

**THE EFFECTS OF THREE JARS ON THE DISRUPTIVE BEHAVIOR OF A
SECONDARY ENGLISH LANGUAGE ARTS (ELA) CLASS**

by

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CERTIFICATION OF PROJECT WORK

We, the undersigned, certify that this project entitled *The Effects of Three Jars on the Disruptive Behavior of a Secondary English Language Arts (ELA) Class* by Abigail Wesley, Candidate for the Degree of Master of Science in Education, Department of Curriculum & 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 current situation, a novice teacher was challenged by high rates of disruptive behavior during her 9th grade self-contained English Language Arts (ELA) class. In response she examined the effects of three jars, an intervention package consisting of group contingencies with randomized components, on three specific disruptive behaviors (i.e., talk outs, out of seat, and noncompliance). Results indicated that the three jars intervention produced immediate and noticeable decreases in her students' disruptive behaviors. In fact, overall disruption dropped by approximately 67% when the intervention was in effect. Additional analyses suggested that the intervention had the most noticeable impact on student talk outs. In addition, consumer satisfaction data indicated that students found three jars to be socially acceptable for the most part, although some questions were raised about its fairness and impact on peer relationships. Implications for research and practice are discussed.

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Introduction

The ability to manage student behavior effectively and efficiently was identified as critical to achieving positive educational outcomes (Oliver & Reschly, 2007). While good classroom management skills don't guarantee academic success, they can create an environment in which effective learning can occur. Conversely, poor behavior and classroom management skills are associated with a variety of adverse educational outcomes. For example, disruptive classroom behavior is the primary reason why most teachers leave the profession (Ingersoll & Smith, 2003). Second, teachers with chronic classroom disruptions are often ineffective academically and report elevated levels of stress and burnout (Berliner, 1986; Espin & Yell, 1994). Third, teachers' inability to manage classroom behavior contributes to poor academic performance, especially among "at risk" learners, as well as higher referral rates for remedial and special education programs (e.g., Donovan & Cross, 2002). Finally, chronic disruptive behavior also impedes the learning of normally developing peers (Epstein, Kutash, & Duchnowski, 1998).

Although the importance of good classroom and behavior management skills are widely acknowledged, most practitioners report being ill-prepared to (a) create positive and productive learning environments; and (b) address common behavioral challenges in their initial or existing teaching placements (e.g., Baker, 2005; Oliver & Reschly, 2007). Seibert (2005) also noted that many new teachers received very few *supervised* opportunities to manage pupil behavior in their preparation programs, while Oliver and Reschly (2007) found similar inadequacies in contemporary professional development activities for experienced teachers. Oliver and Reschly concluded that there was *no* evidence that teachers will simply "pick up" good management skills on the job.

Although teacher preparation and professional development around classroom and behavior management leaves much 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 offending 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.

This paper describes three types of group contingencies (i.e., independent, dependent, and interdependent) and discusses their relative effectiveness in improving pupils' academic and behavioral performance. Next, procedures are described for randomizing different parts of group contingencies to maximize benefits for pupils. The paper concludes with suggestions for using effective group contingency programs in the classroom and conducting further research on their effects.

Group Contingencies

Group contingencies have a rich empirical history in psychology and education. They were used to improve a wide range of academic, behavioral, and interpersonal outcomes for individuals with special needs and their normally developing peers (e.g., Gresham & Gresham,

1982; Hulac & Benson, 2010; Litow & Pomroy, 1975; Skinner, Skinner, & Burton, 2009; Theodore, Bray, Kehle, & DioGaurdi, 2003). Litow and Pomroy (1975) first described three types of group contingencies: (a) independent, (b) interdependent, and (c) dependent.

Independent group contingencies are used often in school with traditional grading and classroom management systems as prime examples. 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 pupils' own performance, independent group contingencies are perceived as *fair* by students, teachers, school leaders, and parents (Skinner, Cashwell, & Dunn, 1996; Skinner et al., 2009). *Interdependent* group contingencies, in contrast, provide entire classes with consequences based on some aspect of their *collective* performance. For example, a whole class earns a pizza party when they read a total of 100 books, or all students get homework passes when the class average on math quizzes is 80% or above. Under interdependent contingencies, pupil access to positive consequences depends on them *and* their peers. Therefore, they must work collaboratively if everyone is to benefit. Because all-or-none of the group receives consequences, these contingencies are fairly easy to implement (Skinner et al., 2009). Finally, *dependent* group contingencies provide access to consequences based on the performance of one or a few individuals. For example, the entire class earns five minutes of free time if table #1 completes their assignments before the bell rings. Similarly, everyone receives homework passes if Jacob refrains from talking out in class. The procedural advantage to dependent contingencies is that teachers can monitor and evaluate fewer students before providing consequences (Skinner et al., 2009).

All three types of group contingencies have been shown to be more effective than existing instruction in improving academic achievement, reducing disruptive behavior,

increasing compliance with requests, enhancing social skills, improving homework completion and accuracy, and reducing room-to-room transition times in school. Comparative studies involving the three contingency types found them to be *equally effective*, for the most part, in improving pupil outcomes (Gresham & Gresham, 1982; Lynch, Theodore, Bray, & Kehle, 2004; Theodore, Bray, & Kehle, 2009).

Advantages and Disadvantages of Group Contingencies

Given that all three group contingencies appear to be equally effective and are more powerful than traditional teaching practices, practitioners may want to become familiar with the advantages and disadvantages of each type. Independent group contingencies, for example, are the most frequently used contingency type. Since they provide the same or similar instructional activities, criteria, and consequences for everyone, they are relatively easy to use and are perceived as fair by most participants. However, there are a few concerns with independent group contingencies. The first concern involves the selection of reinforcers. Teachers must be wary of using tangible rewards, for example, because students might buy or steal them (Theodore et al., 2003). To prevent this, educational activities can be used instead of objects as rewards. Another concern is that the same consequences (i.e., rewards) may not be equally attractive or reinforcing for all students (Theodore et al., 2003). If rewards do not interest students, then they will not work hard to reach these goals, and it can be difficult to find consequences that are equally appealing to diverse groups of learners. Finally, it is difficult to set appropriate standards or criteria when using independent group contingencies. Since the same criterion is set for everyone, it may be too high for some students, yet too low for others. Those in the former group may not expend much effort because the goal is perceived as unattainable, while the latter may not work hard because such effort is not necessary for success. Theodore et

al. (2003) cautioned as well that, “it would not be appropriate to hold exceptional children to the standards of their general education peer counterparts” (p. 82).

Classroom teachers might also consider using interdependent group contingencies. The advantages include (a) promoting collaboration among students; (b) ease of implementation (i.e., everyone either wins or loses); and (c) the whole class celebrates rewards together (Skinner et al., 2009; Theodore et al., 2003). However, there are some disadvantages as well. Similar to independent contingencies, rewards must interest or appeal to all students to work effectively (Theodore et al., 2003). If pupils don’t like them, they will not exert the effort to secure positive consequences. Another concern with interdependent group contingencies is that sometimes high performing and well-behaved students do not earn rewards because of poor peer performance. These students may become frustrated, complain of unfairness, and/or direct negative comments to offending peers (e.g., Skinner et al., 2009; Romeo, 1998; Theodore et al., 2003).

Dependent group contingencies have similar strengths and limitations. Because group rewards depend on one or a small group of students, class atmosphere may be more social and cooperative (Theodore et al., 2003). Teachers have also reported that dependent group contingencies are time-efficient (Theodore et al., 2003). Common concerns about dependent group contingencies suggest that some students may sabotage their work or behavior so that the class does not get rewarded. This, in turn, may create a hostile classroom environment (Romeo, 1998; Theodore et al., 2003). Romeo (1998) stated that, “the student who misbehaves is held fully responsible by the other students in the class, for they are being denied an anticipated reward” (p.130). As such, pupils may retaliate and threaten peers who do not meet the goals (Theodore et al., 2003).

Given that all three group contingencies have inherent limitations, researchers have worked to develop procedures to minimize or eliminate these short-comings. One way to diminish potential limitations is by randomizing contingency components (i.e., target behaviors, criteria, students, and consequences) and keeping them unknown to students (e.g., Kelshaw-Levering, Sterling-Turner, & Henry, 2000; Skinner, Williams, & Neddenriep, 2004). If students don't know which target behaviors, criteria, or consequences they will receive, they may be more likely to display more generalized behavior changes. The next two sections provide exemplars of how group contingency systems with randomized components were used to improve the academic and behavioral performance of school-aged children.

Effects on Academic Performance

Interdependent group contingencies were shown to be effective in improving academic performance in a number of different studies. Reinhardt, Theodore, Bray, and Kehle (2009), for example, improved the homework accuracy of six, 4th-grade students in a general education classroom using interdependent group contingencies, a goals box, and mystery motivators. Prior to intervention, students had privileges taken away when they did not complete their homework. During the intervention, students were informed that they could earn mystery motivators if their homework in reading comprehension, math, and spelling was completed. The criterion for rewards was determined randomly and included (a) highest score of 100%; (b) lowest score of 70%; (c) class average of 80%; and so on (Reinhardt et al., 2009). If students met the criterion, they received mystery motivator rewards that day; if they did not meet the criterion, the teacher encouraged the class to try harder the next day. Results showed that all six students maintained or improved their homework accuracy in reading comprehension and math and that five of six students maintained or improved spelling homework accuracy (Reinhardt et al., 2009).

Effects on Disruptive Behaviors

Several studies have been conducted to look at the effects of group contingencies on classroom behavior (e. g., Coogan, Kehle, Bray, & Chafouleas, 2007; Kelshaw-Levering et al., 2000; Lohrmann & Talerico, 2004; Mottram, Bray, Kehle, Broudy, & Jenson, 2002; Schanding & Sterling-Turner, 2010). Lohrmann and Talerico (2004), for example, investigated the effects of a class-wide intervention (“Anchor the Boat”) on three target behaviors in a self-contained special education classroom. The ten 4th and 5th graders were given three target behaviors which included (a) time spent out of seat; (b) incomplete assignments; and (c) talk-outs (Lohrmann & Talerico, 2004). The classroom teacher introduced the “Anchor the Boat” program to students and explained that they could earn rewards if they met three target behaviors. After reviewing examples and non-examples, the class took part in a role-play activity to ensure students understood each target behavior. The intervention included a picture of a boat on the wall and 20 inches away a picture of an anchor. Students received one paperclip per class period (42 minutes) if they met the criterion (i.e., fewer than 50 occurrences of the target behaviors). Once 10 paperclips were received, they would connect the boat to the anchor and a reward would be given to the entire class (Lohrmann & Talerico, 2004). After students chose a random reinforcer the chain of paperclips was removed and the students started over again. Lohrmann and Talerico found that, “dedicating time to directly teaching behavioral expectations and reinforcing student appropriateness has a positive effect on student behavior” (p. 116).

Mottram et al., (2002) and Coogan et al., (2007) also examined the effectiveness of group contingencies on disruptive behavior while focusing on a small number of participants in a general education classroom. Mottram et al. studied three, 7 year old males in second grade and defined disruptive behaviors as not following instructions, making noises at inappropriate times,

being out of their seats, playing with objects, and not looking at the teacher or their work. These behaviors were reinforced by using a token economy with response cost, mystery motivators, and posted classroom rules (Mottram et al., 2002). If students met the criterion for 10 minutes they were given one token. Once five tokens were accumulated, students received a mystery motivator at the end of the day. This study differed from others in that when posted classroom rules were being broken students had tokens taken away. Mottram et al. found this group contingency system to be very effective in decreasing disruptive behavior. The classroom teacher also thought the program was easy to use and would recommend it to others (Mottram et al., 2002).

The study by Coogan et al. (2007) examined the effectiveness of a multi-component intervention involving self-management, peer feedback, and the randomization of reinforcers and criteria to reduce inappropriate behaviors. Participants were five, 12-year-old males in a general education classroom. Inappropriate behaviors were defined as touching, making noise, being aggressive, playing, and out of seat (Coogan et al., 2007). The intervention protocol included students using monitoring boards and self-monitoring sheets. 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 what behavior(s) were going to be targeted (Coogan et al., 2007). If students met the randomly selected criterion, they received mystery motivator rewards. Coogan et al. found that the multi-component intervention was effective in reducing inappropriate classroom behaviors for all five students.

Additional studies examined how group contingencies impacted whole-class behaviors (e. g., Kelshaw-Levering et al., 2000; Schanding & Sterling-Turner, 2010). Kelshaw-Levering et

al. (2000) investigated how randomized group contingencies impacted problem behaviors in a second grade classroom. Target behaviors were defined as students being off task, making inappropriate vocalizations, wandering away from their desks, and/or non-compliance (Kelshaw-Levering et al., 2000). The teacher used one jar and four jars to randomize contingency components and set a goal to decrease disruptive behaviors by 40%. Kelshaw-Levering et al. (2000) found that both jar interventions produced immediate and significant decreases in the entire class' disruptions. Data from the four jars, however, were slightly better than one jar conditions.

In another study, Schanding and Sterling-Turner (2010) used mystery motivators in an interdependent group contingency system to decrease problematic behaviors in a high school biology classroom. Thirty students ranging in age from 14 to 17 were told that they would be taking part in a *mystery motivator game* that focused on reducing off-task and out-of-seat behaviors as well as inappropriate vocalizations. Students chose rewards provided as mystery motivators contingent on their improved classroom behavior (Schanding & Sterling-Turner, 2010). The intervention included two envelopes: one labeled "reward" and the other labeled "chance." The reward envelope contained rewards that students could receive if they met established criterion. The chance envelope contained slips of paper with an M (for mystery motivator) or X (for no reward given that day) on them. Schanding and Sterling-Turner noted the importance of including only "M" slips of paper at first so students would be encouraged by the intervention and then fade the use of "M" slips of paper while increasing "X" papers. Results showed immediate and noticeable class-wide reductions in problematic behaviors (Schanding & Sterling-Turner, 2010). Moreover, students reported that they liked the game and that it improved their classroom behavior.

Collectively, these studies showed that group contingencies, independent, dependent, or interdependent, can be used to improve pupils' 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 (Coogan et al., 2007; Mottram et al., 2002; Theodore et al., 2003). Second, group contingency interventions maximized positive consequences for all pupils (Lohrmann & Talerico, 2004; Skinner et al., 2004; Theodore et al., 2003). Instead of punishing students when they do not meet expectations, teachers rewarded students when they met or surpassed expectations. Finally, using randomized rewards was a key to success for implementing group contingencies effectively (Coogan et al., 2007; Kelshaw-Levering et al., 2000; Mottram et al., 2002; Reinhardt et al., 2009; Schanding & Sterling-Turner, 2010; 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).

Given the success of group contingency interventions in reducing disruptive classroom behavior, the present study was undertaken. The purpose of this investigation was to examine the effects of a three jars intervention (i.e., combination of interdependent and dependent group contingencies and mystery motivators) on the disruptive behavior of a 9th grade, self-contained, English and Language Arts class. As such, this was a partial replication study that addressed the following questions: (a) what effects, if any, will three jars have on pupils' rates of disruptive behavior? and (b) to what extent will the pupils rate intervention components as important, feasible to implement, and satisfying to use?

Method

Participants and Settings

The present study was conducted in a small (950 students) rural high school in Western New York. Nine students (8M, 1F) enrolled in a 9th grade, self-contained English and Language Arts (ELA) classroom served as participants. Four pupils were Caucasian, three were Native American Indian, and two were Hispanic. The students ranged in age from 14 to 15 years old. All nine students had Individualized Education Plans (IEPs) for attention and refocusing deficits. In general, pupils were working well below grade expectations and a number of them exhibited a variety of disruptive behavior 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 (e.g., 10 seconds). Pupils were recruited for participation and informed consent was obtained from them and their parents or guardians.

The setting was a typical secondary classroom with four rows of seats and two or three pupils in each row. Students did not have assigned seats, but generally sat in the same desks each day. The teacher moved student seats occasionally when excessive disruptions occurred. Students also moved into partners or small learning groups for some instructional activities during the ELA time block. All desks faced the front of the classroom where a Smart Board and chalkboard were located. Most teacher-led instruction incorporated these items. There was also a table in the back of the room where one student sat alone because he had been distracting other students. Curriculum materials included literacy notebooks and folders that were kept in the room on a side table. Students also had access to laptops to create power points, word documents, and search the internet for curriculum projects. During this study, students participated in midterm review and poetry units.

The primary investigator, a Caucasian female with approximately two years of teaching experience, also served as the teacher of record in this classroom. She was quite concerned with high levels of pupil disruption which interfered with student learning and her own teaching effectiveness. The following academic and behavioral concerns were noted: (a) high rates of disruptive behavior (e.g., out-of-seat, talk outs, and non-compliance); (b) negative social interactions (i.e., verbal and physical) towards peers and instructor; and (c) a failure to complete in class work.

Dependent Variables

There were four dependent variables in this study: (a) out-of-seat, (b) talk outs, (c) non-compliance, and (d) social acceptability ratings of the three jars intervention. *Out-of-seat* was defined as, “students repeatedly leaving their seats or desks without permission either during independent work time or teacher-led instruction.” *Talk outs* were defined as, “students blurting or speaking out without teacher permission.” This target behavior also included instances of negative verbal interactions (e.g., teasing, name-calling, and other forms of inappropriate verbal comments directed toward others) that were directed to peers and/or the classroom teacher. *Non-compliance* was defined as, “students not doing what the teacher asked or directed them to do within 10 seconds.” Instead of doing what was requested, students intentionally delayed, ignored, and/or challenged requests or broke classroom rules.

Daily frequency counts were derived *for the entire class* on the three target behaviors using the attached data collection sheet (see Appendix A). The primary investigator recorded the frequency with which pupils engaged in the targeted behaviors by making tallies next to numbers assigned to students (to keep anonymity) each time they engaged in targeted behaviors. Daily frequency counts were aggregated for the entire class and then converted to rate measures by

dividing frequency by number of observed minutes and multiplying by 100%. Separate aggregated data totals were calculated for (a) combined measures of disruption (i.e., all three target behaviors); and (b) for each target behavior. These data were then displayed using simple line graphs.

The fourth dependent variable was pupils' objective ratings of the three jars intervention. Immediately after the final study session, pupils completed a 20-item, 5-point, Likert-type scale *anonymously* and *independently* (see Appendix B). The survey asked pupils to rate the intervention in terms of the (a) importance of instructional *goals*; (b) acceptability of instructional *procedures*; and (c) satisfaction with strategy outcomes. Pupil ratings were then aggregated by item and presented in tabular fashion.

Independent Variable

The independent variable was an intervention package called three jars. The intervention consisted of interdependent and dependent group contingencies with randomized components (i.e., target behaviors, students, and rewards) and mystery motivators. Three opaque jars were used to randomize contingency components and keep them a mystery to students. The first jar, labeled "Behavior and Criteria," was used to randomize *target behaviors*. It contained 18 popsicle sticks with the names of each target behavior (i.e., six popsicle sticks each with the words "Out-of-seat 1 time," "Talking out – 1 time," or "Comply within 10 seconds" written on them), as well as six popsicle sticks with the word "All" written on it. If the teacher selected a stick that read "Talking out- 1 time," then that was the behavior to be monitored during that class session. If the "All" stick was picked, then the teacher monitored all three target behaviors on that particular day. The teacher would *not* announce, however, which target behavior(s) was selected that day.

The second jar, labeled “Names,” was used to randomize *target students*. This jar contained (a) six popsicle sticks with the words “Whole Class” written on it; and (b) 54 popsicle sticks with each pupil’s name written on one stick (each of the 9 students had 6 sticks with their names on them). The teacher picked a popsicle stick from this jar to determine *whose* performance would be monitored on the previously selected target behavior. If, for example, the teacher selected a popsicle stick that read “Jose,” then his performance would be monitored during class. If Jose’s performance met the pre-established criterion (i.e., one talk out, one out-of-seat, or compliant behavior within 10 seconds) then the entire class was rewarded. On days when a “Whole Class” stick was selected, an interdependent group contingency was in effect, while on days when individual students were picked a dependent group contingency was in place. Once again, students were not told whose performance was being monitored each day.

The third jar, labeled “Reinforcers,” was used to randomize *consequences*. This jar contained approximately 20 popsicle sticks with the names of activity-based or novel rewards (e.g., no Quick Write coupons, 5 points added to quiz scores, 5-minutes free time, and preferred seating arrangements). Reward suggestions were elicited from students by having them take a “Jackpot Reward Finder” survey at the beginning of the project (interventioncentral.org). The teacher then selected appropriate and inexpensive consequences to include in jar # 3. Among the 20 popsicle sticks were five sticks with the words “mystery motivator” written on them. Mystery motivators, or unknown rewards, were written on paper slips and placed inside a series of sealed envelopes displayed prominently in the classroom (e.g., clipped to the front chalkboard). On days when a “mystery motivator” popsicle stick was pulled from jar #3, students were allowed to vote on which envelope to open that day. It should be noted that the third jar was only used on

days when the pre-established criterion was met. Whichever rewards were selected were then provided for the *entire class* during the most immediate and practical time.

To ensure that the three jars intervention was being implemented as intended, the investigator used an 11-item, procedural fidelity checklist (see Appendix C). This form contained each procedural step as well as a space to note its presence or absence. During 25% of intervention sessions, an independent observer watched the investigator implement three jars and noted whether each procedural step occurred or was omitted. Fidelity of implementation was then calculated as the number of steps present divided by the number present and absent times 100%. Fidelity data indicated that three jars was implemented with over 90% accuracy. This suggests that the intervention was used as intended.

Experimental Design and Procedures

An A-B-A-B single-case research design was used to examine the effects of three jars on pupils' rates of disruptive behavior during ELA class (Kennedy, 2005). This particular design is capable of establishing cause-and-effect relationships by showing that pupil performance changes when and only when the intervention is applied and/or withdrawn. Initially, the investigator monitored talk outs, out-of-seat, and non-compliant behaviors over five days for the entire class under normal instructional conditions. These data served to establish an initial baseline for pupil disruption. Baseline data served to (a) determine if there was a need for intervention; (b) predict future pupil performance if existing instructional conditions were maintained; and (c) provide a comparison for intervention outcomes. A typical baseline session worked as follows. Most classes started with a quick review of previous work, followed by teacher-led instruction on new content, and then either small group or independent seatwork. When students behaved appropriately, the teacher would provide specific praise (e.g., thank you

for raising your hand Michael). If students' talked out, left their seats, or failed to comply with directives, then they were either redirected or reprimanded. One student also had an Individualized Behavior Plan that worked on a "three strikes and you're out" principle. His consequence was to be sent to the Internal School Suspension (ISS) room for the remainder of class whenever he exceeded "three strikes." To keep this action "fair," the teacher kept track of all student behavior on a "strikes" chart at the front of the room. Students who used inappropriate language, refused to do work, or acted out were given a strike. Three strikes led to the student having to serve detention with the teacher (unless it was the student with the Individualized Behavior Plan who was then sent to ISS). There were no set criteria for strikes and the teacher also wrote discipline referrals for behavior deemed especially offensive or inappropriate.

After initial baseline data stabilized, the investigator introduced three jars to students during a brief (i.e., 15-20 minute) training session. She explained that the purpose of the game was to improve pupil behavior during daily, 40-minute English classes. In particular, she identified three disruptive behaviors (i.e., out-of-seat, talk outs, and non-compliance) that the class must reduce if they were to win the game and earn rewards. All target behaviors and criteria were defined operationally and posted publicly in class using a large yellow chart-board. As such, students were aware of which target behaviors were being monitored; however, they did not know which one was being observed on specific days. This was done because previous research found that pupils typically change *all* target behaviors in hopes of meeting criteria and earning rewards (Kelshaw et al., 2000; Skinner et al., 1996).

The teacher then began intervention sessions by selecting one popsicle stick from Jars #1 and #2 at the beginning of each class to determine which and whose behavior(s) would be

monitored. As noted, students were not informed of either the target behavior or students. The teacher then monitored pupil performance using a relatively simple monitoring sheet (see Appendix D). The investigator then taught her 40-minute English class using her normal instructional routine and responded to pupils' appropriate and inappropriate behaviors in the same manner (i.e., praising appropriate and ignoring or reprimanding inappropriate behaviors). In addition, the investigator made tally marks on the monitoring sheet each time one of the three target behaviors was displayed. At the end of the session, the investigator checked the target student(s)' behavior(s) against the criterion. If the criterion was met, she announced that the class had earned a reward and asked the target student to select a popsicle stick from Jar #3. The reward was then shared among the entire class. If a mystery motivator stick was selected, then the investigator told the class that they must vote on which envelope to select. If the criterion was not met, then she simply announced that it was a no reward day and encouraged them to try harder the next day. Target students' names were not made public. After intervention data stabilized, three jars and all related materials were removed and students were told that they would not be playing the game for the next week. The investigator continued to respond to pupil behavior in the same way and monitored the class' disruptive behavior rates. After data were stable once again, the three jars were reintroduced for the remainder of the study. Immediately after the final intervention session, pupils completed consumer satisfaction surveys independently and anonymously.

Results

The effects of three jars on students' total rate of disruptive behavior can be seen in Figure 1. As depicted, students exhibited high and fairly stable rates of disruptive behavior during initial baseline sessions. Disruption was clearly the highest on the first day of the study when students engaged in an average of 2.3 disruptive behaviors per minute. The mean disruptive behavior rate was 1.3 during initial baseline (i.e., 52 disruptions per session) with a range of .8 to 2.3. When three jars were implemented, there was an immediate and noticeable decrease in disruptive behavior. Total disruption dropped to an average of .5 per minute (i.e., 20 disruptions per session) with a range of .4 to .6. There were also no overlapping data points across initial baseline and intervention conditions. When the three jars were removed, disruptive behavior continued at a relatively low level for three days and then a clear accelerating trend in disruption appeared. The average rate of disruptive behavior during second baseline was approximately twice as high (.97) as the first intervention rate (i.e., 39 disruptions per session) and there were three 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 .46 disruptions per minute (range = .4 to .52) and there were no overlapping data points between adjacent experimental phases. Overall, three jars significantly reduced total class disruptions and its variability.

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 occurred the least often of the three target behaviors and initial baseline data were quite variable. On average, pupils got out of their seats without permission about .12 times per minute (range = .03 to .20). This is the equivalent of approximately five students leaving their seats per 40-minute class. It is also

important to note that a decelerating trend appeared in students' out-of-seat behavior just prior to three jars implementation. When the intervention was put into effect, the rate of out-of-seat behavior decreased to a mean of .06 (range = 0 to .13) or about one half of initial baseline levels. There were, however, three overlapping data points between baseline and intervention phases. When three jars were removed, pupils' out-of-seat behavior increased slightly to an average of .08 and a clear accelerating trend emerged. The trend coincided with the re-introduction of three jars. When the intervention was put back into place, out-of-seat behavior dropped to .02 per minute (range = 0 to .02) or the equivalent of less than one student out of seat during class. There were also two overlapping data points across adjacent baseline and intervention conditions.

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, 1.07 times per minute or about 43 times per class (range = .65 to 1.85). When three jars were put into effect, there was an immediate and noticeable decrease in student talk outs. The class mean dropped to .39 per minute with a range of .25 to .68. This was the equivalent of about 15 talk outs in a typical 40-minute class. There were also no overlapping data points between the first two experimental phases. When the second baseline was introduced, the rate of talk outs doubled to a mean of .78 per minute with a range of .4 to 1.4. As shown, talk outs did not begin to escalate noticeably until about the fourth baseline session and there was overlap between three data points across adjacent conditions. When three jars was put back into effect, pupil talk outs were cut in half once again (i.e., $M = .39$; range = .28 to .48) and there were two overlapping data points.

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. On average, the class failed to comply with teacher requests about .16 per

minute (range = .05 to .28) or the equivalent of about six non-compliant behaviors per class. When three jars were introduced the mean non-compliant rate dropped to .05 with a range of 0 to .08. This was approximately two non-compliant behaviors per class session or less than half of initial baseline rates. There were, however, two overlapping data points between baseline and intervention conditions. When three jars were removed, non-compliance increased once again to an average of .11 per minute (range = .05 to .13). There was one overlapping data point. When the final intervention phase began, there was another decrease in the rate of non-compliant behavior to a mean of .04 (range = 0 to .10). During the final intervention phase, the class engaged in less than two non-compliant behaviors per class.

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 9th graders during a 40-minute ELA class in a suburban high school in the Northeast. Intervention effects were most noticeable and clearest when all target behaviors were combined. During a typical baseline session the class displayed about 52 disruptive behaviors per class. This was over one disruption per minute which clearly interfered with teaching and learning. By the end of the study, the class averaged around 18 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 emerging data base on the positive effects of mystery motivators on disruptive classroom behavior (e.g., Moore et al., 1994; Mottram et al., 2002; Murphy et al., 2007; Musser, Bray, Kehle, & Jenson, 2001). These results extend the literature on the use of group

contingencies to a new student population and geographic location, 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 novice teachers' classrooms, and their adverse effects on student achievement and educator stress levels have been 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 material development and pupil training, actual implementation requirements were minimal each day. Basically, the teacher had to pick popsicle sticks from the jars, monitor pupil performance, and provide consequences based on the class' daily performance. This took only a few minutes per day. Of these acts, clearly monitoring the entire class' behavior each day took the most time and effort. It was noted that, at times, it was challenging for the teacher to collect data and simultaneously instruct the class. This is an issue for future researchers and practitioners to address.

While the positive effects of three jars were most clear on aggregated behavioral outcomes, the impact on individual target behaviors was also positive although less apparent. The most noticeable effects, for example, were found for talk outs which were the most frequently occurring target behavior. The good news was that talk outs were the most frustrating and challenging behaviors for the teacher and their immediate reduction greatly improved instructional flow in the classroom. Similarly, although intervention effects on low frequency target behaviors were less clear, there were general trends toward fewer out-of-seat and non-

compliant behaviors while three jars were in effect. Interventions that consistently reduce disruptive behavior with minimal time and effort should be acceptable 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 ELA class, complete their class work and stay on task. They were less positive in their importance ratings for peers doing well and getting along with classmates. 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., Bookstore Bucks) 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 ELA 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 and the majority did not want to extend the program to other classes. Similarly, some students felt that three jars were unfair, a concern noted elsewhere in the group contingency literature (e.g., Litow & Pomroy, 1975; Skinner et al., 2009). More attention should be focused, therefore, on the perceived fairness of interdependent group contingencies in future research and practice. 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.

While current findings are promising and consistent with other recently completed jars studies, there are some important study limitations to consider when interpreting results. First, the study was conducted with only one group of students ($N = 9$), in one geographical location, and across a narrow range of disruptive behavior (i.e., talk outs, out-of-seat, and non-compliance). Generalizations to other grade levels, geographic settings, and target behaviors are not warranted at this time. Second, the study was conducted for a relatively short duration (5 to 6 weeks) and no generalization and maintenance data were collected. It is not appropriate to conclude, therefore, that the same effects would be obtained over a longer time period, that benefits would generalize to other disruptive behaviors, and/or that these behavior changes will be maintained in the absence of the intervention. As such, future research should include longer intervention durations and explicit generalization measures for examining potential “spillover effects.” 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 (i.e., fidelity and inter-rater reliability assessments), one cannot rule out potential experimenter bias effects. Future research should utilize independently-trained data collectors to the maximum extent possible. Finally, present findings are limited by the absence of direct independent observations of pupils’ interpersonal behavior during baseline and intervention phases. It is quite likely that one can learn much more about intervention effects by observing the faces and hearing the voices when intervention procedures are implemented and/or taken away. Are they excited, dismayed, or some other affect? Future researchers should consider, therefore, the use of more direct observational measures of the intervention’s impact.

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Figure 1 shows the effects of three jars on students' overall rate of disruptive behaviors across experimental phases.

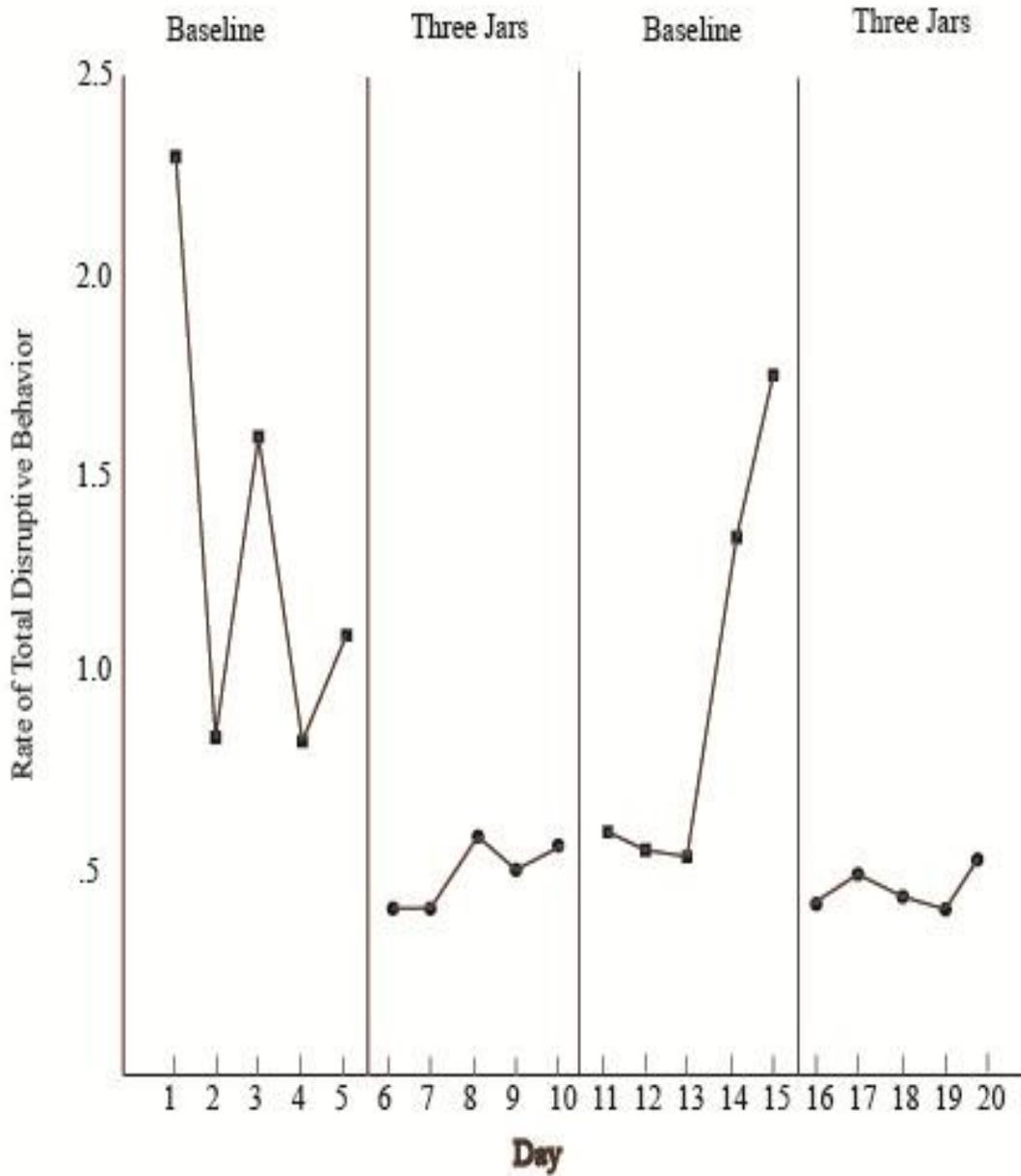


Figure 2 shows the effects of three jars on students' out-of-seat behaviors across experimental phases.

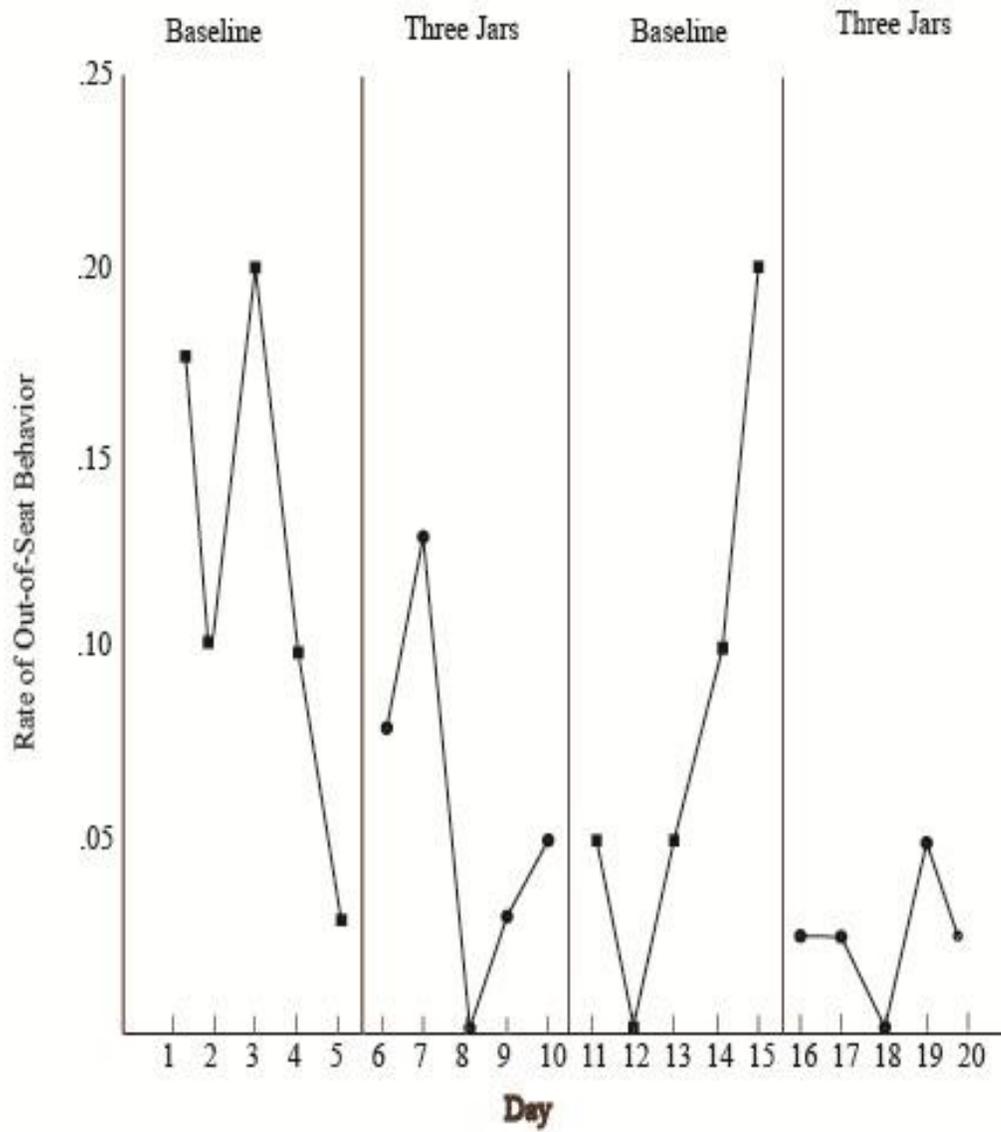


Figure 3 shows the effects of three jars on student talk outs across experimental phases.

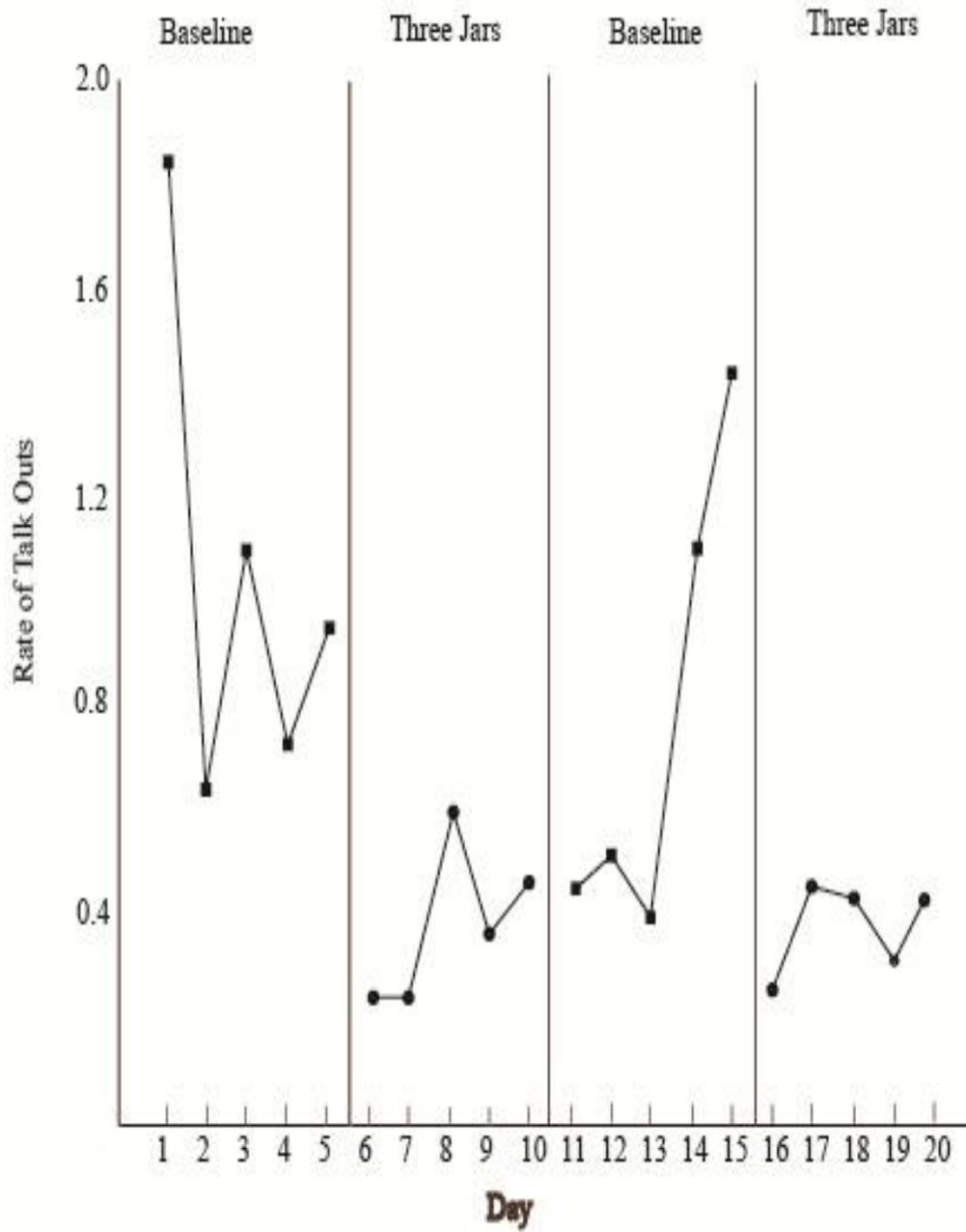


Figure 4 shows the effects of three jars on students' noncompliant behavior across experimental phases.

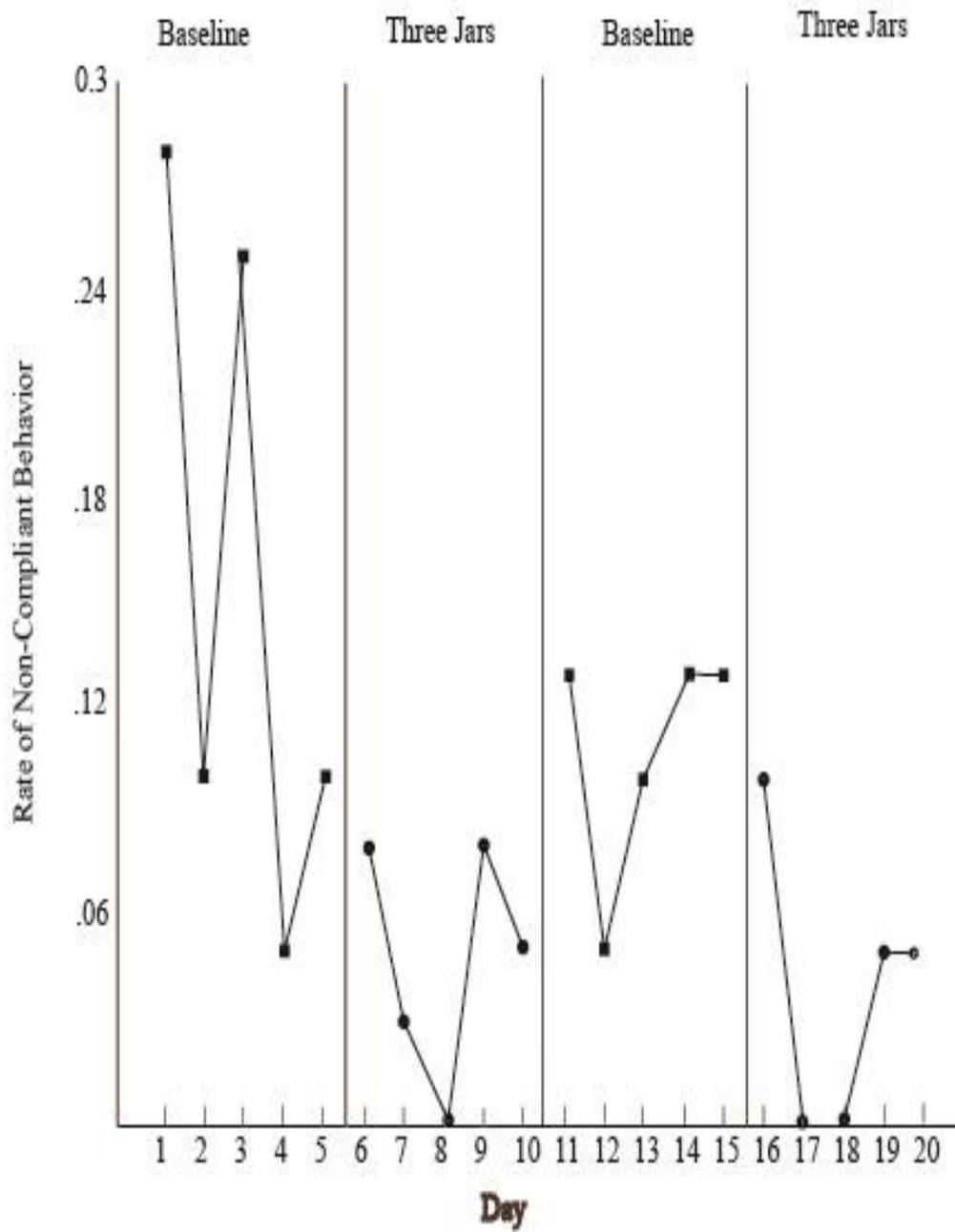


Table 1. Mean consumer satisfaction ratings by 9th grade pupils.

Items	Mean
1. How important is it for you to do well in English Language Arts (ELA) class?	4
2. How important is it for other students in your class to do well in ELA class?	3
3. How important is it for students to complete in-class assignments in ELA class?	4.2
4. How important is it for students to get along well with one another?	3.5
5. How important is it for students to stay on task during ELA class?	4.1
6. How much did you like the classroom rules?	2.8
7. How much did you like using Jar #1 to determine which goal/behavior would be monitored each day?	2.1
8. How much did you like using Jar #2 to figure out whose behavior would be monitored each day?	2.4
9. How much did you like using Jar #3 to find out what rewards the class earned that day?	3.2
10. How much did you enjoy playing the 3 Jars game?	2.8
11. How much did you like picking one of the mystery motivator envelopes?	2
12. How satisfied are you with your overall performance in ELA class?	4.2

13. How satisfied are you with your performance when using 3 Jars?	3.4
14. How much did the 3 Jars Game help you learn ELA content better?	2.8
15. How much did 3 Jars help you to complete class assignments?	2.9
16. How much did 3 Jars help you to get along better with others in class?	1.8
17. Does 3 Jars seem like something that should be done in other classes?	1.5
18. Could 3 Jars be harmful to other students?	2.2
19. How fair was 3 Jars to everyone in class?	2.2
20. Did other students think that you were smarter after using 3 Jars?	1.8

Appendix A
Data Collection Sheet

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			

How to use this data collection sheet:

Fill in the date each day at the left upper corner. Then record which “Behavior and Criteria” was chosen to monitor. You must also record who will be observed from the “Names” jar (i.e. whole class or individual student). Each day you will highlight or circle the target behavior and student(s) you are looking at so that the data collection process is as simple and quick as possible. If you are monitoring the whole class you do not need to highlight all the students, just be sure to mark it under the “Name” heading in the top left corner. In the top box you will also see “Reinforcer.” This is for marking if the students met the criteria for that day and received a motivator. Simply write “Y” for yes, or if they failed write “N” for no. You may choose to write down which reward was chosen also, but this is not required.

This form is designed for use with the observer.

Appendix B
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 **English and Language Arts (ELA)** 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 ELA class?

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

3. How important is it for students to **complete in-class assignments** in ELA class?

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

4. 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

5. How important is it for students to **stay on task** during ELA class?

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

II. *Acceptability of Instructional Procedures*

6. How much did you like **the classroom rules**?

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

7. 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

8. 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

9. 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

10. How much did you enjoy **playing the 3 Jars game**?

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

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

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

III. *Satisfaction with Strategy Outcomes*

12. How satisfied are you with **your overall performance** in ELA class?

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

13. How satisfied are you with your performance when using **3 Jars**?

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

14. How much did the 3 Jars Game **help you learn** ELA content better?

1	2	3	4	5
Not at all		some		a lot

15. How much did 3 Jars **help you to complete** class assignments?

1	2	3	4	5
Not at all		some		a lot

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

1	2	3	4	5
Not at all		some		a lot

17. Does 3 Jars seem like something that **should be done** in other classes?

1	2	3	4	5
Not at all		maybe		definitely should

18. Could 3 Jars **be harmful** to other students?

1	2	3	4	5
Not at all		maybe		definitely could

19. How **fair** was 3 Jars to everyone in class?

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

20. Did other students think that **you were smarter** after using 3 Jars?

1	2	3	4	5
Not at all		some did		everyone did

Additional Comments/Suggestions:

Appendix C

Three Jars Intervention

Fidelity of Treatment Record

Investigator: Abigail Wesley Date: _____

Observer: _____

Time session began: _____ Time session ended: _____

Directions: Observe the investigator as she implements the intervention and use the scoring code below to note the presence and/or absence of each component.

Scoring Code:

+	Behavior demonstrated
-	Behavior not demonstrated
NA	Not applicable

General Implementation

- _____ 1. Investigator announces classroom rules that must be followed and possible criteria that will be monitored.
- _____ 2. Investigator announces possible rewards if students successfully meet the pre-established criteria.
- _____ 3. Possible reinforcers were identified by seeking pupil input (e.g., having them complete reinforcement surveys).
- _____ 4. Classroom rules are posted and reviewed by the investigator.
- _____ 5. Investigator has a checklist of student numbers and spaces to record checks or “strikes” for target behaviors.
- _____ 6. Three labeled jars are visible in classroom; Jar #1 is labeled “Behavior and Criteria,” Jar #2 is labeled “Names,” and Jar #3 is labeled “Reinforcers.”
- _____ 7. At the beginning of the designated time period, the investigator selects a popsicle stick from Jar #1 to identify target behavior(s) and criteria (i.e., each target behavior with criteria specifically named or “all” which means all behaviors are being targeted).
- _____ 8. Investigator then selects a popsicle stick from Jar #2 (with the words “whole class” or a specific student printed on them).

- _____ 9. Investigator then evaluates pupil performance on basis of first two jar selections: if pupils meet pre-established criteria, then investigator congratulates students and randomly selects one pupil to pick a reinforcer from Jar #3.

- _____ 10. If individual or group fails to reach criteria, then investigator announces that they did not meet the criteria and encourages them to work hard the following day.

- _____ 11. Teacher does not mention name of individuals when criteria is not reached.

Total _____/11 **(Please record the number of behaviors demonstrated plus the number of NA)**

_____ % **Procedural fidelity**

Anecdotal Comments: _____

Appendix D

Student Behavior Monitoring Sheet

<i>Student</i>	<i>Strikes</i>		
	Talking Out without Raising Hand	Out of Seat without Raising Hand and Asking	Not Complying with Requests within 10 sec.
1			
2			
3			
4			
5			
6			
7			
8			
9			