

The Effects of Randomized Group Contingences on Student Disruptive Behavior in a Fourth
Grade General Education Classroom

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled The Effects of Randomized Group Contingencies on Student Disruptive Behavior by Sarah E. Shulman, Candidate for the Degree of Master of Science in Education, Curriculum and Instruction, is acceptable in form and content and demonstrates a satisfactory knowledge of the field covered by this project.


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Abstract

A considerable amount of evidence suggests that disruptive classroom behavior interferes with the teaching and learning process. In the present study, a teacher was challenged by high rates of disruptive behavior in her 4th grade classroom during math lessons. In response to the students' disruptive behavior Three Jars, an intervention package consisting of group contingencies with randomized components, on three specific disruptive behaviors (i.e., talk outs. Out of seat, non-compliance), was implemented. Results indicated that the Three Jars intervention produced immediate decreases in the students' disruptive behaviors. The intervention had the most noticeable impact on student talk-outs. Consumer satisfaction data indicated that students enjoyed math class more with the implementation of Three Jars. Implications for research and further research are discussed.

Introduction

Student disruptive behavior is a major concern of educators in elementary school. Disruptive Student Behavior is defined as an action or combination of actions by an individual that unreasonably interferes with, hinders, obstructs, or prevents the rights of others to freely participate in an activity, program, or service (Theodore et al., 2001). Disruptive classroom behavior is the primary reason why most teachers leave the profession (Ingersoll & Smith, 2003). In many instances a considerable amount of teacher time is “allocated in an attempt to control inappropriate and disruptive behavior” (Theodore et al., 2001, p. 267), at the expense of academic instruction. Teachers who have chronic classroom disruptions are often ineffective academically (Espin & Yell, 1994). Teachers’ inability to manage classroom behavior contributes to poor academic performance, especially among “at risk” learners. Chronic disruptive behavior can also interfere with the learning of classmates (Ling et al., 2011). This causes, not only the students with disruptive behaviors to fall behind, but the entire class as well.

Disruptive classroom behaviors can not only detract from a student’s educational experience, but may also lead to social isolation. Students who exhibit disruptive behaviors are more likely to isolate themselves from the rest of the classroom. When students are isolated socially from their peer group it can have many negative effects on the student’s social and emotional well-being.

The development of efficient and engaging interventions to address disruptive behaviors that are easy for the teacher to implement in the classroom is a significant challenge and a primary focus of behavioral consultation (Theodore et al., 2001). The ability to manage student behavior effectively and efficiently was identified as critical to achieving positive educational outcomes (Oliver & Reschly, 2007). While in many cases good classroom management skills

can help academic success for students and reduce the amount of disruptive behaviors that is not always the case. A well-managed classroom does not always guarantee academic success, but it can create an environment in which effective learning can occur.

Educators face the challenging task of effectively addressing the disruptive behaviors that characterize students with these disruptive behaviors (Theodore et al., 2004). Many teachers are not well prepared to deal with disruptive classroom behaviors. Baker (2005) notes that teachers report being unprepared to address common behavioral challenges in their teaching placements. Although many teachers report being unprepared for disruptive behaviors in the classroom there has been much research done on how to best deal with these classroom behaviors.

Although teacher preparation, focusing on classroom management, leaves a lot to be desired, a solid body of knowledge does exist about how best to deal with classroom disruptions (e.g., Alberto & Troutman, 2010; Epstein et al., 2008; Oliver & Reschly, 2007; Stage & Quiroz, 1997). In general, highly effective teachers are *proactive, positive* and *instructive* in their approach to classroom organization and management (Alberto & Troutman, 2010; Rhode, Jenson, & Reavis, 1993). They structure their classrooms for academic and behavioral success, routinely recognize good academic and behavioral performance, and re-teach students how to behave more appropriately in the future. Researchers have also found a number of powerful interventions (e.g., explicit rules and routines, contingent rewards, group contingencies, token economy, time out, response cost, and performance-based feedback) that can be used to improve classroom disruptions. Following a comprehensive meta-analysis, Stage and Quiroz (1997) identified group contingencies as *the* most effective interventions for dealing with disruptive classroom behavior.

Group contingencies have a large amount of empirical history in education. Group contingencies have been used to improve academic, behavioral, and interpersonal outcomes for students with disabilities as well as normally developing students (Skinner, Skinner & Burton, 2009; Theodore, Bray, Kehle & DioGaurdi, 2003). Group contingencies can be dependent, interdependent, or independent. Consequences, or rewards, are given based on whether appropriate criteria were met.

One intervention that involves the use of interdependent and dependent group contingencies is Three Jars. This intervention uses a simple reward system to increase compliance with classroom rules, while randomizing the rewards given. In addition, this strategy randomizes the target behavior and criteria for earning rewards which encourages students to maintain many appropriate behaviors because they are unsure which ones will earn reinforcement. The goal of Three Jars is to decrease disruptive behavior and increase appropriate behavior.

Statement of the Problem

Student disruptive behavior is a problem that is seen far too often within many elementary classrooms throughout the country. Disruptive student behaviors include, but are not limited to, talking while teacher was talking, moving around classroom or leaving classroom without permission, distracting noises, and general non-compliance to teacher directions. Disruptive student behaviors are a problem in the classroom for many reasons. In many instances a considerable amount of teacher time is allocated in an attempt to control inappropriate and disruptive behavior (Theodore et al., 2001). When teachers are constantly trying to eliminate inappropriate student behavior from their classroom they are wasting a large portion of their

teaching time. This causes, not only the students with inappropriate behaviors to fall behind, but the entire class to fall behind as well.

Addressing the problem of disruptive behavior in the classroom is a very important thing for educators to do. Both old and new teachers are constantly trying to find behavior management plans and different forms of interventions that they hope will eliminate the disruptive behaviors seen in their classroom. If disruptive behaviors are removed from the classroom it will lead to a more proactive learning environment.

Students are going to show different forms of disruptive behaviors from time to time. It is when those disruptive behaviors become a constant threat to the academic welfare of others that educators need to intervene to find an appropriate replacement behavior. This is done by finding an intervention that helps diminish those behaviors. Researching this problem will allow researchers to find interventions that will reduce or eliminate the inappropriate disruptive behaviors. Previous research suggested that interdependent and dependent group contingencies had positive effects on numerous elementary classrooms (e.g., Lynch, Theodore, Bray, & Kehle, 2009; Reinhardt, Theodore, Bray, & Kehle, 2009; and Theodore et al., 2009). Few studies have examined the effects of applying group contingencies with randomized components on behavior (e.g., Kelshaw-Levering et al., 2000; Murphy et al., 2007). In addition, although several researchers have randomized one or two contingency components (e.g., Hawkins et al., 2009; Murphy et al., 2007) few have randomized more than two contingency components (e.g., Kelshaw-Levering et al., 2000; Theodore, Bray, Kehle, & Jenson, 2001). It can be seen that many researchers did not evaluate the effects that randomized multiple interdependent group contingency components would have on the engagement of general education students.

Purpose of Study

Given the success of group contingency interventions in reducing disruptive classroom behavior, the present study was undertaken. The present study will investigate the effects of an interdependent and dependent group contingency intervention (i.e., Three Jars) on student disruptive behavior for a fourth grade general education classroom. The Three Jars intervention randomized three specific components of the group contingencies: (a) target behaviors (b) students and (c) rewards. The primary research question is: What effects will the Three Jars intervention, a combination of dependent and interdependent group contingencies with randomized components, have on classroom disruptions in a fourth grade general education classroom?

Through the present study I hope to find what effect randomized group contingencies has on disruptive behavior. As previously stated student disruptive behavior is a very important problem in elementary schools that needs to be addressed. It is important that researchers study this inquiry question because the outcome has a possibility to benefit student performance and behavior. The possibility of potential benefits from this research will add to the educational field of knowledge for future teachers as well as researchers.

Literature Review

To be considered for inclusion in this review, studies must have met the following criteria: (a) targeted all learners in Kindergarten through fifth grade; (b) involved one of the three forms of group contingencies; and (d) focused on academic achievement or disruptive student behaviors. Search procedures included searching electronic databases such as ERIC and Education Research Complete, and using the references of related articles. The terminology and key words for locating the students included the following: *group contingences, dependent*

group, special education, general education, elementary education, educational instruction, disruptive behaviors, and randomizing. Through these procedures the following literature review was created by synthesizing the articles that were found.

Group Contingencies

Researchers have found a number of interventions that can be used to improve classroom disruptions. McKissick (2010) notes group contingencies are an effective and efficient way for teachers to manage student behavior. In group contingencies, the same behavioral goal, criteria, target behaviors, and consequences are applied to the whole class (McKissick et al. 2010). Instead of managing numerous individualized contingencies, teachers can apply group contingencies to improve the behavior of all students within the classroom. Group contingencies are used to improve a wide range of academic, and behavioral outcomes for individuals with special needs and their peers (Skinner, Skinner, & Burton, 2009; Theodore, Bray, Kehle, & DioGaurdi, 2003). It has been suggested that the success of group contingencies is due to the invaluable importance of peer acceptance as well as the element of group cooperation because students have a vested interest in the performance of other classmates (Theodore et al., 2001). Group contingencies are categorized as independent, interdependent, or dependent.

Independent group contingencies reinforce students based on the individual performance of the student. Students are given common assignments, rules, and criteria for success and consequences are delivered based solely on each pupil's independent performance. Because consequences are based on pupil's own performance, independent group contingencies are perceived as fair by students, teachers, school leaders, and parents (Skinner et al., 2009).

Interdependent group contingencies reinforce the group contingent upon the entire class meeting certain criteria (Theodore et al., 2001). Under interdependent contingencies, pupil

access to positive consequences depends on them and their peers. Therefore, they must work collaboratively with each other to benefit.

Dependent group contingencies reinforce the entire group based on the performance of one or a couple of target students meeting the criteria (Theodore et al., 2001). For example, the entire class earns extra free time if student x refrains from talking during class. The advantage to dependent contingencies is that teachers can monitor and evaluate fewer students before providing consequences (Skinner et al., 2009).

Several studies have been completed to find ways to improve classroom behaviors using group contingencies. These studies can be dated back to the sixties. In 1966 Quay, Werry, McQueen, and Sprague pointed out that schools require the development of behavior-remediation techniques that will allow children to be managed by a few adults as possible. “They consider behavior-change techniques developed on an individual basis to be economically unfeasible,” (Quay et. al., p 341). Hall, Lund, and Jackson (1968) suggested that it would be more practical and effective to place direct control of classroom attention in the hands of the teacher by using group contingencies.

Advantages and Disadvantages to Group Contingencies

There are also advantages and disadvantages to each type of group contingency. Independent group contingencies are the most used contingency because they provide the same instructional activities, criteria, and consequences for all students in the classroom. There are few concerns with independent group contingencies. The first concern of independent group contingencies is the selection of the rewards for the students participating. Teachers must be cautious of using tangible rewards because students might buy or steal these rewards (Theodore et al., 2003). To prevent this, educational activities can be used instead of objects. Another

concern is that not all students may like the reward that is given (Theodore et al., 2003). If a student is not interested in the reward being given then that student will not want to work for the reward. It is also difficult to set appropriate standards for criteria. Because all of the students must meet the same criterion it may be too low for some students, yet too high for others. For the students where the criterion is set too high they might not put in much effort because they feel the goal is not attainable. For those students where the criterion is set too low they may not work hard because not a lot of effort is needed for success.

Interdependent group contingencies also come with its advantages and disadvantages. The advantages include ease of implementation and the whole class celebrates the rewards together (Skinner et al., 2009; Theodore et al., 2003). However, there are also disadvantages to interdependent group contingencies that must be looked at. Rewards must attract the interest of all students in the classroom to work efficiently (Theodore et al., 2003). Another disadvantage might be that the well-behaved students do not earn rewards because of the poor performance of classmates. The well-behaved students may also begin complaining about unfairness (Theodore et al., 2003).

Dependent group contingencies have similar advantages and disadvantages. With dependent group contingencies student rewards depend on one student or a small group of students. This makes the class more social and cooperative because everyone is working towards the same goal (Theodore et al., 2003). Theodore et al. (2003) notes that teachers have reported dependent group contingencies as being more time efficient. Disadvantages of dependent group contingencies are that some students may sabotage work or behavior so peers will not get rewarded (Theodore et al., 2003).

The use of these three group contingencies have been used for decades. A study by Gresham and Gresham (1982) compared the three group oriented systems. They were compared to evaluate each contingencies effectiveness in controlling disruptive behavior in a self-contained classroom. Interdependent and dependent group contingencies were more effective than independent contingencies in controlling disruptive behavior. Dependent and interdependent group contingencies have also shown improvement in social skills for students who are socially withdrawn as well as with handicapped students (Lew, Mesch, Johnson, & Johnson, 1986).

Homework Completion and Accuracy

To date, relatively few studies have examined the effects of homework completion and accuracy on academic achievement. The relationship between homework completion and academic performance increases over the developmental period (Theodore et al 2009). Given the effect of homework on academic achievement, it is important to find practical and effective methods to improve and promote rates of homework completion accuracy (Lynch et al., 2009). It is sensible to promote homework completion and accuracy in groups rather than individual students because homework is typically not tailored to each individual but assigned to the entire class (Lynch et al., 2009). Group contingencies are effective, save teacher time, are easy to implement and manage, and have been shown to be motivating for both teachers and students (Lynch et al., 2009). Although the effects of homework completion on academic outcomes are somewhat moderate during the earlier grades, there are nonacademic benefits of homework assignments (Theodore et al., 2009).

In a recent study Theodore, Dioguardi, Hughes, Aloiso, Carl, and Eccles (2009), for example, improved the homework accuracy of twenty-one, fourth-grade students in a special education classroom using interdependent group contingencies and the “Three Jars Game”.

Students were informed that the criterion for earning a reward for their spelling homework completion and accuracy was going to be randomly selected each day. The criterion for the class was determined by randomly selecting one card from the first two jars. Specifically, the eight possible criteria were (1) everyone completed their spelling homework, (2) lowest grade of 70%, (3) lowest grade of 75%, (4) lowest grade of 85%, (5) highest grade of 85%, (6) highest grade of 90%, (7) highest grade of 100%, and (8) class average of 85% (Theodore et al., 2009). The teacher emphasized to the class that everyone would need to work together as a team to obtain a reward as a class. Results showed that the randomized interdependent group contingency coupled with randomized reinforcers overall had a positive impact on the spelling accuracy of students (Theodore et al., 2009).

Disruptive Behaviors

Several studies have been conducted to look at the effects of group contingencies on classroom disruptive behaviors (e.g., Coogan, Kehle, Bray, & Chafouleas, 2007; Heering & Wilder, 2006; Kelshaw- Levering, Sterling-Turner, Henry, & Skinner, 2000; McKissick, Hawkins, Lentz, Hailley, & McGuire, 2010; Murphy, Theodore, Aloiso, Alric-Edwards, & Hughes, 2007; Theodore, Bray, Kehle, & Jenson, 2001; Theodore, Bray, & Kehle, 2004). Coogan, Kehle, Bray, & Chafouleas (2007), for example, investigated the effects of a multi-component intervention involving self-management, peer feedback, and the randomization of reinforcers and criteria to reduce inappropriate behaviors. Inappropriate behaviors were defined as touching, making noise, being aggressive, playing, and out of seat (Coogan et al., 2007). When students displayed inappropriate behaviors, they had to move a marker on the group monitoring board and record it on their self-monitoring sheets. The criterion for the day was randomly chosen from a jar at the end of the period so that during class students were unaware of

the behavior that was going to be targeted (Coogan et al. 2007). If students met the randomly selected criterion, they received mystery motivator rewards. Coogan et al. (2007) found that the multi-component intervention was effective in reducing inappropriate classroom behaviors for all students.

Research in the field of applied behavior analysis indicates that all group contingency programs (i.e., independent, dependent, and interdependent) have been effective in both increasing academic and behavior success in both special and general education classrooms (e.g., Alric, Bray, Kehle, Chafouleas, & Theodore, 2007; Lynch et al., 2009; Theodore, Bray, & Kehle, 2004; Thorne & Kamps, 2008; Skinner et al., 2009).

Group Contingencies and Whole-Class

Additional studies examined how group contingencies impacted whole-class behaviors (Heering & Wilder, 2006; Kelshaw-Levering et al., 2000; McKissick et al., 2010). Kelshaw-Levering et al. (2000) studied how randomized group contingencies impacted problem behaviors. The teacher used one jar and four jars to randomize contingency components and set a goal to decrease student disruptive behaviors by 40%. This study found that both jar interventions led to a decrease in student disruptive behavior. In another study, Heering & Wilder (2006) used data collection sheets to collect on-task behavior for individual rows. Results show that student disruptive behavior decrease by 35% when group contingencies were in place (Heering & Wilder, 2006).

A study conducted by Sharp & Skinner (2004) used interdependent group contingencies to increase student's willingness to read. A consultant worked with their teacher to develop an intervention that consisted of paired readings and two interdependent group contingencies. Following the implementation of the program, all students began reading chapter-books and the

number of chapter-book quizzes passed increased from an average of less than 0.70 per week during baseline to 7.5 per week during the intervention phase (Sharp & Skinner, 2004).

Collectively, these examined studies showed that group contingences, independent, dependent, or interdependent, can be used to improve pupil's academic and behavioral performance. Studies varied slightly in method, yet several key factors emerged. First, group contingency programs were relatively easy to use and well-liked by teachers. Second, group contingency interventions maximized positive consequences for all pupils. Instead of punishing students when they do not meet expectations, teachers rewarded students when they met or surpasses expectations. Finally, randomized rewards was a key to success for using group contingencies effectively (Coogan et al., 2007; Kelshaw-Levering et al., 2000; Skinner et al., 2004; Theodore et al., 2003). Using mystery motivators allowed students to maintain intrinsic motivation to reach target behaviors and academic performance levels in the classroom (Theodore et al., 2003). Through this research it can be inferred that the use of group contingencies in the classroom will in fact decrease student disruptive behavior and increase student on-task behavior.

Group Contingences in General Education

Several studies have demonstrated the effectiveness of applying group contingences to decrease disruptive behavior in the classroom. The majority of research, however, has focused on special education student populations (McKissick et al., 2010). Less research exists supporting the use of group contingencies in general education classrooms. McKissick et al. (2010) notes the studies that have been completed in general education settings, however, indicate that group contingencies can be effective at improving student behavior. Stage and Quiroz (1997) found that group-oriented contingencies yielded the largest effect size of interventions designed to

reduce inappropriate behaviors in public schools. However, such procedures may be underutilized for enhancing academic performance and learning. A study of the effectiveness of dependent group contingencies in third and fourth grade general education classrooms found that the contingencies increased student on-task behavior (Heering & Wilder, 2006). A study by Murphy et al. (2007) shows how mystery motivators reduced the disruptive behaviors of preschoolers in a general education setting.

Skinner et al. (2004) describes how interdependent group-oriented reward procedures with randomly selected unknown contingency components (i.e., target behaviors, rewards, and criteria for earning rewards) can be used to enhance student academic performance. Skinner et al. (2004) found that when students were introduced to randomized group contingencies in their classroom they showed a lower rate of those disruptive behaviors.

Randomized Group Contingences

Although it has been proven that group contingences help decrease student off-task behavior there has not been much research on the effects of randomizing those contingencies. Skinner and colleagues have developed procedures where the target behaviors, criteria for earning rewards, and rewards are randomly selected each day (Popkin & Skinner, 2003; Skinner, Williams & Neddennier; 2004). Instead of the target behavior, criteria for rewards and rewards being determined and announced to the students prior to the intervention period, these contingency components can be randomly selected from a pool of possibilities at the conclusion of the intervention period (McKissick et al., 2010). By randomizing target behaviors, students may be more likely to modify all inappropriate behaviors. McKissick et al. (2010) notes by randomizing criteria levels students may exhibit higher levels of appropriate behaviors in case the selected criteria are high. Finally, randomizing rewards may prevent mismatch between

chosen consequences and what is reinforcing for individual students (Kelshaw-Levering, Sterling-Turner, Henry, & Skinner, 2000).

Researchers have used group contingences with randomized components to improve academic performance in many different subject areas (McKissick et al., 2010). Fewer studies have examined the effects of applying group contingencies with randomized components on behavior (e.g., Kelshaw-Levering et al., 2000; Murphy et al., 2007). In addition, although several researchers have randomized one or two contingency components (e.g., Hawkins et al., 2009; Murphy et al., 2007) few have randomized more than two contingency components (e.g., Kelshaw-Levering et al., 2000; Theodore, Bray, Kehle, & Jenson, 2001). None of these studies evaluated the effects of randomizing multiple interdependent group contingency components on the engagement of general education students.

Random components to contingencies offer a number of advantages. Two advantages are that it includes maximizing student motivation and promoting excellent behavior (Fabiano et al., 2008). For example, with explicitly set, known criteria students who know they cannot earn a reward may stop trying. With randomized group contingencies student never know if they are the ones being targeted. The study completed by Fabiano et al. (2008) shows the effects of randomized group contingencies on student disruptive behavior in other school settings besides the classroom. Fabiano et al. (2008) documents the effect of a group contingency intervention with a random reward component, targeting disruptive behavior cafeteria behavior. The results suggest that behavior improved once the group contingency component was put in place. Rule following dramatically increased. Random components have been successfully employed in classrooms and during recess in elementary schools (Popkin & Skinner, 2003; Roderick, Pichford, & Miller, 1997).

Kelshaw-Levering et al. (2000) randomized multiple components within interdependent group contingences to reduce disruptive behavior in a second-grade classroom. Instead of the criteria, target behavior, and positive contingencies being set at selected levels prior to implementation of the intervention period, levels were randomly selected and announced at the conclusion of the intervention period. Data suggested that randomizing multiple components was effective in reducing all inappropriate behaviors being targeted. In a similar study, Theodore et al (2001) found that applying an interdependent group contingency with multiple randomized components improved the behavior of five special education students. Theodore et al. (2001) states randomizing criteria for reinforcement requires students to strive to modify their behavior because they are unaware of exactly what will be selected for evaluation (as cited in Skinner et al., 1996). Researchers concluded the students were motivated to change their behavior because they did not know what reward criterion would be selected (Skinner et al., 1996).

Method

Participants and Settings

The present study was conducted in a small (1231 total students) rural school district in Western New York. Within the district 252 students (20%) are eligible for free lunch, 80 students (6%) receive reduced price lunch, and 4 students (0%) are limited English proficient. The district in which the present study was conducted does not have a diverse population. 1141 students (93%) are white, 8 students (1%) are American Indian or Alaska Native, 19 students (2%) are black or African American, 17 students (1%) are Hispanic or Latino, 32 (3) are Asian or Native Hawaiian/Other Pacific Islander, and 14 students (1%) are multiracial.

One 4th grade elementary classroom was selected for this study based on their high levels of disruptive classroom behaviors. The classroom had 17 students (11 males and 6 females) all of whom were Caucasian. The students ranged in age from 9-11 years old. Only two students in the

classroom had an Individualized Education Plan (IEP). These two students were pulled out during specific times of the day to complete work in a resource room. A number of students exhibited a variety of disruptive classroom behaviors that interfered with the teaching and learning process. In particular, students talked out, were out of their seats, and failed to do what the teacher asked in a reasonable amount of time. All students received a letter of consent and letter of explanation that was sent home to a parent or guardian. The letter explained to the parents or guardians what the intervention was and why it was being used. The consent forms also had contact information. The consent form allowed students to take part in the study. Students were also asked to sign a letter of consent. A student only participated in the study if they gave consent as well as their parents or guardian.

The setting was a typical elementary classroom with three rows of seats with 5 or 6 students in each row. Students had assigned seats and they were expected to sit in these seats unless otherwise stated by the teacher. The teacher moved student's desks around occasionally if disruptive behaviors occurred. All of the student's desks faced the front of the classroom where a white board was located. There was a table in the back of the room for small group or individual work. The teacher's desk was located behind all of the student's desks.

The teacher in this classroom was a middle aged Caucasian female with 4 years of teaching experience. The teacher was concerned with the high levels of student disruptive behaviors which interfered with student learning or her own teaching.

Dependent Variables

There were three dependent variables in this study: (a) out-of-seat, (b) talk outs, and (c) non-compliance. *Out-of-seats* was defined as "students repeatedly leaving their desks without permission from the teacher." *Talk outs* were defined as, "students speaking out without teacher permission." *Non-compliance* was defined as, "students not doing what the teacher asked them to

do within 10 seconds.” With non-compliance students intentionally ignore or delay the request given by the teacher.

Daily frequency counts were derived for the entire class on the three target behaviors using a collection data sheet (Appendix A). The researcher recorded the frequency with which students engaged in the target behaviors by making tallies next to the numbers assigned to students each time they engage in targeted behaviors. The students were assigned numbers so their identity remained anonymous during the study. Daily frequency counts were collected for the entire class.

Independent Variable

The independent variable that was used in this study was an intervention called Three Jars. The Three Jars intervention intertwined interdependent and dependent group contingences with randomized components (target behaviors, students, and rewards) and mystery motivators. These three jars were used to randomize the contingency components. The first jar was labeled “Behavior”. This jar was used to randomize the aforementioned target behaviors being looked at. The “Behavior” jar contained 15 pieces of paper with names of the target behaviors. (i.e., five pieces of paper each with the words “Out-of-seat,” “Talking out,” or “Comply within 10 seconds” written on them), as well as five pieces of paper with the word “All” written on it. This means the teacher and researcher were looking for all behaviors. Whatever behavior the teacher randomly selected was the target behavior that was being monitored for that day. The teacher did not announce to the class which target behavior was selected for that day.

The second jar was labeled “Names”. This jar was being used to randomly select target students. This jar contained a piece of paper each with a student’s name on it. There was also a piece of paper with “Whole Class” written on it as well as pieces of paper with different rows.

The teacher picked a piece of paper from this jar to determine who was being monitored for that day based on the previously selected target behavior. For example, if the piece of paper read “Emily” then her performance was monitored for that time. If the selected student met the criterion then the whole class was rewarded. When “Whole Class” was selected, an interdependent group contingency was in place. Once again, students were not told who was being monitored.

The third jar was labeled “Rewards”. This jar was used to determine consequences, in this case the rewards, for the entire class. This jar was filled with pieces of paper each with a different reward on it. The rewards were generated by a student rewards inventory to see what the students wanted as a reward. The teacher only picked from the rewards jar if the target group met the criterion for the target behavior being monitored. The researcher provided the rewards for jar #3. Mystery motivators, or unknown rewards, were also included in jar #3. Each time they chose the piece of paper with the word mystery motivator on it they would receive an envelope with a letter in it. The letter was one letter in a word. Each time they chose a mystery motivator from the rewards jar a new letter was added. For example, if the reward was pizza party and the student picked the mystery motivator the first letter to be given would be p, then i, and so on, until the word pizza was spelt out. Whichever rewards were selected were then provided for the entire class during the most practical time.

Experimental Design and Procedures

This study used an A-B-A-B single-case research design. This study used this research design to show the effects of Three Jars on student’s rate of disruptive behavior. In the current study, student disruptive behavior was first examined under typical or normal teaching conditions (i.e., baseline I)

Baseline I.

During the initial baseline sessions, the researcher observed and monitored student's disruptive behaviors within the classroom and kept track of every disruptive behavior on a monitoring sheet (Appendix A). The baseline determined how many times during a math class the students were showing a particular disruptive behavior. During baseline sessions, students worked under dependent group contingencies (i.e., access to rewards was based solely on their own performance in the classroom).

After the initial baseline data was gathered the students were introduced to the Three Jars. The teacher announced that the class would be playing Three Jars in class for the next few weeks during the designated time. The teacher explained how the intervention is used and she drew sample pieces of paper from each jar to further explain the method to the intervention.

Intervention I.

After the intervention was explained to the class the Three Jars intervention was started the next day. A typical Three Jar intervention session worked as follows. First, the teacher began class by choosing a piece of paper from jar #1 (target behaviors). Next, the teacher chose a piece of paper from jar #2 (student names). The teacher did not tell the class what behavior or student was selected. The teacher continued teaching a normal lesson to the students. While the teacher was teaching she was also monitoring student disruptive behavior. The teacher was only monitoring the behavior that was selected out of jar #2. The teacher did not have a data collection sheet for the intervention period. The researcher was also monitoring student behaviors in the back of the classroom. The researcher was not only observing the target student and target behaviors, but all of the students and behaviors as well (Appendix B). This information helped determine if the game helps reduce disruptive behaviors for all students when

they do not know who is being observed. After intervention data was collected the Three Jars were removed for five days (Baseline II). Once again the teacher taught under normal teaching conditions and students worked work under dependent group contingencies. Data was once again collected on disruptive behavior during baseline conditions. Following the second baseline period, the Three Jars intervention was again re-introduced (Intervention II). The second intervention period was conducted exactly as the first. Following the final intervention session the students were asked to complete a consumer satisfaction survey (Appendix C). These surveys were anonymous. The survey asked the students select questions about the game (i.e., did you like class better with Three Jars or without?).

To ensure that the Three Jars intervention was implemented as intended, the investigator used a procedural fidelity checklist. This form contained each procedural step to use Three Jars. There were also a spot for the investigator to write notes about the absence of steps. Fidelity of implementation was calculated as the number of steps present divided by the number of steps absent. This number will then be multiplies by 100. This number was the accuracy number or the implementation of Three Jars game.

Results

The effects of Three Jars on students' total rate of disruptive behavior can be seen in Figure 1. As illustrated, students exhibited high and fairly stable rates of disruptive behavior during initial baseline sessions. Total disruptive behavior ranged from 18-22 displayed behaviors during a typical 40 minute math block taught under normal teaching conditions. That is an average of 20 disruptions during an average baseline session. That is an average of 2 disruptive behaviors every two minute. The initial baseline session showed stable patterns for data, high levels of disruptive behavior, therefore Three Jars were implemented. When Three Jars were implemented, there was an immediate and noticeable decrease in disruptive behavior. Total

disruption dropped to an average of 6.2 disruptions per 40 minute math block with a range of 4 to 8 disruptions. There were overlapping data points across initial baseline and intervention conditions. When Three Jars were removed, disruptive behavior continued at a relatively low level for the first day and then a clear accelerating trend in disruption appeared. The average rate of disruptive behavior during second baseline was 16.2 with a range of 9 to 20. There were no overlapping data points. At this point, Three Jars were put back into effect and there was another immediate and noticeable drop in disruptive behavior. The class averaged 6.4 disruptive behaviors with a range of 5 to 8 and there were no overlapping data points between adjacent experimental phases. Overall, Three Jars significantly reduced total class disruptions and its variability between experimental conditions.

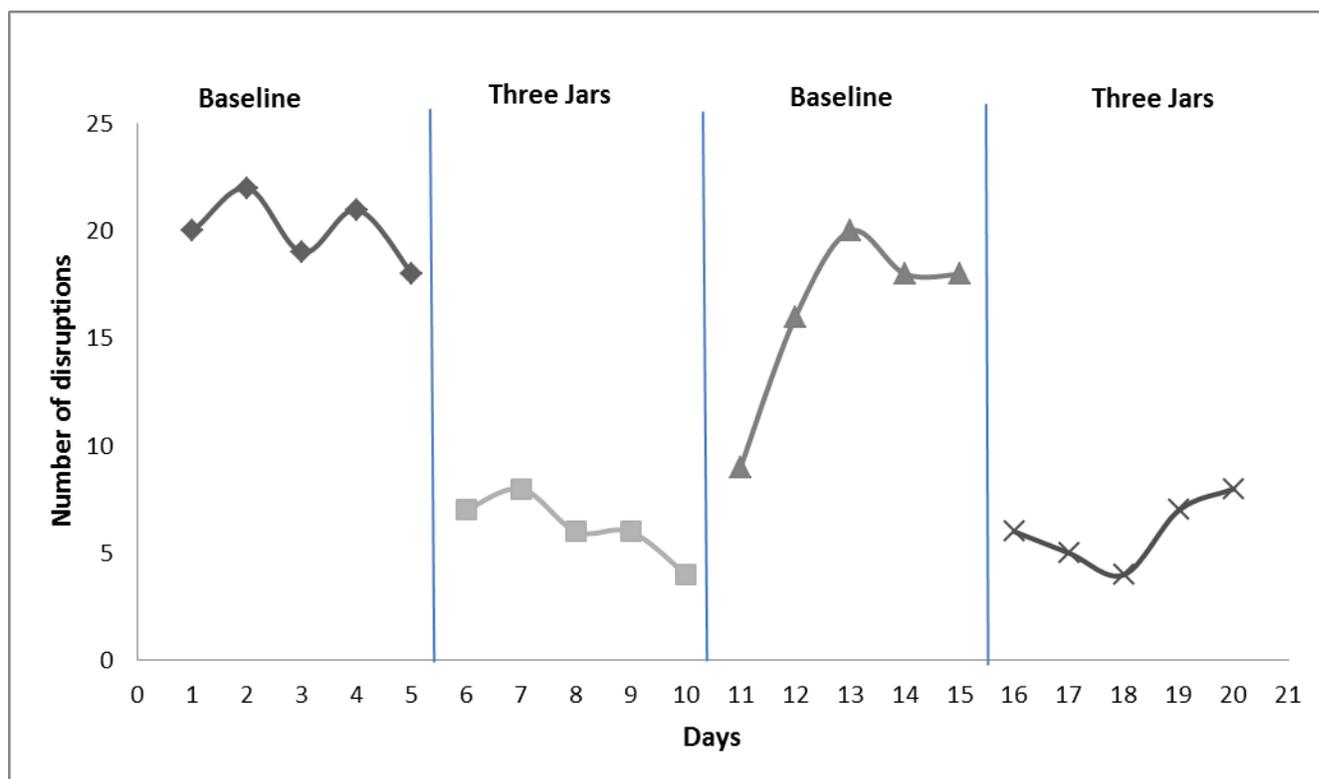


Figure 1 shows the effects of Three Jars on students' overall number of disruptions per session across experimental phases.

Graphic displays were also generated for each target behavior. Figure 2 shows the impact of Three Jars on the class' out-of-seat behavior. Out-of-seat behavior was the second most disruptive behavior displayed in the classroom among the three target behaviors and initial baseline data was quite variable. On average, pupils got out of their seats without permission about 4.56 times with a range of 2 to 5. It is also important to note that a stable trend appeared in students' out-of-seat behavior just prior to Three Jars implementation. The students were displaying higher levels of out-of-seat behavior. When the intervention was put into effect, the mean of out-of-seat behavior decreased to an average of 1.8 or about three times as low as initial baseline levels. The range was 1 to 2. The level and trend both decreased due to the Three Jars implementation. There were, however, overlapping data points between baseline and intervention phases. When Three Jars were removed, pupils' out-of-seat behavior increased slightly to an average of 4.4 with a range of 3 to 6 and a clear accelerating trend emerged. The amount of out-of-seat behaviors tripled. The trend coincided with the re-introduction of Three Jars. When the intervention was put back into place, out-of-seat behavior dropped to an average of 1.2 with a range of 1 to 2. This was about four times as low as both the first and second baseline sessions. There were also two overlapping data points across adjacent baseline and intervention conditions.

Figure 2 shows the effects of Three Jars on students' out-of-seat behaviors across experimental phases.

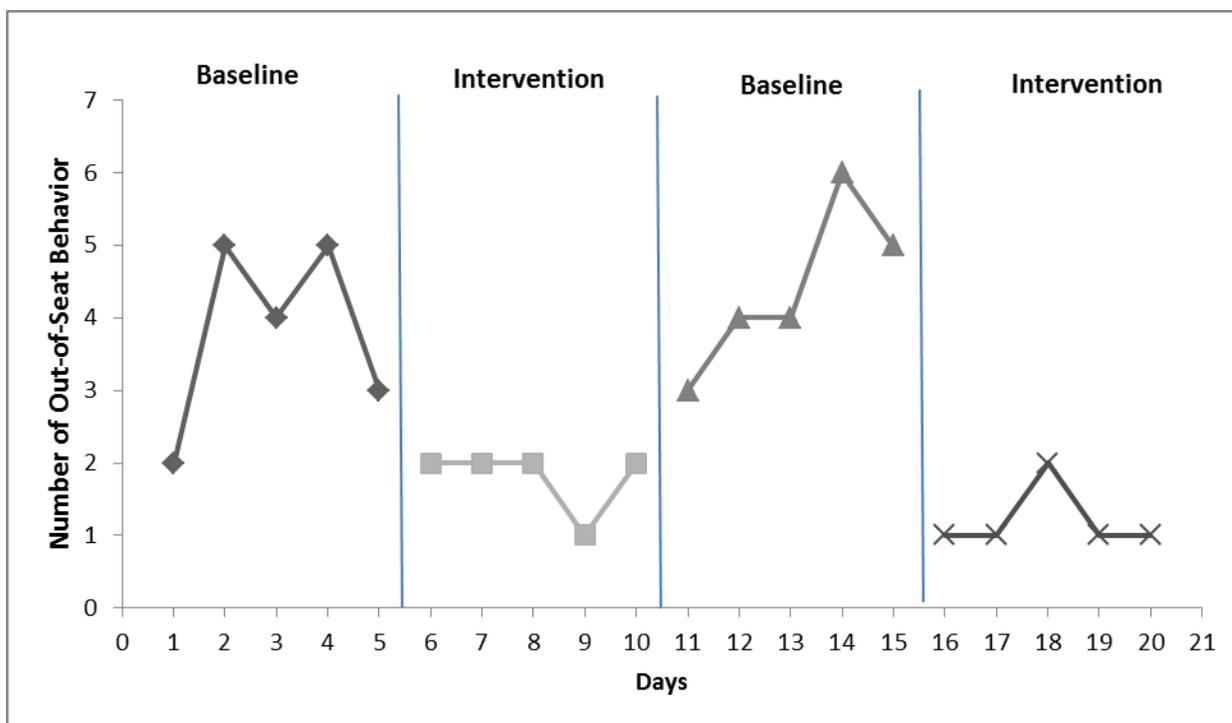
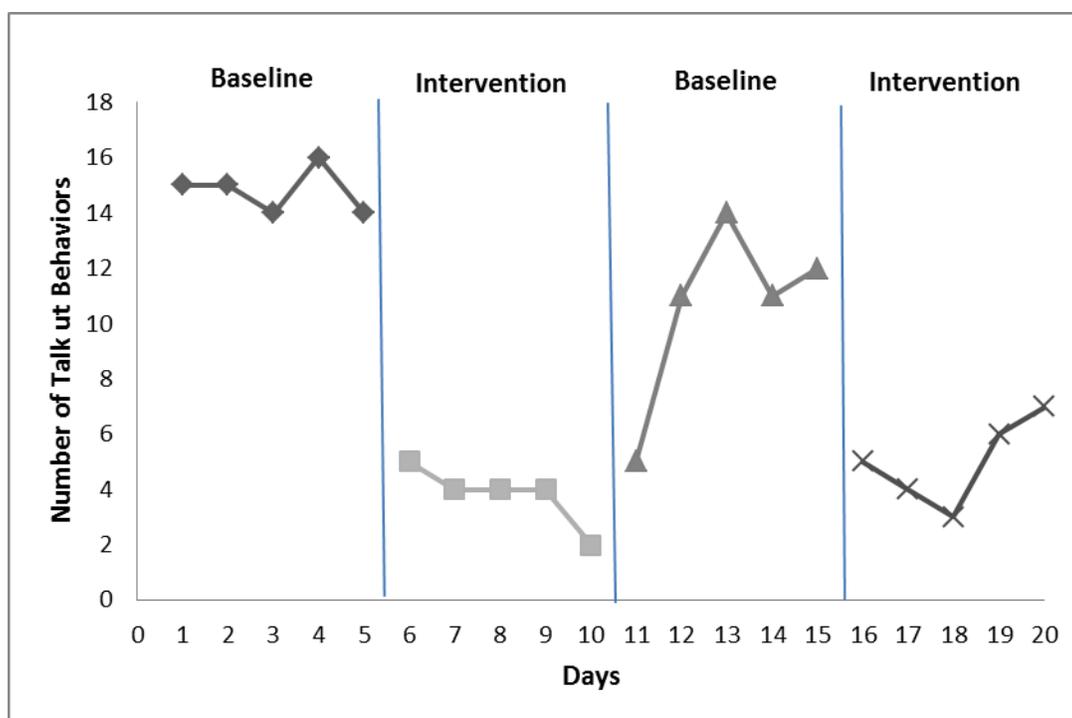


Figure 3 shows the effects of Three Jars on the class' talk outs. Talk outs were the most frequent target behavior that occurred, on average 14.8 talk outs were recorded during the 40 minute math block with a range of 14-16. When Three Jars were put into effect, there was an immediate and noticeable decrease in student talk outs. The average dropped to 3.8 talk outs during with a range of 2 to 5. This is about four and a half times lower than initial baseline data. There were also no overlapping data points between the first two experimental phases. When the second baseline was introduced student talk outs remained low for the first day, but steadily increased to an average of 10.6 talk outs and a range of 14 to 5. Because the data points are steadily increasing there were no overlapping data points across adjacent conditions. When

Three Jars was put back into effect, pupil talk outs were cut in half (i.e., average= 5; range= 3 to 7) and there was one overlapping data point.

Figure 3 shows the effects of Three Jars on student talk outs across experimental phases.



The effects of Three Jars on the class' non-compliant behavior can be seen in Figure 4. Like the other two target behaviors, non-compliant behavior was quite variable during initial baseline sessions. Non-compliance was the third most frequent target behavior. On average, the class failed to comply with teacher requests an average of 1.4 times with a range of 0 to 3. When Three Jars were introduced the mean non-compliant rate dropped to .4 with a range of 0 to 1. This was about three times less than initial baseline rates. There were, however, overlapping data points between baseline and intervention conditions. When Three Jars were removed, non-compliance increased once again to an average of 1.2 with a range of 1 to 2. There were

overlapping data points. When the final intervention phase began, there was another decrease in the rate of non-complaint behavior to a mean of .2 and a range of 0 to 1. During the final intervention phase, the class engaged in one-fifth the amount of disruptions than they did in the second baseline session.

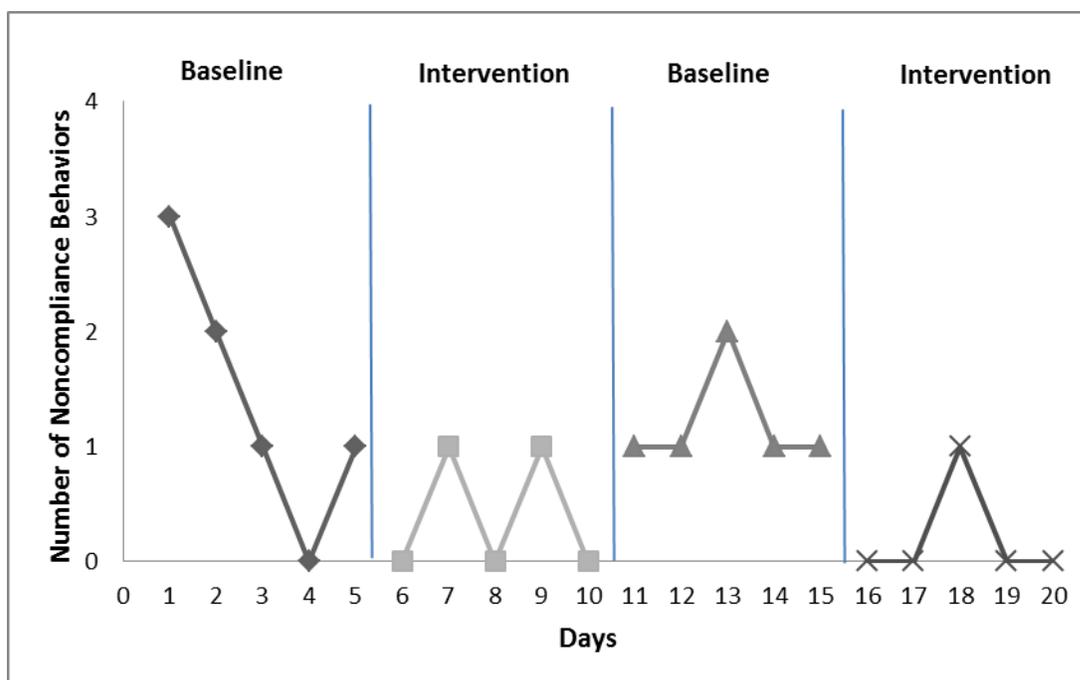


Figure 4 shows the effects of Three Jars on students' noncompliant behavior across experimental phases.

Discussion

The present findings show that the Three Jars intervention was an effective and efficient way to reduce disruptive classroom behaviors among a group of fourth graders during a 40-minute math class. During a typical baseline session the class displayed about 20 disruptive behaviors per class. During intervention sessions the class averaged 6 total disruptions or about one-third as many as baseline sessions. The present findings are consistent with previous research which showed that group contingencies with randomized components can improve

disruptive behavior (e.g., Kelshaw-Levering et al., 2000; McKissick, Hawkins, Lentz, Hailly, & McGuire, 2010; Theodore et al., 2001; 2003; 2004) and is also supportive of the positive effects of mystery motivators on disruptive classroom behavior (Murphy et al., 2007). These results extend the literature on the use of group contingencies to a new student population, another content area, and adapted intervention procedures (i.e., randomized behaviors, criteria, and rewards combined with the use of mystery motivators).

The current findings are important because talk outs, out-of-seat, and non-compliance are fairly common in typical classroom settings, particularly in many beginner teachers' classrooms, and their conflicting effects on student achievement and educator stress levels have been easily and clearly documented (Alberto & Troutman, 2009; Oliver & Reschly, 2007). It is also important to note that Three Jars were relatively easy to implement. While additional time and effort was required initially for the teacher to gather the necessary material, as well as for pupils to be trained in the understanding of the game, actual implementation requirements were minimal each day. The teacher only had to pick a piece of paper from each of the three jars, monitor pupil performance, and provide consequences based on the class' daily performance. This took only a few minutes each day. The researcher was the one who had to make more detailed observations in order to gather useable data. Of these acts, clearly monitoring the entire class' behavior each day took the most time and effort.

Positive effects of Three Jars were most clear on combined behavioral outcomes and talking without raising hand. Although the impact on non-compliance and out-of-seat was less apparent it was still a positive impact. It is clear to see the intervention had a major impact on student 6 who reduced his average disruptive behaviors by more than half. The most noticeable effects, for example, were found for talk outs which were the most frequently occurring target

behavior. According to the teacher the most frustrating and challenging behavior were talk outs within the classroom. This included talking without raising hand as well as talking with neighbors during lessons or quiet times. With the immediate reduction of talk outs during interventions session's instructional flow was greatly improved in the classroom. There were general trends toward fewer out-of-seat and noncompliant behaviors while Three Jars were in effect as well. The teacher noted that with all three target behaviors reduced the class ran more smoothly and she was able to cover more material during any given lesson. Interventions that consistently reduce disruptive behavior with minimal time and effort should be suitable to other practitioners.

Students' consumer satisfaction ratings were summarized and shown in Table 1. As shown, Three Jars appeared to be generally acceptable to most pupils. This finding is consistent with previous research that shows positive consumer satisfaction evaluations for jars-related studies (Skinner et al., 2009). Students appeared to be positive about intervention goals, procedures, and outcomes. They reported that it was important to do well in math class, complete their class work and stay on task. They also reported that getting along with peers was very important to them. In terms of the acceptability of Three Jars procedures, pupils rated earning rewards as the most appealing aspect of the intervention. An interesting, unexpected outcome was that students found mystery motivators to only be somewhat acceptable. This may be because they were really looking forward to opening one particular envelope (i.e., Pizza Party) which didn't happen during the study, or they didn't have sufficient opportunities to experience the different mystery motivators, or some other reason. Students also appeared to be generally satisfied with their work in math class and felt that Three Jars may have helped somewhat. Interestingly, some reported that the intervention did not help them to get along better with peers,

but the majority of them did want to extend Three Jars into their other classes. Almost all students reported that they liked playing the game a lot. Finally, the teacher commented during the study that students were enjoying Three Jars because they encouraged one another to act appropriately so the class could earn rewards. The teacher also noted that students were upset when Three Jars were taken away during baseline conditions. As a whole the students in this particular fourth grade classroom enjoyed using Three Jars during math period.

Table 1. Mean consumer satisfaction rating by fourth grade pupils.

Items	Mean
1. How important is it for you to do well in math class?	4
2. How important is it for other students in your class to do well in math class?	2
3. How important is it for students to get along well with one another?	4
4. How important is it for students to stay on task during math class?	4.1
5. How much did you like the classroom rules used in the game?	3
6. How much did you like using Jar #1 to determine which goal/behavior would be monitored each day?	3.5
7. How much did you like using Jar #2 to figure out whose behavior would be monitored each day?	2.2
8. How much did you like using Jar #3 to find out what rewards the class earned that day?	4
9. How much did you enjoy playing the Three Jars game?	5
10. How much did you like picking one of the mystery motivator envelopes?	3
11. How satisfied are you with your overall performance in math class?	4
12. How satisfied are you with your performance when using the Three	3.4

Jars Game?	
13. How much did 3 Jars help you to get along better with others in class?	
14. Does the Three Jars game seem like something that should be done during other lessons?	4.5
15. Could the Three Jars game be harmful to other students?	1.5
16. How fair was 3 Jars to everyone in class?	2.2

While current findings are encouraging and consistent with other recently completed Three Jars studies, there are some important study limitations to consider when interpreting results. First, the study was conducted with only one small group of students ($N = 17$), in one geographical location, and across a narrow range of disruptive behavior (i.e., talk outs, out-of-seat, and non-compliance). Therefore, it cannot be concluded that the same effects would occur if the number of students increased or the behaviors were to change. Further research should be completed using more disruptive student behaviors and more students to fully test how well this intervention truly is at reducing disruptive behaviors.

Second, the study was conducted for a relatively short duration (4 weeks). It cannot be concluded, therefore, that the same effects would be obtained over a longer period of time. As such, future research should include longer intervention durations. The current findings are also limited because the investigator was also the primary data collector. Although procedures were used to monitor fidelity of implementation and reliability and accuracy of outcome measures (e.g., fidelity and inter-rater reliability assessments), the results may have still been biased. To minimize bias in the classroom future research should utilize independently trained data collectors who are not associated with the research, but who have been trained.

Another limitation is the presence of a student teacher in the classroom on Tuesdays and Thursdays. On these days the student teacher takes full responsibility for math and social studies lessons. Therefore, the student teacher was in charge of Three Jars every Tuesday and Thursday during the baseline and intervention sessions (40 minute math block). This was a total of eight times during the study. The student teacher was told how to use the game, but limitations still may have occurred. Because the student teacher is not a certified teacher she may lack knowledge about disruptive behavior or be more likely to miss an occurrence of an inappropriate behavior. The absence of the classroom teacher during these days may have caused the students to display disruptive behavior at a higher rate. This is also a limitation because the students were not given a fixed teacher to work with. Future research should be done in a classroom that will not have a student teacher to help provide more reliable data.

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Appendix A- Baseline I &II Data Collection Sheet

Student	Strikes		
	Behavior: Out of Seat without Raising Hand and Asking	Behavior: Talking Out without Raising Hand	Behavior: Complying with Requests within 10 seconds
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

Appendix B- Data Collection Sheet- During Intervention I & II

Date:			
Behavior & Criteria:			
Name:			
Reinforcer:			
Students	Behavior: Out of Seat without Raising Hand and Asking Criteria: No more than 1	Behavior: Talking Out without Raising Hand Criteria: No more than 1	Behavior: Complying with Requests within 10 seconds Criteria: All the time
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			

Appendix C
Consumer Satisfaction Survey
Three Jars

Directions:

Please read each item aloud to your students and ask them to circle the number that best represents their feelings about that particular item. Emphasize the importance of completing the rating individually and privately.

I. Importance of Instructional Goals

1. How important is it for you to do well in math class?

1	2	3	4	5
Not at all		somewhat important		very important

2. How important is it for other students in your class to do well in math class?

1	2	3	4	5
Not at all		somewhat important		very important

3. How important is it for students to get along well with one another?

1	2	3	4	5
Not at all		somewhat important		very important

4. How important is it for students to stay on task during math class?

1	2	3	4	5
Not at all		somewhat important		very important

II. Acceptability of Instructional Procedures

5. How much did you like the classroom rules used in the game?

1	2	3	4	5
Not at all		OK		Liked it a lot

6. How much did you like using Jar #1 to determine which goal/behavior would be monitored each day?

1	2	3	4	5
Not at all		OK		Liked it a lot

7. How much did you like using Jar #2 to figure out whose behavior would be monitored each day?

1	2	3	4	5
Not at all		OK		Liked it a lot

8. How much did you like using Jar #3 to find out what rewards the class earned that day?

1	2	3	4	5
Not at all		OK		Liked it a lot

9. How much did you enjoy playing the Three Jars game?

1	2	3	4	5
Not at all		Somewhat liked it		Liked it a lot

10. How much did you like picking one of the mystery motivator envelopes?

1	2	3	4	5
Not at all		Somewhat liked it		Liked it a lot

III. Satisfaction with the Three Jars Game

11. How satisfied are you with your overall performance in math class?

1	2	3	4	5
Not at all		Somewhat satisfied		Very satisfied

12. How satisfied are you with your performance when using the Three Jars Game?

1	2	3	4	5
Not at all		Somewhat satisfied		Very satisfied

13. How much did 3 Jars help you to get along better with others in class?

1	2	3	4	5
---	---	---	---	---

Not at all

Somewhat

A lot

14. Does the Three Jars game seem like something that should be done during other lessons?

1

2

3

4

5

Not at all

Maybe

Definitely

should

15. Could the Three Jars game be harmful to other students?

1

2

3

4

5

Not at all

Maybe

Definitely

could

16. How fair was 3 Jars to everyone in class?

1

2

3

4

5

Not fair at all

Somewhat fair

Very fair

Additional Comments/Suggestions:
