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THE QUIET CLASSROOM GAME WITH AN INDISCRIMINABLE CONTINGENCY IN A HIGH SCHOOL

by

Stefanie R. Schrieber

A Thesis
Submitted to the Graduate School,
the College of Education and Human Sciences
and the School of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts

Approved by:

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ABSTRACT

The Quiet Classroom Game (QCG) is an interdependent group contingency utilized to decrease classroom noise levels, increase student engagement, and decrease disruptive behaviors in the classroom setting. The purpose of the current study was to investigate the effects of the QCG in three high school classrooms in the Southeastern United States. Classrooms were recruited based on teacher reports of excessive noise and high rates of disruptive behavior. A multiple baseline design with two intervention phases was utilized to examine the effects of the intervention. The first phase was the QCG alone, and the second phase was the QCG with an indiscriminable contingency. The indiscriminable contingency was added to determine if the effects of the QCG would maintain with a thinner schedule of reinforcement. Results were primarily analyzed through visual analysis and indicated that the intervention was effective in decreasing noise levels; however, no changes were present for student behavior in either phase. Effect sizes were also calculated as a secondary analysis and were reported in the moderate to large range for decibel level and small to moderate range for student behavior. Social validity measures were also administered to students and teachers, with reports of moderate acceptability from both raters. Findings overall indicate that the QCG is an effective intervention in the high school setting for reducing noise levels. Additional research is necessary to determine the effect of the QCG on student behavior.
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I would like to acknowledge all individuals who assisted with this project. This project would not have been possible without the support from the faculty, graduate students, and participating teachers. A special thank you to the director of my thesis, Dr. Radley as well as my committee members, Dr. Dart and Dr. Dufrene. I would also like to thank all of the graduate students who assisted with data collection, especially Sarah Wright – I really appreciate all of the time and effort you put forth into helping with data collection procedures. Finally, thank you to all of the teachers and students for participating in the project.
DEDICATION

I would like to provide a special thank you to my family and friends. Without their continuous love, support, and encouragement, I would not be where I am today. The biggest thank you goes to my mother, who has supported me in every way possible -- even when I decided to move miles and miles away from home to obtain my graduate degree. Thank you for being my rock and helping me through all the hard times, and especially for all of the retail therapy. Another thank you to my fiancé, Eric, for sticking with me through our long-distance relationship, staying positive and driven, and for dealing with all of the stress that comes with being a graduate student. I would also like to thank my siblings, Sheena, Brandon, and Jeremy, and my niece and nephew, Addy & Keller, for their love and support. Finally, a quick shout out to my skull friends, who continue to support me and accept me for still being a poor graduate student. And a quick shout out to the new friends I have made in graduate school. I would not have made it this far without them!
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CHAPTER I - INTRODUCTION

The National Center for Education Statistics reported that 38% of teachers indicated student disruptive behavior as an interference to teaching (Musu-Gillete, Zhang, Wnag, Zhang, & Oudekere, 2017). Educators have reported inappropriate vocalizations, out of seat behavior, low work completion, and disorganization as problematic disruptive behaviors in the classroom (Christ & Christ, 2006). Teachers’ responsibility to foster an environment suitable for student learning can become challenging when time is spent minimizing disruptions in the classroom. In addition, teachers consistently report a lack of training in managing student problem behaviors, and often experience high-stress when faced with these issues (Ducharme & Shecter, 2011). Strategies teachers utilize to reduce classroom disruptions are often time-consuming and result in loss of valuable instruction time (Riley, McKevitt, Shriver, & Allen, 2011).

Disruptive behaviors have negative outcomes for both the student engaging in the problem behavior as well as surrounding students in the classroom (Lane, 2007). Lower grades, poorer standardized test scores, antisocial behavior, and decreased academic engagement are just a few possible outcomes of engaging in disruptive behavior in the classroom (Stage & Quiroz, 1997; Trentacosta, Hyde, Shaw, & Cheong, 2009). Off-task and disruptive behaviors are the second largest contributor to office discipline referrals (ODRs), with defiance being the number one contributor to ODRs. These referrals often result in disciplinary actions that further reduce the time students receive direct academic instruction (Spaulding et al., 2010). High rates of problem behavior in the classroom can also serve to model negative behaviors to surrounding students (Barth, Dunlap, Dane, Lochman, & Wells, 2004). Due to the social consequences that follow negative behavior,
such as peer attention, students who typically demonstrate academically engaged behaviors can begin engaging in disruptive behaviors with their peers (Barth et al., 2004). With disruptive behavior reported as having one of the largest negative impacts on students’ learning, effective classroom interventions are necessary for teachers in their efforts to reduce problem behavior and increase academically engaged behavior.

Below are examples to illustrate the formatting of each style, all of these styles are accessible using the style ribbon in Word (in the Home section). Review the USM Guidelines for additional formatting instructions. You may highlight and delete all the examples below, make sure that you leave the section break (next page) in place.

Evidence-Based Practices (EBPs)

Teachers often utilize methods for reducing problem behaviors and improving positive behaviors that are not empirically supported, which can include techniques they have adopted from co-workers, media, other experts, or personal experience (Cook & Cook, 2011). Consequently, outcomes of these techniques are highly subjective and may result in false identification of intervention effects. An alternative to these methods are EBPs, which are strategies with strong research supporting their effectiveness. EBPs are evaluated based on their research design, quality and quantity of research, magnitude of effect, as well as the background of research supporting the practice (Horner et al., 2005). Horner and colleagues suggested the following guidelines for determining EBPs in single-case design: a minimum of (a) five high-quality studies published in peer reviewed journals (b) three different geographical locations (c) three different researchers, and(d) a minimum of 20 participants across studies.
A systematic review conducted by Maggin and colleagues (2012) concluded that group-oriented contingencies are an EBP, specifically for addressing problem behaviors. The review analyzed both group and individual data and indicated significant effects at the $p < .001$ level for studies supported by the What Works Clearinghouse standards (Kratochwill et al., 2013). As an EBP, group contingencies are widely accepted due to their versatility and ability to promote behavior change across students, behaviors, and contexts (Maggin, Johnson, Chafouleas, Ruberto & Berggren, 2012; Theodore, Bray, Kehle, & DioGuardi, 2004).

Group-Oriented Contingencies

When multiple students exhibit problem behaviors in the classroom, it can be an arduous process for teachers to manage multiple individual contingencies (Tingstrom, Sterling-Turner, & Wilczynski, 2006). An alternative strategy utilizes group contingencies to modify the behavior of an entire group of individuals. Group-oriented contingencies allow teachers to provide a single consequence to an entire group of individuals contingent on the behavior of an individual, part, or entirety of a group (Litow & Pomroy, 1975). A single consequence refers to the delivery an identical consequence to all individuals in the group, which can involve a group reward such as free time, or an individual reward such as a piece of candy. Regardless of the consequence chosen, all students in the group receive the same consequence. The delivery of a single consequence substantially reduces the amount of time teachers spend providing different and individualized consequences to students. They also diminish the need for multiple interventionists or teacher’s aides to assist with multiple individual contingencies.
In comparison to individual contingencies, group contingences include involvement from peers to increase academically engaged behavior class-wide (Litow & Pumroy, 1975). The inclusion of peers as agents of behavior change is particularly useful. Peers can serve as powerful motivators for others, as they often provide additional reinforcement (e.g., attention) for positive behaviors directly tied to the group contingency (Theodore, Bray, Kehle, & DioGuardi, 2003). Individuals can also influence their peers to engage in appropriate behavior, and discourage them from engaging in disruptive behaviors. (Gable, Arllen, & Hendrickson, 1994).

Group contingencies can be divided into three subtypes: dependent, independent, and interdependent (Litow & Pumroy, 1975). In a dependent group contingency, the whole group can earn access to a reinforcer contingent on the behavior of one or few individuals. For example, if the criterion to access reinforcement is completing homework with 80% accuracy, the entire class would have an opportunity to obtain the reward if the selected individual or selected few individuals met the criterion. Independent group contingencies provide access to a reward for each individual’s behavior. This type of group contingency does not rely on other’s behavior – it provides a reward to each individual who meets criteria. For example, if the same criterion is in place, each individual who completed their homework with 80% accuracy would obtain the reward. Students who did not complete their homework with 80% accuracy would not receive a reward. Interdependent contingencies provide an opportunity for reinforcement to the entire group contingent on the behavior of the entire group. Therefore, everyone in the class would be required to complete their homework with 80% accuracy to receive the reward.
Choosing which group-oriented contingency would be most effective in changing behavior is largely dependent on the context. In a recent meta-analysis, Little, Akin-Little, and O’Neill (2015) compared the three group contingencies to determine the most effective intervention for promoting behavior change. Results indicated that all contingencies were effective, with an effect size of 3.41, and no contingency was significantly better than others at promoting behavior change. Effect sizes for dependent, independent, and interdependent contingencies were also reported, respectively: 3.75, 3.27, and 2.88. Effect sizes were also calculated by dependent variable, with the largest reported for the (1) reduction in negative behaviors, (2) reduction of noise level according to decibel level, and (3) increase in positive behaviors. Although no research suggests a superior contingency, it is suggested that a group contingency be chosen based on the desired outcome. Promoting behavior change in one or few students would suggest a dependent contingency, each individual student would suggest an independent contingency, and at the class level would suggest an interdependent contingency (Litow & Pumroy, 1975). For the purpose of the current research, the focus of this literature review will be placed on interdependent group contingencies.

Interdependent Group Contingencies

As stated above, interdependent group contingencies provide access to reinforcement contingent on the behavior of the entire group. One of the reasons interdependent group contingencies are so effective is because they rely on peer involvement to promote behavior change. By challenging students to reach a common goal, individuals can become more motivated by their peers to engage in appropriate behaviors (Tingstrom et al., 2006).
Interdependent group contingencies are beneficial because they reduce the required resources a teacher uses when compared to independent contingencies. Not only do interdependent group contingencies decrease the amount of time educators spend addressing the behavior of individuals, but they also reduce the amount of assistance teachers need from other aides and educators during implementation (Flower, McKenna, Muething, Bryant, & Bryant, 2014). Additionally, they allow for delivery of a single consequence, which reduces the amount of time teachers would spend distributing individual rewards (Skinner, Cashwell & Dunn., 1996). An added benefit of providing reinforcement to the group is that individual students are not separated from the group for not meeting the contingency in place (Skinner et al., 1996).

A review of the school-based group contingency literature conducted by Maggin, and colleagues (2012) supported interdependent group contingencies as an evidence-based intervention effective in promoting behavior change. At the time, only three studies were reviewed that targeted the increase of academically engaged behavior (Christ & Christ, 2006; Crouch, Gresham & Wright, 1985; McKissick, Hawkins, Lentz, Hailley, & McGuire, 2010), indicating a lack of research in the area. Improvement in academically engaged behavior is crucial to classroom interventions due to the correlation with academic achievement (Finn & Zimmer, 2012). Although many interdependent group contingencies have aimed to decrease disruptive behavior, an increase in academically engaged behavior can not necessarily be inferred. Since the review, multiple evaluations of interdependent group contingencies targeting academically engaged behavior have been published (e.g., Flower et al., 2014).
Despite the promising results of these evaluations, the majority of studies suggested limitations in regard to the teacher’s ability to judge student behavior. For example, Crouch and colleagues (1985), Christ and Christ (2006) and Flower and colleagues (2014) relied on the educator’s judgement to determine whether the classroom met the contingencies. The researchers indicated that the teacher’s perceptions may not have been an accurate depiction of the classroom’s behavior. To avoid this limitation, McKissick and colleagues (2010) utilized the researcher’s systematic direct observations of the classroom behavior to manage the contingencies. However, this reduced the utility of the intervention as the intervention could not be entirely implemented by a teacher. Overall, research using interdependent group contingencies have been limited in the high school setting (Little et al., 2015). Thus, interventions should be identified for this population, as behavior problems at the high school level may be more serious and detrimental to learning than in lower grade levels.

Interdependent Group Contingencies in the High School Setting

Although limited in research, group contingencies have been effective in promoting behavior change at the high school level (Little et al., 2015). Behavior problems at the high school level can be more difficult to manage than behavior problems at the elementary level. According to the National Center for Education Statistics (2008), high school teachers rated student problem behavior as a larger interference to teaching than elementary teachers reported. Additionally, behavior problems at the high school level can lead to more severe consequences that have life-long effects such as dropping out of school (Suh & Suh, 2007). More evidenced-based interventions to address these
behaviors in the classroom are needed to improve academic engagement in the classroom.

In one example of intervention in high school, Christ and Christ (2006) utilized an interdependent group contingency to increase appropriate behavior and decrease talking-out in three high school classrooms. The researchers used a multiple baseline design across classes to evaluate the effects of the intervention. The intervention incorporated an automated feedback device (i.e. scoreboard) which was placed at the front of the classroom. Teachers divided the class into two groups and awarded points when students did not engage in any disruptive behaviors during two-minute intervals. If students met a previously set criterion for number of points, they earned access to free time. The intervention was successful at increasing appropriate behaviors and decreasing inappropriate behaviors.

The Good Behavior Game (GBG) has also been successful in the high school setting. Tingstrom, Dufrene, Ford and Sterling (2015) evaluated the effects of the GBG on decreasing disruptive behaviors in the classroom utilizing a multiple baseline design across classrooms. Teachers divided the class in two teams and awarded points when students engaged in a disruptive behavior. If students stayed below the previously set criterion, students were awarded with a small reinforcer such as: homework pass, bathroom pass, bonus points, or free time. The GBG was effective in decreasing disruptive behavior in the high school setting.

Recently, Lum, Tingstrom, Dufrene, Radley, and Lynne (2017) investigated the effects of tootling in the high school setting. An ABAB reversal design was employed to evaluate the effects of tootling on increasing academically engaged behavior and
decreasing disruptive behaviors in three classrooms. The intervention required students to write positive peer behaviors on a slip of paper and turn them into a box in the classroom. If the class obtained a specified number of tootles, they were provided with a reward such as bonus points or a movie day. Results indicated that tootling was effective in promoting academically engaged behavior and decreasing disruptive behavior in all three classrooms.

Although research shows that interdependent group contingency interventions in high school are effective, they still rely on teacher judgements to make decisions about behavior. Subjective judgements of student behavior can lead to inaccurate distributions of points in interventions such as those described by Christ and Christ (2006) and Tingstrom and colleagues (2015). This could lead to decreased student motivation to engage in appropriate behaviors if points are being awarded unfairly. Although Lum and colleagues (2017) did not directly rely on teacher judgements of behavior, they still relied on students’ subjective judgements of behavior. Teachers are responsible for determining whether tootles accurately depict the student behavior in the classroom, which can also lead to decreased motivation if students believe tootles are judged unfairly. Thus, interventions utilizing a more objective judgement of behavior is necessary.

Noise Levels

With inappropriate vocalizations being reported as one of the most common disruptive behaviors and largest interferences to teaching (Sun & Shek, 2012), noise may be an objective measurement of behavior that interdependent group contingencies can target. Evidence supports that high levels of noise are not conducive to a healthy learning environment (Shield & Dockrell, 2008). Excessive levels of noise have been linked to
poorer test scores (Shield & Dockrell, 2008), as well as poorer academic performance on spelling and reading verbal tasks (Shield & Dockrell, 2006). A noisy environment requires an individual to exert more effort to listen to instruction and reduces the amount of energy able to be directed toward additional tasks (Howard, Munro, & Plack, 2010). For example, if a teacher is demonstrating a problem on the board while surrounding students are talking out of turn, this would require the student to put more effort into listening to the teacher at the board. Such a scenario may result in the student not having the additional resources available to understand the steps to the problem as well as write it down on their notes.

Decibel levels range from 0 to 194, with higher decibel levels indicating a greater intensity of noise. As a reference, a level of 10 decibels is a barely detectible level of noise, 50 decibels a quiet conversation at home, 60 decibels a conversation in a restaurant or office, 70 decibels living room music, and 150 decibels jet take off, which would rupture an individual’s ear drum. The National Institute for Occupational Safety and Health (NIOSH) under the Center for Disease Control and Prevention (CDC) provides standards for lengths of exposure to varying decibels. It is recommended that individuals are exposed to no more than an average of 85 decibel levels across an 8-hour work day. Exposure to noise levels at or above this recommended criterion are considered hazardous, as over exposure to high decibel levels can lead to hearing loss. With the potential effects of increased decibel level may have on an individual’s health and the identification of talking out being reported as the most common problem behavior in classrooms, noise level should be a target for intervention to improve student behavior and aide in the prevention of hearing loss.
Decibel meters can be purchased online or through retailers for various prices. Typically, the more functions the decibel meter includes, the more expensive the price. A more accessible decibel meter can be downloaded on smart devices for little to no cost. As of February 2018, 77% of American’s were identified to own smartphones, providing the majority of individuals access to free sound-meter applications (Pew Research Center, 2018).

Previous research has evaluated the effectiveness of reducing noise levels in various locations in schools. Interventions targeting noise levels have successfully decreased noise in the cafeteria (Davey, Alexander, Edmonson, Stenhoff, & West, 2001; LaRowe, Tucker, & McGuire, 1980), hallway (Staub, 1990; Kartbub, Taylor-Greene, March, & Horner, 2000), and restroom (Pasqua, Dart, & Radley, 2016). Although data were collected regarding decibel level in these studies, there were no data collected indicating a change in student behavior (e.g., academic engagement). Only three interdependent group contingencies using noise level as a means to promote behavior change in the classroom were found to date.

Schmidt and Ulrich (1969) used an ABAB design in their first study to decrease noise level in a fourth-grade classroom. During baseline, noise levels were recorded via a sound-level meter. Teachers did not inform the class of the intervention, and feedback was not provided regarding noise-level. During intervention, the teacher informed the class that they must stay below a specified noise level for ten minutes. If the class was successful, two minutes would be added to their gym time, and a two-minute beak would be provided for the students before the next 10-minute block began. However, if the class exceeded the noise-level at any time during the 10 minutes, a whistle would be blown and
the timer would start over. Results indicated that the intervention was successful in decreasing the level of noise in the classroom. The second study by Schmidt and Ulrich included a second-grade classroom. In addition to noise level, this study also included student out of seat behavior. During phase one of intervention, the students were required to remain below the specified noise level for five minutes to obtain access to two minutes of extra gym time. Should the classroom exceed the specified noise-level, a harmonica would blow and the timer would restart.

During phase two, the intervention stayed similar, only the class had to earn their entire gym time. If the class stayed under the specified noise-level without interrupting the five minutes, they were provided with three minutes of gym time. Students responsible for excess noises in the classroom were required to write their name on the board, and lost five minutes of gym time. In addition to the noise level intervention, out of seat behavior was also targeted in phase two. An additional timer was set on a variable interval schedule. When the timer rang, any students out of their seat without permission were provided with the same consequences as students engaging in excessively loud behaviors (i.e. name on board and lost 5 minutes of gym time). Following phase one and two, a withdrawal phase was implemented in which the intervention was completely removed and follow up data were collected during the following school year. Results indicated that the intervention was successful in decreasing the level of noise in the classroom and out of seat behavior. The decibel level immediately decreased following the implementation of phase one and remained low through phase two, withdrawal, and follow-up. Out of seat behavior slightly decreased in level during phase one, but
immediately decreased following implementation of phase two, and remained low through reversal and follow up.

Strang and George (1975) used a simple AB design to decrease noise-level in a first and second grade classroom. A device able to measure decibel level with a lapse-time clock and control activation of lights on the front side of the device was used. The device was in the shape of a clown, with 5 lights down the clown’s body, representing buttons, and 8 lights on the clown’s face, representing eyes, nose, and teeth. During intervention, if students noise-level remained below the pre-determined level for 20 seconds, a button light would turn on. The same pattern continued if students remained below the noise-level until all five buttons were lit. Once all five button lights were illuminated, students were required to keep the noise below the specified level for 20 more seconds. If successful, one of the clown’s face lights would illuminate. If at any point during the intervention the students exceeded the noise level, the clown would make a ‘gasp’ noise, and all of the button lights would be turned off. The students reward for remaining below the noise level was illumination of all eight lights on the clown’s face. The intervention time averaged around 30 minutes. Results indicated the intervention to be successful in decreasing the noise level for both the first and third grade class; however, the noise level remained lower and more stable during intervention for the first-grade classroom compared to the third-grade classroom.

Limitations are similar for both Schmidt and Ulrich (1969) and Strang and George (1975). Both studies only incorporated elementary-aged students between grades first and fourth, making it difficult to determine generalizability of the interventions to other grade levels. In addition to this, neither study recorded data regarding academically engaged
behavior. Considering the effect disruptive behavior can have on a student’s learning environment, this is a crucial aspect in evaluating whether noise is functionally related to academically engaged behavior. A more recent study conducted by Radley, Dart, and O’Handley (2016) targeted this limitation to determine the effect noise level may have on academically engaged and disruptive behavior

Quiet Classroom Game (QCG)

Radley and colleagues (2016) implemented a novel interdependent group contingency labeled the Quiet Classroom Game (QCG), which used noise level to improve student academically engaged behavior. Three elementary school teachers who reported classroom problems with disruptive behavior and noise participated in the study. Dependent variables recorded throughout the study included academically engaged behavior, disruptive behavior, and decibel level. Decibel level was recorded via an iPad with the Decibel 10th © app, and behaviors were recorded via 10-s momentary time sampling. A multiple baseline with an embedded ABAB withdrawal design was implemented to determine the effectiveness of the intervention.

During baseline, information regarding the intervention was not provided to the students. Although the teachers had access to view the iPad with the decibel app, they did not provide feedback to students regarding their noise level. During the QCG intervention, teachers informed students of the rules and expectations and provided students with their noise-level goal. In addition to this, students were told the noise level would be checked periodically and a reward would be delivered should the students stay at or below the noise level goal on five of seven noise-level checks. Every two minutes, a MotivAider® prompted the teacher to provide feedback regarding the noise level.
Feedback consisted of the teacher either congratulating the class on meeting their goal, or informing the class that they did not meet the goal but to try again for next time. At each check, the teacher would mark a smiley face on the board if students met their goal. This allowed students to visually determine the amount of smiley faces they needed to obtain the reward. The withdrawal and reimplementation of the intervention were identical to baseline and intervention, respectively. In all three classrooms, there were substantial increases in academically engaged behavior from baseline to intervention, as well as decreases in disruptive behavior and decibel level. Once the intervention was removed, behaviors and decibel level returned to levels near baseline. Following reimplementation, a clear intervention effect was concluded based on increased levels of academically engaged behaviors and decreased levels of noise and disruptive behavior.

Although clear increases were observed in academically engaged behavior once the QCG was implemented, there was an overall decreasing trend in the behavior across time. With how quickly intervention effects disappeared, it is not likely the intervention would continue to be successful across a longer period of time. As such, it is important that researchers evaluate procedures that may promote maintenance of intervention effects. The addition of a mystery motivator may be useful in promoting high levels of academic engagement.

The QCG utilizes a continuous schedule of reinforcement (i.e. reinforcement is provided every time students meet the goal). Although a continuous schedule of reinforcement is beneficial in teaching and strengthening new behaviors, this dense schedule may be difficult to maintain across long periods of time. Implementation of an indiscriminable contingency would serve to thin the schedule of reinforcement, as
reinforcement would not be provided every time the students meet the goal. The indiscriminable contingency would incorporate a variable ratio schedule of reinforcement, in which students are rewarded for a specified number of times, on average, for meeting the goal. Variable ratio schedules have been successful in producing high, durable rates of responding (Peele & Silberberg, 1984) and therefore may aide in maintaining the effects of the intervention. An additional benefit to the indiscriminable contingency includes the randomization of reinforcers. Randomization keeps students motivated and working toward the common goal because students are unaware of some aspect of the contingency.

**Indiscriminable Contingencies**

The Mystery Motivator (MM) is a tool that utilizes an indiscriminable contingency. It was designed by Rhodes Jenson, and Reavis (1992) to keep students motivated through performance feedback and an intermittent or “randomized” schedule of reinforcement. Additionally, the Indiscriminable Contingencies have been listed in the literature as a strategy to promote generalization of skills to novel contexts and persons (e.g., classrooms, teachers; Stokes & Baer, 1977). The MM was originally implemented by using a weekly chart, “erasables” markers, and a reward menu. Prior to the intervention, educators request students to provide a list of three rewards they would like to work towards. The weekly chart is used for the teacher to draw symbols using the transparent marker in the “erasables” marker pack. The symbol indicates that the students have access to a reward. Each day, the teacher presents the goal to the classroom and informs the class that if they meet their goal, they will be able to color in the day with the watercolor markers in the “erasables” pack on the weekly chart. If a symbol appears
when the day has been colored in, the students will be able to choose their reward from
the menu they created. Teachers may choose any goal relevant to their classroom such as
homework completion, accuracy, behavior, and more.

This intervention was first evaluated by Moore, Waguespack, Wickstrom, Witt
and Gaydos (1994) in two classrooms to increase rates of homework completion and
accuracy. There were five targeted male students from Classroom A, which consisted of
21 total third-grade students, and four targeted male students from Classroom B, which
consisted of 28 fifth-grade students. During baseline, targeted students in Classroom A
averaged a homework completion rate of 64.9% and accuracy rate of 56.6%.
Implementation of the MM, which set a goal for students to complete 100% of their
homework, increased the average completion rate to 89.4% and accuracy to 81.2%. All
five students in Classroom A increased both their completion and accuracy of homework
rates. In Classroom B, the targeted students’ baseline rates of homework completion
averaged 70.1% and accuracy averaged 52.1%. During intervention, Classroom B also set
a goal for 100% homework completion. The average rate of homework completion
increased to 80.8% and accuracy increased to 65.1%. In Classroom B, three out of four
students increased their rates of accuracy and completion.

Additional data were collected to determine the social acceptability of the MM
intervention. The Intervention Rating Profile (IRP-15; Martens, Witt, Elliot & Darveaux,
1985) was administered to teachers, who rated the intervention as highly acceptable. In
addition, The Children’s Intervention Rating Profile (CIRP; Witt & Elliot, 1985) was
administered to students, who also rated the intervention as highly acceptable. The study
provided preliminary evidence to suggest the effectiveness and acceptability of the MM to improve academic outcomes.

Schanding and Sterling-Turner (2010) evaluated the effects of the MM using an ABABAB design to decrease problem behaviors in three high school students. Prior to intervention, students were given a preference assessment to determine potential rewards. Rather than using a weekly chart, two envelopes were used during the intervention, one was used to determine if reinforcement would be provided that day, and the other to indicate the reward. If the entire class had met the goal, a student was randomly chosen to pick from the first envelope. If an “M” was written on the slip in the first envelope, the student would continue to choose the reward. If an “X” was written, the class did not earn the reward, even if they had met their goal.

Implementation of the intervention immediately decreased problem behaviors in all three students, as well as class-wide. A clear decrease in problem behaviors was seen from baseline to intervention, withdrawal one to reimplementation one and withdrawal two to reimplementation two. The teacher’s acceptability of the intervention was not formally assessed, although anecdotal information from the researchers indicated the teacher found the MM intervention easy to implement.

More recently, Kowalewicz and Coffee (2014) investigated the effects of the MM on eight elementary school classrooms. An ABAB changing criterion design was used to evaluate the effects of the intervention on disruptive behavior in the classroom. Similar to Moore and colleagues (1994), the intervention used a calendar to indicate which days reinforcement would be delivered. The letter “M” was written on days in which reinforcement was delivered, while other days were left blank. A piece of paper covered
each day so students would be unaware of the days reinforcement was available. At the end of each session, the paper was removed to determine whether an “M” was present. If the entire group met the goal, and an “M” was present, reinforcement was provided, which was randomly decided based on drawing from an envelope at the front of the classroom. If they did not meet the goal, the paper was still removed from the day, but reinforcement was not provided regardless of the presence of an “M.”

Immediately following implementation of the intervention, problem behavior substantially decreased in all eight classrooms. Once the intervention was briefly removed, disruptive behaviors slightly increased. Reimplementation of the MM reduced problem behaviors again in all eight classrooms. Follow-up data indicated a slight increase in problem behavior. Seven of eight teachers rated the intervention as strongly acceptable, and specified the intervention as feasible, practical and likely to be used in the future.

In 2007, Coogan, Kehle, Bray and Chafouleas investigated the effects of an indiscriminable contingency utilizing randomized reinforcement and criteria for reinforcement with self-monitoring and peer feedback on disruptive behavior in the classroom. An ABAB reversal design was used to evaluate five 12-year-old students in a single classroom. Following each session, students gained access to three jars located near the teacher’s desk. Jar one contained slips of paper indicating the criteria for reinforcement, meaning which student(s) needed to meet criteria. Jar two contained the names of individual students (use of this jar was dependent on the results of jar one). Jar three contained possible rewards. Once the session concluded, a spinner was used to indicate which student would draw the slips from the jars. If jar one indicated the whole
group had to meet the goal, jar three would be used to determine the reward (if the class met the goal). If jar one indicated an individual had to meet the goal, jar two would be used to determine the student, and then jar three would be used to determine the classes reward (if the selected individual met the goal).

Once the intervention was implemented, there was an immediate decrease in disruptive behavior. When the intervention was withdrawn, disruptive behavior returned to levels similar to baseline. Disruptive behavior substantially decreased once the intervention was re-implemented. Student and teacher acceptability ratings were also obtained. Student’s indicated a neutral liking to the intervention, and the teacher rated it as satisfactory, and further indicated she intended to use the intervention in the future.

Purpose of the Present Study

Educators have suggested a need for strategies to manage problem behaviors in the classroom. Although research has indicated that various contingencies are successful in decreasing disruptive behavior, teachers often report multiple students exhibiting disruptive behaviors. Managing multiple independent contingencies can be resource consuming (e.g. additional classroom aides, reduced academic instruction time, distribution of individualized reinforcers). Interdependent group contingencies reduce the time teachers spend providing individual feedback to disruptive students. Although research has been conducted on the effectiveness of decreasing disruptive behavior and increasing academically engaged behavior through interdependent group contingencies, these studies have relied on teacher judgment to manage reinforcement contingencies. There is a need to identify objective measures of behavior for educators to manage reinforcement contingencies in the classroom. With inappropriate vocalizations reported
as the most common and disruptive problem behavior in the classroom, monitoring
decibel level may be a feasible and objective strategy for teachers to manage
contingencies. The literature has suggested a potential relationship between the level of
noise and academically engaged behavior; however only one study to date has examined
this relationship in the classroom with use of the QCG. Although the QCG was
successful in promoting behavior change, effects of the intervention decreased across
time, with academically engaged behavior showing an overall decreasing trend during
intervention phases. The addition of an indiscriminable contingency may help maintain
the effects of the intervention by thinning the schedule of reinforcement and
incorporating an element of uncertainty about the reward for the day.

The QCG, an interdependent group contingency, will be implemented by trained
high school teachers in the classroom. The present study aims to widen the population of
the QCG from elementary school classrooms to high school classrooms and incorporate
an indiscriminable contingency as a means of thinning the schedule of reinforcement.
The goal of the QCG is to increase academically engaged behavior while simultaneously
decreasing disruptive behavior using an objective measure, decibel level, to manage
reinforcement contingencies.

Research Questions
1. Will the QCG, implemented by a teacher in the general education high school
classroom, decrease decibel level in the classroom while simultaneously
increasing academically engaged behavior and decreasing disruptive behavior?
2. Will the QCG with an indiscriminable contingency, implemented by a teacher in
the general education high school classroom, maintain reduced levels of decibel
level, increased levels of academically engaged behavior, and decreased levels of disruptive behavior?

3. Will high school teachers implement the QCG and the QCG with an indiscriminable contingency with integrity?

4. Will the QCG and the QCG with an indiscriminable contingency be regarded as a socially valid intervention by classroom teachers and students participating in the classrooms?
CHAPTER II - METHOD

Participants and Setting

The study took place at a high school in rural Southeastern United States. At the time of the study, 590 students were enrolled in the high school, which consisted of 52.72% males and was made up of 68.03% White students, 28.40% African American students, and 2.04% Hispanic or Latino students. Three general education high school classrooms were recruited to participate in the study and were identified by teacher self-referral for assistance with classroom management. Approval was obtained by the institutional review board (IRB) and school administration, and consent was obtained from participating teachers prior to beginning the study (see Appendices A and B). Parent consent was not obtained for student participation, as the intervention utilized general classroom management strategies to address behavior class-wide and no identifiable student data was collected.

Teachers referred for participation were briefly interviewed by the primary researcher to identify student problem behaviors (see Appendix D), as well as to obtain basic demographic information (see Appendix C). Direct observation was conducted for each classroom referral to determine the percentage of intervals in which students exhibited academically engaged and disruptive behaviors. Requirements for participation in the study included academically engaged behavior in 70% or less of observed intervals and teacher report of excessive noise. A total of four classrooms were recruited; however, one classroom was dropped from the study due to low decibel levels. Supports for classroom management that did not incorporate the reduction of noise level were provided to this teacher.
Classroom A

The first classroom recruited was a biology class taught by Ms. King, a 44-year-old Caucasian female. Ms. King’s highest degree earned was a Bachelor of Science and she had 12 years of teaching experience. A total of 18 students were enrolled in the course, with the majority of students in the ninth grade. There were 15 males and three females, of which seven students were African American and eight were Caucasian. There were seven students receiving services for special education under the following rulings: specific learning disability in math and reading and other health impairment. Although there was an inclusion teacher assigned to assist in the room, he/she was not present during any of the observation periods.

Classroom B

The second classroom was also a ninth-grade biology course taught by Ms. Rock, a 31-year-old Caucasian female with a Master of Education and 10 years of teaching experience. There were also 18 students enrolled in this course, 15 males and three females, of which five were African American and 13 were Caucasian. Three of the students in the classroom were receiving services for special education under the following rulings: specific learning disability in math and reading and emotional disability. There was an inclusion teacher assigned to assist in this classroom as well; however, they were not present during any of the observation periods.

Classroom C

The final classroom was an elective course for tenth to twelfth graders titled Human Anatomy and Physiology. The class was taught by Ms. Bark, a 39-year-old Caucasian female with a Bachelor of Science degree in her first year of teaching. There
were 19 students enrolled in the course, 17 females and two males, of which four were African American and 15 were Caucasian. There were no students enrolled in this class that were receiving services for special education.

Materials

Teacher Script

The script was a full write-up of specific instructions for the game. It provided an example of instructions the teacher could state to the students regarding the rules of the game. There were two separate teacher scripts explaining each phase of the study (see Appendices G-H).

Integrity Checklist

A list of steps necessary to implement the game at each phase of the intervention was also created. This was utilized to ensure the intervention was being completed with integrity (see Appendices I-J).

Noise Level Board

A poster board at the front of the classroom was labeled with the classroom noise level goal and 10 empty boxes that indicated each noise level check. Laminated thumbs-up and thumbs-down cards were utilized to indicate whether the class passed or failed a noise level check. Thumbs-up/down cards were attached to the board via a small strip of Velcro.

Rewards

Rewards during Phase B were chosen by each teacher and were held consistent throughout the phase. All participating teachers selected a small edible item for a reward (i.e. candy). During phase C, the teacher selected three different rewards for students to
vote on. All three teachers selected the same three different rewards: candy, five minutes of free time outside, and bonus points.

**Indiscriminable Contingency**

An envelope with a slip of paper inside was provided to the teacher during each day Phase was implemented. The slip of paper was either labeled with a “Y” for yes or “N” which indicated whether reinforcement was available that day. Randomization was used to determine whether reinforcement was available by flipping a coin. There was a 50% chance that reinforcement was available each day. Randomization of access to reinforcement was completed by the primary researcher prior to implementation of Phase C.

**Decibel (dB) Meter Pro**

The dB Meter Pro application was installed on multiple iPods and smartphones throughout the study. New devices were calibrated to the original iPod to ensure sound frequencies were being recorded the same across devices. The application was developed by Performance Audio and can be purchased on the iTunes store for ninety-nine cents. dB Meter Pro recorded decibel level every one tenth of a second exported the data into a downloadable sheet after the specified period of time. The primary researcher utilized the downloadable data sheet to determine average decibel level for each observation.

**Lonely Screen**

This is an application that can be downloaded to a Mac device or PC and allows for screen sharing between devices. Lonely Screen was downloaded onto the researcher’s computer and connected to the iPad device. The iPad device was placed in the center of the classroom where the screen could not be easily accessed. The Lonely Screen allowed
the iPad screen to be shared to a computer at the front of the classroom that was visible to
the teacher.

MotivAider®

This device was utilized to prompt teachers, with a vibration, to conduct a noise
level check. The MotivAider® can be set to a fixed or variable schedule. For the
purposes of the study, the device was set to 2-minute fixed intervals and was worn by
teachers during all intervention phases.

Usage Rating Profile – Intervention, Revised (URP-IR)

The URP-IR was used as a social validity measure to assess teacher’s perception
of the intervention on six different factors: Acceptability, Understanding, Family-School
Collaboration, Feasibility, System Climate, and System Support (Briesch, Chafouleas,
Nugebauer, & Riley-Tillman, 2013). Alpha coefficients for each factor were reported as
.95, .80, .79, .84, .91, and .72, respectively. These coefficients indicate high internal
consistency, meaning items within each factor are closely related. The scale consists of
29 items in which individuals rate their agreement ranging from 1 (strongly disagree) to 5
(strongly agree). Higher scores reported on the URP-IR suggest greater approval of the
intervention. Separate URP-IR scales were completed for each intervention phase
following the conclusion of the study (see Appendix M for full form).

Children’s Usage Rating Profile (CURP)

The CURP was used as a social validity measure to assess the student’s
perception of the intervention on three different factors: Personal Desirability,
Understanding, and Feasibility (Briesch & Chafouleas, 2009). Alpha coefficients for each
factor were reported as .92, .75, .82, respectively. The scale consists of 23 items in which
individuals rate their agreement ranging from 1 (total disagreement) to 5 (total agreement). Higher scores reported on the CURP suggest greater approval of the intervention. Students completed separate scales for each intervention phase following the conclusion of the study (see Appendix N for full form).

Dependent Measures

Four dependent variables were measured to investigate the effects of the intervention: academically engaged behavior (AEB), disruptive behavior (DB), passive off-task behavior (POT) and decibel level. The primary dependent variable was AEB. AEB was inclusive of both active and passive on-task behaviors, similar to previous studies (Briesch, Chafouleas & Riley Tillman, 2010). Academic engagement included students actively or passively attending to the task demand. Examples of academically engaged behavior included asking a question, answering a question, writing, participating in class, typing on ChromeBooks, looking at the teacher or assigned work and reading an assignment. The secondary dependent measure was DB. DB was operationally defined following teacher interviews to determine frequent problem behaviors in each classroom. DB was operationally defined similarly to Radley and colleagues (2016) implementation of the QCG. DB occurred when a student was out of seat without permission, playing with objects, and engaging in inappropriate vocalizations. Examples of DB included use of cellphone and headphones, tapping pencil, talking about non-school related subjects, playing games on ChromeBooks, walking around the classroom without permission, and playing with hair. POT was defined as a student not actively or passively engaged nor disruptive to the classroom. Examples of POT behaviors included sleeping, looking away from the teacher or task demand and laying head on desk. Decibel level was the third
dependent measure. Decibel level was recorded by the Decibel Meter Pro app and the primary researcher recorded the application’s calculated average decibel level for the observation period.

Data Collection

Data was collected during 20-minute observation periods using 10-second momentary time sampling. Momentary time sampling was chosen over other recording methods (i.e., partial and whole interval) for its ability to provide the best representation of behavior with the least amount of observer errors (Green, McCoy, Burns, & Smith, 1982). Other recording methods are often linked to overestimates and underestimates of behavior (Green et al., 1982). During observations, the researcher(s) entered the classroom five minutes prior to the observation and placed the iPad with the sound meter application on in a predetermined location in the center of the classroom. The observer then stood in an unobtrusive location in the back of the classroom. The observer recorded the start time in which they began recording student behavior data. At the beginning of each 10-second interval, the observers determined whether the student was AEB, DB, or POT and recorded the respective behavior on their data sheet (see Appendix E). The Individual-Fixed observation method was used, meaning the sequence for observing students was predetermined and held consistent (Briesch, Hemphill, Volpe, & Daniels, 2015). Observers continued in this fixed pattern in the classroom until the 20-minute observation period had ended. Following the conclusion of the observation, the observer stopped the decibel recording application and saved and exported the decibel data. Because the decibel app started recording prior to the collection of student data, the exportable data sheet was adjusted to reflect the actual observation time for a more
accurate representation of the average decibel level during the 20-minute observation period. Student behavior data was calculated into class-wide percentages to determine the percent of intervals in which each behavior occurred. The total number of occurrences of AEB, DB, and POT were added separately and each divided by the total number of intervals and multiplied by 100. This provided class-wide percentages of intervals in which AEB, DB, and POT occurred.

**Interobserver Agreement (IOA)**

A secondary observer was trained to collect data with the primary observer to increase reliability of the observations. IOA was collected for a minimum of 20% of observations within each classroom and phase. Secondary observers were required to obtain 90% agreement during training and maintain 80% agreement throughout observations. If a secondary observer fell below 90% agreement, the observer would be retrained immediately following the observation and be required to demonstrate 90% agreement with the primary researcher before conducting additional observations. It is important to note that IOA never fell below 90%, therefore retraining procedures were not necessary. IOA was calculated by adding the total number of intervals for which the primary and secondary observers agreed and dividing this by the total number of intervals observed. To obtain a percentage, this number was multiplied by 100. IOA was calculated for combined AEB, DB, and POT as well as individually. Average agreement for AEB was 96.13% (range = 91.7-100%), for DB was 96.1% (range = 90.8-100%), and for POT was 97.69% (range = 94.2-100%). IOA was also calculated for the total number of possible intervals and averaged across all observations ($M = 96.58$; range = 92.2-100%).
Design

A multiple baseline design across subjects was utilized to evaluate the effects of the intervention. Phases included (A) baseline, (B) QCG, and (C) QCG with an indiscriminable contingency. Standards for a multiple baseline design include: a minimum of three repetitions with a minimum of five data points per phase, IOA between 80-90% for a minimum of 20% of data points per condition, and systematic manipulation of the independent variable (Kratochwill et al., 2012). All standards were met for the current study.

Procedures

Baseline (Phase A)

Data were collected for AEB, DB, and POT utilizing the recording procedures described above. The iPad was placed in a consistent location in the classroom, with the screen facing down on a desk so students could not view the decibel level. Participating teachers were encouraged to follow their typical classroom management routines and did not inform students of the intervention procedures. Average decibel level was recorded following the classroom period using the method described above. Teachers did not provide feedback regarding the classroom noise level, as indicated on the iPad, and did not implement any steps of the intervention. A treatment integrity checklist was utilized to ensure no intervention procedures were implemented during this phase (see Appendix J). A minimum of five data points were collected for each classroom, with a two data point stagger for classrooms two and three to demonstrate verification of predicted levels of baseline if under similar circumstances. All phase change decisions were made based on decibel level.
Teacher Training

Teachers met independently with the primary researcher to discuss Phase B of the intervention. Trainings were 15 minutes long and provided didactic instruction for the intervention. During the training teachers were provided with the teacher script, integrity checklist, and a model for reading the decibel level from the screen share application. Additionally, each teacher was provided with a noise-level goal, which was derived from the average noise level during baseline minus five decibels. This criterion was derived per Cavanaugh, Tocci, and Wilkes (2011), who suggested that a change in noise level by five decibels is a clearly differentiable change. Training ended once teachers were trained on the QCG with 100% accuracy according to the procedural integrity checklist (see Appendix H).

Quiet Classroom Game (QCG)

During intervention, teachers informed the class that they were going to play a game. The teacher provided the class with a noise level goal and informed the students they would have 10 opportunities to pass the goal. When the class met the noise level goal, they would receive a thumbs up for that opportunity and when the class failed the noise level goal, they would receive a thumbs down. The students were informed that they needed to pass seven of the noise level checks in order to earn access to a piece of candy, which was preselected as a reward by the teacher.

Prior to beginning the game, the teacher set the MotivAider® to 2-minute fixed intervals. The noise level board was placed at the front of the classroom in a visible location to the students. The teacher started the MotivAider® when they announced the start of the game and continue with their typical classroom routine. Every two minutes,
the MotivAider® prompted the teacher to check the decibel level on the iPad. The teacher informed the class of the current decibel level and indicated whether they were above or below the noise level goal. Then, the teacher either placed a ‘check mark,’ indicating they met the goal, or an ‘X,’ indicating they did not meet the goal, in the box on the board. These procedures have been slightly modified from Radley and colleagues (2016) to address a high school population (i.e. using check marks instead of smiley faces and increasing intervention time).

Teacher Training 2

Following Phase B, teachers independently met with the primary researcher a second time. This training was approximately 10 minutes in duration and included a brief didactic instruction for Phase C. Teachers were provided with the Phase C script and integrity check list. The primary researcher explained the new schedule of reinforcement to the teacher and provided an example of the envelope that was utilized for determining access to reinforcement.

QCG with a Mystery Motivator

Prior to implementation of Phase C, the teacher and researcher developed a list of possible rewards. Each teacher then chose three rewards that could be available each time the game was played. During this phase, the QCG was implemented as described in Phase B; however, an indiscriminable contingency was added. Prior to beginning the game, the teacher informed the students that they still had to meet the noise level goal, but that they also would open an envelope at the end of the game to determine whether they received reinforcement. When the class met the goal, they opened the envelope that contained a slip of paper with either a “Y” or “N” to determine whether the class obtained
the reward. When the class revealed a “Y”, the students voted on the three possible reward to determine which one they received. When the class drew an “N” they were told they would have an opportunity to earn a reward next time.

Procedural Integrity

To ensure that training across all teachers was consistent, a procedural integrity checklist was completed during each teacher training (see Appendices I and J). Procedural integrity for teacher training was completed with 100% accuracy prior to the teacher’s implementation of the intervention. If any steps were missed, the primary researcher provided an overview of steps missed. There was only one occasion in which an integrity step was missed because researcher did not provide the teacher with an integrity checklist. The teacher was provided with the checklist and allowed the opportunity to ask any additional questions prior to starting intervention. IOA was collected for procedural integrity for 33% of training sessions and was reported as 100% agreement.

Treatment Integrity

A treatment integrity checklist was completed by the observers during each observation session (see Appendices K-M). The checklist contained all necessary steps for accurate implementation of the intervention. Treatment integrity was collected during baseline, Phase B, and Phase C. When treatment integrity scores fell below 90% the teacher was provided with corrective feedback prior to future implementation. Average treatment integrity across all phases and classrooms was 92.75% (50-100%). During baseline, treatment integrity was 100% across all observations in all classrooms. Average treatment integrity for phase B across all teachers was 87.36% and across phase C was
88%. IOA was collected for a minimum of 20% of all observation sessions across each classroom and phase and was reported as 100% agreement.

Data Analysis

Effects of the intervention were primarily examined by visual analysis of level, trend, variability, immediacy of effect, overlap across adjacent phases, and consistency across phases (Horner et al., 2005). A secondary measure of the intervention effect was calculated using an effect size, Baseline Corrected Tau (Tarlow, 2017). Baseline Corrected Tau scores were calculated across classrooms and will compare baseline to Phase B, baseline to Phase C, and Phase B to Phase C. This effect size statistic was chosen for its more conservative calculation method. Scores are reported between -1 and +1 and are able to be visually graphed, unlike other effect sizes where scores are not bound. Baseline Corrected Tau was calculated via a free online calculator that recommended whether an adjustment should be made to account for trends in baseline. Moderate effects were those between .2 and .6, large effect sizes between .6 and .8, and large to very large effect sizes .8 and above (Vannest & Ninci, 2015).
CHAPTER III - RESULTS

Student Behavior and Decibel Level

Classroom A

Results of classroom A are displayed in the top panels of Figure 1 for student behavior and Figure 2 for noise level. During baseline for classroom A, student levels of AEB were consistent and stable, and averaged 56% of observed intervals (range = 50.8-60.8%). DB was more variable, starting at a moderate level, followed by a decreasing trend and then a slight upward trend. DB was observed as occurring during an average of 22% of observed intervals (range = 11.7-26.7%) Passive off-task behavior was also variable, starting with an increasing trend and ending with a slight decreasing trend. Average percent of intervals observed for POT was 22% (range = 12.5-35%). Decibel levels remained stable throughout baseline, with an average decibel level of 60.8 dB (range = 59-63 dB). Following implementation of phase B, there were no immediate changes in AEB, DB, or POT. There was a slight increasing trend in AEB followed by a return to levels near baseline. The average percent of intervals observed as AEB was 63.6% (range = 59.2-73.3%). DB and POT remained variable, with DB being observed an average of 16.4% of intervals observed (range = 8.3-28.3%) and POT observed an average of 19.5% of intervals observed (range = 10.8-29.2%). An immediate change in decibel level was noted following implementation of Phase B. The average decibel level decreased to 54.6 (range 51-57 dB), which was more than a five-decibel difference and indicated a noticeable change. Once phase C was implemented, levels of AEB increased in variability, and overall decreased in average to 48.3% (range = 30-69.17%). Intervals in which DB was observed was also very variable, with an increasing trend followed by a
decreasing trend (36.2%; range = 11.7-69.2%). POT behaviors were also very variable, with an overall decreasing trend (15.5%; range = 0.8-33.3%). Decibel levels remained similar to phase B levels, with the exception of one data point in which the decibel level increased to baseline levels (54.8 dB; range = 51-61 dB).

Effect sizes were calculated for each dependent variable to compare baseline to phase B, baseline to phase C, and phase B to phase C. Results are displayed in Table 1. There were large to moderate effect sizes for all dependent variables comparing baseline to phase B. There were also moderate effect sizes comparing baseline to phase C for all dependent variables except AEB. There were moderate effect sizes for AEB and DB comparing phase B to phase C, and small effect sizes for POT and decibel level.

Classroom B

The results of Classroom B are displayed in the second panels of Figure 1 for student behavior and Figure 2 for noise level. Students were observed engaging in AEB during an average of 47.2% of intervals during baseline (range = 35-67.5%). There was some variability but there was an overall decreasing trend. Levels of disruptive behavior were very variable during baseline, occurring an average of 39.5% of intervals (range = 22.5-52.5%). POT remained low, with a slight increasing trend during the last three data points occurring an average of 13.3% of intervals (range = 5.8-22.5). Decibel levels were high and stable during baseline (65 dB; 51-72 dB). Once phase B was implemented, there were no changes in AEB, DB, or POT. AEB remained at moderate levels and was stable with the exception of one low data point (45%; 34.2-51.7%). DB was also observed at moderate levels, occurring an average of 35.3% of observed intervals (25.4-40.8%). POT was also low and stable with the exception of one high data point (19.8%; range 9.6-
Decibel levels immediately decreased following implementation of phase B (60dB; range = 58-63dB). Levels overall decreased by five decibels, indicating a noticeable change in noise level. During implementation of phase C, there were no effects seen for level, trend, or variability. Data remained consistent with the previous levels for AEB (46.6%; range = 34.1-55%), DB (34.7%; 29.2-40%), and POT (18.7%; range = 8.3-31.7%). Noise levels during phase C immediately decreased to 53dB and was followed by a small increase to levels comparable to phase B. The average noise level was 59.6dB (range = 53-65dB) which is a five decibel decrease from baseline, and is slightly below the average from phase B.

Effect size calculations indicated all small effects for AEB when utilizing all three different comparisons. The only moderate effect sizes for DB were comparing baseline to phase C. Calculations for POT behaviors indicated there was a trend in baseline, therefore baseline corrected tau scores were calculated. Moderate effect sizes were reported for baseline to phase B and baseline to phase C. There were also moderate effect sizes for decibel level comparing baseline to phase B and baseline to phase C. Results are displayed in Table 2.

**Classroom C**

The results of classroom C are displayed in the third panel of Figure 1 for student behavior and Figure 2 for noise level. Students exhibited AEB during an average of 51.5% of intervals observed during baseline (range = 30.8-64.2%). Levels varied, but there was an overall decreasing trend prior to implementation of phase B. DB was exhibited during an average of 40.9% of intervals observed during baseline (range = 26.7-55%), with an increasing trend prior to implementation of phase B. POT remained at
low levels throughout baseline, occurring an average of 7.6% of intervals observed (range = 0-18.3%). Decibel levels were overall stable with the exception of one data point ($M = 61.3\text{dB}$; range = 57-69dB). Following implementation of phase B, there was an immediate change in level for AEB and there was a decreasing trend in AEB across time ($M = 57.4\%$; range = 40.9-75.4%). A similar pattern was observed for DB, with an immediate change in level and a decreasing trend in DB followed by an increase in DB ($M = 28\%$; range = 17.8-48.7%). There was an immediate change in noise level once phase B was implemented. There was also a steady decreasing trend in decibel level during phase B, averaging 54.2dB (range = 49-57dB). During phase C, AEB continued in a gradual decreasing trend over time ($M = 40.8\%$, range = 26.6-57.5%). DB was exhibited with more variability and continued to increase over time ($M = 45.2\%$, range = 20-59.3%). Students were engaged in POT behaviors near similar levels as the previous phase, occurring an average of 15.7% of intervals (range = 8.3-24.2%). Noise levels remained stable with similar levels to phase B. There was one data point in which students exhibited noise levels similar to baseline levels; however, noise levels decreased to previous levels before removal of the intervention ($M = 57.2\text{dB}$; range = 53-66dB).

Effect size calculations for classroom C are displayed in Table 3. Moderate effect sizes were reported for all AEB and DB comparisons. A small effect size was reported for POT behaviors comparing baseline to Phase B. Additionally decibel levels were all reported to have a moderate to large effect size.
Social Validity

Teacher Reports

All teachers completed the Usage Rating Profile – Intervention, Revised (URP-IR). Teachers rated their agreement with 29 items on a scale from one to six, with higher numbers indicating more agreement. The scale was completed for both phases of the intervention to determine the social validity of each intervention. The results of each factor are reported by teacher in Table 4. When comparing social validity scores between phase B and phase C, there were little differences. Teachers generally rated the intervention as highly understandable and moderately acceptable, feasible, and fitting to the current school climate. Based on the teacher’s responses to the scale, teachers reported they would be able to successfully implement the intervention without the support of home, and with moderate support at school.

Student Reports

Students in each classroom were asked to complete the Children’s Usage Rating Profile for both phases of the intervention. The form contained 21 items in which students rated their agreement with the statement from one to four, with higher scores indicating higher agreement. In classroom A and B, 15 students completed and returned the form and in classroom C, 16 students completed and returned the form. Missed items as well as items that had two responses were removed from the mean of each factor to prevent inaccuracies from being reported. Additionally, if students did not complete both sides of the rating scale, their scores were not included in the calculation. There were three cases in which students did not complete both sides of the scale: two phase B ratings, and one phase C rating. Overall, students rated all factors as moderate, with little
variability across both phases. The scores indicated that the students had a moderate
desire to participate in the intervention, that it was moderately feasible, and that they
understood why the intervention was implemented. Table 5 contains the results of the
CURP from each classroom by phase and factor.
CHAPTER IV – DISCUSSION

The purpose of the current study was to identify an intervention to support high school teachers need for effective classroom management interventions. Although previous interventions (e.g. the GBG) have been successful in improving academically engaged behavior and decreasing disruptive behavior, they rely heavily on teacher judgement to determine student access to reinforcement. Reliance on teacher judgement has been noted in the limitations of the GBG, indicating that teachers may not be able to reliably assess student behavior while simultaneously performing their teaching duties. In the literature, it has been suggested that noise level may be related to student behavior in the classroom. Therefore, decibel level may be an objective measure of student behavior in the classroom that can be incorporated into interventions. The Quiet Classroom Game, invented by Radley and colleagues (2016), was the first intervention to utilize a decibel meter in an elementary level classroom and assess changes in student academically engaged behavior. The current study extended previous research through the addition of an indiscriminable contingency in an attempt to maintain the effects of the QCG across time by changing the schedule of reinforcement. Overall, results of the present study indicated that the QCG was effective in decreasing average decibel level in a high school classroom; however, it was not successful in promoting a change in academically engaged behavior. Additionally, high school teachers implemented the intervention with moderate to high integrity, and the intervention was perceived as moderately acceptable by all participating teachers and students.
Research Question 1

It was hypothesized that the QCG would decrease the decibel level in a high school classroom while simultaneously increasing AEB and decreasing DB and POT behaviors. It has been suggested in the literature that a change in five decibels is defined as a noticeable change in noise level. There was at least a five decibel decrease in each classroom’s noise level average from baseline to phase B. Effect size calculations also support a change in decibel level from baseline to phase B and baseline to phase C. Classroom A’s effect size calculations for each comparison respectively was .76 and .56; indicating a large and moderate effect size. Classroom B’s effect size calculations for each comparison were in the moderate level. Respective calculations for each comparison were .53 and .49. Classroom C’s effect size calculations were also in the moderate range and were reported at .69 and .45, respectively. Visual analysis of data in all three classrooms indicated that the QCG did not result in any changes in the level, trend, or variability for AEB, DB, or POT. Therefore, the intervention was not successful in simultaneously increasing on-task behaviors and decreasing off-task and disruptive behaviors. Effect size calculations indicated that the only large effect for student behaviors was in classroom A from baseline to phase B. All other effect size calculations indicated small to moderate effects.

These results do not align with previous research. Interdependent group contingencies have been successful at increasing AEB and decreasing DB and POT in the high school setting (Christ & Christ, 2006; Tingstrom, Dufrene, Ford & Sterling, 2015). Additionally, the QCG has been successful in decreasing noise level in addition to increasing AEB and decreasing DB with a younger population (Radley et al., 2016).
Based on the Problem Identification Interview with each teacher, there were reports of excessive noise; however, there were also additional disruptive behaviors that each teacher reported. These included out of seat behavior, cell phone use, and headphone use. While the intervention successfully targeted the noise level in the classroom, addressing talking out of turn behaviors, there were many alternative disruptive behaviors that the students could engage in without impacting the decibel level in the classroom. Subsequently, students could engage in these alternative problem behaviors and still access reinforcement.

Research Question 2

The second hypothesis was that the QCG, implemented with an indiscriminable contingency, would maintain reduced decibel levels, increased AEB, and decreased DB and POT behaviors. Based on the data from phase C, noise levels remained at five decibels below baseline levels with the exception of classroom C. Classroom C’s average was approximately four decibels below the baseline level. Although this does not meet the five-decibel difference standard, there was one day in which the decibel level was substantially higher than the other days during this phase; therefore, the average may not be an accurate representation of the decibel level in this classroom. Moderate effect size calculations further support the difference in decibel levels from baseline to phase C. Similar to phase B, there were no visual changes in the level, trend, or variability for AEB, DB, or POT.

Indiscriminable contingencies, such as mystery motivators, have been successful in maintaining behavior change (Schanding & Sterling-Turner, 2010). Therefore, the results of phase B are consistent with previous literature, as decreased decibel levels were
maintained across phase C. Because the QCG alone did not promote student behavior change in phase B, it is impossible to note whether the QCG with an indiscriminable contingency maintained behavior change. Based on effect size calculations, only small to moderate effect sizes were reported from baseline to phase C. Effect sizes were also calculated comparing phase B to phase C. If effects were maintained from phase B to phase C, large effect sizes would not be noted. All small to moderate effect sizes were reported when comparing the two phases, therefore no major differences were reported from phase B to phase C.

**Research Question 3**

The third research question investigated whether high school general education teachers would be able to implement the QCG (phase A) and the QCG with an indiscriminable contingency (phase B) with integrity. Observers completed the treatment integrity checklist during each observation to investigate teacher’s integrity. Teachers did not consistently meet 100% treatment integrity during any of the intervention sessions. Average treatment integrity for phase B was 87.36% and for phase C was 88%. Although higher percentages would be preferred, teachers were able to implement with moderately high integrity. Treatment integrity averages below 100% may be due to the high number of steps required for implementation. Additionally, multiple items on the checklist were multi-step. For example, if teachers forgot to provide feedback on one of ten noise level checks, they automatically received a ‘no’ for that item. Teachers were also required to state the full instructions and rules of the game each time the QCG was played. The QCG was often played for multiple consecutive days, and teachers often forgot to restate the
rules and instructions each day. Overall, teachers were able to implement both phases of
the game with moderately high integrity.

Research Question 4

The final research question aimed to examine whether the QCG (phase A) and the
QCG with an indiscriminable contingency (phase B) would be regarded as socially valid
by the participating high school teachers and students. Responses to the URP-IR
completed by all participating teachers were broken down to six different factors to help
determine whether the interventions were socially valid. Very small differences were
noted between the two interventions, suggesting that teacher’s viewed phase A and phase
B similarly. Ms. King from classroom A, viewed both interventions as moderately
acceptable, and feasible. Her responses to the scale also indicated that she highly
understood the intervention and felt that it matched the current climate in the high school.
Additionally, her responses suggested that there was some support necessary from home,
and that if she were to implement the intervention in the future, she would need a
moderate amount of support for it to be successful. Ms. Rock from classroom B found the
intervention to be highly acceptable, feasible, and matching to the school climate. She
indicated that she highly understood the intervention and that little to no support was
needed from student’s homes for it to be successful. Based on her responses to the scale,
if she were to implement the intervention again, she would need some additional school
support in order for the game to be successful. Ms. Bark’s, from classroom C, responses
to the scale indicate that she moderately understood the intervention and found it
moderately feasible and acceptable. She believed the intervention slightly matched with
the school climate, and that some support would be necessary from home for the
intervention to be successful in the classroom. Additionally, her responses indicated that she would need the least support from the school of the participating teachers to implement the intervention. Overall, the intervention was viewed as moderately acceptable by the teachers, although the responses indicate that system support would be necessary for future implementation.

Students responses to the CURP were broken down to three different factors: personal desirability, feasibility, and understanding. Results of student responses to each phase were also very comparable and had very small differences. In classroom A, students moderately desired to participate, found it moderately feasible, and agreed they understood why the intervention was in place. In classroom B, students had similar responses, but there was a slight difference in the understanding factor, with students reporting higher understanding for phase B than phase C. In classroom C, students had the least desirability to participate in the intervention, found it moderately feasible, and moderately understood why the intervention was necessary. Students overall had moderate ratings, which may be due to the averaging of numbers. This suggests that some students found the intervention as socially valid, while others did not.

Limitations

There are limitations that should be considered while interpreting the results of this study. First, the study was conducted in all science-related courses at a rural high school in the southeastern United States. The effects of the intervention in other subjects (e.g. math, English), is unknown at the current time. Additionally, this was only conducted in one high school; therefore, further replications are necessary to determine whether the same effects would be observed in other high schools. Second, data was only
collected during the specified observation periods in each class. It is unknown whether
decreased noise levels were maintained outside of the time of intervention or generalized
to other courses throughout the day. Third, there was no screen-in criteria for noise level
in the classroom, requiring the primary researcher to rely on teacher reports of excessive
noise. This created a floor effect, as some classroom noise levels were not excessive
according to the decibel meter and could not be reduced as much as other classrooms.
Fourth, the QCG only targeted noise levels; therefore, it only addressed problem
behaviors related to talking out. Students were able to engage in various other disruptive
behaviors that did not result in increased noise level. Anecdotally, teachers reported that
they believed student participation decreased during the 20-minute observations in effort
to keep a low decibel level. Fifth, the study required two separate technology devices
with downloaded apps. Technology is more readily accessible; however, applications can
fail or stall and are not always reliable. Finally, the ratings to the social validity measures
indicate that the teachers would need additional assistance from resources outside of their
classroom. This decreases the likelihood that a teacher would utilize the intervention
independently.

Future Research

This is the first implementation of the QCG in a high school setting; therefore, it
is recommended that future researchers replicate the current study across different high
schools and in different subjects (e.g. math and English). Future research should continue
to examine the relationship between noise level and on-task and disruptive behaviors.
Because the QCG was successful in increasing AEB and decreasing DB in an elementary
setting, the screening procedure for high school classrooms may need to be improved. A
screening procedure should also be utilized to identify classrooms with excessive noise, such as decibel levels above 70dB. It is also recommended that researchers collect data on the type of disruptive behavior that is occurring to determine whether the classroom disruptive behaviors are contributing to increased noise levels.

Future researchers should also consider changing the manner in which the decibel level is read. Because the iPad was in the center of the classroom and was not easily accessible to the teacher, an additional technological device was required to screen share. Using only one device would increase the feasibility for teachers as well as decrease the chance of technological failure. Researchers should determine a centralized location that can be easily accessible to the teacher to place the decibel meter in future projects.

Conclusion

Disruptive behaviors in the classroom are an interference to teaching and can lead to lower grades, poor standardized test scores, antisocial behavior and poor academic engagement (Stage & Quiroz, 1997; Trentacosta, Hyde, Shaw, & Cheong, 2009). Interdependent group contingencies can be utilized to decrease disruptive behaviors and have been shown successful in the high school setting (Flower, McKenna, Muething, Bryant, & Bryant, 2014; Christ & Christ, 2006). Indiscriminable contingencies have been used to maintain behavior change across time by changing the schedule of reinforcement and adding an unknown component to the common group contingency (Schanding & Sterling-Turner, 2010). A common limitation noted across group contingency research is the heavy reliance on teacher judgements to determine access to reinforcement. Noise may be an objective measure than can be utilized in group contingencies, as inappropriate vocalizations are one of the highest teacher-reported problem behaviors in the classroom.
(Sun & Shek, 2012). Most research examining noise levels in the classroom have not examined the effects on student behavior. Radley and colleagues (2016) implemented a novel group contingency known as the Quiet Classroom Game which utilized a decibel meter within an interdependent group contingency and measured the effects on student behavior. The intervention was successful in promoting behavior change in the students as well as decreasing the decibel level in elementary classrooms. The results of the current study indicate that the QCG is an effective intervention in the high school setting for decreasing classroom noise. Additionally, the QCG can be used in combination with an indiscriminable contingency to maintain reduced noise levels. Teachers were able to implement the current intervention with moderate to high levels of integrity and found the intervention moderately acceptable. The current study also aimed to increase levels of on-task behaviors and decrease levels of off-task behaviors; however, this goal was not achieved. Future research is needed to determine whether reduced noise levels can also promote student behavior change at the high school level. While this intervention may be an effective option for classroom teachers to decrease classroom noise, additional research is needed to improve the feasibility and effectiveness of the intervention.
March 6, 2018

Dear Institutional Review Board of The University of Southern Mississippi,

Stefanie Schrieber has approached me with a research project idea that she would like to implement on campus at Forrest County Agricultural High School. I have met with Ms. Schrieber and given approval of the project with details to be determined as target classrooms are identified.

If you have any questions or concerns about my support of Ms. Schrieber's research project, please contact me at the school.

Sincerely,

Charles Johnson
Principal
Forrest County Agricultural High School
APPENDIX B – Teacher Consent Form

**Title of Study:** Quiet Classroom Game with an Indiscriminable Contingency in a High School

**Purpose:** The purpose of this study is to investigate the effects of an intervention titled the Quiet Classroom Game in combination with an indiscriminable contingency to increase academically engaged behaviors, decrease disruptive behaviors, and decrease classroom noise level.

**Participants:** Students in high school (grades 9-12) and their teachers can participate in the study. Students must exhibit above average noise levels as well as disruptive behavior in the classroom to be included in the study.

**Methods and Procedures:** Upon agreeing to participate, you will be contacted by the primary researcher to obtain information regarding your class’ overall disruptive behaviors and to determine target behaviors to be observed. If the criterion for inclusion *is not* met, you may request services through an alternative intervention. If the criterion of less than 70% class-wide academically engaged behavior *is* met, you will be asked to implement the QCG intervention. The primary researcher will train you in implementing the intervention using all necessary materials, and you will be provided with a teacher script to train the students on the game. Using an iPad with the Decibel Sound Meter app, you will monitor the classroom noise level and provide feedback to the students. In consultation with the primary researcher, you will select the target behaviors to be observed. At the start of each class during the intervention, you will provide the students with the game expectations and a noise-level goal. Every two minutes, you will be prompted via a tactile vibration delivered through a MotivAider® to conduct a noise level check and provide the class with feedback. Three envelopes will be provided to you during the second intervention phase. One envelope will contain the criteria for reinforcement, the next will indicate whether the students are able to access the reward, and the third will indicate the reward for the day. Disruptive behaviors of concern and academically engaged behaviors you wish to improve will be observed and recorded. In addition, average decibel level will be recorded to determine noise-level goals.

**Benefits:** Your benefits by participating in this study may include observed improvements in student behavior and learning a unique intervention designed to improve student behavior.

**Risks and Discomfort:** There are few anticipated risks associated with participation. Initially, you may not be comfortable with the time required to implement this intervention in your classroom. You also may not feel comfortable implementing an unknown and new procedure in your classroom. However, you will be provided with training by the primary investigator as well as any additional materials needed for implementation. The primary investigator will also be available to answer any questions you may have. Throughout the experiment, your students’ behavior will be monitored.
In the event that undesired and unanticipated effects arise (i.e., increase in disruptive behaviors), modifications or termination of procedures will occur and you and your students will be provided with other services.

Confidentiality of Records: All interviews, observations, and other information obtained during this study will be kept strictly confidential. Your name, students’ names, and other identifying information will not be disclosed to any person not connected with this study. Results from this research project may be shared at professional conferences or published in scholarly journals; however, all identifying information will be removed from publications and/or presentations.

Voluntary Participation: Your participation in this study is voluntary. You may withdraw from this study at any time without penalty, prejudice, or loss of benefits. Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted), the primary investigator will take every precaution consistent with the best scientific practice.

Teacher’s Consent: If you agree to participate, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact Stefanie Schrieber or Dr. Keith Radley (Phone: 601-266-6748; Email: stefanie.schrieber@usm.edu; keith.radley@usm.edu). This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research subject should be directed to the Institutional Review Board Office, The University of Southern Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

Sincerely,

____________________________
Stefanie R. Schrieber, B.S.,
School Psychologist-in-Training
Department of Psychology
The University of Southern Mississippi

____________________________
Keith Radley, Ph.D.
Supervising Licensed Psychologist
Department of Psychology
The University of Southern Mississippi
THIS SECTION TO BE COMPLETED BY TEACHER

Please Read and Sign the Following:

I have read the above documentation and consent to participate in this project. I have had the purpose and procedures of this study explained to me and have had the opportunity to ask questions. I am voluntarily signing this form to participate under the conditions stated. I have also received a copy of this consent. I understand that I will be asked to implement a classroom-based intervention, and observations will be conducted in the classroom on the students’ behavior. In order to do so, I will be required to complete a consultation session, to implement the intervention, and to complete a structured questionnaire to assess my satisfaction with the intervention. In addition, I will be trained on all of the intervention procedures by the primary researcher. I further understand that all data collected in this study will be confidential and that my name and the students’ names will not be associated with any data collected. I understand that I may withdraw my consent for participation at any time without penalty, prejudice, or loss of privilege.

___________________________  ______________________
Signature of Teacher            Date

___________________________
Signature of Witness
APPENDIX C – Teacher Demographics Form

Teacher Demographics:

Age ____________
Number of years teaching ____________
Race ____________
Gender ____________
Highest Degree earned _______________________

Classroom Demographics:

Number of students in the class _________
Number of: Males _________ Females _________
Number of: African-American _____ Asian _____ Caucasian _____
Hispanic _____

Number of SPED students in your classroom: _________
Please list the disability categories of each child in SPED (do not include names or any other identifying information):

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
APPENDIX D – Problem Identification Interview

Student: _____________________ Teacher (s): _______________________________

School: ________________ Age: _____ Sex: M F Date: ____________

1. Describe the class’ behavior problems in order of severity and give examples.

2. How manageable is the problem behavior?

3. In what settings does the problem behavior occur?

4. Goals for the problem behavior (what would you like to see happen)

5. Tell me about what happens before the behavior occurs. After the behavior occurs?

6. Intervention attempts, degree of success, reasons for failure.
   a. What procedures have you tried in the past to deal with this problem behavior?
   b. What, if anything, have you done to deal with similar behavior problems in the past?
   c. What’s worked? What hasn’t?

7. Rules and typical procedures carried out in the classroom (constraints and assets).

8. Reinforcers - used now and potentials for future (e.g., praise, activities, or notes sent home).

9. Any data collected presently?

10. Ask teacher for any additional comments or questions.

APPENDIX E – Observation Form

Date: ____________ Classroom: ____________ Observer: ____________ Phase: _____

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<tr>
<td>Interval</td>
<td>15.1</td>
<td>15.2</td>
<td>15.3</td>
<td>15.4</td>
<td>15.5</td>
<td>15.6</td>
<td>16.1</td>
<td>16.2</td>
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<tr>
<td>AEB</td>
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<tr>
<td>Interval</td>
<td>17.1</td>
<td>17.2</td>
<td>17.3</td>
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<td>17.6</td>
<td>18.1</td>
<td>18.2</td>
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<td>AEB</td>
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</tr>
<tr>
<td>Interval</td>
<td>19.1</td>
<td>19.2</td>
<td>19.3</td>
<td>19.4</td>
<td>19.5</td>
<td>19.6</td>
<td>20.1</td>
<td>20.2</td>
<td>20.3</td>
<td>20.4</td>
<td>20.5</td>
<td>20.6</td>
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<tr>
<td>AEB</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Percentage of Intervals</th>
<th>IOA: Yes / No</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEB:</td>
<td>_____ / 120 = _______ %</td>
<td>_____ / 120 = _____ %</td>
</tr>
<tr>
<td>DB:</td>
<td>_____ / 120 = _______ %</td>
<td>_____ / 120 = _____ %</td>
</tr>
</tbody>
</table>

Noise level checks | Avg. Decibel Level: _____
APPENDIX F – Teacher Script QCG

1. Introduce the Quiet Classroom Game
   Say: We are going to start a new procedure called the Quiet Classroom Game. The goal of the game is to make sure everyone is quiet and on-task in their seats. I will be monitoring your noise level through the iPad in the classroom.

2. Explain Noise level checks
   Say: At the front of the board are 10 boxes indicating 10 different noise level checks. Your goal is to be at or below X decibels. Every so often, I will look at the current decibel level on the iPad and let you know how you are doing. I will tell you each time I look at the iPad if you are above or below the decibel level goal and indicate accordingly on the board. If I place a check mark on the board, you have passed the noise level check. If I place an X on the board, you have not passed the noise level check, and should try again for the next check. If you pass 7 out of 10 noise level checks, you will win X reward.
   It is important that you stay on-task and seated quietly at your desk so that you can pass the noise level checks.

3. Set the MotivAider® to 2-minute intervals (do not tell the student how much time will pass between noise level checks)

4. Begin the game (turn on MotivAider®)
   Say: I am pressing start on the Decibel monitor and the Game is beginning now.

5. When the MotivAider® provides a prompt (every 2 minutes), check the Decibel X app and provide the class with feedback
   a. Say: “Great job, you are below our noise level goal and have earned a check on the board” and place a check in the box
   b. Say: “You are currently above the noise level, and will not earn a check on the board. Remember to earn a check you must be on-task sitting quietly at your desk.” And place an X in the box.

6. End the Game after 20 minutes (press pause on the Decibel X app and save the data)
   Say: The Quiet Classroom Game has ended. You have passed X noise level checks out of 10, and therefore you have (not) earned the reward today. You will have another opportunity to play next class period.

7. Provide students with reward if they met the goal!
1. Introduce the new procedures.
   **Say:** Today we are going to keep playing the Quiet Classroom Game, only we are going to be changing how we earn a reward using a mystery motivator.

2. Explain the three envelopes
   **Say:** There is an envelope on my desk that contains a paper marked with either a “Y” or “N”. If you reach the noise level goal for the day and we draw a “Y” this means we get to earn a reward. If we draw an “N” we do not get to draw a reward. If we draw a “Y” we will vote on three possible rewards (X, X, X). If we do not meet the goal, we will still be able to open the envelope to see whether we would have obtained a reward.

3. Review Quiet Classroom Game Procedures
   **Say:** We still have 10 boxes indicating 10 different noise level checks on the front board. Your goal is to be at or below X decibels. Every so often, I will look at the current decibel level on the iPad and let you know how you are doing. I will tell you each time I look at the iPad if you are above or below the decibel level goal and indicate accordingly on the board. If I place a check mark on the board, you have passed the noise level check. If I place an X on the board, you have not passed the noise level check, and should try again for the next check.
   It is important that you stay on-task and seated quietly at your desk so that you can pass the noise level checks so that you have a better chance at earning a reward.

4. Set the MotivAider® to 2-minute intervals (do not tell the student how much time will pass between noise level checks)

5. Begin the game (turn on MotivAider®)
   **Say:** I am pressing start on the Decibel monitor and the Game is beginning now.

6. When the MotivAider® provides a prompt (every 2 minutes), check the Decibel X app and provide the class with feedback
   a. **Say:** “Great job, you are below our noise level goal and have earned a check on the board” and place a check in the box
   b. **Say:** “You are currently above the noise level, and will not earn a check on the board. Remember to earn a check you must be on-task sitting quietly at your desk.” And place an X in the box.

7. End the Game after 20 minutes (press pause on the Decibel app and save the data)
   **Say:** The Quiet Classroom Game has ended. You have passed X noise level checks out of 10, I am going to open the envelope to if we have earned access to the reward.
   a. If you draw a “Y” have students vote from the possible reward options. If you draw a “N” stop do not vote, but encourage students to try again the next day.
   b. Provide reward to students.
# APPENDIX H – Procedural Integrity (Training #1)

Class:_________ Date:_______ Observer:_________ IOA: N Y _________

<table>
<thead>
<tr>
<th>Training Steps</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Show teachers the iPad with the Decibel X app</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Provide brief demonstration of the application functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Provide the teacher with a decibel level goal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Provide the teacher with a MotivAider® and explain functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Researcher and Teacher choose classroom reward</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Provide teacher with integrity sheet for QCG and walk through full intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Allow opportunity for teacher to ask questions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of steps competed: /7 %: _________
APPENDIX I – Procedural Integrity (Training #2)

Class:_________ Date:_______ Observer:_________ IOA: N Y __________

<table>
<thead>
<tr>
<th>Training Steps</th>
<th>Y</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Explain that we will be adding an indiscriminable contingency but QCG still used</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Provide teacher with example envelope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Explain “Y”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Explain “N”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Explain reward options</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Provide teacher with integrity sheet for QCG + indiscriminable contingency and walk through full intervention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Allow opportunity for teacher to ask questions</td>
<td></td>
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</tr>
</tbody>
</table>

Number of steps competed: /7 %: _______
### APPENDIX J – Treatment Integrity for Baseline

Class:_________ Date:_______ Observer:_________ IOA: N Y _________

<table>
<thead>
<tr>
<th>Intervention Steps</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Place iPad in predetermined location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Teacher presses start on decibel app</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Teacher does not provide information about the intervention</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Teacher does not provide feedback regarding noise level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Teacher presses stop on decibel app</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 No rewards are provided for noise levels</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Number of steps competed: /6 %: _________
## APPENDIX K – Treatment Integrity for QCG

Class:_________ Date:_______ Observer:_________ IOA: N Y _________

<table>
<thead>
<tr>
<th>Intervention Steps</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Place iPad in predetermined location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 10 empty boxes on the board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Inform students they will be playing a game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Provide noise level goal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Tells students there will be 10 noise level checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Tells students they must be below the goal for 7/10 checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Informs students of the reward if they meet this goal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Teacher wears MotivAider® set to 2-minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Teacher announces start of game and starts decibel X app</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Teacher conducts 10 noise level checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Teacher provides verbal feedback during checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Teacher places checks or X on board accordingly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Teacher stops Decibel X app and announces end of game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Teacher provides reward</td>
<td></td>
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</tbody>
</table>

Number of steps competed: /14  
%: _________
APPENDIX L – Treatment Integrity for QCG with Indiscriminable Contingency

Class:_________ Date:_______ Observer:_________   IOA:   N     Y   _________

<table>
<thead>
<tr>
<th>Intervention Steps</th>
<th>Y</th>
<th>N</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Place iPad in predetermined location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 10 empty boxes on the board</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Inform students they will be playing a game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Provide noise level goal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Tells students there will be 10 noise level checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Tells students they must be below the goal for 7/10 checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Explains envelope</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Teacher wears MotivAider® set to 2-minutes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Teacher announces start of game and starts decibel X app</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Teacher conducts 10 noise level checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Teacher provides verbal feedback during checks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 Teacher places checks or X on board accordingly</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 Teacher stops Decibel X app and announces end of game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 Draws from envelope 1</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15 Teacher provides reward</td>
<td></td>
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</tbody>
</table>

Number of steps competed: /15 %: _________
### APPENDIX M – Teacher Social Validity Scale

**URP-Intervention**

**Directions:** Consider the described intervention when answering the following statements. Circle the number that best reflects your agreement with the statement, using the scale provided below.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Slightly Disagree</th>
<th>Slightly Agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>This intervention is an effective choice for addressing a variety of problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>I would need additional resources to carry out this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>I would be able to allocate my time to implement this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>I understand how to use this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>A positive home-school relationship is needed to implement this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>I am knowledgeable about the intervention procedures.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>The intervention is a fair way to handle the child’s behavior problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>The total time required to implement the intervention procedures would be manageable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>I would not be interested in implementing this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>My administrator would be supportive of my use of this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>I would have positive attitudes about implementing this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>This intervention is a good way to handle the child’s behavior problem.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Preparation of materials needed for this intervention would be minimal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tr>
<tr>
<td>14</td>
<td>Use of this intervention would be consistent with the mission of my school.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Parental collaboration is required in order to use this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16</td>
<td>Implementation of this intervention is well matched to what is expected in my job.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>Material resources needed for this intervention are reasonable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>I would implement this intervention with a good deal of enthusiasm.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>This intervention is too complex to carry out accurately.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>These intervention procedures are consistent with the way things are done in my system.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>This intervention would not be disruptive to other students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>22</td>
<td>I would be committed to carrying out this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>23</td>
<td>The intervention procedures easily fit in with my current practices.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>24</td>
<td>I would need consultative support to implement this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>I understand the procedures of this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>My work environment is conducive to implementation of an intervention like this one.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>27</td>
<td>The amount of time required for record keeping would be reasonable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>28</td>
<td>Regular home-school communication is needed to implement intervention procedures.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>29</td>
<td>I would require additional professional development in order to implement this intervention.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
APPENDIX N – Student Social Validity Scale

CURP - Actual

Directions: Think about the method that your teacher or other adult has used with you. After reading each sentence, circle the number that matches your belief about it. For example, if the sentence was “I like chocolate ice cream,” you might circle “4” for “I totally agree.”

<table>
<thead>
<tr>
<th></th>
<th>I totally disagree</th>
<th>I kind of disagree</th>
<th>I kind of agree</th>
<th>I totally agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>This was too much work for me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>I understand why my teacher picked this method to help me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>I could see myself using this method again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>This is a good way to help students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5.</td>
<td>It is clear what I had to do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6.</td>
<td>I would not want to try this method again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7.</td>
<td>This took too long to do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8.</td>
<td>If my friend was having trouble, I would tell him/her to try this.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9.</td>
<td>I was able to do every step of this method.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10.</td>
<td>I felt like I had to use this method too often.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th>I totally disagree</th>
<th>I kind of disagree</th>
<th>I kind of agree</th>
<th>I totally agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Using this method gave me less free time.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>There are too many steps to remember.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Using this method got in the way of doing other things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>I understand why the problem needed to be fixed.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>This method focused too much attention on me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>I was excited to try this method.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>This method made it hard for the other students to work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>I would volunteer to use this method again.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>It is clear what the adult needed to do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>I was able to use this method correctly.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>I liked this method.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the “Adverse Event Report Form”.
- If approved, the maximum period of approval is limited to twelve months.
- Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 18031501
PROJECT TITLE: The Quiet Classroom Game with a Mystery Motivator in a High School
PROJECT TYPE: Master's Thesis
RESEARCHER(S): Stefanie Schrieber
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Exempt Review Approval
PERIOD OF APPROVAL: 03/28/2018 to 03/25/2019

Lawrence A. Hosman, Ph.D.
Institutional Review Board
Table 1 *Classroom A Effect Sizes*

<table>
<thead>
<tr>
<th></th>
<th>BL Corrected Tau</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academically Engaged Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.60</td>
<td>Large</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.15</td>
<td>Small</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.51</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Disruptive Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.328</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.21</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.39</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Passive Off-Task Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.21</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>0.36</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.12</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Decibel Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>-0.76</td>
<td>Large</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.57</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.06</td>
<td>Small</td>
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Table 2 *Classroom B Effect Sizes*

<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Academically Engaged Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>-0.02</td>
<td>Small</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>0.02</td>
<td>Small</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.15</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Disruptive Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.19</td>
<td>Small</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>0.25</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.000</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Passive Off-Task Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>*0.44</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>*0.36</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.03</td>
<td>Small</td>
</tr>
<tr>
<td><strong>Decibel Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>-0.53</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.49</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.12</td>
<td>Small</td>
</tr>
</tbody>
</table>

*Indicates baseline scores were corrected due to trend*
Table 3 *Classroom C Effect Sizes*

<table>
<thead>
<tr>
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<tr>
<td><strong>Academically Engaged Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.21</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.41</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.51</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Disruptive Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>0.39</td>
<td>Moderate</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.22</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.51</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Passive Off-Task Behavior</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>-0.13</td>
<td>Small</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.42</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>-0.31</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Decibel Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline to Phase B</td>
<td>-0.69</td>
<td>Large</td>
</tr>
<tr>
<td>Baseline to Phase C</td>
<td>-0.45</td>
<td>Moderate</td>
</tr>
<tr>
<td>Phase B to Phase C</td>
<td>0.22</td>
<td>Moderate</td>
</tr>
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</table>
Table 4 *Mean Teacher Ratings on the URP-IR*

<table>
<thead>
<tr>
<th>Classroom A</th>
<th>Acceptability</th>
<th>Understanding</th>
<th>Home-School Collaboration</th>
<th>Feasibility</th>
<th>System Climate</th>
<th>System Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase B</td>
<td>4.78</td>
<td>6.01</td>
<td>3.67</td>
<td>4.83</td>
<td>6.01</td>
<td>5.33</td>
</tr>
<tr>
<td>Phase C</td>
<td>4.11</td>
<td>6.00</td>
<td>4.00</td>
<td>4.50</td>
<td>5.00</td>
<td>4.67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom B</th>
<th>Acceptability</th>
<th>Understanding</th>
<th>Home-School Collaboration</th>
<th>Feasibility</th>
<th>System Climate</th>
<th>System Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase B</td>
<td>5.44</td>
<td>6.00</td>
<td>1.33</td>
<td>6.00</td>
<td>6.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Phase C</td>
<td>6.00</td>
<td>6.00</td>
<td>1.00</td>
<td>6.00</td>
<td>6.00</td>
<td>3.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom C</th>
<th>Acceptability</th>
<th>Understanding</th>
<th>Home-School Collaboration</th>
<th>Feasibility</th>
<th>System Climate</th>
<th>System Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase B</td>
<td>4.44</td>
<td>5.67</td>
<td>3.00</td>
<td>5.00</td>
<td>4.40</td>
<td>2.33</td>
</tr>
<tr>
<td>Phase C</td>
<td>4.22</td>
<td>5.00</td>
<td>2.00</td>
<td>4.67</td>
<td>4.20</td>
<td>1.67</td>
</tr>
</tbody>
</table>

Table 5 *Mean Student Ratings on the CURP*

<table>
<thead>
<tr>
<th>Classroom A</th>
<th>Phase B</th>
<th>Phase C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Desirability</td>
<td>2.69</td>
<td>2.62</td>
</tr>
<tr>
<td>Feasibility</td>
<td>2.03</td>
<td>2.02</td>
</tr>
<tr>
<td>Understanding</td>
<td>3.02</td>
<td>3.02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom B</th>
<th>Phase B</th>
<th>Phase C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Desirability</td>
<td>2.00</td>
<td>1.77</td>
</tr>
<tr>
<td>Feasibility</td>
<td>2.42</td>
<td>1.78</td>
</tr>
<tr>
<td>Understanding</td>
<td>2.67</td>
<td>1.95</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Classroom C</th>
<th>Phase B</th>
<th>Phase C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Desirability</td>
<td>1.99</td>
<td>1.74</td>
</tr>
<tr>
<td>Feasibility</td>
<td>2.33</td>
<td>1.96</td>
</tr>
<tr>
<td>Understanding</td>
<td>2.85</td>
<td>2.69</td>
</tr>
</tbody>
</table>
Figure 1. Student Behavior

Percentage of intervals of academically engaged, disruptive, and passive off-task behavior.
Figure 2. Decibel Level

Average decibel level per observation.
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