The University of Southern Mississippi

The Aquila Digital Community

Fall 12-2013

A Comparison of Behavioral and Academically-Focused Goals Within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance

Christina Michelle Hardy
University of Southern Mississippi

The University of Southern Mississippi

A COMPARISON OF BEHAVIORAL AND ACADEMICALLY-FOCUSED

GOALS WITHIN THE MYSTERY MOTIVATOR: EFFECTS ON

DISRUPTIVE BEHAVIOR AND ACADEMIC PERFORMANCE

by

Christina Michelle Hardy

Abstract of a Dissertation
Submitted to the Graduate Studies Office
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

December 2013

ABSTRACT

A COMPARISON OF BEHAVIORAL AND ACADEMICALLY-FOCUSED

GOALS WITHIN THE MYSTERY MOTIVATOR: EFFECTS ON DISRUPTIVE

BEHAVIOR AND ACADEMIC PERFORMANCE

by Christina Michelle Hardy

December 2013

Class-wide group contingencies are effective for decreasing inappropriate behavior and increasing academic performance. An interdependent group contingency, a subtype of group contingencies, sets a specific goal for performance across the class, and a reward is delivered only if the group meets the specified criterion. One interdependent group contingency, the Mystery Motivator, has been designed to target behavioral or academically-based goals; however these goals have guided the type of data collected. There are no published studies, to date, that compare behavioral and academic goals and the effects of each type of goal on both decreasing disruptive behavior as well as improving academic performance. The purpose of this study was to test the effects of behaviorally-focused versus academically-focused goals within the Mystery Motivator on students' level of disruptive behavior and level of academic performance. Results of this study showed that the Mystery Motivator with academically-focused goals was equally as effective as the Mystery Motivator with behaviorally-focused goals for reducing the disruptive behavior and increasing the academic performance of three out of four students placed in the general education setting.

ACKNOWLEDGMENTS

Completing one's dissertation is a project never taken on in isolation. As it is commonly believed, "it takes a village to raise a child,"… it also takes a solid school psychology program to raise a successful school-based practitioner and contributing researcher to the field. As such, I would like to begin by recognizing the professors who have supported me during this endeavor. Without the support of Dr. Heather Sterling, Dr. Brad Dufrene, Dr. Joe Olmi, and Dr. Daniel Tingstrom, I would not have been able to complete this project. Although not a formal member of my committee, I would also like to acknowledge Dr. Sterett Mercer for feedback with regard to experimental design and my favorite topic… statistical analyses. A special thank you to Dr. Chris Barry for joining my committee late into this project. Last but not least, I would like to thank Katherine Hannon-Perera, Traci Taber, Allison Battaglia, and Zachary Lebrot, for all of their data collection efforts. May the dissertation force be with you all!

The University of Southern Mississippi

A COMPARISON OF BEHAVIORAL AND ACADEMICALLY-FOCUSED

GOALS WITHIN THE MYSTERY MOTIVATOR: EFFECTS ON DISRUPTIVE

BEHAVIOR AND ACADEMIC PERFORMANCE

by

Christina Michelle Hardy

A Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

Approved:

_Brad Dufrene_____
Director

_D. Joe Olmi_____

_Daniel Tingstrom_____

_Christopher Barry_____

_Susan A. Siltanen_____
Dean of the Graduate School

December 2013

TABLE OF CONTENTS

CHAPTER

           Positive Behavior Interventions and Supports (PBIS)
           Managing Behavior in the Classroom
           Mystery Motivator with Academic Goals
           Mystery Motivator with Behavioral Goals
           Current Study

           Participants and Setting
           Materials and Measures
           Dependent Variables and Data Collection
           Experimental Design
           Procedure

           Dyad 1
           Dyad 2
           Treatment Acceptability

           Limitations and Future Research
           Implications for Applied Practice

LIST OF ILLUSTRATIONS

Figure

CHAPTER I

INTRODUCTION

The Individuals with Disabilities Education Improvement Act (IDEA, 2004) is a federal law that provides specified mandates for providing appropriate educational services to children identified as having a disability. Although the mandates provided in IDEA are targeted towards special education initiatives and programs, the revision of IDEA in 1997 by Congress included a recommendation for *school-wide* supports (i.e., *whole-school approaches*) as a tool to reduce the number of students currently labeled as having disability, thereby reducing the number of students that would potentially be excluded from mainstream educational settings. With the most recent revision of IDEA in 2004, this policy still remains in effect and states:

> (5) Almost 30 years of research and experience has demonstrated that the education of children with disabilities can be made more effective by…
>
> (F) providing incentives for whole-school approaches, scientifically based early reading programs, positive behavioral interventions and supports, and early intervening services to reduce the need to label children as disabled in order to address the learning and behavioral needs of such children. (Individuals with Disabilities Education Act, 20 U.S.C. § 1401(c)(5)(F))

As a result of this revision, many schools have begun adopting evidenced-based, multi-tiered approaches designed to increase the likelihood of success for students that may have otherwise required the need of special education services. School-Wide Positive Behavioral Intervention and Supports (PBIS) is one evidenced-based approach that has been adopted by over 9,000 schools across 40 states (National Technical Assistance

Center for Positive Behavioral Interventions and Supports, 2009) to address the current

educational standards set forth by IDEA (2004) and has been shown to reduce behavioral

problems and increase students' academic performance (Bradshaw, Mitchell, & Leaf,

2009; Horner et al., 2009).

<div align="center">Positive Behavioral Interventions and Supports</div>

PBIS is a framework for incorporating evidenced-based practices into the school

environment that is designed to support the development of appropriate pro-social

behaviors and improve academic outcomes for all students (Sugai & Horner, 2002a).

PBIS is a multi-tiered, prevention-based approach that emphasizes the use of supports at

several levels including school-wide, classroom settings, non-classroom settings, and at

the individual student level. At the universal level (i.e., Tier I), evidence-based practices

are implemented across all students in the entire school, in addition to all students at the

classroom level. These practices typically target approximately 80% of the student

population, resulting in zero to one out-of-classroom referral (i.e., major behavioral

referral resulting in administrator support) for problem behavior throughout an entire

school year (Office of Special Education Programs, 2012-2013). At the classroom level,

Sugai and Horner (2002b) suggest a number of classroom management strategies such

as the use of proactive strategies to manage student behavior that include clearly

identified routines to maximize a student's time spent on instruction, increased rates of

positive interactions, use of pre-corrections, and active supervision as key components

to reducing students' problem behaviors.

Those students who fail to respond to universal systems of behavioral support are

typically referred for supports at the secondary level. At the secondary level (i.e., Tier

II), high efficiency evidence-based practices are implemented, sometimes in small groups to 10% to 15% of the student population, typically resulting in two to five out-of-classroom referrals (i.e., major behavioral referral resulting in administrator support) for problem behavior for these students per year (Office of Special Education Programs, 2012-2013). Students failing to respond to behavioral supports at the secondary level are then referred for tertiary-level supports. At the tertiary level (i.e., Tier III), students have been identified as being at significant risk for behavioral failure, resulting in the need for individualized supports. Usually, 3% to 5% of the student population requires this level of support, with students at this level typically receiving six or more out-of-classroom referrals (i.e., major behavioral referral resulting in administrator support) for problem behaviors per year (Office of Special Education Programs, 2012-2013; Sugai & Horner, 2002a).

<div align="center">Managing Behavior in the Classroom</div>

As schools across the country continue to move forward with the implementation of prevention-based efforts to manage student behavior, the ability of teachers to manage problem behaviors within the classroom setting continues to be a common concern of both teachers and administrators (Harrison, Vannest, Davis, & Reynolds, 2012). With many teachers reporting a lack of training in behavior management strategies during their college coursework (Tillery, Varjas, Meyers, & Collins, 2010), these teachers further indicate that their experience and knowledge with effectively managing student behavior results from on-the-job experience or via consultation support from colleagues. School psychologists are one of the behavioral support staff teachers may consult with regarding the behavior management of their classrooms. As

the responsibilities of school psychologists continue to expand, with increased focus on prevention and systems-level change (NASP, 2006), providing daily direct intervention services to handle specific problem behaviors may not be feasible. Therefore, consultation with teachers may be the preferable means by which to provide efficient and effective behavioral intervention recommendations. Likewise, consultation may be more effective for classroom management concerns because educators are already present in the child's academic environment on a daily basis (Kratochwill & Bergan, 1990); therefore, potentially increasing the teacher's efficacy to an identified intervention.

As a result of the indirect nature of consultation, it is important that school psychologists provide teachers with intervention recommendations that are easily implemented, efficient, and easily sustained within a classroom environment (Zins & Ponti, 1990). As interventions become increasingly complex, the integrity with which those interventions are implemented decreases (Gresham & Gresham, 1982). In response to the need for effective classroom management strategies, researchers have suggested that classroom management, through the use of group contingencies, provides effective treatment, high levels of treatment acceptability, and high levels of treatment integrity (Christ & Christ, 2006; Coogan, Kehle, Bray, & Chafouleas, 2007; Gresham & Gresham, 1982; Kelshaw-Levering, Sterling-Turner, Henry, & Skinner, 2000; Murphy, Theodore, Aloiso, Alric-Edwards, & Hughes, 2007; Shapiro, Albright, & Ager, 1986; Skinner, Skinner, & Sterling-Turner, 2002; Theodore, Bray, & Kehle, 2004; Theodore, Bray, Kehle, & Jenson, 2001).

Group contingencies can be classified into one of three categories: independent, interdependent, and dependent. Independent group contingencies include setting a criterion for reward for the entire class, but each class member's access to the reward is based on their individual performance. Interdependent group contingencies set a specific goal for performance across the class, and the reward is delivered to the entire class only if the group meets the specified criterion. Dependent group contingencies include delivering a reward to the class based on the performance of one, or at most a few, students in the class (Litlow & Pumroy, 1975; Skinner et al., 2002).

Group contingency effectiveness has been assessed in a variety of settings (e.g., classroom, school cafeteria, and home) across a variety of populations. Group contingencies used in isolation and in combination with other treatment elements (e.g., effective instruction delivery, public rule posting, randomized reinforcement criteria) have been used in classroom settings to decrease disruptive behaviors (De Martini-Scully, Bray, & Kehle, 2000; Gresham & Gresham, 1982; Kelshaw-Levering et al., 2000; Musser, Bray, Kehle, & Jenson , 2001; Shapiro et al., 1986; Theodore et al., 2004) and increase prosocial behaviors (Skinner, Cashwell, & Skinner, 2000). In addition, group contingencies have also been used to increase homework completion and accuracy percentages (Madaus, Kehle, Madaus, & Bray, 2003), to increase reading performance (Sharp & Skinner, 2004), to increase spelling performance (Bennett, 2006), and to increase math fluency (Hawkins, Mutsi-Rao, Hughes, Berry, & McGuire, 2009).

In a recent review of the group contingency literature, Theodore, Bray, Kehle, and DioGuardi (2003) indicated that the use of group contingency-based interventions may be considered more advantageous to teachers when compared to individualized student

interventions as they require less time and effort. Furthermore, Theodore et al. (2003) note that the application of the same consequence to all students in the classroom may be easier for teachers, likely increasing the fidelity of implementation and reducing the likelihood that students may feel they are not being treated fairly. In a more recent meta-analysis of the group contingency literature base, Maggin, Johnson, Chafouleas, Ruberto, and Berggren (2012) reviewed 95 studies that evaluated the effectiveness of group contingencies on problem behaviors occurring in the school setting. The results of this analysis indicated that group contingencies are an empirically supported intervention procedure for reducing the disruptive behavior of students both class-wide and individually. The researchers further noted that the majority of studies included in the analysis utilized interdependent group contingencies, suggesting that sufficient empirical data may exist to support the use of interdependent group contingencies, specifically, as an evidenced-based practice. However, this conclusion is limited by the number of studies that included additional group-based contingency features (e.g., dependent group contingencies) in combination with the identified interdependent group contingency. Lastly, additional analyses conducted on the effectiveness of group contingencies across different populations and settings found that contingencies based on the behavior of a group-based performance criterion and contingencies implemented for shorter durations of time were likely more effective in reducing problem behaviors. Few studies reported demographic variables, consequently preventing further analysis on the effectiveness of group contingencies across different populations of students (Maggin et al., 2012).

Gresham and Gresham (1982) suggested the use of group contingencies as an economical solution to classroom management problems. More specifically, in Gresham

and Gresham's comparison on the effectiveness of independent, dependent, and interdependent group contingencies on the disruptive behavior of a special education elementary class, the lowest rate of class-wide disruptive behavior was observed when the interdependent group contingency was in effect. In contrast to Gresham and Gresham (1982), Shapiro et al. (1986) investigation on the effectiveness of dependent group contingencies versus independent contingencies on disruptive behavior of students placed in a setting for behavioral and emotional needs found independent contingencies to be more effective in reducing disruptive behavior. In a more recent evaluation of group contingency effectiveness, Theodore et al. (2004) replicated Gresham and Gresham's (1982) study, utilizing an alternating treatments design as the results of Gresham and Gresham's study were notably limited by the potential of carry-over effects. Theodore et al. (2004) results found substantial decreases in problem behavior across all three contingencies. Although Theodore et al. (2004) findings suggested each type of group contingency would provide equally effective treatment results, utilizing an interdependent group contingency could prove more useful because measuring group performance may be more time efficient for educators, and other students are engaged as behavioral change agents (Gresham & Gresham, 1982; Skinner et al., 2002).

As described previously, interdependent group contingencies emphasize group performance and require a cooperative effort among students. Interdependent group contingencies also have additional advantages. More specifically, Gresham and Gresham (1982) suggested that teachers find it easier to deliver rewards to an entire group of students based on a group criterion rather than assessing individual student performance and providing individual contingent rewards. Providing rewards within an

interdependent group contingency also reduces the likelihood of students stealing rewards from their peers or students sharing their rewards with peers who did not meet the stated criterion (Skinner et al., 2002). Gresham and Gresham (1982) also note that a collateral effect of the cooperative effort facilitated by this type of contingency is improved social skills amongst students.

Despite the aforementioned advantages of interdependent group contingencies, the group nature of this type of contingency may lead to several disadvantages. For example, public posting of rules could lead to bullying behaviors when students are observed engaging in rule-violating behaviors. Student knowledge of the potential reward could lead to students sabotaging the class performance for that day. Furthermore, setting a reward criterion too high or too low could adversely affect contingency effectiveness. A potential solution to these disadvantages would be the randomization of contingency components. More specifically, randomizing the target behavior, randomizing the criteria for reward, and randomizing potential rewards can address potential problems that may result from interdependent group contingencies (Skinner et al., 2002).

Interdependent group contingencies may be designed in a variety of ways. However, one interdependent group contingency, the Mystery Motivator (MM; Rhode, Jenson, & Reavis, 1993), has many of the advantages of interdependent group contingencies (e.g., efficiency and an increased likelihood of prosocial behaviors), in addition to components typically used to address potential weaknesses of this type of contingency (i.e., randomization of intervention components). More specifically, the MM is structured such that students are rewarded on randomly selected days, reducing

the predictability of the class-wide contingency, thereby making the class-wide contingency more effective in increasing desired behaviors (Moore, Waguespack, Wickstrom, Witt, & Gaydos, 1994; Rhode et al., 1993). The MM also incorporates randomly selected rewards that remain unknown to the students until students reveal a "win" for the day. The use of randomized reinforcers is supported by LeBlanc's (1998) investigation which found mystery motivators to be slightly more effective in increasing appropriate behavior than using a reward menu with three out of four students. Lastly, the MM may be used for a group of individuals or with a single individual (Skinner et al., 2002).

The MM requires teachers to establish three to five positively stated behavioral or academic goals for their classroom. A class-wide performance criterion is established based on the identified goal(s) (e.g., the class has to earn five or fewer checks for inappropriate behaviors to earn an opportunity to play the MM). Teachers then determine how frequently they would like students to earn a reward (e.g., three out of five days). A MM chart, which lists each day of the school week, is created and posted in an area visible to all students. The teacher randomly selects which day students will earn a reward and utilizing an invisible-ink pen, the teacher writes an "M" on those days. On the days when students are unable to earn a reward, an "X" is placed in the box with an invisible-ink pen. Prior to beginning the MM, the teacher reviews the established goals. During the intervention, the teacher tracks the frequency of student behaviors or assesses performance of an academic goal. At the end of the pre-determined time for the MM, the teacher informs the class whether they have met the goal. If the goal is met, a student is selected to color in the MM square for that day (utilizing a reveal-ink pen). If an "X" is

revealed in the box, the class does not receive a reward for that day. If an "M" is revealed in the box, the class receives a reward for that day. Rewards for each day may be determined a priori by the teacher or a student may be asked to select a reward from a "reward grab bag" (Rhode et al., 1993). As a packaged intervention, research has demonstrated the MM effective in reducing disruptive behavior (Murphy et al., 2007; Schanding & Sterling-Turner, 2010), increasing academic engagement (Scoggins, 2003), increasing homework accuracy (Madaus et al., 2003), increasing homework completion (Madaus et al., 2003; Moore et al., 1994; Teta, 2008), and reducing noncompliance during bedtime routines (Robinson & Sheridan, 2000).

<center>Mystery Motivator with Academic Goals</center>

Moore et al. (1994) conducted the initial investigation on the effectiveness of MM as a strategy to increase homework completion. More specifically, the researchers implemented the MM across two elementary classrooms identified as having students demonstrating difficulty with homework completion as a result of a performance deficit (i.e., a "won't do") rather than a skill deficit (i.e., a "can't do"). Nine target students were identified across the two classrooms; however, the MM was implemented across the entire group of students for each respective classroom. The results of this study demonstrated increased levels of homework completion (baseline: $M = 64.9\%$, range = 45% - 82%) for the five target students in Classroom A during the MM ($M = 89.4\%$; range = 78% -98%). Although accuracy was not targeted during the MM (i.e., both participating teachers identified goals for homework completion only), increases in accuracy were observed across all of the target students (baseline: $M = 56.6\%$; range = 35% - 74%; and intervention: $M = 81.2\%$; range = 69% - 93%). The four target students

identified in Classroom B showed similar increase in homework completion when the MM was in effect (baseline: $M = 70.1\%$; range $= 62\% - 87\%$; and intervention: $M = 80.8\%$, range $= 62\% - 95\%$). Increases in homework accuracy were observed for three of the four target students (baseline: $M = 52.1\%$, range $= 36\% - 70\%$; and intervention: 65.1%, range $= 52\% - 78\%$) (Moore et al., 1994).

Madaus et al. (2003) also investigated the effectiveness of the MM on homework completion and accuracy percentages. Five general education students (4 males, 1 female) across two classrooms were identified by the principal and their respective teacher for difficulties related to their mathematics homework. Unlike Moore et al.'s (1994) evaluation of the MM utilizing a class-wide application (i.e., interdependent group contingency), Madaus et al. (2003) assessed the effectiveness of the MM for an individual student. More specifically, each target student was provided with their own MM chart with two goals targeting homework completion (i.e., students must turn in their assignment with all math problems complete) and homework accuracy (i.e., students must complete at least 80% of the problems correctly). Students earned a chance to play the MM based on individual performance. Results indicated four of the five target students demonstrated improvements in their homework completion percentages during the MM. The researchers noted that the one student who did not appear to respond to treatment initially had high rates of completion, therefore, leading to a potential ceiling effect. Reliable Change Index (RCI) scores were calculated for each student's homework accuracy, indicating significant improvement for three of the five target students (2 students' performances were significant at the level $p < 0.05$); 1 student's performance was significant at the level $p < .01$; Madaus et al., 2003).

Teta (2008) furthered the MM literature base by investigating the effectiveness of this intervention in increasing homework completion for elementary students diagnosed with Attention Deficit/Hyperactivity Disorder (ADHD). Similar to Madaus et al. (2003) study, the researchers utilized individual MM charts which indicated that the student would be allowed to play the MM if their assigned homework was complete upon submission to the teacher. The results indicated that the MM was effective in increasing homework completion percentages for all participating students. More specifically, baseline levels of performance indicated that participants one through seven completed $M = 11\%$, $M = 30\%$, $M = 10\%$, $M = 30\%$, $M = 40\%$, $M = 30\%$, and $M = 40\%$ of their homework, respectively. Upon implementation of the MM, the mean percentage of homework completed by participants one through seven was 70%, 100%, 30%, 80%, 90%, 90%, and 80%, respectively. When the intervention was withdrawn, decreases in homework completion percentages were observed for participants two, three, four, and five only (i.e., mean percentage of homework problems completed by participants two, three, four, and five was 53%, 20%, 0%, and 70%, respectively). Participants one, six, and seven showed performance at levels observed during the first intervention phase. Once treatment was reinstated, the mean percentage of homework problems completed for participants one through seven was 70%, 80%, 90%, 60%, 70%, 100%, and 100%, respectively. Medium to large effect sizes were observed for six of the seven participants (effect sizes for participants one through seven were 1.76, 1.24, 1.58, .83, .03, -1.1, and .95, respectively). Further analysis of academic performance (i.e., student grade point averages) revealed improvement in only two students. Teta suggested possible ceiling effects for the lack of student improvement. In addition, Teta noted that two students

demonstrated accuracy problems which may have contributed to the lack of observed overall academic gains. Although this analysis provided some measure of generalization in academic performance, it is unclear whether students' grades were increasing due to improved performance on varied academic tasks or by simply turning their homework in for a higher grade.

<div align="center">Mystery Motivator with Behavioral Goals</div>

Scoggins (2003) utilized two multiple baseline designs across classrooms (A-B-C versus A-C-B) to assess the differential effectiveness of two types of reinforcement systems within the MM on academically engaged behavior (AEB). Academically engaged behavior was defined as students attending or engaging with the assigned academic activity. More specifically, this study compared the effectiveness of the MM with unknown (i.e., mystery envelope) rewards versus the MM with an identified reward menu (i.e., the students voted on a reward and were provided with the reward that received the highest number of votes prior to participating in the MM). Furthermore, the criterion for performance was set by the teacher each day and reviewed with the class prior to the MM. Results of this study showed an increase in the level of AEB for both intervention phases. Further analysis revealed a differential treatment effect for the two intervention phases. More specifically, the MM appeared to be more effective when rewards were unknown to the students. As such, this study provides further support for the MM as originally described by Rhode et al. (1993).

Schanding and Sterling-Turner (2010) investigated the effectiveness of the MM in a high school class to reduce disruptive behavior. The results of this study showed immediate decreases in the level of disruptive behavior observed during baseline

(participant 1: $M = 71\%$; participant 2: $M = 51.8\%$; participant 3: $M = 54\%$; class-wide performance: $M = 26.5\%$) when the MM was implemented (participant 1: $M = 21.75\%$; participant 2: $M = 21.5\%$; participant 3: $M = 17.67\%$; class-wide performance: $M = 10\%$) for all four identified target students and the entire class. During the natural (i.e., unexpected withdrawal related to teacher's absence) withdrawal phase, the level of disruptive behavior increased to a levels similar to those observed during baseline (participant 1: $M = 80\%$; participant 2: $M = 80\%$; participant 3: $M = 100\%$; class-wide performance: $M = 36\%$). When the intervention was reinstated, disruptive behavior immediately decreased for all participants and the entire class (participant 1: $M = 30\%$; participant 2: $M = 13.5\%$; participant 3: $M = 10\%$; class-wide performance: $M = 12\%$). The second planned withdrawal phase also resulted in an increase in disruptive behavior for each student and the entire class (participant 1: $M = 67\%$; participant 2: $M = 33\%$; participant 3: $M = $ not reported%; class-wide performance: $M = 18\%$). Although the class-wide measure increased slightly; disruptive behavior remained much lower than observed baseline levels. Finally, during the last treatment phase, decreases in disruptive behavior consistent with previous intervention phases were observed for all participants (participant 1: $M = 33.33\%$; participant 2: $M = 11\%$; participant 3: $M = 0\%$; class-wide performance: $M = 8\%$). Although the study adds to the limited literature base of classroom contingency management in a secondary school setting, replication is needed. Data were only collected approximately two days per week, limiting the length of each experimental phase. More specifically, the short length of the second intervention phase (i.e., only two observations) makes it impossible to evaluate trends (Schanding &

Sterling-Turner, 2010) in students' performance. Despite these limitations, the study

provides support for use of the MM in a secondary-level education setting.

<div align="center">Current Study</div>

The purpose of the present study was to combine the current MM literature base

to examine the effects of behaviorally-focused goals versus academically-focused goals

on disruptive behaviors and academic performance. Although the MM has been proven

effective in reducing inappropriate behaviors, it is unclear whether these effects

generalize to increase academic performance. Furthermore, when academic goals are the

focus of the MM, it is unclear whether increases in academic performance are a result of

less disruptive behavior. Although some studies have suggested that academic

performance and behavior are often perceived as functionally related variables

(Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008), a more recent evaluation

conducted by Algozzine, Wang, and Violette (2010) found no direct relationship between

those two variables when evaluating the relationship between social behavior and reading

performance. Without causal evidence that academic performance and behavior are

interrelated variables, it is important that school-based consultants are able to provide

efficient and easily maintained, evidenced-based practices designed to improve both

social and academic gains. As such, this study was designed to evaluate which version of

the MM would provide the most efficacious treatment for reducing disruptive behavior

and increasing academic performance. This study addressed the following research

questions:

1. Will the implementation of the MM class-wide intervention with behavior-focused targets/goals decrease inappropriate behavior below the levels observed during baseline for a target student?

2. Will the implementation of the MM class-wide intervention with behavior-focused target/goals increase academic performance (completion and accuracy) above those levels observed during baseline for a target student?

3. Will the implementation of the MM class-wide intervention with academic-focused targets/goals decrease inappropriate behavior below levels observed during baseline for a target student?

4. Will the implementation of the MM class-wide intervention with academic-focused target/goals increase academic performance (completion and accuracy) above those levels observed during baseline for a target student?

5. Will the levels of inappropriate behavior and academic performance differ across treatment phases (behavior-focused goals vs. academic-focused goals)?

CHAPTER II

METHODS

Participants and Setting

Four lower elementary school (i.e., third and fourth grade) students were selected from four general education classrooms across several schools in the northeast and one school in the southeastern United States. The participants were referred by building administrators for (a) poor work completion in mathematics (i.e., completed an average of 70% or less of math seatwork) and (b) engaging in disruptive behavior (e.g., off-task behavior). Criteria for participation also included brief screeners for behavior and current grade level performance in mathematics computation. Informed consent was obtained from the participating students' legal guardian(s) and their teacher prior to participation (see Appendix A and B).

Alex, an eight-year-old Caucasian male attending third grade in the northeast, was referred for participation due to his frequent off-task behaviors and failure to complete his independent seatwork. Max, an eight-year-old Caucasian male attending third grade in the northeast, was referred for participation as the original target student after the target student in his classroom selected for participation dropped out of the study due to medical reasons. Max was initially one of three students screened as a potential participant from his classroom; however, the initial target student was selected based on a higher percentage of disruptive behavior recorded during the initial behavior screener. Although Max was placed in the general education setting, he received pull-out special education services in a self-contained classroom several hours a day as a result of an Emotional Disturbance ruling. Max's teacher indicated that he was frequently off-task

and often talked to his classmates without permission. Andy, a ten-year-old Hispanic

male attending fourth grade in the northeast, was referred for participation due to his

frequent off-task behavior and inability to complete mathematics assignments during a

specified time(s). Davin was a nine-year-old, African American male referred for

participation due to his disruptive behavior and poor academic performance. Davin

attended school in the southeastern United States and was placed in a third grade general

education classroom for mathematics; however, he spent most of his day in a behavioral

support classroom as a result of an Emotional Disturbance ruling.

Behavior and Academic Screener

Target students were screened for participation utilizing a 20 minute observation

during the target student's mathematics class. A 10 second partial interval recording

procedure was used to record disruptive behavior, and those students observed engaging

in disruptive behavior in at least 20% of the observed intervals proceeded with the

curriculum-based assessment. Target students who met criteria for inclusion in this study

based on the behavioral observation were then required to complete a direct skill

assessment to assess their current level of academic functioning. The procedure used in

this study was similar to the assessment procedure described in Shapiro and Lentz (1985),

requiring the student to complete three AIMSweb Math – Curriculum Based

Measurement (M-CBM) probes per assessed grade level. The number of digits correct

per minute and the number of digits incorrect per minute were calculated, and the median

scores were compared to Deno and Mirkin's (1977) criteria for determining frustrational,

instructional, and mastery levels of academic performance for math computation. Based

on the results of this assessment, each target student was provided with grade-level

M-CBM probes throughout the entire study. All students met the criteria (i.e., engaged in disruptive behavior for at least 20% of observed intervals and demonstrated grade-level performance for math computation) for participation in the current study; however, a third student in Max's class did not complete the academic screener as Max was identified as the target student for the remainder of the study.

Andy. During screening, Andy was observed engaging in disruptive behavior during 43% of observed intervals. Based on Andy's behavioral screener, a curriculum-based assessment was conducted to determine Andy's current level of performance for math computation. The curriculum-based assessment was conducted by giving Andy three grade-level, multi-skill M-CBM probes. Andy's median score was 22 correct digits per minute and 6 incorrect digits per minute, placing him in the instructional range for 4th grade per Deno and Mirkin's (1977) criteria.

Davin. During screening, Davin was observed engaging in disruptive behavior during 42% of observed intervals. Based on Davin's behavioral screener, a curriculum-based assessment was conducted to determine Davin's current level of performance for math computation. The curriculum-based assessment was conducted by giving Davin three grade-level, multi-skill M-CBM probes. Davin's median score was 11 correct digits per minute and 2 incorrect digits per minute, placing him in the instructional range for 3rd grade per Deno and Mirkin's (1977) criteria.

Alex. During screening, Alex was observed engaging in disruptive behavior during 33% of observed intervals. Based on Alex's behavioral screener, a curriculum-based assessment was conducted to determine Alex's current level of performance for math computation. The curriculum-based assessment was conducted by giving Alex three

grade-level, multi-skill M-CBM probes. Alex's median score was 14 correct digits per minute and 2 incorrect digits per minute, placing him in the instructional range for 3rd grade per Deno and Mirkin's (1977) criteria.

Max. During screening, Max was observed engaging in disruptive behavior during 30% of observed intervals. As Max was not initially selected as the target student for his class, a curriculum-based assessment was not conducted after the behavioral screener. More specifically, once Max was identified as the target student, a curriculum-based assessment was conducted to verify he was on grade level for mathematics as his participation during previous data collection sessions utilized grade level M-CBM probes. The curriculum assessment was conducted by giving Max three grade-level, multi-skill M-CBM probes. Max's median score was 14 correct digits per minute and 3 digits incorrect per minute, placing him in the instructional range for 3rd grade per Deno and Mirkin's (1977) criteria.

<div align="center">Materials and Measures</div>

Problem Identification Interview

The primary researcher conducted a semi-structured interview utilizing the Problem Identification Interview (*PII*; Kratochwill & Bergan, 1990) with each referring teacher to identify specific problem behavior and academic referral concerns. The interview included questions that asked the teacher to (a) identify inappropriate behaviors for the target student as well as for the class as a whole, (b) identify goals for reductions of inappropriate behaviors, (c) identify what methods have been used and/or attempted to address the inappropriate behaviors in the past (d) identify academic goals for the target student as well as for the class as a whole, (e) identify hypothesized levels of academic

functioning for the target student, and (f) to identify what methods have been used and/or attempted to address poor academic performance in the past (see Appendix C). Currently, psychometric properties are not reported for the PII; however, the PII is a commonly used instrument in behavioral consultation (Zuckerman, 2005).

Intervention Rating Profile-15 (IRP-15)

Teacher satisfaction with intervention procedures were measured using the Intervention Rating Profile-15 (*IRP-15*; Martens, Witt, Elliott, & Darveaux, 1985; see Appendix D). The *IRP-15* requires teachers to rate their satisfaction with the intervention on a 1 = "Strongly Disagree" to 6 = "Strongly Agree" Likert scale for 15 items, and all items load on the single factor general acceptability (Martens et al., 1985). The cut-off for an "acceptable" treatment is set at 52.50. The *IRP-15* is reported to have high internal consistency, Cronbach's alpha = .98 (Martens et al., 1985). The *IRP-15* was modified for a post-intervention measure and adapted to fit the MM and was completed by the teacher after each respective intervention phase (Von Brock & Elliot, 1987). Research has shown that modifying the *IRP-15* as a post-intervention measure for a specified intervention does not alter the internal consistency of the scale (Freer & Watson, 1999; Sheridan, 1992).

Children's Intervention Rating Profile (CIRP)

Student satisfaction with the MM was measured using the Children's Intervention Rating Profile (*CIRP*; Witt & Elliot, 1985; See Appendix E). The *CIRP* is a seven-item rating scale that requires students to rate their satisfaction with the intervention on a 6 point Likert scale (1 = "Strongly Disagree" to 6 = "Strongly Agree"), with higher ratings indicating higher intervention acceptability. The *CIRP* is written on a fifth grade

readability level; therefore, the *CIRP* was administrated by reading the questions aloud to the entire classroom and answering student questions about the rating scale accordingly. The *CIRP* is reported to have high internal consistency, Cronbach's alpha = .89 (Witt & Elliot, 1985).

Math Probes

Multi-skill mathematics computation probes were utilized from AIMSweb.com. The probes are specific to a student's expected level of performance given their current grade and may be a tool used for screening for at-risk status and progress monitoring a student's response to intervention (Shinn, 2004). For the purpose of this study, math computation probes from grades three and four were utilized. Two-page math computation probes were provided to students via a double-sided, single printed sheet. Based on previous research evaluating the internal consistency of the mathematics computation probes, the reported Cronbach's alpha for AIMSweb M-CBM probes is .93 (NCS Pearson Inc., 2010).

<div align="center">Dependent Variables and Data Collection</div>

Behavioral Performance

Data for two dependent measures (i.e., disruptive behavior and academic performance) were collected across all phases. Disruptive student behavior was based on specific teacher referral concerns. Individual behaviors were later aggregated into a summary measure of disruptive behavior, consequently providing the percentage of intervals in which problem behavior occurred.

Dyad 1

Andy. As per Andy's teacher's report that his most problematic behaviors included being off-task and talking to his peers without permission, Andy was recorded as engaging in disruptive behavior any time he was considered to be off-task or engaging in inappropriate vocalizations. Off-task behavior was defined as Andy's eyes not being in contact with the presented math worksheet for three or more seconds. Inappropriate vocalizations were defined as any academically irrelevant verbal behavior Andy engaged in, which included talking to his teacher or peers without permission and making noises with his mouth (e.g., humming or rapping quietly to himself).

Davin. As per Davin's teacher's report that his most problematic behaviors were off-task behavior, getting out of his seat without permission, and talking without permission, Davin was recorded as engaging in disruptive behavior any time he was considered to be off-task, talking without permission, and any time he was out of his seat without permission. Off-task behavior was defined as Davin's eyes not being in contact with the presented math worksheet for three or more seconds. Inappropriate vocalizations (i.e., talking without permission) were defined as any academically irrelevant verbal behavior Davin engaged in, which included talking to his teacher or peers without permission or making any noises/sounds with his mouth as Davin's teacher indicated his inappropriate vocalizations often included laughing at other peers engaging in inappropriate behaviors. Out of seat behavior was recorded anytime Davin's buttocks or legs (he was allowed to sit on his knees) were no longer in contact with the seat.

Dyad 2

Alex. As per Alex's teacher's report that his most problematic behaviors were having challenges staying on task with independent seatwork and frequently talking to his

peers, Alex was recorded as engaging in disruptive behavior anytime he was observed as off-task or talking and/or laughing with his peers without permission. Off-task behavior was defined as any instance of Alex's eyes no longer in contact with the presented math worksheet for three or more seconds. Inappropriate vocalizations were defined as any instance Alex was observed talking to his peers or laughing at his peers without teacher permission.

Max. As per Max's teacher's report, his most frequent problem behaviors were failure to complete his work as a result of being easily distracted and/or frequently off-task and talking to his peers without permission, Max was recorded as engaging in disruptive behavior any time he was observed off-task or talking with any of his classroom peers. Off-task behavior was defined as Max's eyes no longer being in contact with the presented math worksheet. In addition, Max's teacher indicated that Max typically played with his pencils and erasers while off-task. Therefore, Max was recorded as engaging in disruptive behavior any time he was observed playing with objects in any fashion other than that objects intended purpose. Inappropriate vocalizations included any instance Max talked with his peers. Playing with objects was defined as any instance Max was observed using an object for any reason other than that objects intended purpose (e.g., flying a pencil through the air as an airplane instead of using the pencil to write).

Observations were conducted three to five times per week during each target student's mathematics class. Observations varied from ten to fifteen minutes, based on the allotted time for mathematics seatwork for each class. More specifically, Alex, Max, and Davin's teachers consistently provided fifteen minutes to complete the assigned math worksheet, whereas, Andy's teacher consistently provided ten minutes to complete the

assigned math worksheet. The frequency of behavior was recorded within intervals utilizing a continuous 10 s recording procedure. Frequency within intervals was utilized in order to establish behavioral criterion(s) for the behavioral version of the MM. The data were utilized to calculate the total percentage of intervals with disruptive behavior.

Although not a primary dependent variable of interest, class-wide behavioral and academic performance were also assessed as the MM was implemented across all students in each class utilizing an interdependent group contingency. More specifically, during each observation session, three comparison peers were randomly selected. Observers rotated to a different student for each10 s interval (i.e., target student was observed for the first 10 s interval, and the first peer comparison was observed for the second 10 s interval; the target student was observed for the third 10 s interval, and the second peer comparison was observed for the fourth 10 s interval; and so on until the observation ended. During each interval, the observer recorded the frequency of disruptive behaviors for any of the identified aggregated variables for each target student (see Appendix F for sample data collection sheet). The percentage of intervals students were observed engaging in disruptive behavior was calculated. The disruptive behaviors identified for each target student were those used when collecting peer comparison data as well.

Academic Performance

Academic performance (i.e., work completion and accuracy) was assessed utilizing AIMSweb M-CBM probes. AIMSweb M-CBM probes varied in level of difficulty across participants as the probes used for each target student were based on their current level of performance as indicated by an academic screener conducted prior

to the beginning of the study. Work completion was defined as the number of problems completed divided by total number of problems on the worksheet. Accuracy was defined as the number of problems solved correctly divided by the number of problems completed at the end of the instructional period. Both accuracy and completion measures were converted to percentages. Class-wide academic performance was calculated by collapsing the completion and accuracy measures across the three students identified as peer comparisons. More specifically, each peer comparison's score was summed and divided by the total number of peers observed.

Experimental Design

Two separate multiple baseline designs across two pairs of target students (A-B-C vs. A-C-B) with counterbalancing of interventions were utilized to assess the effects of behaviorally-focused versus academically-focused goals within the MM on the level of disruptive behavior and on academic performance. The design included a baseline condition (A), the MM with behavior-focused goals (B), and the MM with academically-focused goals (C). Phase changes were made when observable treatment effects were seen in the target student's completion percentages. More specifically, phase changes were made when stable responding was observed or data were observed trending in an undesirable direction (e.g., decreasing trend in the amount of work completed). Academic performance was selected as the dependent variable for phase change as immediate decreases in disruptive behavior have been observed with the MM (Schanding & Sterling-Turner, 2010). It was hypothesized that observable treatment effects in academic performance may not be as immediate upon implementation of the MM, limiting the

scope of observable treatment effects on academic performance if phase changes were made prematurely based on behavioral data.

<div align="center">Procedure</div>

Once students were identified as potential participants for (a) engaging in frequent disruptive behaviors and (b) completing an average of 70% of less of their mathematics assignments, parents were notified via phone call from the teacher and a follow-up written consent form for their child's participation was sent home. Once written consent was provided by the target student's legal guardian(s), a brief behavioral screener was conducted to assess the student's level of problem behavior. If the student met criteria for inclusion into the study, a brief curriculum-based assessment followed to identify the student's current level of academic performance for math computation.

Baseline (A)

During the baseline condition, no contingencies were in effect. The students (i.e., all students in each respective target student's class) were provided with M-CBM probes for a predetermined amount of time which was based on the average length of time the teacher felt the students would need to complete the probe. Students were instructed to complete the probe as their independent seatwork assignment for math for the day. Observations were conducted to assess the level of disruptive behavior of the target student and comparison peers as students completed the probes. The probes were collected by the consultant at the end of each observation session and scored to assess the academic performance of the target student and comparison peers.

Teacher Training. Each teacher was provided with all materials necessary to implement the MM, including implementation guidelines, an MM chart, blank AIMSweb

M-CBM probes, and tangible reinforcers. Upon completion of the baseline phase and prior to the implementation of the second intervention phase, the primary investigator provided a didactic training that included a review of the MM implementation guidelines and corresponding scripts as well as an opportunity for role-playing with follow-up performance feedback (see Appendix G and H). In addition, each teacher was provided with performance feedback on adherence to the provided scripts and guidelines after the first day of implementation for each intervention phase based on treatment integrity checklists conducted by the primary investigator at the conclusion of each observation session (see Appendix I and J). Lastly, it was determined that teachers failing to implement the MM with at least 90% integrity (including the implementation of all steps identified as 'critical items'), would be provided with additional didactic training prior to the next schedule session. It should be noted that each teacher implemented the MM with 90% or higher treatment integrity across both intervention phases; therefore, additional teacher training sessions were not needed.

During each teacher training session, criterion level(s) for a chance to play the MM were established via a collaborative consultation model. More specifically, teachers were provided with baseline levels of performance and asked to identify a criterion level for the behavioral and academically-focused versions of the MM. The criterion level for the behavior-focused MM (e.g., the class as a whole must earn five or fewer checkmarks for inappropriate behavior) was based on inter-interval frequency data collected on the target student's and comparison peer's behavior during baseline. The criterion level for both work completion and accuracy were also based on the median score for each respective academic measure for the target student and the identified peer comparison

students. During the consultation process, teachers were encouraged to select a goal

within the student's current range of performance. Teachers were informed that setting

the goal(s) too high could reduce the likelihood of the students earning a chance to play

the MM as a result of skill related deficits that would be better addressed via direct

teaching strategies focused on accuracy and fluency. Prior to the implementation of the

MM, the teachers also completed an informal preference assessment with the entire class

to identify activity-based and tangible rewards the students would like to earn during the

MM. Rewards included homework passes, small edibles, extra points on assignments,

small tangibles (e.g., bouncy balls, bookmarks, and bracelets), and extra recess/gym time.

Dyad 1

    Andy's Class. Upon review of data collected during baseline, Andy's teacher

determined that the behavioral goal for the classroom would focus on staying on-task.

Although the consultant suggested that additional goals be included in the game related to

working quietly, the teacher felt that working quietly was one of the key features to

staying on task. As such, when providing the students with an overview of what the target

behavior(s) looked like, the teacher provided both examples and nonexamples of "staying

on-task." Within the examples provided to the classroom, the teacher included working

quietly and keeping your eyes on your own sheet of paper. During baseline, Andy and his

peers were observed engaging in disruptive behavior an average of 13 instances during

the 10 minute work period (range = 6 to 17 instances of behavior). As such, Andy's

teacher determined that the class would earn a chance to play the MM-B if they received

six or fewer checkmarks for engaging in disruptive behavior. With regard to the MM-A,

the teacher reviewed baseline data collected on the class average completion and

accuracy percentages, determining that the students would be able to earn a chance to play the MM-A if the class completed an average of 85% of their math worksheet and got at least an average of 80% correct.

Davin's Class. Upon review of data collected during baseline, Davin's teacher determined that the behavioral goal for the classroom would focus on staying on-task, working quietly, and staying in one's assigned seat. As Davin and his peers were frequently observed engaging in disruptive behavior ($M = 28$ instances of behavior during 15 minute work period; range = 22 to 52 instances of behavior), Davin's teacher selected a goal much higher than goals utilized in previous studies. More specifically, Davin's teacher determined that the class would earn a chance to play the MM-B if they received 25 or fewer checkmarks for engaging in disruptive behavior. With regard to the MM-A, the teacher reviewed baseline data collected on the class average completion and accuracy percentages, determining that the students would be able to earn a chance to play the MM-A if the class completed an average of 60% of their math worksheet and got at least an average of 65% correct.

Dyad 2

Alex. Upon review of data collected during baseline, Alex's teacher determined that the behavioral goal for the classroom would focus on staying on-task. Although Alex's target behaviors included off-task behavior and inappropriate vocalizations, it was anecdotally noted by the consultant that Alex was observed generally engaging in off-task behavior (i.e., looking out window during assignment). Alex's classroom peers engaged in similar behaviors. As such, it was determined in collaboration with the teacher that the primary behavioral goal would focus on staying on-task during the math

seatwork assignment. Furthermore, Alex and his peers were observed engaging in disruptive behavior during baseline an average of 22 instances during a 15 minute work period (range = 21 to 24 instances of behavior). Alex's peers were observed engaging in disruptive behavior infrequently during baseline ($M = 2$ instances of behavior during 15 minute work period; range = 2 to 8 instance of behavior). Although the rate of disruptive behavior was much higher when Alex was included into the data set, Alex's teacher indicated that she felt the class as a whole engaged in disruptive behavior infrequently. Therefore, she would like a behavioral goal that would not permit a high rate of disruptive behavior to occur during seatwork. As such, Alex's teacher determined that the class would earn a chance to play the MM-B if they received three or fewer checkmarks for engaging in disruptive behavior. With regard to the MM-A, the teacher reviewed baseline data collected on the class average completion and accuracy percentages, determining that the students would be able to earn a chance to play the MM-A if the class completed an average of 85% of their math worksheet and got at least an average of 85% correct.

Max. Upon review of data collected during baseline, Max's teacher determined that the behavioral goal for the classroom would focus on staying on-task. Similar to Andy's teacher, Max's teacher also felt that on-task behavior included working quietly. In addition, as Max's peers were not observed playing with objects during baseline, Max's teacher felt that providing clear examples of on-task behavior in comparison to off-task behavior would be sufficient to address behaviors that included playing with objects. Max and his peers were observed engaging in disruptive behavior during baseline an average of 17 instances during a 15 minute work period (range = 12 to 30

instances of behavior). As Max's peers were infrequently observed engaging in disruptive

behavior ($M = 5$ instances of behavior during 15 minute work period; range = 2 to 8

instances of behavior), Max's teacher determined that the class would earn a chance to

play the MM-B if they received three or fewer checkmarks for engaging in disruptive

behavior despite higher rates of behavior during baseline observations. Similar to Alex's

teacher, Max's teacher indicated that she did not feel the goal should be higher as it

would permit the occurrence of more frequent disruptive behaviors. With regard to the

MM-A, the teacher reviewed baseline data collected on the class average completion and

accuracy percentages, determining that the students would be able to earn a chance to

play the MM-A if the class completed an average of 85% of their math worksheet and got

at least an average of 80% correct.

Mystery Motivator with Behavior-Focused Goals (MM-B)

On the first day of the MM-B phase, the teacher introduced the MM by informing

the students that they were going to play a class-wide game to improve their behavior

while completing their daily mathematics seatwork. The teacher oriented the students to

the MM chart (posted at the front of the classroom) which identified one to three

behaviorally-focused rules. Rules were positively stated (e.g., "stay on-task") and based

on each teachers' referral concern for the identified target student. Class-wide disruptive

behaviors were also considered in the development of the behavioral expectations as the

MM was applied utilizing an interdependent group contingency. The MM chart also

included each day of the week (i.e., Monday through Friday). A 4x6 manila envelope,

labeled "Play the MM" was attached to the chart under the corresponding day (e.g., if the

MM was introduced on Wednesday, the envelope was placed on the section of the chart

corresponding with Wednesday). Five slips of paper, labeled with an "X" or "M," were placed in the envelope (i.e., two "X's" and three "M's"). At the top of the MM chart, a second 4x6 manila envelope, labeled "Reward" was attached. Rewards for each day were randomly selected by the teacher and placed in the envelope for the students to reveal if they were able to earn a reward (i.e., met the established performance criterion and selected an "M"). Rewards that were activity-based or too large to fit inside the reward envelope were written down on a slip of paper and enclosed in the envelope. Lastly, in the MM-B phase, a disruptive behavior tracking sheet was posted so the teacher could publically record each instance of inappropriate behavior.

The teacher further explained the MM by reading each behavioral expectation aloud to the class, accompanied by a physical demonstration of what the behavioral expectation looked like (e.g., the teacher modeled on-task behavior for the students by completing her assignment with a quiet voice). The students were then asked to model each expected behavior to ensure the behavioral expectations were understood. The teacher further explained that each time a student in the class violated one of the stated behavioral expectations, the class as a whole would earn a checkmark. Furthermore, the teacher informed the students of their specific goal for earning a chance to play the MM (e.g., five or fewer checkmarks for inappropriate behavior). If the students met the criterion, one student would be randomly selected to pull a slip of paper from the "Play the MM" envelope. If the student selected an "M" from the envelope, the entire class earned a reward; however, if the student selected an "X," the class was provided with verbal praise and encouraged to try the next time. After introducing and posting the MM chart, the teacher reviewed the potential rewards the students could earn if they met the

stated criterion and selected an "M" from the "Play the MM" envelope. Students were only able to access the MM reward envelope if they met the criterion to play the MM and an "M" was selected from the "Play the MM Envelope."

After reviewing the MM with the entire class, the students were provided with a novel AIMSweb M-CBM probe and instructed to complete the worksheet independently as their independent seatwork activity for approximately 15 minutes (note: one teacher provided 10 minutes to complete the worksheet and three teachers provided 15 minutes to complete the worksheet). The teacher moved throughout the group as they completed their worksheets and publically tracked the occurrence of disruptive behavior in the designated area of the MM chart. When the predetermined amount of time ended for the given task, the teacher prompted the students to turn in their assignment, which was scored by the primary investigator. All worksheets were returned to the teacher once scored and provided to the students later during the week. Each worksheet factored into the student's participation grade for mathematics. Implementation of the MM during the remainder of the MM-B phase included a brief, scripted reminder of the MM guidelines followed by the presentation of an M-CBM probe for the student's independent seatwork assignment. The length of time allotted to complete the task remained constant across all phases of the study.

Mystery Motivator with Academic Focused Goals (MM-A)

On the first day of the MM-A phase, the teacher introduced the MM by informing the students that they were going to play a class-wide game while completing their daily mathematics seatwork to improve their behavior. The teacher oriented the students to the MM chart (posted at the front of the classroom) which identified two academically-

focused goals. The MM chart also included each day of the week (i.e., Monday through Friday). A 4x6 manila envelope, labeled "Play the MM" was attached to the chart under the corresponding day (e.g., if the MM was introduced on Wednesday, the envelope was placed on the section of the chart corresponding with Wednesday). Five slips of paper, labeled with an "X" or "M," were placed in the envelope (i.e., two "X's" and three "M's"). At the top of the MM chart, a second 4x6 manila envelope, labeled "Reward" was attached. Rewards for each day were randomly selected by the teacher and placed in the envelope for the students to reveal if they were able to earn a reward (i.e., met the established performance criterion and selected an "M"). Rewards that were activity-based or too large to fit inside the reward envelope were written down on a slip of paper and enclosed in the envelope.

The teacher further explained the MM by reading each academic expectation aloud to the class (e.g., the class as a group must complete at least an average of 80% of their assignment and must earn at least an average of 85% correct on their assignment). Teachers then explained how an average was calculated based on their individual scores and answered any follow-up questions the students had. The students were informed that upon completing their math worksheet, the primary investigator would score the submitted assignments and inform the class if they had met the criteria to play by the end of the school day. If the students met the criteria, one student would be randomly selected to pull a slip of paper from the "Play the MM" envelope. If the student selected an "M" from the envelope, the entire class earned a reward; however, if the student selected an "X," the class was provided with verbal praise and encouraged to try the next time. After introducing the MM chart and reviewing the guidelines for earning a chance

to play the MM, the teacher reviewed the potential rewards the students could earn if they met the stated criterion and selected an "M" from the "Play the MM" envelope. Students were only able to access the MM reward envelope if they met the criteria to play the MM and an "M" was selected from the "Play the MM."

After reviewing the MM with the entire class, the students were provided with a novel AIMSweb M-CBM probe and instructed to complete the worksheet independently as their independent seatwork activity for approximately 15 minutes (note: one teacher provided 10 minutes to complete the worksheet and three teachers provided 15 minutes to complete the worksheet). The teacher moved throughout the group as they completed their worksheets. When the predetermined amount of time ended for the given task, the teacher prompted the students to turn in their assignment, which was scored by the primary investigator. All worksheets were returned to the teacher once scored and provided to the students later during the week. Each worksheet factored into the student's participation grade for mathematics. Implementation of the MM during the remainder of the MM-A phase included a brief, scripted reminder of the MM guidelines followed by the presentation of an M-CBM probe for the student's independent seatwork assignment. The length of time allotted to complete the task remained constant across all phases of the study.

Interobserver Agreement and Treatment Integrity

Interobserver agreement (IOA) was calculated for at least 30% of the observations conducted for each participant across each phase of the study based on observations conducted by trained primary and secondary observers. Interobserver agreement for disruptive behavior was calculated based on the number of agreements for the occurrence

and nonoccurrence of the target behavior divided by the total number of agreements and disagreements. The score was converted to a percentage by multiplying by 100. Secondary observers were trained by the primary investigator until an agreement score of 90% or higher was obtained prior to independent data collection. Average IOA was 98% for Alex (range = 87% - 100%), 97% for Max (range = 91% -100%), 96% for Andy (range = 92% - 98%), and 97% for Davin (range = 91% - 100%). Interscorer agreement was also calculated for permanent product data collected on completion and accuracy percentages. Interscorer agreement was calculated by dividing the total agreements by the total number of agreements and disagreements, and then multiplying by 100. Average interscorer agreement was 100% for all participants for both completion and accuracy measures.

Treatment integrity checklists were developed for each intervention phase (see Appendix J and K). The teacher and the primary investigator completed the treatment integrity checklist after each intervention session. Treatment integrity scores were calculated by taking the number of steps implemented, divided by the total possible steps and then multiplying by 100. The implementation scripts provided to the teacher were developed such that if the teacher(s) followed the script, they would be able to implement the MM with 100% procedural integrity. As such, procedural integrity scores were 100% for Andy, Davin, Alex, and Max's teachers across both treatment phases. A trained observer also completed the integrity checklists during 30% of observations for each phase. Interobserver agreement scores for all treatment integrity observations were 100%.

CHAPTER III

RESULTS

Dyad 1

Figure 1 shows the percentage of intervals during which Andy and Davin were observed engaging in disruptive behavior during baseline, the MM-A phase, and the MM-B phase. Figure 2 shows the percentage of math problems completed and the percentage of problems completed accurately by both Andy and Davin during baseline, the MM-A phase, and the MM-B phase. Figure 3 shows the percentage of intervals Andy's and Davin's classes were observed engaging in disruptive behavior during baseline, the MM-A phase, and the MM-B phase. Figure 4 shows the percentage of math problems completed and the percentage of problems completed accurately by Andy's and Davin's classes.

Andy

Target Student Performance. During baseline, Andy's disruptive behavior was slightly variable and occurred an average of 34% of observed intervals (range = 20% - 47%). With regard to academic performance, Andy also demonstrated slightly variable and low performance for work completion ($M = 47.7\%$; range = 32% - 60%); however, Andy's accuracy remained high and stable ($M = 95\%$; range = 93% - 96%). Disruptive behavior showed an immediate decrease upon implementation of the MM-A ($M = 4.6\%$; range = 0% - 19%) and remained stable during the initial sessions in this phase. An increase in disruptive behavior was observed during the fourth intervention session, which showed an immediate decrease during the next intervention session. Andy's disruptive behavior remained low and stable throughout the remainder of the phase. In

addition, Andy also demonstrated immediate increases in the level of work completed during the MM-A phase ($M = 76.6\%$; range $= 72\%$ - 83%). Andy's accuracy remained at levels similar to his baseline performance ($M = 97.6\%$; range $= 96\%$ - 98%). Furthermore, Andy's accuracy on his math worksheet remained stable throughout the MM-A phase. The MM-B followed the MM-A phase, resulting in a cessation of disruptive behaviors across all intervention sessions during the phase. Andy's academic performance showed a slight decrease in level for both work completion ($M = 71\%$; range $= 69\%$ - 75%) and accuracy ($M = 92\%$; range $= 88\%$ - 96%). Andy's academic performance remained stable during the MM-B phase.

Class-wide Performance. During baseline, class-wide disruptive behavior was low and variable, occurring an average of 5% of observed intervals (range $= 2\%$ - 10%). With regard to academic performance, Andy's classroom peers also demonstrated high and stable performance for work completion ($M = 91.7\%$; range $= 89\%$ - 100%) and accuracy ($M = 96.3\%$; range $= 94\%$ - 98%). Disruptive behavior showed an immediate decrease upon implementation of the MM-A ($M = 0.8\%$; range $= 0\%$ - 3%) and remained stable throughout the phase. In addition, Andy's classroom peers work completion ($M = 96.6\%$; range $= 85\%$ - 100%) and accuracy remained at levels similar to those observed during baseline ($M = 94.6\%$; range $= 85\%$ - 98%). The MM-B followed the MM-A phase, resulting in a cessation of disruptive behaviors across all intervention sessions during the phase. Andy's classroom peers' academic performance remained high and stable for work completion ($M = 100\%$; range $= 100\%$ - 100%) and accuracy ($M = 96.7\%$; range $= 96\%$ - 97%).

Davin

 Target Student Performance. During baseline, Davin's disruptive behavior was highly variable with an overall increasing trend, occurring an average of 40.8% of observed intervals (range = 4% - 91%). With regard to academic performance, Davin also demonstrated highly variable performance for work completion (M = 90%; range = 50% - 100%) and accuracy (M = 26%; range = 8% - 64%). Anecdotally, Davin was observed completing his worksheet with little to no effort as evidenced by his performance. More specifically, Davin completed several problems correctly and then wrote the numbers "1", "2," "3," and so on for each answer for the remaining problems on the worksheet. As such, Davin's high work completion percentages were artificially inflated by his performance, necessitating a phase change to intervention based on his overall decreasing trend in accuracy during baseline. Disruptive behavior showed an immediate decrease in level with a decreasing trend upon implementation of the MM-A (M = 18.7%; range = 2% - 37%). In addition, Davin also demonstrated immediate decrease in the level of work completed during the MM-A phase (M = 31.8%; range = 17% - 47%), although his performance showed a slight increasing trend towards to the beginning of the intervention phase with an increase in variability during the last three intervention sessions during this phase. Davin's accuracy showed an initial increase followed by an overall decreasing trend for the remainder of this phase (M = 70%; range = 61% - 83%). The MM-B followed the MM-A phase, resulting in a low and stable rate of disruptive behavior throughout the phase (M = 8%; range = 7% - 9%). Davin's academic performance for work completion (M = 42%; range = 17% - 47%) was initially higher in the percentage of work completed during the MM-A with a slight decrease in performance at the end of the

intervention phase; however, Davin's accuracy ($M = 63.5\%$; range $= 52\%$ - 68%) continued at the level observed during the previous phase followed by a decreasing trend in performance.

Class-wide Performance. During baseline, class-wide disruptive behavior was low and variable, occurring an average of 3% of observed intervals (range $= 0\%$ - 12%). With regard to academic performance, Davin's classroom peers demonstrated variable performance for work completion ($M = 61\%$; range $= 43\%$ - 73%) and accuracy ($M = 63\%$; range $= 46\%$ - 75%). Disruptive behavior remained low upon implementation of the MM-A ($M = 0.3\%$; range $= 0\%$ - 2%) and remained stable throughout the phase. In addition, Davin's classroom peers' work completion ($M = 57.6\%$; range $= 33\%$ - 80%) and accuracy remained at levels similar to those observed during baseline ($M = 69.5\%$; range $= 51\%$ - 87%). The MM-B followed the MM-A phase, resulting in a low and slightly variable level of disruptive behavior ($M = 5\%$; range $= 0\%$ - 11%). Davin's classroom peers' academic performance remained variable for work completion ($M = 57.5\%$; range $= 39\%$ - 83%) and accuracy ($M = 63.8\%$; range $= 59\%$ - 74%).
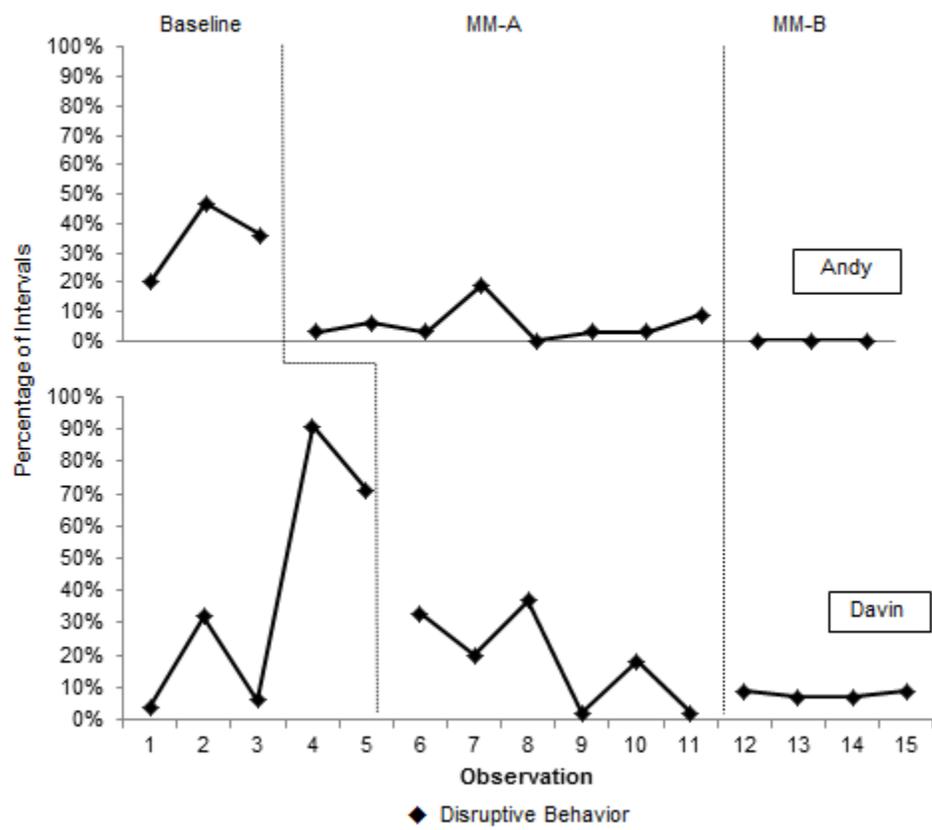
Figure 1. Andy and Davin's Percentage of Disrutpive Behavior(s).
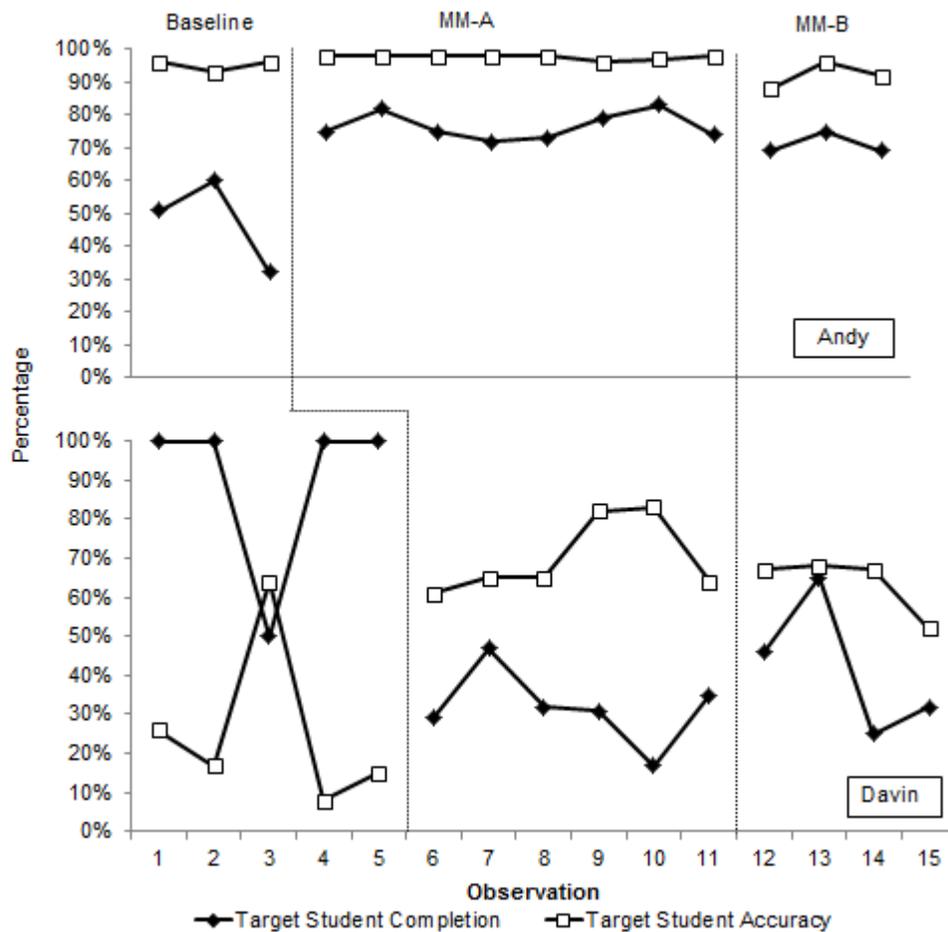
Figure 2. Andy and Davin's Percentage of Problems Completed and Percentage of Problems Completed Accurately.
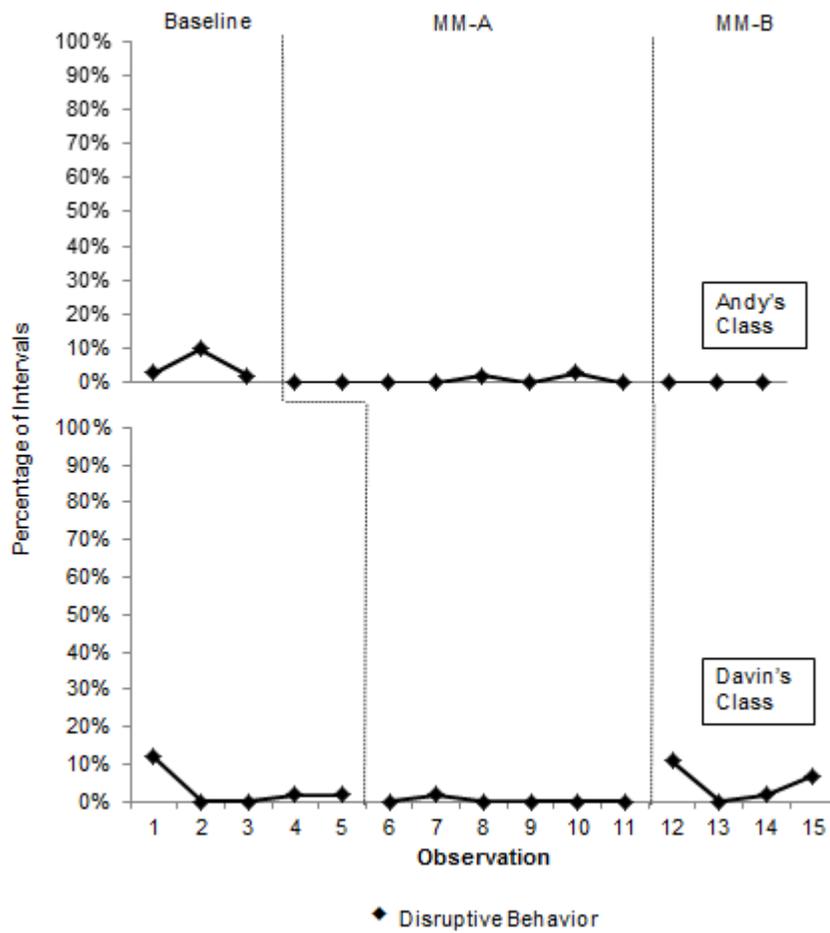
Figure 3. The Percentage of Intervals Andy and Davin's Classes Engaged in Disruptive Behavior(s).
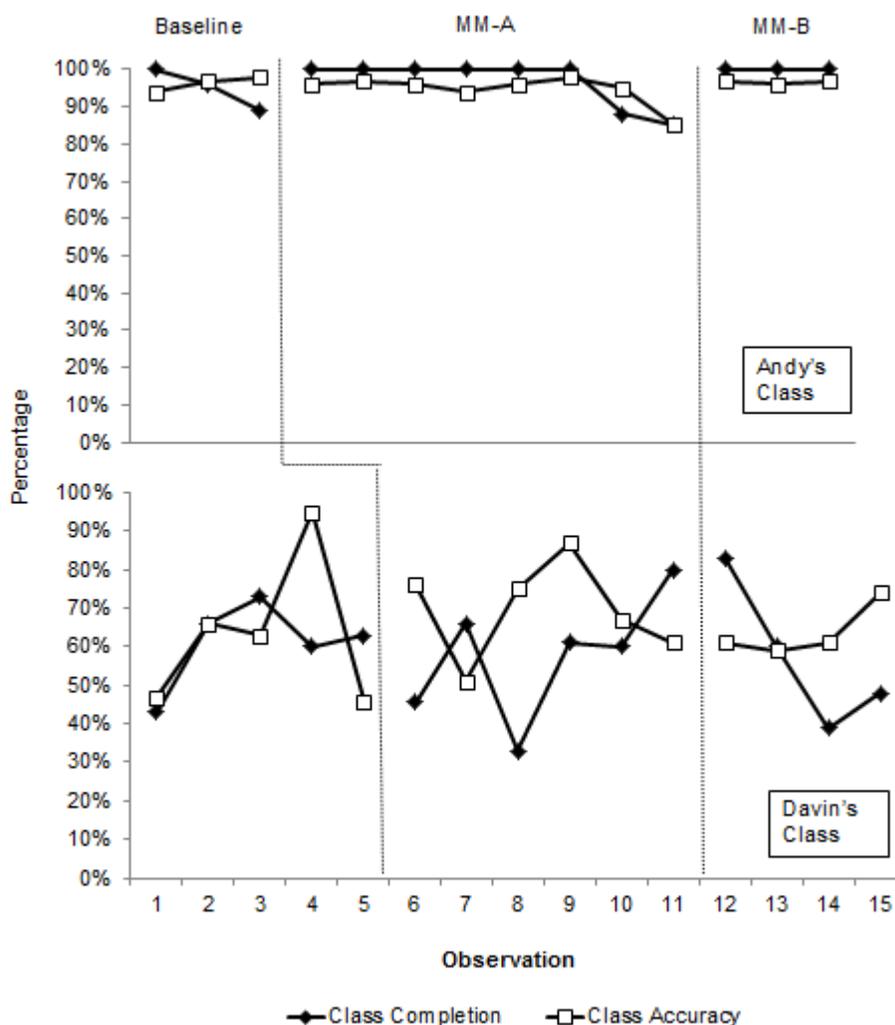
Figure 4. The Percentage of Problems Completed and the Percentage of Problems Completed Accurately by Andy and Davin's Classes.

Dyad 2

Figure 5 shows the percentage of intervals during which Alex and Max were observed engaging in disruptive behavior during baseline, the MM-B phase, and the MM-A phase. Figure 6 shows the percentage of math problems completed and the percentage of problems completed accurately by both Alex and Max during baseline, the MM-B phase, and the MM-A phase. Figure 7 shows the percentage of intervals Alex and Max's classes were observed engaging in disruptive behavior during baseline, the MM-B phase,

and the MM-A phase. Figure 8 shows the percentage of math problems completed and

the percentage of problems completed accurately by Alex and Max's classes.

Alex

Target Student Performance. During baseline, Alex's disruptive behavior was

high and stable, occurring an average of 44% of observed intervals (range = 42% - 48%).

With regard to academic performance, Alex also demonstrated low and stable

performance for work completion ($M = 53.3\%$; range = 53% - 54%), whereas Alex's

accuracy performance remained high and stable ($M = 92.3\%$; range = 90% - 95%). Upon

implementation of the MM-B, disruptive behavior showed an immediate decrease in level

that remained very low and stable throughout the phase ($M = 2\%$; range = 0% - 14%). In

addition, Alex also demonstrated an immediate increase in the level of work completed

during the MM-B phase ($M = 100\%$; range = 100% - 100%) which remained high and

stable throughout the phase. Alex's accuracy performance remained at levels similar to

those in baseline ($M = 96\%$; range = 90% - 99%). The MM-A followed the MM-B phase,

resulting in a low and slightly variable level of disruptive behavior throughout the phase

($M = 3\%$; range = 0% - 11%). Alex's academic performance for work completion ($M =$

100%; range = 100% - 100%) and accuracy ($M = 96.4\%$; range = 93% - 99%) remained

at the same level as his performance during the MM-B phase.

Class-wide Performance. During baseline, class-wide disruptive behavior was

low and stable, occurring an average of 2% of observed intervals (range = 1% - 4%).

With regard to academic performance, Alex's classroom peers demonstrated high and

stable performance for work completion ($M = 99.7\%$; range = 99% - 100%) and accuracy

($M = 92\%$; range = 90% -94%). Disruptive behavior remained low upon implementation

of the MM-B ($M = 0.6\%$; range $= 0\%$ - 2%) and remained stable throughout the phase. In addition, Alex's classroom peers' work completion ($M = 99.3\%$; range $= 98\%$ - 100%) and accuracy remained at levels similar to those observed during baseline ($M = 96.5\%$; range $= 93\%$ - 98%). The MM-A followed the MM-B phase, resulting in continued low levels of disruptive behavior across all intervention sessions during the phase ($M = 3\%$; range $= 0\%$ - 11%). Alex's classroom peers' academic performance remained high and stable for work completion ($M = 99.3\%$; range $= 95\%$ - 100%) and accuracy ($M = 94.1\%$; range $= 91\%$ - 97%).

Max

Target Student Performance. Prior to Max's inclusion in this study as a target participant, Max was randomly selected as a peer comparison during baseline sessions that utilized a different classroom peer as the target student. Once the initial target student dropped out of the study due to medical reasons (i.e., after three days of baseline data collection), Max was then selected as the new target student as he had successfully screened into the study prior to the beginning of baseline data collection. As a result of Max's participation during initial baseline sessions, additional parental consent was obtained to utilize those data collected prior to inclusion as a target student. Max's mother consented to the use of the individualized data (i.e., the data were no longer part of the class-wide aggregate measure). It should be noted that the behavioral data collected during Max's first two baseline sessions are limited as they provide an abbreviated measure of behavior, given that the number of intervals Max's behavior was sampled during the rotating peer comparison observation was substantially lower than observations conducted upon his identification as the target student.

During baseline, Max's disruptive behavior was high with an overall increasing trend, occurring an average of 28.8% of observed intervals (range = 14% - 51%). The first two observations during baseline consisted of abbreviated observations; thereby limiting the opportunities to record Max's disruptive behavior. As such, the initial two observations during baselines may be artificially inflated, as data collected on Max's behavior was substantially more infrequent than the remaining observations throughout the study. With regard to academic performance, Max also demonstrated slightly variable performance with an overall decreasing trend for work completion (M = 68.2%; range = 49% - 83%); however, Max's accuracy performance remained high and relatively stable (M = 94.4%; range = 89% - 100%). Disruptive behavior showed an immediate decrease in level that remained very low and stable during the MM-B phase (M = 0.4%; range = 0% - 2%). In addition, Max also demonstrated an immediate increase in the level of work completed during the MM-B phase (M = 98%; range = 93% - 100%). Max's accuracy performance remained high and stable (M = 96.6%; range = 94% - 98%) throughout the phase. The MM-A followed the MM-B phase, resulting in an initially low and stable level of disruptive behavior which demonstrated a sharp increasing trend towards the end of the intervention phase (M = 17.2%; range = 0% - 52%). Max's academic performance for work completion (M = 71.6%; range = 60% - 100%) showed an immediate decrease in level during the second intervention session and remained low and relatively stable throughout the remainder of the intervention phase. Max's accuracy performance remained high and stable throughout the MM-A phase (M = 97.2%; range = 92% - 100%).

Class-wide Performance. During baseline, class-wide disruptive behavior was low and stable, occurring an average of 7.6% of observed intervals (range = 6% - 11%). With regard to academic performance, Max's classroom peers demonstrated high and stable performance for work completion (M = 98.2%; range = 95% - 100%) and accuracy (M = 94.4%; range = 89% -100%). Disruptive behavior remained low upon implementation of the MM-B (M = 0.6%; range = 0% - 2%) and remained stable throughout the phase. In addition, Max's classroom peers' work completion (M = 100%; range = 100% - 100%) and accuracy remained at levels similar to those observed during baseline (M = 95%; range = 91% - 98%). The MM-A followed the MM-B phase, resulting in continued low levels of disruptive behaviors across all intervention sessions during the phase (M = 5%; range = 2% - 13%). Max's classroom peers' academic performance remained high and stable for work completion (M = 99%; range = 97% - 100%) and accuracy (M = 95.6%; range = 92% - 97%).
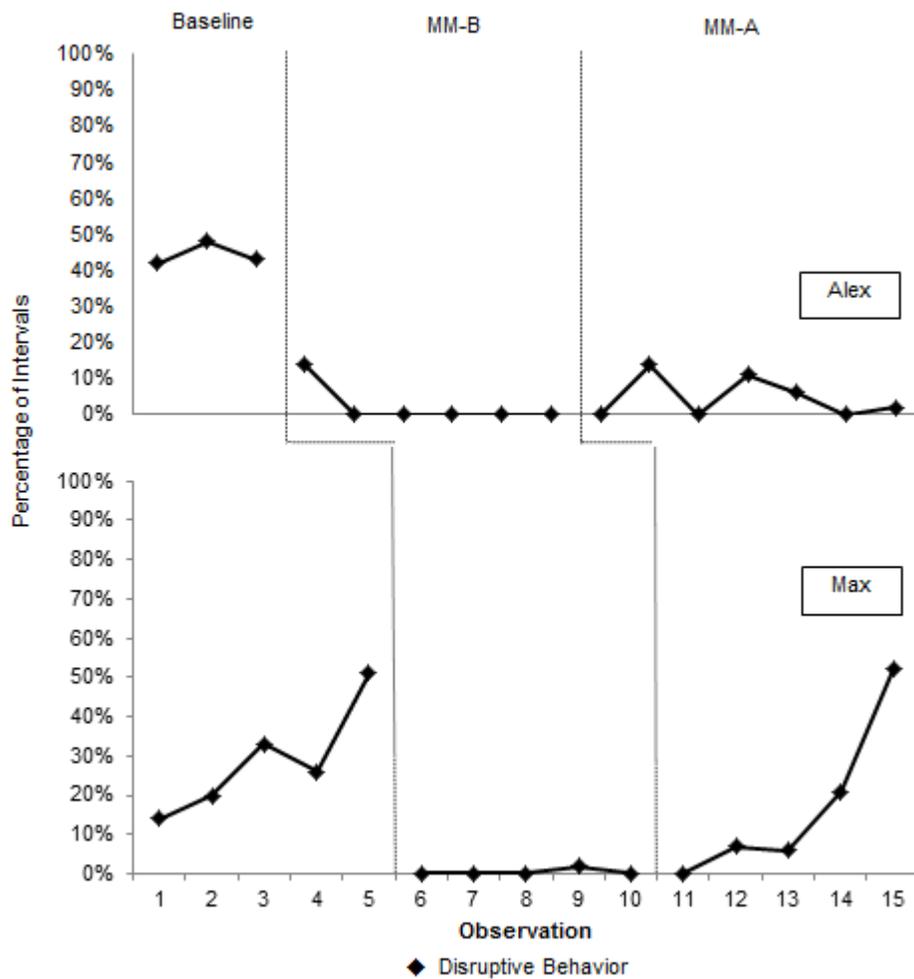
Figure 5. Alex and Max's Percentage of Disruptive Behavior(s).
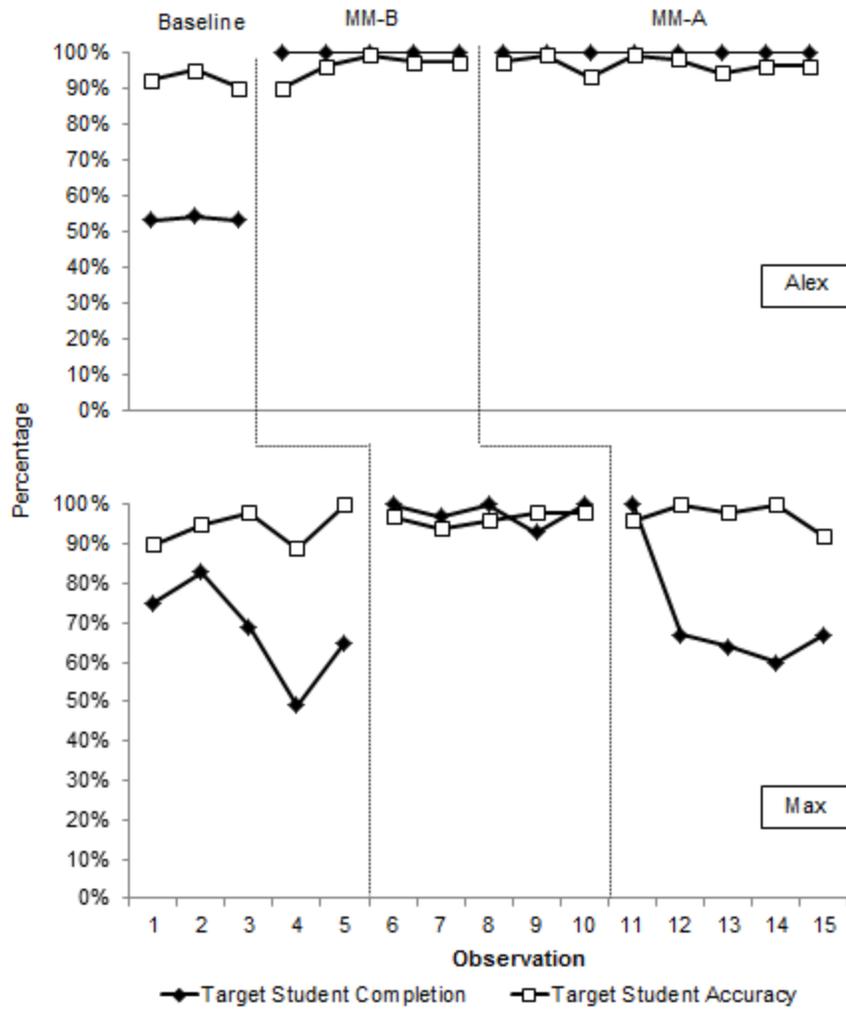
Figure 6. Alex and Max's Percentage of Problems Completed and Percentage of Problems Completed Accurately.
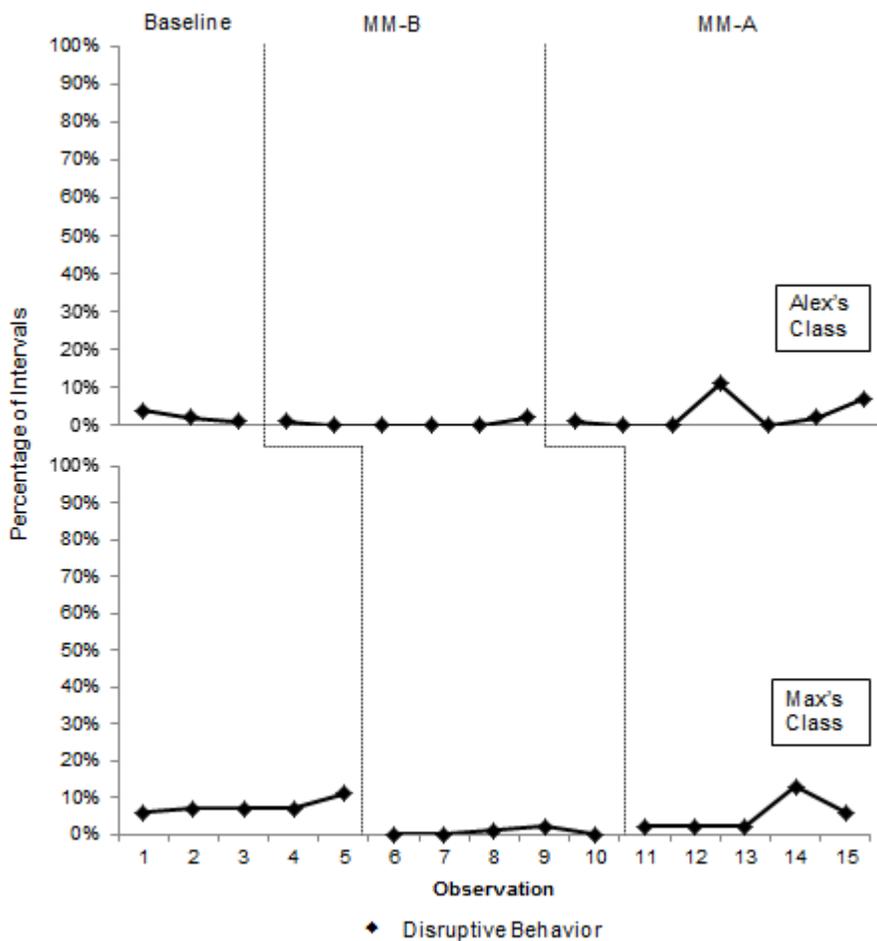
Figure 7. The Percentage of Intervals Alex and Max's Classes Engaged in Disruptive Behavior(s).
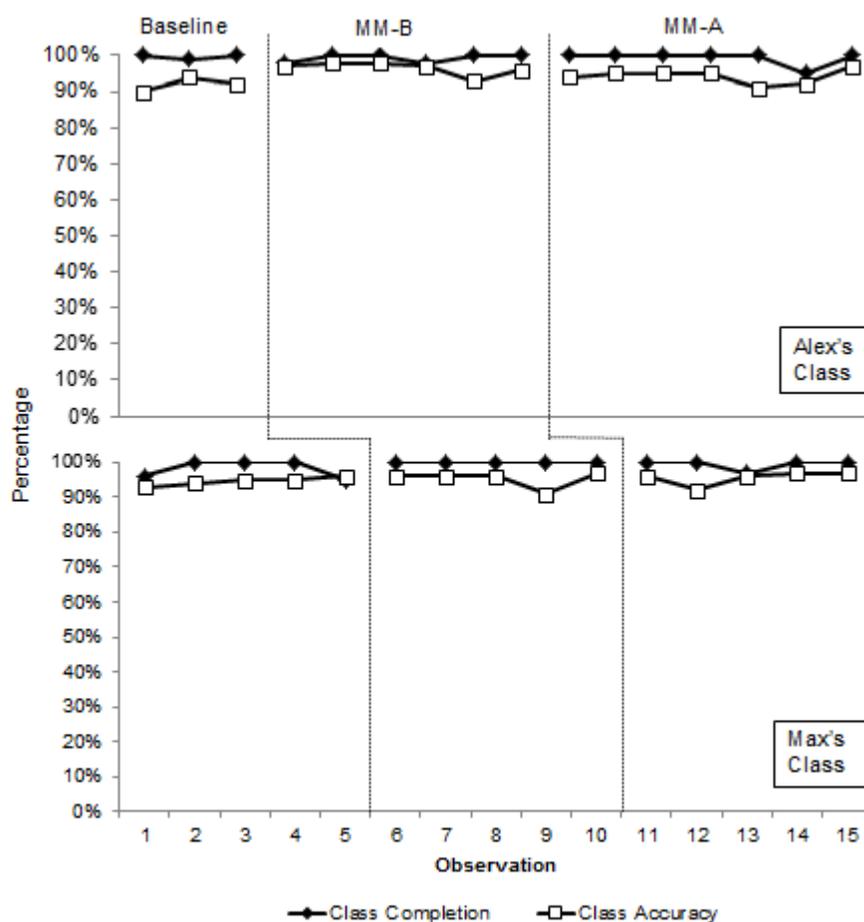
Figure 8. The Percentage of Problems Completed and the Percentage of Problems Completed Accurately by Alex and Max's Classes.

Treatment Acceptability

Teachers rated the MM-A and the MM-B for acceptability on the IRP-15. The average score for the MM-A was 83.75 (range = 79 - 90), and the average score for the MM-B was 82 (range = 76 - 90). The results suggest that the participating teachers found both interventions to have a high level of general acceptability, and all of the participating teachers reported that they would continue to use the MM when the study was concluded. However, anecdotally, all four teachers stated a preference for the MM-B due to students receiving more immediate feedback on their performance as behavioral

data (i.e., checkmarks) were recorded as behavior occurred, whereas feedback for academic performance was delayed due to having to score M-CBM probes. Each classroom also rated the acceptability of the MM-A and the MM-B utilizing the CIRP. Andy's score for the MM-A was 25 with an average item rating of 3.6 indicating that he 'slightly agreed' with the use of the MM-A as an acceptable strategy to facilitate his academic performance; whereas Andy's score of the MM-B was 31 with an average item rating of 4.4 indicating a moderate level of acceptability for the MM-B as an acceptable strategy for improving his behavior. Davin's score for the MM-A was 20 with an average item rating of 2.8 indicating that he 'slightly disagreed' with the use of the MM-A as an acceptable strategy to facilitate his academic performance; whereas Davin's score of the MM-B was 27 with an average item rating of 3.9 indicating a moderate level of acceptability for the MM-B as an acceptable strategy for improving his behavior. Alex's score for the MM-A was 31 with an average item rating of 4.4 indicating that he 'slightly agreed' with the use of the MM-A as an acceptable strategy to facilitate his academic performance; whereas Alex's score of the MM-B was 32 with an average item rating of 4.5 indicating a moderate level of acceptability for the MM-B as an acceptable strategy for improving his behavior. Max's score for the MM-A was 31 with an average item rating of 4.4 indicating that he 'slightly agreed' with the use of the MM-A as an acceptable strategy to facilitate his academic performance; whereas Max's score of the MM-B was 25 with an average item rating of 3.6 indicating a moderate level of acceptability for the MM-B as an acceptable strategy for improving his behavior.

CHAPTER IV

DISCUSSION

The MM as a packaged intervention has been demonstrated an effective tool for reducing problem behaviors (e.g., Schanding & Sterling-Turner, 2010) and for increasing student's academic performance (e.g, Teta, 2008); however, the current literature base does not include a direct comparison of the relative effectiveness of the MM with behaviorally-focused versus academically-focused goals on students problem behaviors and academic performance. As such, the purpose of the current study was to evaluate the effectiveness of each version of the MM on reducing problem behaviors and increasing students' academic performance. This investigation was driven by the following five research questions: (1) will the MM-B lead to decreases in disruptive behavior for an identified target student, (2) will the MM-B lead to increases in academic performance for an identified target student, (3) will the MM-A lead to decreases in disruptive behavior for an identified target student, (4) will the MM-A lead to increases in academic performance for an identified target student, and (5) will behavioral and academic performance for target students vary as a function of the version of the MM implemented?

Mystery Motivator – Behavior

With regard to the first research question, reductions in disruptive behaviors were observed for all students upon implementation of the MM-B, which is consistent with previous investigations evaluating the effectiveness of the MM on reducing problem behavior (Schanding & Sterling-Turner). In addition, disruptive behavior remained low and stable for all participants during the MM-B phase. With regard to the second

research question, increases in the percentage of problems completed were observed for Andy, Alex, and Max; however, their accuracy scores remained similar to levels observed during baseline. The lack of observed differences in Andy, Alex, and Max's accuracy scores from baseline to intervention are likely due to a ceiling effect as all of the students' accuracy scores were very high during baseline. Davin's accuracy performance during the MM-B phase was initially higher than the level of performance observed during baseline; however, it showed a decreasing trend in performance during the last intervention sessions. Davin's completion percentage scores during the MM-B phase were much lower than those observed during baseline and showed an overall decreasing trend. As Davin's median score during the curriculum-based assessment was high enough to place him toward the lower end of the instructional range (Deno & Mirkin, 1977) for grade level materials, it is possible that the task was more difficult for Davin than the other three participants. Additionally, the curriculum based assessment was somewhat brief; therefor, the limited sample of academic performance may not have provided a reliable indicator of Davin's skill development. As such, the probes used during the intervention may not have been matched to his current level of functioning. This hypothesis is further supported by the increase in stability observed in Davin's accuracy, which remained low and decreased when his completion scores decreased. Given use of the MM as a motivation-based intervention strategy (Moore et al., 1994; Rhode et al., 1993), it is unlikely that the continued use of this intervention would have resulted in any further gains in Davin's academic performance as he may have been displaying a skill deficit for mathematics computation fluency.

Mystery Motivator - Academic.

With regard to the third research question, decreases in disruptive behavior were observed for Andy, Davin, and Alex during the MM-A phase. Max's disruptive behavior remained low during initial observations; however, Max's disruptive behavior started to increase with a steep increasing trend. As such, Max's level of disruptive behavior towards the end of MM-A phase was similar to levels observed during baseline. The increase in Max's disruptive behavior also corresponded with a decrease in the percentage of math seatwork completed. As the goal for the MM-A phase focused on the average of the class's performance, it is possible that Max's disruptive behavior (i.e., off-task behavior) increased as a result of Max's individual academic performance being part of a composite score that determined whether the class was able to earn a chance to play the game. More specifically, during the second intervention session during the MM-A, Max only completed 70% of his assignment; however, the class was still able to earn a chance to play the MM based on the average level of performance of all students in class meeting the criteria. As such, Max may have learned that his disruptive behavior and lower completion percentage would still potentially be followed by a reward. It should be noted that Max's class was able to earn a chance to play the MM each day during this phase; therefore, providing further support of this hypothesis as Max's performance indicated an increasing trend in disruptive behavior and decrease in his percentage of problems completed. Max's accuracy scores remained high throughout the MM-A phase. In terms of the fourth research question, Andy's accuracy performance remained at levels similar to those observed in baseline. The percentage of problems completed by Andy increased in level and remained stable throughout the MM-A, suggesting that the MM-A

may be an appropriate strategy to use for students who fail to complete their assignments as a result of a performance deficit; however, this conclusion is limited as performance deficits were not evaluated prior to implementation of the MM. Davin's academic performance during the MM-A showed more stability than the performance observed during baseline. Although Davin's accuracy scores were higher than those observed in baseline, his completion scores were lower with an overall slight decreasing trend when compared to baseline levels of performance. Davin's academic performance (i.e., work completion) was much higher during baseline and consequently inflated by Davin's performance on his math seatwork (i.e., writing numbers in consecutive order as answers to the math problems). As such, is it is difficult to compare Davin's response to intervention with this discrepancy in his performance.

Comparison of Mystery Motivator-Academic and Mystery Motivator Behavior

With regard to the fifth research question, the results of this study indicated the MM-A and MM-B resulted in similar decreases in disruptive behavior and increases in academic performance for three out of four students. These results suggest that both interventions may be equally effective; however, the MM-B resulted in slightly higher and more consistent responding for both behavior and academic performance. It should be noted that one student demonstrated differential responding across both treatment phases. Although one participant demonstrated different levels of responding across both intervention phases, data indicated that when disruptive behavior increased, the student also demonstrated a decrease in academic performance (i.e., percentage of work completed). Despite that student's drop in performance, the student was still able to access the class-wide reward as the performance criteria was based on the average of 14

students academic performance rather than the student's performance at the individual

level. As such, establishing the criteria for academic performance should take into

consideration the variability of scores within the classroom and any outlying scores that

may influence the average utilized for the goal.

<div align="center">Limitations and Future Research</div>

Although this study provides support for the use of the MM-A and MM-B as

effective interventions for reducing disruptive behavior and increasing academic

performance, several limitations should be noted. First and foremost, this study is limited

as the experimental design (i.e., two multiple baselines with a crossover element) and

number of participants (i.e., two participants per multiple baseline) allowed for only one

replication of treatment effects per multiple baseline. Although this does somewhat limit

confidence in the extent to which changes in student performance were due to the effects

of the independent variables, the consistency of the effect across three of the four

participants somewhat buffers the limited number of replications. As such, future

research replicating these findings will provide further support for the use of the MM-A

and MM-B as effective interventions for reducing disruptive behavior and increasing

academic performance.

In addition to the limitations based on the experimental design, the single-subject

design leads to challenges regarding the external validity of the obtained results. More

specifically, this study only utilized elementary-aged students, limiting the capacity to

assume that these interventions would be effective strategies for students at the secondary

level. Although Schanding and Sterling-Turner (2010) found the MM to be a successful

intervention for reducing the disruptive behavior of general education students in a high

school setting, their study did not provide data for students' academic performance. Future researchers should test the relative effectiveness of MM-B and MM-A in grades other than those included in this study.

In addition to the limitations based on the experimental methodology utilized for this study, this study is also limited by the abbreviated observation scheme utilized during the first two baseline sessions with Max. It is possible that Max's behavioral data may be inflated as a result of limited samples as data were collected for only a third of the intervals used to collect data on the target student; however, data collected throughout the remainder of baseline showed a high level of disruptive behavior with an increasing trend. Furthermore, Davin's variable performance across all phases suggested the possibility of a fluency-based skill deficit in mathematics. As this study did not include performance-based assessments on grade level probes, it is not possible to rule out the possibility of Davin's poor performance being a product of a skill deficit that was not adequately identified during the brief skill assessment conducted prior to the beginning of baseline data collection. Lastly, although class-wide data were collected on student behavior, ceiling and floor effects prevent the analysis of the MM-A and MM-B's effectiveness across the four classrooms. Future studies should consider the application of this intervention across classrooms demonstrating behavioral and academic challenges.

<div align="center">Implications for Applied Practice</div>

This study adds to the MM literature in that an additional experimental demonstration is provided demonstrating the efficacy of MM in elementary classrooms. As a result, school-based behavioral support staff may continue to recommend MM as class-wide intervention procedure that may result in beneficial social and academic

outcomes for students. Nevertheless, future research focused on replications across

different settings and populations is certainly needed to increase confidence in the results

obtained in this study related to the lack of observed differential treatment effects

between the MM-A and the MM-B. However, should future research indicate that there

are not meaningful differences between MM-B and MM-A, then school-based

consultants may use this information to inform their applied practice accordingly. In

particular, school-based consultants may inform teachers that behaviorally focused and

academically focused goals may produce equally beneficial results, and teachers may be

allowed some flexibility in administration of the MM intervention. As a result, a teacher

may choose the goal type that is most appropriate for his or her educational setting.

Allowing teachers to choose certain aspects of the intervention may be viewed as

beneficial as doing so increases the collaborative nature of the consultation experience,

resulting in an increased likelihood of teacher "buy-in" within the intervention process.

Despite the limitations of this study, it is important and encouraging to note that

this study provides additional empirical support for the use of the MM as a beneficial

intervention for reducing problem behavior and increasing academic performance. The

current MM literature base is somewhat limited, as few studies have experimentally

tested the impact of the MM as a packaged intervention (i.e., as described in Rhode et al.,

1993). The MM as a packaged intervention has been demonstrated as a beneficial

intervention, albeit in a small number of studies, that can be applied class-wide or to an

individual student. As current national education initiatives move toward the use of

evidence-based positive, prevention-based strategies, it is important that teachers can be

provided with classroom management strategies that maximize efficiency. As a group-

based intervention, the MM appears to be an effective strategy that meets the current

standards set forth in education.

APPENDIX A

TEACHER CONSENT FORM

Title of Study: A Comparison of Behavioral and Academically-Focused Goals within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance.

Purpose of the Study: Your permission is requested for participation in a study that is investigating the effects of an intervention called the Mystery Motivator on disruptive behavior and academic performance.

Who Can Participate: Students in a general education setting and their teachers can participate in the study. Additionally, the student must exhibit behavior that is inappropriate and/or disruptive to the classroom and must complete an average of 70% or less of his daily mathematics assignment during the school week.

Procedures: If you agree to participate, you will be asked to implement the Mystery Motivator. You will be trained to implement the Mystery Motivator and you will also be provided with all materials needed to implement the Mystery Motivator. However, if the referred student does not qualify for the study, services will be provided to you and the student outside the scope of this study.

Mystery Motivator implementation will involve surveying the class to identify potential rewards, explaining rules and procedures to the students, distributing worksheets, collecting disruptive behavior data, scoring worksheets, announcing class performance, and potentially providing rewards to the class when the established goal is reached. There will be two phases utilizing the Mystery Motivator. One phase will include behavior-focused rules and the other phase will include academic-focused goals. The experimenter and trained graduate students will continue to observe your students during each phase. These observations will be used to determine if a difference exists in your students' behavior during any of the phases of the study.

At the end of each phase, you will be asked to complete a structured questionnaire in order to assess your satisfaction with the different Mystery Motivator interventions. Additionally, for each intervention session, you will be asked to complete checklists to ascertain that the intervention is being carried out as designed. The number of days during which each phase of the Mystery Motivator will be implemented will vary depending on the performance of the target student.

Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted), the researcher will take every precaution consistent with best scientific practice.

Benefits: This study may result in three benefits for you and your students: (a) your referred student and the whole class may display increased academic performance, (b) the referred student and the whole class may engage less in disruptive behaviors, and (c) you may acquire skills to implement a new intervention technique that can be used with subsequent students.

Risks: Throughout the study, student behavior and academic performance will be monitored to ensure undesired effects (i.e., increase in disruptive behavior; decrease in academic responding) do not happen. If any unanticipated, untoward effects on student behavior and/or academics are observed, appropriate modifications or discontinuation of the procedure will occur. The target student will then be provided with other appropriate services. There would appear to be very few risks for either yourself or the students participating in this study. Because winning a chance to play the Mystery Motivator is based on a class-wide performance, individual performances will be anonymous, minimizing issues of harassment due to poor performance. The greatest discomfort for you may involve the time required to implement the Mystery Motivator. Besides declaring whether the class has met criteria for the day and providing rewards to the class, there are no other anticipated additions to your existing work requirements. However, there may be some discomfort related to implementing a new procedure in the classroom. To reduce discomfort, I and/or other trained graduate students will provide training, materials, and will be available to answer any questions you may have.

Confidentiality of Records: All information obtained during this study will be kept confidential, meaning that your name and the names of students in your class as well as any other identifying information will be withheld from all persons not connected with the study. In the event that data taken from this investigation are used for presentation publications, no identifying information will be released. Participant records will be maintained for 3 years after the last contact with the participant. Outdated material will be disposed of by paper shredding.

Voluntary Participation: Your participation in this study is voluntary. You may withdraw from this study at a 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 researcher will take every precaution consistent with the best scientific practice.

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 Christina Hardy or Dr. Heather Sterling-Turner at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follows 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,

_____   _____
Christina Hardy, M.A.   Heather E. Sterling-Turner, Ph.D.
School Psychologist in Training   Supervisor

Consent for participating in the study "A Comparison of Behavioral and Academically-Focused Goals within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance" conducted by Christina Hardy as a part of her doctoral dissertation at The University of Southern Mississippi

_____

THIS SECTION TO BE COMPLETED BY TEACHERS

Please Read and Sign the Following:

I have read the above document and I consent to participate in this dissertation 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 class-wide academic/behavior intervention called the Mystery Motivator. In order to do so, I will be trained to implement the Mystery Motivator. In addition, I will be required to complete three acceptability questionnaires and daily integrity checklists. I further understand that all data collected in this study will be confidential and that my name and my students' name 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 B

PARENT CONSENT FORM

Title of Study: A Comparison of Behavioral and Academically-Focused Goals within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance.

Purpose of the Study: Your permission is requested for your child to participate in a study that is investigating the effects of an intervention called the Mystery Motivator on disruptive behavior and academic performance.

Who Can Participate: Students in a general education setting and their teachers can participate in the study. Additionally, the student must exhibit behavior that is inappropriate and/or disruptive to the classroom and must complete an average of 70% or less of his daily mathematics assignment during the school week.

Procedures: Your child's teacher will be asked to implement the Mystery Motivator. The Mystery Motivator will be played in two ways. In the first version of the Mystery Motivator, the students in your child's class will be required to follow a set of behavior rules (e.g., Raise your hand before speaking). If students meet the goal for the day, the class is allowed to play the Mystery Motivator and potentially earn a reward. In the second version of the Mystery Motivator, the students in your child's classroom will be required to meet an academic goal on their mathematics worksheets. More specifically, the class completion average and class accuracy average will be assessed to see if students meet a predetermined goal. This goal will be based on a class-wide percentage; therefore, your child's individual performance will not be the determining factor in whether students get to play the Mystery Motivator for the day. The researcher and trained graduate students will conduct observations during the Mystery Motivator. Disruptive behaviors as well as academic performance for your child will be recorded to assess whether the Mystery Motivator influences your child's behavior. It is unknown how many sessions it will take to clearly see the effectiveness of the Mystery Motivator on your child's behavior.

Benefits: Your child may benefit by participating in this study because the intervention may improve your child's behavior and academic performance.

Risks and Discomfort: There are few anticipated risks associated with participation. All students in the class will participate in the Mystery Motivator; therefore, no one child will be singled out.

Confidentiality of Records: All information obtained during this study will be kept confidential, meaning that your child's name and any other identifying information will be withheld from all persons not connected with the study. Some circumstances may obligate us to release information about you and your child, such as if you child reports that he or she plans to harm him or herself or others, if the child reports abuse, if we are ordered by the court to release information, or if there is a medical emergency in which the release of information is important to ensure your child's or another person's safety.

In the event that data taken from this investigation are used for presentation publications, no identifying information will be released. Participant records will be maintained for 3 years after the last contact with the participant. Outdated material will be disposed of by paper shredding.

<u>Voluntary Participation:</u> Permission for your child's participation in this study is voluntary. You may withdraw your child from this study at any time without penalty, prejudice, or loss of benefits. Because we are teaching an intervention to the classroom teacher, he or she may elect to discontinue using the intervention. However, at your request we would not include any data associated with your child in the present investigation. Whereas no assurance can be made concerning results that may be obtained (as results from investigational studies cannot be predicted), the researcher will take every precaution consistent with the best scientific practice.

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 Christina Hardy or Dr. Heather Sterling-Turner at (601) 266-5255. This project and this consent form have been reviewed by the Human Subjects Protection Review Committee, which ensures that research projects involving human subjects follows 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,

_____
Christina Hardy, M.A.
School Psychologist in Training

_____
Heather E. Sterling-Turner, Ph.D.
Supervisor

Consent for participating in the study "A Comparison of Behavioral and Academically-Focused Goals within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance" conducted by Christina Hardy as a part of her doctoral dissertation at The University of Southern Mississippi

_____

THIS SECTION TO BE COMPLETED BY PARENTS

Please Read and Sign the Following:

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 for my child to participate under the conditions stated. I have also received a copy of this consent. If I have any questions about this study, I can contact Christina Hardy or Dr. Heather Sterling-Turner at (601) 266-5255. 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 participant should be directed to the Institutional Review Board Office, The University of Mississippi, Box 5147, Hattiesburg, MS 39406-5147, (601) 266-6820.

_____   _____

Name of Child   Age

_____   _____

Signature of Parent   Date

_____   _____

Signature of Investigator   Date

APPENDIX C

PROBLEM IDENTIFICATION INTERVIEW (PII)

Student: _____   Teacher (s): _____

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

1. Describe target child's 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 student's 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

Taken from Kratochwill, T. R., & Bergan, J. R. (1990). *Behavioral consultation in applied settings: An individual guide.*New York, NY: Springer.

APPENDIX D

INTERVENTION RATING PROFILE -15/MODIFIED VERSION

Please respond to each of the following statements thinking about the intervention (MM; Mystery Motivator) you implemented. Please then circle the number associated with your response. Be sure to answer all statements.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
The MM was an acceptable intervention for the student's problem behavior.	1	2	3	4	5	6
Most teachers would find the MM appropriate for behavior problems in addition to the one described.	1	2	3	4	5	6
The MM proved effective in helping to change the student's problem behavior.	1	2	3	4	5	6
I would suggest the use of the MM to other teachers.	1	2	3	4	5	6
The student's behavior problem was severe enough to warrant use of the MM.	1	2	3	4	5	6
Most teachers would fine the MM suitable for the problem behavior described.	1	2	3	4	5	6
I would be willing to use the MM in the classroom setting.	1	2	3	4	5	6
The MM did *not* result in negative side effects for the student.	1	2	3	4	5	6
The MM would be appropriate for a variety of students.	1	2	3	4	5	6
The MM was consistent with those I have used in the classroom setting.	1	2	3	4	5	6
The MM was a fair way to handle the student's problem behavior.	1	2	3	4	5	6
The MM was reasonable for the problem behavior described.	1	2	3	4	5	6
I liked the procedures used in the MM.	1	2	3	4	5	6
The MM was a good way to handle the student's problem behavior.	1	2	3	4	5	6
Overall, the MM was beneficial to the student.	1	2	3	4	5	6

Taken and adapted from, Martens, B. K., Witt, J. C., Elliot, S. N. & Darveaux, D. (1985). Teacher judgments concerning the acceptability of school-based interventions. Professional Psychology: *Research and Practice, 16*, 191-198.

APPENDIX E

CHILDRENS INTERVENTION RATING PROFILE (CIRP)/MODIFIED VERSION

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
The Mystery Motivator was fair.	1	2	3	4	5	6
Do you think the Mystery Motivator caused any problems for your friends?	1	2	3	4	5	6
This Mystery Motivator caused problems with my friends.	1	2	3	4	5	6
Did the Mystery Motivator help you do better in school?	1	2	3	4	5	6
Do you like playing the Mystery Motivator?	1	2	3	4	5	6
Do you think other students would like to play the Mystery Motivator?	1	2	3	4	5	6
Do you think the Mystery Motivator caused any problems for you?	1	2	3	4	5	6

Adapted from Witt, J. C., & Elliot, S. N. (1985). Acceptability of classroom intervention strategies. In T. R. Kratochwill (Ed.), Advances in School Psychology (Vol. 4, pp. 251-288). Hillsdale, NJ: Erlbaum. Copyright 1985 by Lawrence Erlbaum Associates, Inc. Reprinted.

APPENDIX F

OBSERVATION FORM

1.1		6.1		11.1		16.1	
1.2		6.2		11.2		16.2	
1.3		6.3		11.3		16.3	
1.4		6.4		11.4		16.4	
1.5		6.5		11.5		16.5	
1.6		6.6		11.6		16.6	
2.1		7.1		12.1		17.1	
2.2		7.2		12.2		17.2	
2.3		7.3		12.3		17.3	
2.4		7.4		12.4		17.4	
2.5		7.5		12.5		17.5	
2.6		7.6		12.6		17.6	
3.1		8.1		13.1		18.1	
3.2		8.2		13.2		18.2	
3.3		8.3		13.3		18.3	
3.4		8.4		13.4		18.4	
3.5		8.5		13.5		18.5	
3.6		8.6		13.6		18.6	
4.1		9.1		14.1		19.1	
4.2		9.2		14.2		19.2	
4.3		9.3		14.3		19.3	
4.4		9.4		14.4		19.4	
4.5		9.5		14.5		19.5	
4.6		9.6		14.6		19.6	
5.1		10.1		15.1		20.1	
5.2		10.2		15.2		20.2	
5.3		10.3		15.3		20.3	
5.4		10.4		15.4		20.4	
5.5		10.5		15.5		20.5	
5.6		10.6		15.6		20.6	

Target Student: "*Insert Name*"	Frequency Total: /20= Per Minute	Total # of Intervals: /120= %
Peer Comparison 1:		
Peer Comparison 2:	Frequency Total: /20= Per Minute	Total # of Intervals: /120= %
Peer Comparison 3:		
Observer:	**Phase:**	**Observation #:**

APPENDIX G

INSTRUCTIONS FOR IMPLEMENTING THE MYSTERY MOTIVATOR –
BEHAVIOR FOCUSED

Day One Only:

- Announce to the class that they will be playing the Mystery Motivator for the coming days. Tell them the time period in which the game will be played.

Say: *"Today we're going to talk about a new game we are going to play in our class. It is called the Mystery Motivator. This game will be played during mathematics class which is at _____ (indicate the time of your mathematics class)."*

- Present the Mystery Motivator board (which should be posted in the front of your classroom).

Say: *"This is our Mystery Motivator board. As you can see, the rules for the game are listed here* [point to the rules].*"*

- Explain the behavior rules to the students and role model each rule. Practice the rules until each student exhibits the appropriate behavior at least three times. Indicate to your students that following each of the practiced rules would be examples of the appropriate behaviors you expect.

Say: *"Rule 1 states:* [state the behavior rule]. *Rule 1 looks like:* [role model the expectation for the students and have the students practice the behavior until the successfully performed to behavior at least three times; You will do this procedure for each rule]. *These rules are all examples of appropriate behaviors. Each time you engage in an inappropriate behavior, you will receive a check Max beside your name.* [show students your data tracking clipboard.*"*

- Explain to the class that in order to earn a chance to play the Mystery Motivator Game, the entire class must receive _____ or fewer check Maxs for inappropriate behaviors to earn a chance to play the Mystery Motivator.

Say: *"In order to earn a chance to play the Mystery Motivator, the entire class may only receive _____ or few check Maxs for inappropriate behaviors throughout our math class."*

- Inform the students that they will get to select a slip of paper from the Mystery Motivator box that will have either an "M" or an "X". Inform the students that they will earn a reward if an "M" is selected from the box. Inform the students that a reward will not be delivered if an "X" is selected from the box. Remind your students that they will get a chance to play the game the next day, if an "X"

is selected. Be sure to provide verbal praise and encouragement if students select an "X" from the box. Direct the students attention to the Mystery Motivator Reward enveloped posted at the front of the classroom and inform the students that the potential daily reward is written on a slip of paper inside that envelope.

Say: *"If you meet your goals for today, I will pick a student to draw a slip of paper from the Mystery Motivator box. If the student picks an "X", then you will not receive a reward. If the selected student picks an "M" then that student will open this Mystery Motivator envelope to reveal the class-wide reward. Do you have any questions?"* [show the students an example of each slip of paper from the Mystery Motivator box and show the students the Mystery Motivator Reward envelope]

_____

All Days:
- Announce to the class that they will be playing the Mystery Motivator. Remind the students of the behavior rules. Role model each rule to ensure there is a clear understanding of what types of behaviors are expected.

Say: *"Don't forget, we are going to be playing the Mystery Motivator during math! Your goals for the game are the entire class may only receive _____ or few check Maxs for inappropriate behaviors throughout our math class to earn a chance to play the Mystery Motivator."*

- Track each student's instance of disruptive behavior using the behavior tracking sheet.
- At the appropriate time, distribute the student's mathematics worksheets.
- At the end of the game, total up the number of checkmarks for all of your students.
- At the appropriate time, announce the class's behavior performance (i.e., number of inappropriate behavior checkmarks). Congratulate your students if they have met the criterion.
- If the students meet criteria, allow one student to draw a slip of paper from the Mystery Motivator box.
  - If an "M" is selected → select a student to open the Mystery Motivator envelope to reveal the class-wide reward.
  - If an "X" is selected → remind your students of their excellent performance and encourage them to keep up the good work. Remind your students that they can earn a chance to play the game during the next mathematics class.

APPENDIX H

INSTRUCTIONS FOR IMPLEMENTING THE MYSTERY MOTIVATOR –
ACADEMIC VERSION

Day One Only:

- Announce to the class that they will be playing the Mystery Motivator for the coming days. Tell them the time period in which the game will be played.

Say: *"Today we're going to talk about a new game we are going to play in our class. It is called the Mystery Motivator. This game will be played during mathematics class which is at _____ (indicate the time of your mathematics class)."*

- Present the Mystery Motivator board (which should be posted in the front of your classroom).

Say: *"This is our Mystery Motivator board. As you can see, the goals for the game are listed here* [point to the goals].*"*

- Explain to the class that in order to earn a chance to play the Mystery Motivator, the entire class must equal or exceed and average of _____% complete and _____% accurate.

Say: *"In order to earn a chance to play the Mystery Motivator, the entire class must complete at least an average of _____% of their math assignment and must get at least an average of _____% of their math assignment correct."*

- Inform your students that each time they reach their established goal for the day, they will earn a chance to play the Mystery Motivator.

Say: *"If you meet your academic goals for today, you will earn a chance to play the Mystery Motivator."*

- Inform the students that they will get to select a slip of paper from the Mystery Motivator Game box that will have either an "M" or an "X". Inform the students that they will earn a reward if an "M" is selected from the box. Inform the students that a reward will not be delivered if an "X" is selected from the box. Remind your students that they will get a chance to play the game the next day, if an "X" is selected. Be sure to provide verbal praise and encouragement if students select an "X" from the box. Direct the students attention to the Mystery Motivator Reward enveloped posted at the front of the classroom and inform the students that the potential daily reward is written on a slip of paper inside that envelope.

Say: *"If you meet your goals for today, I will pick a student to draw a slip of paper from the Mystery Motivator Game. If the student picks an "X", then you will not receive a reward. If the selected student picks an "M" then that student will open this Mystery Motivator envelope to reveal the class-wide reward. Do you have any questions?"* [show the students an example of each slip of paper from the Mystery Motivator box and show the students the Mystery Motivator Reward envelope]

_____

All Days:
- Announce to the class that they will be playing the Mystery Motivator. Remind the students of the academic goals.

Say: *"Don't forget, we are going to be playing the Mystery Motivator during math! Your goals for the game are the entire class must complete at least an average of _____% of their math assignment and must get at least an average of _____% of their math assignment correct."*

- At the appropriate time, distribute the student's mathematics worksheets.
- At the end of the game, provide the student worksheets to the consultant so he/she can calculate the class-wide completion and accuracy percentages.
- At the appropriate time, announce the class's academic performance (i.e., average completion % and the average accuracy %). Congratulate your students if they have met the criterion.
- If the students meet criteria, allow one student to draw a slip of paper from the Mystery Motivator box.
  - If an "M" is selected → select a student to open the Mystery Motivator envelope to reveal the class-wide reward.
  - If an "X" is selected → remind your students of their excellent performance and encourage them to keep up the good work. Remind your students that they can earn a chance to play the game during the next mathematics class.

APPENDIX I

MYSTERY MOTIVATOR
MATHEMATICS SCORES SHEET

Directions: Please calculate the completion and accuracy percentage for each student on their daily math assignment (use the formulas provided below). Calculate the class average for completion and accuracy to determine whether your students met the required criteria to play the Mystery Motivator Game.

Student	Completion % = *Number of Problems Completed* *Total Number of Problems*	Accuracy % = *Number of Problems Correct* *Total Number of Problems*
Class Average		

APPENDIX J

OBSERVER PROCEDURAL INTEGRITY CHECKLIST (MYSTERY MOTIVATOR-BEHAVIOR)

Teacher: _____ Date: _____
Observer: _____ Phase: _____

Day One Only:
_____**1. Inform the class they will be playing the Mystery Motivator.**
_____ **2. Inform the students of the behavior rules and role-model the behavior rules**.
_____ **3. Explain the game procedures and prompt students for questions**.
_____ 4. Distribute daily mathematics assignment.
_____ 5. Monitor students frequency of disruptive behavior utilizing the tracking sheet provided.
_____ 6. Inform the class whether they have met the criteria to play the Mystery Motivator at end of day.
_____ 7. Deliver the reward if an "M" is drawn and only provide verbal praise if and encouragement if an "X" is drawn.
_____ 8. Do not provide any additional behavior prompts during the Mystery Motivator.

% of Steps Completed: _____
*Bold items indicate critical components.

All Days:
_____ 1. Remind the class that they will be playing the Mystery Motivator during math class.
_____ 2. Remind the class of the behavior criterion for playing the Mystery Motivator.
_____ 3. Distribute daily mathematics assignment.
_____ 4. Monitor students frequency of disruptive behavior utilizing the tracking sheet provided.
_____ 5. Inform the class whether they have met the criteria to play the Mystery Motivator at the end of the day.
_____ 6. Deliver the reward if an "M" is drawn and only provide verbal praise if and encouragement if an "X" is drawn.
_____ 7. Do not provide any additional behavior prompts during the Mystery Motivator.

% of Steps Completed: _____

APPENDIX K

OBSERVER PROCEDURAL INTEGRITY CHECKLIST (MYSTERY MOTIVATOR-ACADEMIC)

Teacher: _____ Date: _____
Observer: _____ Phase: _____

Day One Only:
_____**1. Inform the class they will be playing the Mystery Motivator.**
_____ **2. Inform the students of the academic goals**.
_____ **3. Explain the game procedures and prompt students for questions**.
_____ 4. Distribute daily mathematics assignment.
_____ 5. Monitor students frequency of disruptive behavior utilizing the tracking sheet provided.
_____ 6. Inform the class whether they have met the criteria to play the Mystery Motivator at end of day.
_____ 7. Deliver the reward if an "M" is drawn and only provide verbal praise if and encouragement if an "X" is drawn.
_____ 8. Do not provide any additional behavior prompts during the Mystery Motivator.

All Days:
_____ 1. Remind the class that they will be playing the Mystery Motivator during math class.
_____ 2. Remind the class of the academic goals.
_____ 3. Distribute daily mathematics assignment.
_____ 4. Monitor students frequency of disruptive behavior utilizing the tracking sheet provided.
_____ 5. Inform the class whether they have met the criteria to play the Mystery Motivator at the end of the day.
_____ 6. Deliver the reward if an "M" is drawn and only provide verbal praise if and encouragement if an "X" is drawn.
_____ 7. Do not provide any additional behavior prompts during the Mystery Motivator.

% of Steps Completed: _____
*Bold items indicate critical components

% of Steps Completed: _____

APPENDIX L

IRB APPROVAL

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI.

INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.6820 | Fax: 601.266.4377 | www.usm.edu/irb

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 Effect 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: R10100602
PROJECT TITLE: A Comparison of Behavioral and Academically-Focused Goals
Within the Mystery Motivator: Effects on Disruptive Behavior and Academic Performance
PROJECT TYPE: Renewal of a Previously Approved Project
RESEARCHER(S): Christina Michelle Hardy
COLLEGE/DIVISION: College of Education & Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 01/23/2013 to 01/22/2014

Lawrence A. Hosman, Ph.D.
Institutional Review Board

REFERENCES

Algozzine, B., Wang, C., & Violette, A. S. (2010). Reexamining the relationship between academic achievement and social behavior. *Journal of Positive Behavior Interventions, 13*(1), 3-16.

Bradshaw, C., Mitchell, M., & Leaf, P. (2009). Examining the effects of school-wide positive behavioral interventions and supports on student outcomes: Results from a randomized controlled effectiveness trial in elementary schools. *Journal of Positive Behavior Interventions, 12*, 122-145.

Bennett, M. M. (2006). *An interdependent group contingency with mystery motivators to increase spelling performance*. Unpublished doctoral dissertation. Hofstra University.

Christ, T. J., & Christ, J. A. (2006). Application of an interdependent group contingency mediated by an automated feedback device: an intervention across three high school classrooms. *School Psychology Review. 35(1)*, 78-90.

Coogan, B. A., Kehle, T. J., Bray, M. A., & Chafouleas, S. M. (2007). Group contingencies, randomization of reinforcers, and criteria for reinforcement, self-monitoring, and peer feedback on reducing inappropriate classroom behavior. *School Psychology Quarterly, 22(4)*, 540-556.

Deno, S. L., & Mirkin, P. K. (1977). Data-based program modification: A manual. Reston, VA: Council for Exceptional Children.

De Martini-Scully, D., Bray, M. A., & Kehle, T. J. (2000). A packaged intervention to reduce disruptive behaviors in general education students. *Psychology in the Schools, 37(2),* 149-156.

Freer, P., & Watson, T. S. (1999). A comparison of parent and teacher acceptability

   ratings of behavioral and conjoint behavioral consultation. *School Psychology*

   Review, 28, 672-685.

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

   group contingencies for controlling disruptive behavior. *The Journal of Special*

   Education. 16(1), 101-110.

Harrison, J. R., Vannest, K., Davis, J., & Reynolds, C. (2012). Common problem

   behaviors of children and adolescents in general education classrooms in the

   United States. *Journal of Emotional and Behavioral Disorders, 20(1)*, 55-64.

Hawkins, R. O., Musti-Rao, S., Hughes, C., Berry, L., & McGuire, S. (2009). Applying a

   randomized component to classwide peer tutoring for multiplication fact fluency.

   Journal of Behavior Education, 18, 300-318.

Horner, R. Sugai, G., Smolkowski, K., Todd, A., Nakasato, J., & Esperanza, J. (2009). A

   Randomized wait-list controlled effectiveness trial assessing the school-wide

   positive behavioral support in elementary schools, *Journal of Positive Behavior*

   Interventions, 11, 133-144.

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004)

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

   Randomized interdependent group contingencies: group reinforcement with a

   twist, *Psychology in the Schools. 37(6)*, 523-532.

Kratochwill, T. R., & Bergan, J. R. (1990). *Behavioral consultation in applied settings:*

   *An individual guide.*New York, NY: Springer.

LeBlanc, D. M. (1998). *Mystery motivators versus reward menu: An investigation of the effects of home-based reinforcement delivery systems with home-school notes on disruptive/disengaged classroom behavior*. Unpublished doctoral dissertation, The University of Southern Mississippi.

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

Madaus, M. R., Kehle, T. J., Madaus, J., & Bray, M. (2003). Mystery motivator as an intervention to promote homework completion and accuracy. *School Psychology International, 24(4)*, 369-377.

Maggin, D. M., Johnson, A. H., Chafouleas, S. M., Ruberto, L. M., & Berggren, M. (2012). A systematic review of school-based group contingency interventions for students with challenging behavior. *Journal of School Psychology, 50*, 625-654.

Martens, B. K., Witt, J.C., Elliott, S.N., & Darveaux, D. (1985). Teacher judgments concerning the acceptability of school-based interventions. *Professional Psychology: Research and Practice, 16,* 191-198.

Moore, L., Wageuspack, A., Wickstrom, K., Witt, J., & Gaydos, G. R. (1994). Mystery motivator: An effective and efficient intervention. *School Psychology Review*, *23*, 106-118.

Murphy, K. A., Theodore, L. A., Aloiso, D., Alric-Edwards, J. M., & Hughes, T. L. (2007). Interdependent group contingency and mystery motivators to reduce preschool disruptive behavior. *Psychology in the Schools, 44(1)*, 53-63.

Musser, E. H., Bray, M. A., Kehle, T. J., & Jenson, W. R. (2001). Reducing disruptive

behaviors in students with serious emotional disturbance. *School Psychology Review, 30(2)*, 294-302.

National Association of School Psychologists Task Force on School Psychology: A Blueprint for Training and Practice III. (2006). Retrieved from www.nasponline.org/resources/blueprint/FinalBlueprintInteriors.pdf

National Technical Assistance Center on Positive Behavioral Interventions and Supports U. S. Department of Education, Office of Special Education Programs. (2009). Retrieved from http://www.pbis.org/about_us/default.aspx

NCS Pearson, Inc. (2010). *AIMSweb mathematics computation: Administration and scoring manual*. Retrieved from http://www.aimsweb.com/uploads/M-COMP%20Manual.pdf

Office of Special Education Programs: 2012-2013 School-wide Information System Summary National Data Report. Retrieved from http://pbisassessment.org

Rhode, G., Jenson, W. R., & Reavis, H. K. (1993). *The tough kid book: Practical classroom management strategies*. Longmont, CO: Sopris West.

Robinson, K. E., & Sheridan, S. M. (2008). Using the mystery motivator to improve child bedtime compliance. *Child & Family Behavior Therapy, 22(1)*, 29-41.

Schanding, T. G. & Sterling-Turner, H. E. (2010). Use of the mystery motivator for a high school class. *Journal of Applied School Psychology*, *26*, 38-53.

Scoggins, M. (2003). *Mystery motivator: An investigation of reinforcement delivery systems*. Unpublished master's thesis. The University of Southern Mississippi.

Shapiro, E. S., Albright, T. S., & Ager, C. L. (1986). Group versus individual

contingencies in modifying two disruptive adolescents' behavior. *Professional School Psychology, 1(2)*, 105-116.

Sharp, S. R., & Skinner, C. H. (2004). Using interdependent group contingencies with Randomly selected criteria and paired reading to enhance class-wide reading performance. *Single-Subject Designs for School Psychologists,* 29-45.

Sheridan, S. (1992). Consultant and client outcomes of competency-based behavioral consultation training. *School Psychology Quarterly, 7,* 245-270.

Shinn, M. (2004). *Administration and scoring of mathematics computation curriculum-based measurement (M-CBM) and math fact probes for use with AIMSweb*. Eden Prairie, MN: Edformation, Inc.

Skinner, C. H., Cashwell, T. H., & Skinner, A. L. (2000). Increasing tootling: The effects of peer-monitored group contingency program on students' reports of peers prosocial behaviors. *Psychology in the Schools, 37(3)*, 263-270.

Skinner, C. H., Skinner, A. L., & Sterling-Turner, H. E., (2002). Best practices in contingency management: application of individual and group contingencies in educational settings.   In A. Thomas & J. Grimes (Eds.), Best practices in school psychology, IV: Vol. 2. (pp.   817-830). Bethesda, MD: National Association of School Psychologists.

Sugai, G. & Horner, R. (2002a). The evolution of discipline practices: School-wide positive behavioral supports. *Behavior Psychology in the Schools*, 24, 23-50.

Sugai, G. & Horner, R. (2002b). Introduction to a special series on positive behavioral supports in schools. *Journal of Emotional and Behavioral Disorders*, 10(3), 130-135.

Sutherland, K. S., Lewis-Palmer, T., Stichter, J., & Morgan, P. L. (2008). Examining the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students with emotional or behavioral disorders. *Journal of Special Education, 41*, 223-233.

Teta, A. R. (2008). *Increasing homework completion in children with ADHD using the mystery motivator intervention*. Unpublished doctoral dissertation. Hofstra University.

Theodore, L. A., Bray, M. A., Kehle, T. J., & DioGuardi, R. J. (2003). Contemporary review of group-oriented contingencies for disruptive behavior. *Journal of Applied School Psychology, 20(1)*, 79-107.

Theodore, L. A., Bray, M. A., Kehle, T. J., & Jenson, W. R. (2001). Randomization of Group contingencies and reinforcers to reduce classroom disruptive behavior. *Journal of School Psychology, 39(5)*, 267-277.

Theodore, L. A., Bray, M. A., & Kehle, T. J. (2004). A comparative study of group contingencies and randomized reinforcers to reduce disruptive classroom behavior. *School Psychology Quarterly, 19(3)*, 253-271.

Tillery, A. D., Varjas, K., Meyers, J., & Collins, A. S. (2010). General education teachers' perceptions of behavior management and intervention strategies. *Journal of Positive Behavior Interventions, 12(2)*, 86-102.

Von Brock, M. B., & Elliott, S. N. (1987). The influence of treatment effectiveness information on the acceptability of classroom interventions. *Journal of School Psychology, 25*, 131-144.

Witt, J., & Elliot, S. N. (1985). Acceptability of classroom intervention strategies. In T. R. Kratchowill (Ed.), *Advances in school psychology*. (Vol. 4, pp. 251-288). Hillsdale, NJ: Erlbaum.

Zins, J. E., & Ponti, C. R. (1990). Strategies to facilitate the implementation, organization, and operation of system-wide consultation programs. *Journal of Educational and Psychological Consultation, 1(3)*, 205-218.

Zuckerman, E. L. (2005). *Clinician's thesaurus: The guide to conducting interviews and writing psychological reports* (6th ed.). New York, NY: Guilford Press.