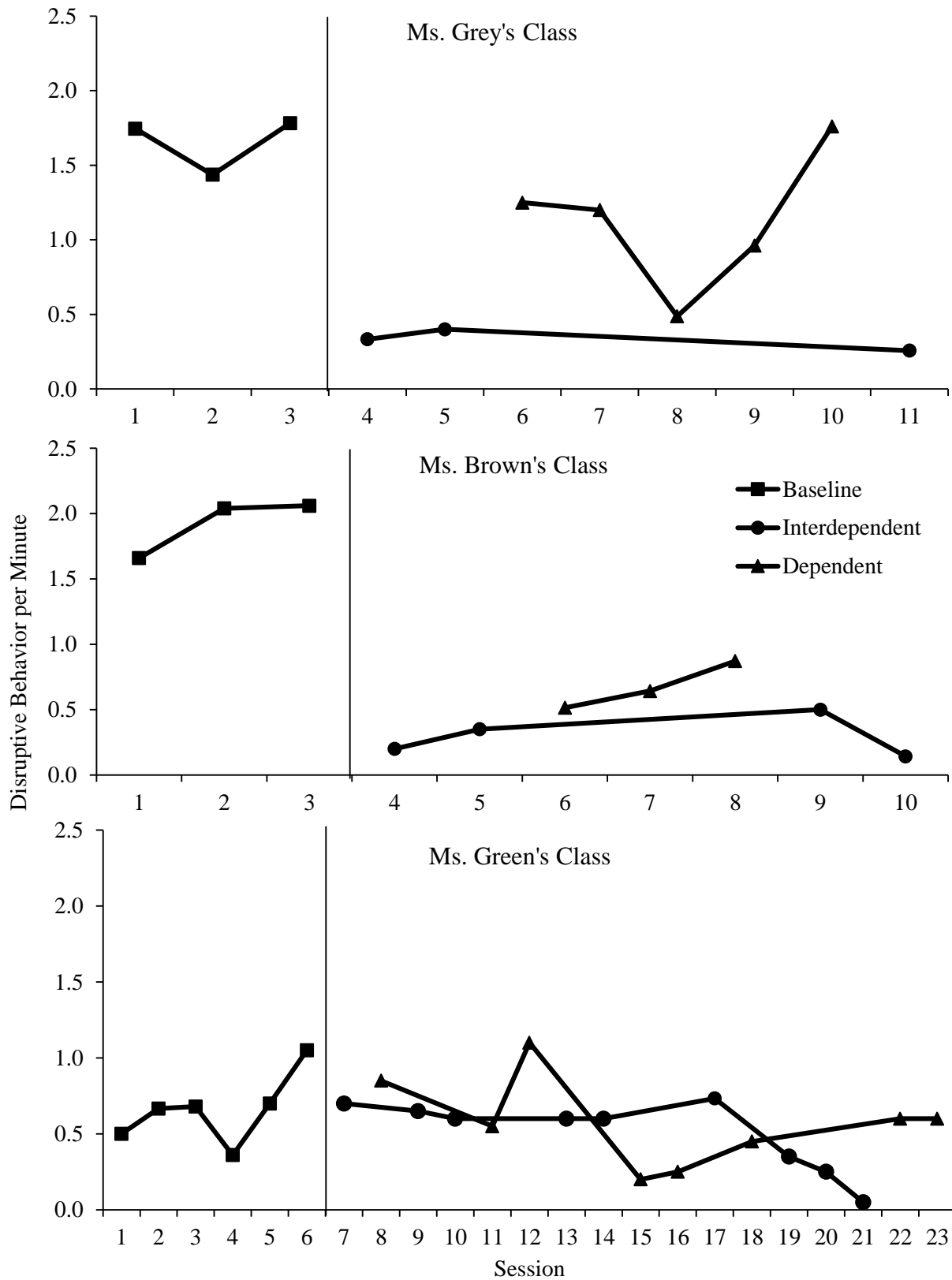


Figure 1. Rate of Disruptive Behavior per Minute by Class

dependent condition, behavior was highly variable, overlapped with baseline levels, and demonstrated a final upward trend. The data suggest differential effects of the group contingencies and the superiority of the interdependent group contingency.

Ms. Brown's class averaged 96 rule violations during approximately 50 minutes of instruction. With the introduction of the Good Behavior Game, there was an immediate reduction in disruptive behavior. The rate of disruptive behavior remained low and stable for the interdependent group contingency condition. When the reward depended on the groups' performance, the class averaged only 20 rule violations during approximately 70 minutes of instruction. Compared to baseline, the rate of rule violations decreased by 84%. However, while the rate of disruptive behavior during the dependent group contingency initially decreased to levels similar to the interdependent condition, the rate of disruptive behavior demonstrated an upward trend. When comparing data in the two group contingencies, overlap was evident; however the upward trend in the dependent condition suggests that the interdependent group contingency may be more effective over time.

Ms. Green's class demonstrated an increasing trend in disruptive behavior in baseline. With implementation of the Good Behavior Game in her class, effects on disruptive behavior were not immediately evident. Despite the initial consistency of the data between baseline and intervention, a downward trend in disruptive behavior became apparent. Ms. Green's class averaged 16 rule violations in approximately 25 minutes of instruction during baseline, which decreased to 10 rule violations on average in approximately 20 minutes of instruction during intervention, an 18% reduction. During baseline, IOA with Ms. Green was consistently below 80%, suggesting inaccuracy in tracking total rule violations and prompting feedback from the observer. While IOA increased to acceptable levels during intervention, the rate of disruptive

behavior per minute calculated by the observer was higher than the teacher's report. Comparison of the interdependent and dependent group contingencies revealed substantial overlap, indicating that neither condition demonstrated superior effects. In the final week of intervention, the effects of the group contingencies began to differentiate, displaying counter-trends.

### **Inter-observer Agreement**

An observer tracked students' rule violations during 42% of sessions and recorded the total number of rule violations. Inter-observer agreement with the teacher was computed using the frequency count on the rule violation tracking sheet from both the teacher and observer. To calculate IOA, the smaller total number of rule violations (recorded by either the teacher or the observer) was divided by the larger total number of rule violations. When IOA was below 80% for a session, the observer discussed with the teacher the operational definitions of the target behaviors and the importance of accurate observation and consistent recording. The average IOA for all teachers was acceptable. The first two IOA sessions yielded agreement below 80% for Ms. Green. The observer provided feedback to Ms. Green, and all subsequent IOA sessions produced acceptable levels. Ms. Brown initially demonstrated acceptable levels of IOA with the observer. However during one IOA session in intervention, IOA fell below 80%. Again the observer met with the teacher, and IOA subsequently improved to previously acceptable levels and gains were maintained. IOA with Ms. Grey was acceptable throughout the study. IOA results may be found in Table 1.

Table 1. Average Inter-observer Agreement

Teacher	IOA	Range
Green	82%	68% - 90%
Grey	90%	82% - 98%
Brown	83%	78% - 88%



## Treatment Integrity

Teachers completed the treatment integrity form following all baseline and intervention sessions. Additionally an observer assessed treatment integrity for 42% of sessions. Treatment integrity was expected to remain low during baseline sessions, as teachers were instructed to use only their typical classroom management procedures. Teachers generally had classroom rules posted, verbally acknowledged rule violations, immediately resumed teaching, and sometimes provided verbal praise for acceptable behavior. When the GBG intervention began, teachers were instructed to implement 100% of intervention components. While treatment integrity did not fall below 80% during the study, the researcher provided Ms. Grey and Ms. Brown with verbal feedback following several intervention sessions to increase verbal praise to students for acceptable behavior, as this behavior was consistently absent. Throughout the study, teachers and the observer demonstrated average of 89% IOA in reporting treatment integrity. Table 2 displays treatment integrity data.

Table 2. Average Treatment Integrity

Teacher	Baseline Integrity		Intervention Integrity	
	Observer	Teacher	Observer	Teacher
Green	33%	40%	97%	100%
Grey	30%	37%	98%	99%
Brown	30%	40%	98%	98%

## Intervention Acceptability

Teachers completed the IRP-15 pre-intervention to evaluate teachers' acceptability of both group contingency conditions of the GBG intervention based only upon verbal explanation of the intervention. Teachers rated the intervention as acceptable pre-intervention, although the interdependent group contingency condition was rated slightly more acceptable than the dependent group contingency condition. Upon conclusion of the intervention, teachers rated the

GBG's acceptability for a second time. Both group contingency conditions of the GBG were again rated as acceptable. All teachers' acceptability ratings of the interdependent group contingency slightly decreased, while acceptability ratings of the dependent group contingency increased. Post-intervention ratings suggest that teachers found both group contingency conditions similarly acceptable. Teachers communicated to the researcher that they intended to continue use of the intervention. Teacher ratings of intervention acceptability on the IRP-15 are shown in Table 3.

Table 3. IRP-15 Average Teacher Ratings of Acceptability

Teacher	Interdependent Group Contingency		Dependent Group Contingency	
	Pre-GBG	Post-GBG	Pre-GBG	Post-GBG
Green	5.80	5.33	4.40	5.33
Grey	5.80	5.67	5.67	5.73
Brown	5.80	5.67	5.67	5.73

### Social Skills and Academic Behaviors

Teachers completed the SSIS-PSG as a global rating of students' social skills (prosocial behavior and motivation to learn) and academic behaviors (reading and math skills).

Comparison of pre- and post-intervention ratings indicated improvement in academic behaviors across all classes. Ms. Grey and Ms. Brown rated their students' social skills higher on average post-intervention, while Ms. Green rated her students' social skills lower on average. Average ratings of social skills and academic behaviors by teachers pre- and post-intervention are displayed in Table 4.

In Ms. Grey and Ms. Brown's classes, 100% of students improved in at least one skill area or maintained ratings, while only 29% of Ms. Green's students were rated higher in at least one skill area or rated similarly. Finally, most students who were rated *at-risk* (rating of 1) pre-intervention in at least one skill area were no longer rated *at-risk* post-intervention. In Ms.

Brown’s class, five students were rated *at-risk* pre-intervention; only one student remained *at-risk* following the intervention. Eight students in Ms. Grey’s class were rated *at-risk* pre-intervention, and only one student remained *at-risk* following the intervention. In Ms. Green’s class, two students were no longer *at-risk* following the intervention, although another student became *at-risk* post-intervention.

Table 4. SSIS-PSG Pre- and Post-Intervention Average Ratings

Teacher	Social Skills		Academic Behaviors	
	Pre-GBG	Post-GBG	Pre-GBG	Post-GBG
Green	3.74	3.53	3.21	3.38
Grey	2.70	3.34	2.64	3.41
Brown	2.66	3.13	2.81	3.25

## CHAPTER 4 DISCUSSION

The Good Behavior Game was effective overall in reducing the rate of disruptive behavior in three elementary, general education classes, providing more evidence of empirical support to an already wide and diverse research base. Large reductions in disruptive behavior occurred in Ms. Grey's and Ms. Brown's classes upon implementation of the Good Behavior Game. Ms. Grey's and Ms. Brown's classes demonstrated 80% and 84% decreases in the rate of rule violations respectively from baseline compared to the interdependent group contingency. While immediate improvements in behavior were also initially evident in both classes under the dependent condition, the data showed an upward trend, suggesting that behavior improvement was not maintaining. Some overlap in the data between the group contingencies indicated similar effects on disruptive behavior. Given that the rate of disruptive behavior remained at a lower level and was also more stable with the interdependent group contingency, the interdependent condition may be more effective over time compared to the dependent group contingency. The superiority of the interdependent group contingency might have been a result of peer cooperation, or the awareness that each student's behavior contributed to the group's performance relative to the criterion. On the other hand, in the dependent group contingency, the student whose behavior determined whether the group earned the reward was a mystery, so students may have assumed that their behavior would not affect the reward opportunity. In other words, the chance that their behavior mattered was low. These results support typical implementation of the Good Behavior Game with an interdependent group contingency.

Although the rate of disruptive behavior in Ms. Green's class did not decrease substantially with the introduction of the Good Behavior Game, the average rate of rule violations decreased by 18% compared to baseline. Additionally Ms. Green's IOA was below

acceptable levels during baseline; her report of total rule violations was consistently less than the observer's report. If Ms. Green had tracked rule violations accurately, baseline data may have been higher and an improvement in behavior with the intervention may have been immediately apparent, given that IOA during intervention was acceptable. Furthermore, differential effects of the group contingencies were not evident. The data displayed substantial overlap, and the final counter-trend suggesting that the interdependent group contingency may be more effective over time should be interpreted with caution. Because the data displayed several changes in trend throughout intervention, the final counter-trend may have reversed given more time. The discrepancy between the differential effects for group contingencies found with the third-grade classes and the absence of differential effects with the kindergarten class may have been due to differences in developmental levels. The third grade classes may have understood the distinctions in how their individual behavior affected the opportunity for reward between the conditions, while the kindergarten students did not. That is, the kindergarten students may not have been aware that their behavior in the dependent condition likely would not influence the possibility for a reward. Furthermore, it may be that the third grade students' behavior was influenced more by peer cooperation than the kindergarten students' behavior was. The third grade students reacted more often in general to other students' rule violations than the kindergarten students did. These phenomena may have precluded the possibility of differential effects between the group contingencies in the kindergarten class.

Teachers' global ratings of students' social skills and academic behaviors on the SSIS-PSG improved overall. Students' academic behaviors were rated higher on average across all classes. Ratings of students' social skills increased on average for Ms. Grey's and Ms. Brown's classes post-intervention, while Ms. Green rated her students' social skills lower on average.

Ms. Green's ratings may have decreased because she began tracking rule violations, which may have made her more aware of some students' disruptive behavior. In Ms. Grey and Ms. Brown's classes, 100% of students were rated higher in at least one skill area or maintained ratings, while only 29% of Ms. Green's students were rated higher in at least one skill area or rated similarly. Greater improvement in the third-grade classes' ratings may have been related to greater reductions in disruptive behavior, as compared to the kindergarten class. In addition, most students who were rated *at-risk* (rating of 1) pre-intervention were no longer rated *at-risk* post-intervention. Eight students in Ms. Grey's class were rated *at-risk* pre-intervention, and only one student remained *at-risk* following the intervention. In Ms. Green's class, two students were no longer *at-risk* following the intervention, although another student became *at-risk* post-intervention. In Ms. Brown's class, five students were rated *at-risk* pre-intervention; only one student remained *at-risk* following the intervention. Overall, implementation of the Good Behavior Game was associated with improvements in teachers' ratings of students' social skills and academic behaviors.

Teachers found the Good Behavior Game to be an acceptable intervention. All teachers' acceptability of the interdependent group contingency diminished slightly after implementation of the Good Behavior Game, while acceptability of the dependent group contingency improved. Both group contingency conditions were similarly acceptable post-intervention. The teachers also perceived the intervention to be effective and expressed interest in continuing its implementation after the conclusion of the study. Given the Good Behavior Game's effectiveness and its acceptability to teachers, this intervention may be beneficial and ideal for use by teachers experiencing high rates of disruptive behavior in their classrooms.

## **Limitations and Future Research**

The results of this study demonstrate several limitations. First, accuracy and consistency of tracking and reporting data by teachers is vital to interpreting outcomes. The IOA for Ms. Green and the observer was below acceptable levels in baseline. Because the observer recorded higher rates of disruptive behavior than the teacher, the Good Behavior Game may actually have been more effective than the teacher's data indicate. The discrepancy in observation highlights the importance of extensive training for teachers who will be tracking and reporting data. Observers will likely observe and track the behavior more accurately in general because they do not have the additional responsibility of instruction and classroom management. However, acceptable IOA is necessary to ensure interpretability of the results.

Second, Ms. Green's class may not have shown substantial reductions in disruptive behavior due to floor effects. Her students did not demonstrate the high rates of disruptive behavior that the third-grade classes did during baseline. Therefore with the introduction of the Good Behavior Game, the rate of disruptive behavior was not high enough for a substantial reduction to be possible. The age of the kindergarten students may also have limited the possibility of differential effects of the two group contingencies. The kindergarten students in Ms. Green's class may not have developed the peer cooperation evident in the third-grade classes in the interdependent group contingency. The kindergarten students may also not have understood how their individual behavior might affect the opportunity for reward in the different conditions. The developmental level of the students may have limited the possibility for differential effects, but it is impossible to definitively conclude what the cause was of the discrepant results among classes.

Third, this study only examined the effects of the Good Behavior Game with two different group contingencies on disruptive behavior in one kindergarten and two third-grade classes. While the Good Behavior Game has been shown to be effective with various populations, generalizing the effects of the two group contingencies in this study to other developmental levels and populations should be done with caution. Students with different developmental levels and/or at different grade levels, students with disabilities, and children in different settings may evidence differential effects with implementation of the two group contingencies in the Good Behavior Game. Only the effects of the two group contingencies on the disruptive behavior of kindergarten and third-grade students may be suggested. The effects may also differ for diverse target behaviors and settings, such as home behaviors.

Because disruptive behavior has such detrimental effects on all students' academic success, interventions to reduce problem behavior are necessary. Implementation of the Good Behavior Game in a variety of settings, with diverse target behaviors, and for all ages is supported by extensive research. Empirical support for its use in the classroom to decrease problem behavior is no exception. The current study contributes to this body of research by providing support for the positive effects of the Good Behavior Game.

On the other hand, while the study found differential effects of the two group contingencies in both third-grade classes, there was no difference in the kindergarten class. These results therefore contribute inconsistency to the existing research on group contingency comparisons. The inconsistency within this study may be due to differences in developmental level, but it cannot be definitively determined. While findings on their differential effects remain inconsistent, the effectiveness of group contingencies has been widely documented. These results suggest that future comparisons of group contingencies might be replaced by examination



of criteria for selection among the group contingencies to be used by educators and practitioners. The advantages and disadvantages of the group contingencies have been suggested by previous researchers and educators. In addition the acceptability of the various group contingencies to intervention agents (e.g., educators) and to the targets for intervention (e.g., students) have been evaluated. Educators might take all of these factors into consideration in choosing among group contingencies and even vary the group contingencies during intervention for novelty.

Ultimately educators may select among group contingencies for practical reasons, such as the ease of providing rewards and tracking data in interdependent and dependent group contingencies, as compared to independent group contingencies. They may choose a group contingency based on their goals for behavior change. For example, if only one or several students in the class exhibit disruptive behavior, the teacher may select a dependent group contingency given that the other students' behavior is already at acceptable levels. Finally educators may take into consideration acceptability of the different group contingencies.

Teachers may not prefer the interdependent and dependent group contingencies because some students who behave appropriately may not earn a reward due to other students' behavior. Given the similar effectiveness of the group contingencies, future research that systematically examines the various considerations in selecting among group contingencies may produce beneficial guidance for educators choosing among interventions.

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## APPENDIX A CONSENT FORMS

**Study Exempted By:**

Dr. Robert C. Mathews, Chairman

Institutional Review Board

Louisiana State University

203 B-1 David Boyd Hall

337-578-8692 | [www.lsu.edu/irb](http://www.lsu.edu/irb)

Exemption Expires: 1/3/2015 Parental Permission Form for Participation in a Research Study

**Project Title:** Examination of the Differential Effectiveness of Interdependent and Dependent Group Contingencies in Reducing Disruptive Behavior in the Classroom

**Performance Sites:** Elementary schools in southeastern Louisiana

**Investigators:** The following investigators are available for questions, Monday – Friday, 8:00 a.m. – 4:30 p.m.

Dr. Frank Gresham  
Professor  
Psychology Dept., LSU  
(225) 578-4663

Kelsey Hartman  
Graduate Student Researcher  
Psychology Dept., LSU  
(317) 600-6263; [khartm3@lsu.edu](mailto:khartm3@lsu.edu)

**Purpose of the Study:** The purpose of this study is to find out whether the Good Behavior Game reduces disruptive behavior in the classroom and whether the Good Behavior Game is more effective when students earn rewards based on their team's behavior or based on their team captain's behavior.

**Description of the Study:** Over a period of 5-6 weeks, your child's teacher will implement one of two intervention techniques daily for reducing disruptive behavior in the classroom. Students will participate in the Good Behavior Game, in which they will work as teams to reduce disruptive behavior and earn rewards. In one technique, students will earn rewards based on the whole team's behavior. In the other technique, students will earn rewards based on their team captain's behavior. During the study the teacher will observe and record the frequency of students' disruptive behavior and reward students for a low frequency of disruptive behavior. The investigator will also occasionally observe students' behavior. Classroom instruction will proceed as usual during the intervention.

**Benefits:** Students will have the opportunity to earn rewards for reduced disruptive behavior. By participating in this study, your child is likely to benefit from a reduction in disruptive behavior in your child's classroom. Your child's teacher will likely accumulate more instructional time and all students will likely spend more time academically engaged. This can lead to improved student academic performance.

**Risks:** There are minimal risks associated with participation in this study. Your child may feel uncomfortable being observed in his/her classroom. However, the researcher will use observation techniques to minimize this risk.

**Right to Refuse:** Participation in this study is voluntary, and your child will become part of the study only if you agree to his/her participation. You may choose to withdraw your child from the study at any time without affecting your relationship with your child's school or with LSU. If you do not wish your child to participate, s/he will be excluded from data collection and will only be subject to the teacher's normal behavior management procedures.

**Privacy:** All information about your child will remain completely confidential. Results of the study may be published, but no names or identifying information will be included for publication. Subject identity will remain confidential unless disclosure is required by law.

**Financial Information:** There is no cost for participation in the study, nor is there any compensation to the subjects for participation.

**Signatures:** The study has been discussed with me and all my questions have been answered. I acknowledge the investigator's obligation to provide me with a signed copy of this consent form, and I may direct additional questions regarding study specifics to the investigator. If I have questions about subjects' rights or other concerns, I can contact Robert C. Mathews, Chairman, Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

---

**Please circle YES or NO below:**

**YES**     I allow my child to participate in the study described above.

**NO**     I prefer that my child not participate in this study.

Parent's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Parent's Name (please print): \_\_\_\_\_

Child's Name (please print): \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Study Exempted By:  
Dr. Robert C. Mathews, Chairman  
Institutional Review Board  
Louisiana State University  
203 B-1 David Boyd Hall  
225-578-8692 | www.lsu.edu/irb  
Exemption Expires: 1/3/2015

### Child Assent for Participation in a Research Study

I, \_\_\_\_\_, say it is okay for me to be in a study to help children act better in school. I will follow the classroom rules and I may get rewards for how I behave and for how my classmates behave. I can decide to stop being in the study at any time without getting in trouble.

Child's Signature: \_\_\_\_\_ Age: \_\_\_\_\_

Date: \_\_\_\_\_

Witness\* Signature: \_\_\_\_\_

Date: \_\_\_\_\_

\*Witness must be present for the assent process, not just the signature by the child.



## APPENDIX B INSTITUTIONAL REVIEW BOARD APPROVAL

### Application for Exemption from Institutional Oversight



Institutional Review Board  
Dr. Robert Mathews, Chair  
131 David Boyd Hall  
Baton Rouge, LA 70803  
P: 225.578.8692  
F: 225.578.5983  
irb@lsu.edu  
lsu.edu/irb

Unless qualified as meeting the specific criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/ projects using living humans as subjects, or samples, or data obtained from humans, directly or indirectly, with or without their consent, must be approved or exempted in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

-- Applicant, Please fill out the application in its entirety and include the completed application as well as parts A-F, listed below, when submitting to the IRB. Once the application is completed, please submit two copies of the completed application to the IRB Office or to a member of the Human Subjects Screening Committee. Members of this committee can be found at <http://research.lsu.edu/CompliancePoliciesProcedures/InstitutionalReviewBoard%28IRB%29/Item24737.html>

-- A Complete Application Includes All of the Following:

- (A) Two copies of this completed form and two copies of parts B thru F.
- (B) A brief project description (adequate to evaluate risks to subjects and to explain your responses to Parts 1&2)
- (C) Copies of all instruments to be used.  
\*If this proposal is part of a grant proposal, include a copy of the proposal and all recruitment material.
- (D) The consent form that you will use in the study (see part 3 for more information.)
- (E) Certificate of Completion of Human Subjects Protection Training for all personnel involved in the project, including students who are involved with testing or handling data, unless already on file with the IRB. Training link: (<http://phrp.nihtraining.com/users/login.php>)
- (F) IRB Security of Data Agreement: (<http://research.lsu.edu/files/item26774.pdf>)

1) Principal Investigator:  Rank:   
 Dept:  Ph:  E-mail:

2) Co Investigator(s): please include department, rank, phone and e-mail for each  
\*If student, please identify and name supervising professor in this space

Kelsey L. Hartman  
Department of Psychology  
Graduate Student  
(317) 600-6263; khartm3@lsu.edu

IRB#	<i>E8072</i>	LSU Proposal #
<input checked="" type="checkbox"/>	Complete Application	
<input checked="" type="checkbox"/>	Human Subjects Training	

3) Project Title:

Study Exempted By:  
Dr. Robert C. Mathews, Chairman  
Institutional Review Board  
Louisiana State University  
203 B-1 David Boyd Hall  
225-578-8692 | [www.lsu.edu/irb](http://www.lsu.edu/irb)  
Exemption Expires: *1/3/2015*

4) Proposal? (yes or no)  If Yes, LSU Proposal Number

Also, if YES, either  This application completely matches the scope of work in the grant  
OR  More IRB Applications will be filed later

5) Subject pool (e.g. Psychology students)

\*Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

6) PI Signature  Date  (no per signatures)

\*\* I certify my responses are accurate and complete. If the project scope or design is later changes, I will resubmit for review. I will obtain written approval from the Authorized Representative of all non-LSU institutions in which the study is conducted. I also understand that it is my responsibility to maintain copies of all consent forms at LSU for three years after completion of the study. If I leave LSU before that time the consent forms should be preserved in the Departmental Office.

Screening Committee Action:	Exempted <input checked="" type="checkbox"/>	Not Exempted <input type="checkbox"/>	Category/Paragraph	<i>1</i>	
Signed Consent Waived?:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Reviewer	<i>Mathews</i>	Signature	<i>Robert C Mathews</i>	Date	<i>1/4/13</i>

## VITA

Kelsey Lynn Hartman, a native of Carmel, Indiana, studied elementary education at Goshen College. After she received her bachelor's degree in 2008, she volunteered with the Boys & Girls Club in Fresno, California, substitute taught in Indianapolis, Indiana, and taught English in Quito, Ecuador. These experiences contributed to her interest in classroom management and children with behavioral, social, and emotional difficulties, and in 2011, she entered graduate school in the Department of Psychology at Louisiana State University. She expects to graduate with her master's degree in May 2014 and begin work on her doctorate.