12-2023

Using Behavior BINGO to Increase Academically Engaged Behavior in a General Education Elementary School Population

Faith Elizabeth Hamilton
University of Southern Mississippi

USING BEHAVIOR BINGO TO INCREASE ACADEMICALLY ENGAGED BEHAVIOR IN A GENERAL EDUCATION ELEMENTARY SCHOOL POPULATION

by

Faith Elizabeth Hamilton

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

Committee:

Dr. Zachary LaBrot, Committee Chair
Dr. Brad Dufrene
Dr. Crystal Taylor

December 2023

Published by the Graduate School

THE UNIVERSITY OF SOUTHERN MISSISSIPPI®

ABSTRACT

Spending instructional and work time addressing disruptive behaviors in the classroom is a common complaint of many teachers. The literature suggests that group contingencies are beneficial for improving behavior on a classwide and individual level. The current study investigated Behavior BINGO, a group contingency intervention whose research is in its infancy, and its effectiveness on increasing academically engaged behaviors and decreasing disruptive behaviors on a classwide basis. This study utilized a nonconcurrent multiple baseline design in three 2nd grade, general education classrooms in a public school.

Keywords: Interdependent Group Contingency, Behavior BINGO, Classwide Intervention, Target Student

ACKNOWLEDGMENTS

My deepest appreciation to my committee chair, Dr. Zachary LaBrot, for his continual encouragement, flexibility, patience, and feedback throughout this process. Further thanks go out to my committee members, Drs. Brad Dufrene and Crystal Taylor, who continue to encourage me to apply my increasing knowledge, broaden my understanding, and stretch my capabilities of critiquing my own work. I could not have undertaken this journey without the aid of Brittany Garza, Brittany Pigg, Lourdes Rodriguez, and Cagla Cobek. Data collection would never have been completed without your flexibility, persistence, dedication, and involvement. Thank you.

DEDICATION

To my husband, Andrew, who is a constant encouragement, sounding board, and support – I would not be here without you. You listen to my complaints, answer my questions, and help me problem solve after a long day of your own clinical work. To my children, Abigail, Anna, and Eli – you are my lights at the end of the tunnel, the motivation to keep going, and the fun at the end of long days. Thank you all for all you do, whether you know it or not. I love you all forever. Ooga-mooga.

To my parents: thank you for making education a priority, for teaching me discipline and time-management skills, for your constant prayers and continual encouragement and support. Thank you for teaching me to have faith and making that the biggest priority of all. Quite literally, I would not be here without you. I love you both.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

LIST OF ABBREVIATIONS

ADHD	Attention-Deficit/Hyperactivity Disorder
AEB	Academically Engaged Behavior
ASD	Autism Spectrum Disorder
CFI	Comparative Fit Index
CURP	Children's Usage Rating Profile
DB	Disruptive Behavior
DBRC	Daily Behavior Report Card
EBD	Emotional and Behavioral Disorders
GBG	Good Behavior Game
IDEA	Individuals with Disabilities Education Act
IOA	Interobserver Agreement
MM	Mystery Motivator
MTSS	Multi-Tiered System of Supports
NCES	National Center for Education Statistics
PBIS	Positive Behavioral Interventions and Supports
RMSEA	Root Mean Square Error of Approximation
STEAM	Science, Technology, Engineering, Arts, and Mathematics
URP-IR	Usage Rating Profile-Intervention, Revised
VR	Variable Ratio
WWC	What Works Clearinghouse

CHAPTER I - INTRODUCTION

A common complaint among teachers is students' displays of disruptive behavior (DB) in the classroom. The complaints of these behaviors in the classroom are becoming more prevalent since the return to in-school instruction after the COVID-19 pandemic (National Center for Education Statistics [NCES], 2022). Since that time, 84% of public schools report that the behavioral development of students has been negatively impacted and classroom disruptions have increased by 56%. The NCES (2022) also found that public schools reported an increased need to train teachers on classroom management strategies, particularly as teachers who lack appropriate training in behavior management may be more likely to leave the field (Bettini et al., 2020). Students' displays of DB contribute to teacher burnout (Aloe et al., 2014), and are a primary reason for teachers leaving the profession within the first four years of teaching, with an average of 0.9% of teachers quitting, per month, during the 2021-2022 school year (Schmitt & deCourcy, 2022). In addition, DBs are a significant disruption to classroom instruction (Müller et al., 2018) and interfere with students' learning and success (Marder et al., 2023). In fact, Korpershoek et al. (2016) found that effective classroom management decreased problem behavior and increased academic achievement by statistically significant amounts. In addition, an individual student's DB can lead to social rejection by peers (Leflot et al., 2013) and to worsening behavior, such as noncompliance, coercion, manipulation, and aggression (Leflot et al., 2013). As such, it is imperative that empirically validated classroom management strategies are implemented to address and prevent student displays of DB in the classroom.

The 1997 reauthorization of the Individuals with Disabilities Education Act (IDEA) first named Positive Behavioral Interventions and Supports (PBIS) to provide guidance to teachers and schools on how to positively influence behavior problems in the classroom. Like the Multi-Tiered System of Supports (MTSS) that the 2004 reauthorization of the IDEA put in place, PBIS operates in three tiers. Tier 1 is universal across all students and classrooms. Nestled in this tier are procedures for establishing classroom behavioral expectations in addition to procedures for encouraging appropriate behavior and discouraging problem behavior. Also included at Tier 1 are universal screening measures to identify those students who may be at-risk of more intensive behavioral problems, in addition to progress monitoring at less frequent intervals than the other two tiers. It is estimated that 80% of students perform adequately at the Tier 1 level (Fluke & Peterson, 2013). Tier 2 interventions are for students who are at risk of developing serious problem behaviors and are intended to be preventative. Universal screening and lack of success in Tier 1 are indicators that a student may need more intensive interventions, typically within small groups of other students. Tier 3 is reserved for students who are unsuccessful with Tier 1 and Tier 2 supports, typically at or less than 5% of student populations (Fluke & Peterson, 2013). These students receive individualized assessments and interventions, in addition to Tier 1 and Tier 2 interventions already in place.

In public schools in the U.S., many classrooms only have one primary, full-time teacher; occasionally, there may be a teacher's aide or assistant. Thus, it is important to develop behavioral management techniques that can be broadly administered by a single interventionist, are easy and quick to implement, and are easily resourced. Group

contingencies are ideal for behavioral management interventions in the classroom due to the need of few adults and less class time required for implementation (Maggin et al., 2017), and are ideal for PBIS Tier 1 or Tier 2 interventions.

Group Contingencies

Group contingencies are interventions that involve applying shared consequences to a group of individuals and can target one, some, or all members of a group (Litow & Pumroy, 1975). In group contingencies, a predetermined criterion must be met by the group or a select portion of the group before a reinforcer is delivered (Maggin et al., 2017). Effective group contingencies also have clearly communicated start and end points that signal the behavior expectations and the potential to earn the reinforcer (Cooper et al., 2020). As such, group contingencies use operant conditioning principles as desired behaviors are met with positive reinforcement (Cooper et al., 2020).

Group contingencies are ideal for the classroom environment as they are easily implemented, time-efficient, and cost-effective (Little et al., 2015). In addition, group contingencies operate on the behavior of the entire classroom simultaneously, requiring less teacher effort (Little et al., 2015) and decreasing teacher workload (Cooper et al., 2020; Ennis et al., 2016). Research on group contingency interventions consistently supports their effectiveness for improving behavior across multiple age groups, such as preschool (Pasqua et al., 2021), elementary school (Kowalewicz & Coffee, 2014), middle school (Dart et al., 2016), and high school (Mitchell et al., 2015) students. In addition, group contingencies have been found to be effective for students with various internalizing and externalizing concerns, such as emotional and behavioral disorders (EBD; Joslyn et al., 2019), Attention-Deficit/Hyperactivity Disorder (ADHD; Roberts et

al., 2023), and autism spectrum disorder (ASD; Ré et al., 2023). Group contingencies also have demonstrated effectiveness for improving a multitude of behaviors, including academic skills (e.g., Ashworth et al., 2019; Roberts et al., 2023), DBs (e.g., Collins et al., 2017), appropriate behaviors (e.g., Pasqua et al., 2021), work completion (e.g., Trevino-Maack et al., 2015), and accuracy (e.g., Lynch et al., 2009).

Group continencies can be independent, dependent, or interdependent. Results of a recent meta-analysis support the use of all three forms of group contingencies for improving students' behaviors in classroom settings (Maggin et al., 2017). While each type of group contingency has relative strengths and benefits, they each have unique limitations that should be addressed to enhance their efficiency and effectiveness.

Independent Group Contingencies

An independent group contingency is one in which the entire group has a predetermined performance criterion, but only those members who meet the criterion receive a reinforcer (Litow & Pumroy, 1975). Independent group contingencies can also involve each member having an individualized predetermined performance criterion (Mayer et al., 2014). Theodore et al. (2004b) suggest that this may be particularly relevant for classrooms with children with disabilities, making the potential to meet the criterion for these students more realistic while not minimizing the goal for those students without disabilities. Independent group contingencies may be considered as fairer by teachers as each students' criterion is based on the same behaviors and have the same reinforcers (Ennis et al., 2016). Research indicates that students also find independent group contingencies to be acceptable as they view them as more fair and less likely to be

sabotaged by fellow students, as each student is responsible for meeting the criterion and earning of the reinforcer (Dart et al., 2016; Joslyn & Vollmer, 2020).

Classroom Password is one such independent group contingency intervention (Dart et al., 2016). The Classroom Password intervention was initially tested by Dart et al. (2016). At the beginning of the implementation session, the students received a recording form and were told the password. Throughout the intervention session, students were responsible for indicating the frequency of the password on the recording form. Throughout instruction, the teacher subtly and randomly said the password. Those students who had correctly indicated the number of times the password was said on their recording forms were eligible to receive reinforcement. Results indicated that the Classroom Password yielded decreases in DBs and improvement in the amount of desired behaviors.

Mystery Student, another independent group contingency intervention, involved two students being randomly selected and remaining anonymous to the class (Pasqua et al., 2021). Throughout the intervention period, the mystery students' behaviors were observed discretely by the teacher for meeting desired target behaviors. At the end of the period, if the mystery students individually met the criteria, reinforcement was given with public praise. Although it is in preliminary phases, the Mystery Student intervention shows promise as an effective strategy to decrease DBs and increase appropriate behaviors. To date, research has clearly demonstrated the beneficial effects of independent group contingencies.

Despite their effectiveness, independent group contingencies have some limitations. First, although students find independent group contingencies to be socially

valid, teachers may struggle to only provide reinforcers to the students who meet the criterion, particularly when faced with a student who put in much effort but continued to not meet the criterion (Kelshaw-Levering et al., 2000). Second, unlike other group contingencies, independent group contingencies are less likely to promote cooperation and collaboration among classmates as each student only works to earn his or her reinforcer (Little et al., 2015). Third, if the criteria are not met or contribute to the group's failure to meet criteria, the member or members may face social retribution from his or her peers (DeStasi et al., 2023). Finally, due to the individualization of the meting out of reinforcers, teachers tend to reinforce with tangibles instead of activities due to ease of distribution. This also may be a limitation of independent group contingencies due to cost and possible sharing of the reinforcer between those who earned it and those who did not (Kelshaw-Levering et al., 2000). If a student is receiving the reinforcer although he or she does not earn it, the problem behaviors may be reinforced further (Ennis et al., 2016) thus undermining the purpose of the intervention. As such, research examining group contingency interventions that promote cooperation and minimize the likelihood that a student is viewed as "deviant" (Skinner et al., 1996) is needed.

Dependent Group Contingencies

Dependent group contingencies involve providing reinforcement to a group of students contingent upon a single individual or a small group of students meeting a predetermined performance criterion (Litow & Pumroy, 1975). This type of group contingency is sometimes utilized in classrooms in which a single or a small group of students' behavior impacts the performance of the entire classroom. Research examining dependent group contingencies has demonstrated their effectiveness for increasing on-

task behavior (Groves et al., 2023), increasing positive interactions (Hansen et al., 2005), increasing social skills (Hartman & Gresham, 2016), decreasing DB during transitions, and increasing compliance (Deshais et al., 2018). Similar to independent group contingencies, research supports that dependent group contingencies are effective for improving classwide student behaviors.

As an example, Williamson et al. (2009) evaluated a dependent group contingency in which a random student was selected by the teacher but remained a mystery to the class. Throughout the class, the mystery student received a mark for on-task behavior. If the predetermined criteria were met, the entire class was given the reinforcer. Results indicated that the intervention was effective at increasing classwide on-task behavior. Another example of a dependent group contingency is demonstrated by Deshais et al. (2018). Similar to Williamson et al. (2009), this intervention involved two students (one boy and one girl) being randomly selected by the teacher but remaining anonymous to the class; these two students were placed into two teams – the boys' team and the girls' team. The class was given the behavioral expectations of remaining quiet and keeping 'hands to oneself' during transitions; if the mystery students were successful during this time period, each member of the 'winner's' team received a piece of candy. Results indicated that the dependent group contingency was beneficial at decreasing the amount of DB during transitions. Despite research demonstrating the positive effects of dependent group contingencies, limitations exist.

While dependent group contingencies may create positive interactions among students when the target student or group of students meet the criterion (DeStasi et al., 2023), hostility towards those classmates may arise if the criterion is not achieved. That

is, the target student or students may be singled out, shunned, or treated poorly by classmates for not meeting the performance criterion, possibly resulting in the target student or students being discouraged from attempting to meet the criterion in the future (Little et al., 2015). Furthermore, dependent group contingencies only target a single or small group of students, and therefore may not be as helpful for improving classwide behavior (DeStasi et al., 2023; Little et al., 2015). Given these limitations, additional research examining group contingencies that reduce negative peer pressure and target the behavior of all students in a classroom is needed.

Interdependent Group Contingencies

In interdependent group contingencies, the reinforcer is distributed to the whole group contingent on the entire group meeting the predetermined performance criterion (Litow & Pumroy, 1975). Per Litow and Pumroy, there are three methods to determine the groups' performance: when the entire group meets the criterion (e.g., Collins et al., 2017), averaging of all individual performances and achieving a mean group score (e.g., Bear & Richards, 1980), and a single, randomly selected performance (e.g., Drabman et al., 1974). In all cases, each student's behavior is important in contributing to meeting the criterion (Theodore et al., 2004b).

Unlike independent and dependent group contingencies, interdependent group contingencies capitalize on positive peer pressure, classmate cooperation, and group cohesiveness (Cooper et al., 2020; Skinner et al., 1999). Students must work together to meet a common criterion, requiring cooperation and promoting peer encouragement. Interdependent group contingencies are also efficient in regard to the teacher's time (Groves et al., 2023) as a single reinforcer can be delivered to an entire group

simultaneously (Little et al., 2015). Another benefit of interdependent group contingencies is that, since the entire group either receives or does not receive a reinforcer, and the reception of such is dependent on the group's behavior, a class caste system is discouraged (as speculated by Skinner et al., 1996, and Theodore et al., 2004b, despite a lack of empirical evidence). A class caste system may divide the class into teacher pets or "the elite"; Skinner et al. (1996) further speculated that, these students may be labeled as "smart" or "well behaved" (p. 64) while those who do not fit into this category (or caste) may be labeled as "deviant" (Skinner et al., 1999, p. 809). In addition, teachers may find this type of group contingency ideal for activity reinforcers (e.g., listening to music, playing ball, field trips, lunch with a teacher) as all students can engage in the activity simultaneously and the cost is reduced due to lack of tangibles (Cooper et al., 2020; Skinner et al., 1996, 1999).

An iconic example of an effective interdependent group contingency is the Good Behavior Game (GBG), which has been researched and implemented in classrooms since the late 1960s. Barrish et al.'s (1969) initial investigation evaluated the effectiveness of the GBG in one fourth-grade classroom consisting of 24 students. Seven of the students had been referred to the principal for problem behaviors multiple times; however, behavioral difficulties were also reported throughout the entire classroom. After an introduction of the intervention with a description of the rules and behavioral expectations, the class was equally divided into two teams, and only the team that won the game received the reinforcer. When a member of a team broke one of the rules (i.e., engaged in a prespecified target behavior), the team received a mark on the board. At the end of the session, the team with the fewest marks received the reinforcer. Although the

results of Barrish et al.'s investigation indicated that the GBG was effective at decreasing disruptive classroom behaviors, the intervention did introduce a possible issue. That is, two of the students with previous principal referrals were placed on the same team and their continued DB throughout the game regularly resulted in their team gaining points and losing. Since this original investigation of the GBG, a bevy of variations and subsequent studies have taken place, showing effects across different ages and populations, with and without disability (e.g., Davies & Witte, 2000; Gresham & Gresham, 1982; Groves & Austin, 2020; Kleinman & Siagh, 2011; Tingstrom, 1994).

Mystery Motivator (MM) is another example of an interdependent group contingency (Kowalewicz & Coffee, 2014). MM involved a chart of the intervention period (typically a week or a month) with randomly selected days in which a reinforcer was available for displays of the agreed-upon behaviors. These selected days were kept hidden from students. At the end of each day, if the agreed-upon behaviors were displayed, the teacher displayed whether the MM was available on the chart. Whether the MM was available or not, students received verbal praise for displays of the agreed-upon behaviors. Research on MM indicates that the intervention is effective in improving behavior problems in the classroom (e.g., Beeks & Graves, 2016; Kowalewiscz & Coffee, 2014; Robichaux & Gresham, 2014). As a whole, research on interdependent group contingencies suggests effectiveness in improving classroom behaviors.

Although interdependent group contingencies address limitations of both independent and dependent group contingencies, they still contain limitations that should be addressed. First, students may view the criteria as unfair (e.g., Bohan & Smyth, 2023); this is particularly relevant to those students who put forth effort yet do not meet the

criteria due to other classmates' inability to do so (Little et al., 2015; Theodore et al., 2004b). Students who follow classroom rules or personally meet behavior criteria but do not receive the reinforcement due to classmates may feel particularly frustrated by the interdependent group contingency which may lead to these individuals feeling a loss of motivation and subsequently engaging in DB. This may also lead to retribution toward those who seemingly did not contribute toward the criteria (DeStasi et al., 2023). There is also the possibility of students intentionally sabotaging the intervention to prevent access to the reinforcer (Rubow et al., 2018). This sabotage may be in response to a non-reinforcing or disliked reinforcer. Likewise, the group contingency's effectiveness may be decreased by a stimulus that is not reinforcing to some or most students (Litow & Pumroy, 1975; Theodore et al., 2004b). Future research may investigate addressing these limitations by randomizing components, such as the reinforcer or criterion, or by anonymizing the student or students who are being observed.

Individually, each group contingency has research to support its individual effectiveness and efficacy in improving academically and pro-social behaviors and in decreasing the amount of DB. Despite this research in the favor of group contingencies, each individual type of contingency has advantages and weaknesses.

Comparison of Group Contingencies

Various researchers have compared the three types of group contingencies. Gresham and Gresham (1982) used a modified reversal design to compare dependent, independent, and interdependent contingency interventions to investigate the effects on DB of 12 students with intellectual disabilities in a special education classroom. They found that interdependent and dependent contingency systems were slightly more

effective than independent systems in decreasing DB. Shapiro and Goldberg (1986) used an alternating treatments design to study the effects of the various group contingencies on spelling test performance. In their study, they found that the effectiveness of all three contingencies was relatively equal, though the students tended to favor the independent group contingency. Shapiro and Goldberg hypothesized that the effectiveness of the group contingencies may have been "diluted" due to the large number of students used in their study.

Also studying the effects of group contingencies on DBs, Theodore et al. (2004a) investigated the group contingencies in adolescent males with EBDs. They found that all three types of contingencies were immediately effective at decreasing levels of DB. The differences between effect sizes of all three types of group contingencies were found to be minimal, with individual data points overlapping across treatments. In 2009, Lynch et al. studied the effects of the various group contingencies on improving homework completion and accuracy among six 10- and 11-year-olds in a special education classroom. Like those before them, they found that the effects of the three types of group contingencies were relatively equal in effectiveness.

In an attempt to determine the relative effectiveness of the different group contingencies, Little et al. (2015) conducted a meta-analysis of 50 group contingency studies from 1980 to 2010. Of the 50 studies, 48 occurred in schools or classrooms; the two studies that were not set in schools were set in residential facilities – one for those with intellectual disabilities and the other for juvenile delinquents. 27 of the 50 studies focused on general education students, while the other 23 studies focused on students in special education. 74% (37) of the studies investigated the effects of group contingencies

among elementary students, while the other 26% of studies included preschoolers (2), middle and high school students (10), and adults with intellectual disabilities (1). Although Little et al. found that all three types of group contingencies were found to be effective across behaviors, ages, and populations, they determined that interdependent group contingencies may be less effective than dependent types; however, effect size differences were minimal, with the dependent group contingencies having a moderate effect size of 3.75, independent group contingencies having a moderate effect size of 3.27, and interdependent group contingencies having a moderate effect size of 2.88, indicating that all three types of group contingencies produce effects. As Little et al. noted, the sample of interdependent group contingencies (n = 35) that met their inclusion criteria was larger than for dependent (n = 11) and independent group contingencies (n = 8), possibly resulting in a lower effect size due to less variability among data. This is particularly important when considering how Little et al. calculated effect size (a variation of Cohen's d in which ES = (intervention mean – baseline mean)/baseline SD). Presumably, the larger amount of data provided by 35 studies resulted in larger levels of variability, impacting the effect size calculations.

Despite Little et al.'s (2015) findings that the three types of group contingencies are effective at addressing classroom behaviors, they also noted limitations commonly listed for each type of contingency. In their findings, dependent group contingencies were frequently thought of as "unfair" to students, with the possibility of creating hostility within the classroom. This type of group contingency also may punish the students who exhibit the target behavior, as they may lose the reinforcement due to others' actions. Little et al. found that independent group contingencies may prove unsuccessful in aiding

group cooperation, as the contingency is based on an individual's performance. A listed advantage of interdependent group contingencies is that the responsibility of meeting the criterion is shared across group members, decreasing the risk of the loss of reinforcement being associated with an individual. A potential disadvantage of the interdependent group contingency is that failure to obtain reinforcement may be blamed on group members that are perceived or suspected to have not met behavioral expectations.

In a follow-up study, Maggin et al. (2017) conducted a meta-analysis of 40 group contingency studies conducted within school settings, published between 1969 and 2016. Maggin et al. divided findings between those studies that investigated the effectiveness of different types of group contingencies on the individual-level (i.e., the unit of analysis was an individual student) or the classroom-level (i.e., the unit of analysis was the class as a whole). On the individual-level, students were between first and tenth grade, 75% male, and 63% in general education settings. Of the 40 studies included in the meta-analysis, 11 focused on the individual as the unit of analysis, while the other 29 focused on the group as the unit of analysis. Only one study evaluated both classwide and individual units of analysis. Evaluating and reporting the data on an individual child's response to a group contingency allows the researcher (and reader) to determine the individual effects of the group contingency, particularly when that individual's baseline levels of DB are higher than his or her peers. When pairing the data collection from an individual student and the group as a whole, the researcher is able to determine if the contingency is effective on an individual and a group level. 63% (25 of 40) of the studies investigated the effects of group contingencies among elementary students, while the other 28% investigated middle and high school students (11) and 4 studies did not report

the population's grade. In Maggin et al.'s meta-analysis, only single-case studies of group contingencies that occurred in schools were included; of these studies, 31 occurred in general education classrooms and 9 occurred in special education or resource classrooms. Studies that investigated the effects of group contingencies on the individual level also focused on students with attention-deficit/hyperactivity disorder (ADHD) and emotional behavioral disorders (EBDs); on the classroom level, only seven studies reported that students with EBDs and learning disabilities were the focus. Of note, Maggin et al. mentioned that the group contingency literature underreports demographic information, in addition to a lack of reporting on disability, primary language, and academic achievement of the population under study.

Across these various studies, the research provides support for the use of group contingencies as a behavior management strategy. Although the research indicates the effectiveness of all three types of group contingencies, interdependent group contingencies may lead to better team building and classroom collaboration towards a goal. Despite this being the case, more research is needed to address the limitations of possible sabotage and the blaming of individuals that may be a result of the use of this strategy.

Strategies to Address Interdependent Group Contingency Limitations

Popkin and Skinner (2003) suggested that randomizing group contingency components may be a possible solution in addressing the disadvantages of interdependent group contingencies. Randomizing components of the group contingency can result in the contingencies being less discriminable (Groves et al., 2023), each student having a chance for a more preferred reinforcer (DiStasi et al., 2023), and students being less

likely to identify those students responsible for not meeting criterion (DeStasi et al., 2023). According to Little et al. (2015), the randomization of reinforcers is recommended as a method to decrease the likelihood of reinforcement satiation. This also aids in removing possible sabotage due to nonpreferred reinforcers, in addition to students losing motivation to attempt meeting behavioral criteria, as they perceive that they have already lost (DeStasi et al., 2023; Groves & Austin, 2020).

Components of group contingencies that may be randomized are subjects, antecedents (e.g., having no specific reinforcer to work toward or not informing subjects of what the reinforcer is), target behaviors, reinforcement criteria, reinforcers (Groves et al., 2023), types of contingencies, and group membership (e.g., changing team members based on teacher selection, seating arrangement, or random draw; Collins et al., 2019). For example, Pasqua et al. (2021) examined the effectiveness of the Mystery Student intervention and randomized preschool students who were eligible to earn a reinforcer. In this intervention, two students were selected at random (i.e., the mystery students) and their identities were not announced to the class. As the intervention period progressed, the teacher recorded whether the mystery student met the predetermined criterion for academically engaged behavior (AEB). Once the intervention period ended, if the mystery student exhibited AEB in 60% or more of intervals, the criterion for the intervention had been met and the student received a reinforcer with an explanation of what behaviors earned the reward. If the mystery student did not meet the criterion, the teacher announced that the criterion for a reinforcer was not earned. Results indicated that the intervention was effective for increasing classwide AEB and decreasing classwide DB.

Theodore et al. (2004a) also utilized a randomized component in their intervention; however, instead of randomizing a target student, the researchers randomized contingency type and reinforcers. In the intervention, students were directed to meet the specified criteria of meeting classroom rules. Using an alternating treatments design, independent, dependent, and interdependent group contingencies were individually implemented. If the criteria of the selected contingency type were met, slips labeling various reinforcers were drawn by the teacher. Criteria were randomized by including a variable ratio (VR) schedule resulting in the number of appropriate behaviors needed to meet criteria being unknown to students. Similarly, Lynne et al. (2017) and Donaldson et al. (2011) both utilized randomized group membership in their GBG implementations: Lynne et al. (2017) grouped students based on seating chart while the teacher in the Donaldson et al. (2011) study attempted to make groups "fair" based on past displays of "problematic" behavior (p. 606).

In addition to being randomized, Cariveau and Kodak (2017) indicated that any of the contingency components can be kept hidden from the students, which can further encourage student engagement with the intervention. For example, Pasqua et al.'s (2021) evaluation of the Mystery Student intervention involved anonymizing the mystery students such that all students engaged in appropriate behavior in the event they were the mystery student. Anonymizing students can further alleviate possible sabotage, lack of effort due to frustration, and working to meet criteria instead of performing to the best of one’s ability (Richardson et al., 2021).

Behavior BINGO

Behavior BINGO is an interdependent group contingency that may address the limitations of interdependent group contingencies, as it allows for the randomization of various components. Behavior BINGO utilizes a BINGO board (five squares by five squares) in which the students aim to get five squares filled in a horizontal, vertical, or diagonal line. To earn a square, the teacher scans a student or students for desired target behaviors. If these behaviors are observed, then a square on the BINGO board is earned. Of note, each empirical examination of Behavior BINGO has included a randomization component of which square was earned. When the BINGO objective has been earned, a group reinforcer is delivered. Because Behavior BINGO is dependent on a group's meeting of a specific criterion (i.e., five squares in a row) and the whole group earning a reinforcer, this is an interdependent group contingency. Behavior BINGO provides reinforcement on a VR schedule, requiring a changing number of responses centered on an average, before reinforcement is delivered; however, the number of responses required for reinforcement is unknown. In Behavior BINGO, the VR schedule is implemented as students and the teacher are uncertain if the criterion of five squares in a line will be achieved within the game session.

Collins et al. (2017) conducted the first Behavior BINGO study, which evaluated the effects of Behavior BINGO for students with EBDs in two classrooms in an alternative high school. The first classroom consisted of nine students in ninth through twelfth grade, ranging from fifteen to twenty years of age. The second classroom consisted of six students in tenth through eleventh grade, ranging from fifteen to eighteen years of age.

Using an ABAB withdrawal design, Collins et al. (2017) evaluated the effectiveness of Behavior BINGO for increasing on-task behavior and decreasing off-task and DB. Planned activity checks were used to gather data on the dependent variables observed in each class, in which researchers recorded the number of students participating in a single behavior (on-task, off-task, or DBs) at the end of each interval. Researchers also indicated the number of students present at the end of each interval, as this number fluctuated due to students being pulled from the class for other services. Percentages of each variable were then calculated by averaging the percentage of each student engaged in each behavior.

During the first intervention phase for Class 1, the teacher announced the Behavior BINGO game and set a MotivAider device to a five-minute interval. At the end of the interval, the teacher scanned the class, counted the number of students engaged in on-task behavior, and pulled the corresponding number of slips from a plastic bag. Slips that were pulled from the bag consisted of numbered slips that corresponded to a square on the BINGO board and "students' choice" slips. Each numbered slip contained a number 1 - 25 that corresponded with a square on the BINGO board, while "students' choice" slips allowed for a class poll to decide which numbered square of the BINGO board to cover. After three days of 85% or higher of on-task behavior, the scanning intervals increased to 10 minutes. Following withdrawal, in addition to the 25 numbered slips and the five "students' choice" slips, the second implementation of the Behavior BINGO intervention added 25 "try again" slips for fading purposes. When a "try again" slip was selected, no square on the BINGO board was covered as a means of fading the intervention.

Procedures for the second classroom differed from the first. During the first intervention phase for Class 2, all elements of the intervention remained the same as those for Class 1; however, the first implementation in Class 2 did not increase intervals to 10 minutes (i.e., intervals remained at 5 minutes). For both classrooms, if five consecutive squares were covered in a vertical, horizontal, or diagonal line during an intervention session, then BINGO was achieved, and the teacher drew a random slip out of the reinforcer bag and immediately provided the randomized reinforcer to the entire class. Similar to Class 1, the reimplementation of the intervention in Class 2 began with 10-minute intervals and included 25 "try again" slips, in addition to the 25 numbered slips and five "students' choice" slips.

Results for Class 1 indicated variable display of on-task and off-task behaviors; levels of on-task generally stayed above baseline while levels of off-task generally stayed below baseline. For Class 2, results indicated variable displays of on-task and off-task behaviors, with multiple instances of overlapping data. Overall, results indicated that Behavior BINGO was effective for increasing on-task behaviors and decreasing off-task behaviors.

Collectively, results of this study indicated that Behavior BINGO might result in minor improvements in on-task and off-task behavior; however, a strong functional relation between implementation of Behavior BINGO and subsequent behavior change is lacking, as data demonstrate variability in phases and contain overlap between phases. This study contained limitations that warrant discussion. First, this study only included two classrooms in an alternative school setting. Second, participants in this study included high school aged students with EBDs. Collectively, these limitations limit the

extent to which findings can be generalized. Future research is needed to replicate this study's results in different settings (e.g., elementary schools) and with different populations (e.g., elementary students of typical development). Third, Collins et al. (2017) noted that the intervention was implemented while students were tasked with independent seat work, potentially limiting generalization of the intervention effects during different types of instructional demands. Collins et al. suggest that the teacher might have been more willing to adhere to the Behavior BINGO protocol because she was not leading classwide instruction. Students also received small breaks from work when BINGO slips were pulled; these breaks may have been a form of unintentional reinforcement and, potentially, impacted the internal validity of the study. The Collins et al. study also implemented planned activity checks which require the teacher to scan all students which requires time, potentially misses observable behaviors, and minimizes anonymity of students being observed which may lead to ostracization by peers.

To address some of these limitations, White (2020) extended the research by examining the effects of Behavior BINGO for three sixth grade classrooms in a STEAM (science, technology, engineering, arts, and mathematics) school. The class size for all classrooms was approximately 25 students. In addition to altering the population and setting, White's study occurred during independent seatwork, teacher-led lecture, and testing.

White (2020) utilized an ABAB withdrawal design to test the effects of Behavior BINGO on the sixth-grade students' AEB and DB. The teacher began each session of the intervention by explaining the game to students. The teachers in White's study (2020) utilized planned activity checks in five-minute intervals to evaluate if students displayed

the behaviors under observation. After counting how many students were engaged in AEB, teachers were required to utilize a chart, provided by researchers, to calculate the percentage of students engaged in the desired behaviors which determined how many slips were earned. After the teacher selected the correct number of slips per this calculation, the corresponding number of slips were put into a clear container. Although students were able to see that slips were being earned, they were unable to tell if the BINGO criterion was met until the end of the game, adding another randomization component to the Behavior BINGO intervention. At the end of the BINGO game, the teacher removed the slips from the container and covered the corresponding square on the BINGO board. BINGO was achieved when five consecutive squares in a vertical, horizontal, or diagonal line were covered. The teacher then selected a random slip from the reinforcer bag and immediately presented the reinforcer to the entire class.

Results of White's (2020) study demonstrated a clear functional relationship between the implementation of Behavior BINGO and AEB and DB. Across all classrooms, implementation of Behavior BINGO resulted in high and consistent levels of AEB and low and consistent levels of DB.

Social validity ratings ranged from moderate to high (White, 2020). Teachers in Classrooms 2 and 3 deemed the intervention as acceptable; however, the teacher in Classroom 1 found the intervention as less acceptable. The possible financial constraints of the school and teacher in purchasing reinforcers and, possibly, smart devices for interval indication, was another limitation listed. White reported that there was no data collected on behavior differences and effectiveness of the intervention during different instruction types.

This study extended the Behavior BINGO literature by using an original population (i.e., sixth grade students), in a novel setting (i.e., STEAM school), bigger class sizes, and across different academic tasks. White also altered the original Behavior BINGO procedures to address the limitations of class-time required. Instead of selecting a slip, reading it out, and covering the board at each interval, the teacher selected the slip and collected them in a jar throughout the class period. Near the end of the class period, the teacher read all the slips consecutively and marked the corresponding spots on the BINGO board.

Summary of Limitations to the Behavior BINGO Literature-base

As research on Behavior BINGO is in its infancy, addressing the documented limitations is integral in improving this intervention for widespread use. The Collins et al. (2017) study, the first on Behavior BINGO, had a small and specific sample: two classrooms in an alternative high school setting, in which all students were classified as having EBDs. The specificity of this sample creates limits to the generalization of this intervention without further study into different populations, settings, and class sizes. The current study addressed another population that this intervention may be utilized among, namely, elementary aged students in general education classrooms in public schools. Another limitation that was noted by Collins et al. was that the intervention was only implemented during independent seat work, again limiting this intervention's utility in addressing student DB, as DB frequently occurs during other types of work, such as lecture or group work. Collins et al. also mentioned that a possible limitation was that students received small breaks from work when BINGO slips were pulled; these breaks may have been a form of unintentional reinforcement and, potentially, impacted the

internal validity of the study. As the implementation of the intervention in the current study modified the intervention to listing the squares earned at the end of the intervention session, the possibility of these reinforcing breaks was reduced. Another noted limitation stated that independent seat work as an intervention period may have made the implementation of Behavior BINGO easier for the teacher as she did not have to instruct simultaneously. To address this, the current study included implementation during various types of work, including during independent seat work, group instruction, and small group work.

Although not mentioned as a limitation by Collins et al. (2017), a potential limitation was in the methodology employed for drawing slips. Collins et al. indicated that the number of numbered slips drawn was on a 1:1 ratio. This is a limitation as the BINGO criteria could have been met very early in the intervention period based on only a few students' (i.e., not every student's) AEB. This methodology also could have contributed to social loafing (Ward & Lee, 2005) as students knew another student would be engaged in AEB, resulting in only a few students' behaviors being improved and the meeting of the criteria being dependent on only a few students. Waiting until the end of the intervention session, in addition to obscuring how many squares had yet to be earned, helped to mitigate the possibility of social loafing. The current study addressed the issue of social loafing by randomizing and anonymizing which students the teacher was actively observing, in addition to observing individual student data as a method of assessing if this randomization and anonymization aided in improving behaviors. Collins et al.'s (2017) Behavior BINGO procedures included the teacher implementing a planned activity check. The current study amended this aspect of the procedures as a planned

activity check requires the teacher to view all students in a moment which leads to the teacher missing a lot of behavior to be observed. In the current study, the teacher looked at a single, random student and tallied if the student was engaged in AEB or DB at that moment. This was less strenuous for the teacher and required less or her time, allowing the teacher to resume teaching or leading the activity quickly and with little interruption.

While White's (2020) study expanded the research on the efficacy of Behavior BINGO on improving classwide levels of AEB and decreasing classwide DB, her sample was also specific: three sixth grade classes in a STEAM school. In addition to introducing the intervention among a new population (elementary aged students), the current study introduced the intervention in public schools and general education classrooms. Among the limitations that White mentioned, were the possible lack of resources to purchase reinforcers and smart devices/interval indicators. While the current study provided these materials to the teacher, many free phone apps exist that can indicate intervals discretely. In addition, many articles have been written about the benefits of activity reinforcers, particularly for group contingencies. As many activity reinforcers are free or are very cheap, such as extra playground time or a classroom dance party, this limitation can easily be addressed. Lastly, White mentioned that data collection did not differentiate which type of work was occurring during the implementation of the Behavior BINGO intervention; this may be significant in that different types of instructional periods may influence behavior differently. The current study introduced the Behavior BINGO intervention during multiple types of work sessions: classwide instruction, small group instruction, and individual seat work; however, the different types of instructional periods were not indicated or differentiated during observations of behavior.

A limitation not mentioned by White (2020) is that the intervention data did not address the effectiveness of the intervention for individual students, which the current study aimed to do. This type of data allows the researcher to investigate the effect of the group contingency on an individual students' behavior, particularly students who display higher levels of DB than their classmates, in addition to evaluating the group contingency's effectiveness on classwide levels of behavior. Likewise, as slips were earned via planned activity check (Collins et al., 2017; White, 2020), students did not receive individual or group feedback on behavior that met or did not meet criteria. The current study addressed this limitation by including classwide feedback at the end of intervention sessions in which BINGO was not earned. Like Collins et al. (2017), the teachers in White's study (2020) implemented planned activity checks which may miss much of the behaviors to be observed. In addition, the teachers in White's study were required to calculate the percentage of students engaged in behaviors, which required time and mental capacity that the teacher may not have in the middle of instruction or an activity that is in progress. The current study's teacher observed a single student, indicated which type of behavior that student was engaged in at the moment of observation, and determined if a slip was earned based on the single student, requiring less of the teacher's time and energy and allowing the teacher to quickly resume the instruction or activity that was in progress at that time with little interruption.

Current Study

This study sought to further the research on this classwide behavioral intervention by modifying Behavior BINGO to further address some of the limitations mentioned by Collins et al. (2017) and White (2020). Namely, the Behavior BINGO intervention was

implemented in three elementary level classes during periods of greater behavioral disturbance and when the teacher believed that ongoing classroom activities would not be interrupted. This involved independent seatwork, in addition to group instruction and group work. Further, momentary time-sampling with an individual fixed rotation was used instead of a planned activity check to observe behavior, along with an altered the method of slip selection to address the amount of class time required for the intervention. This study expanded the definition of DB that was used by Collins et al. (2017) and White (2020). Collins et al. (2017) included two separate variables of off-task behavior (which incorporated out-of-seat, manipulating materials unrelated to the task, and "disengagement" (p. 67) from the task) and DB (which incorporated inappropriate vocalizations and "inappropriate touching" (p. 67)), while White (2020) only used one variable of DB, which incorporated out-of-seat, inappropriate vocalizations, and off-task behaviors. This study used these existing definitions and added noncompliance, aggression, and playing with objects as elements of the DB variable. The amendments also sought to randomize and anonymize the student being observed, lessening the risk of shunning if appropriate behavior was not met.

In addition to evaluating the intervention on the classwide behavior, the effect of the intervention on an individual student's AEB and DB was evaluated. By incorporating a target student, the efficacy of the intervention on an individual student who tends to exhibit more problem behaviors than the majority of the class was evaluated. Data were collected on three target students (one in each classroom) and aggregate data for each classroom. Target students received the same intervention as each class and no procedures were altered in effort to individually address a target student's behavior.

Target students were only addressed differently and individually in data collection techniques (see “Data Collection” for more details).

This study sought to answer the following questions:

1. Does Behavior BINGO increase classwide AEB and decrease classwide DB of elementary students?

2. Does Behavior BINGO increase AEB and decrease DB of a target student?

3. Do teachers involved in Behavior BINGO’s implementation find the intervention to be socially valid for improving AEB and decreasing DB among elementary students?

4. Do elementary students involved in Behavior BINGO's implementation find the intervention to be socially valid for improving AEB and decreasing DB?

CHAPTER II - METHODS

Participants and Setting

After approval from the University of Southern Mississippi's (USM) Institutional Review Board (IRB) and school administration, this study occurred in an elementary school in a southeastern state of the United States of America (Appendix A). The study entailed three second grade general education classes that were instructed by the same teacher. Each class was taught on a rotation, such that the students in one class were not in another class period. The researcher conducted a screening observation in each of three classes to determine that levels of DB were above 30% during an observation period chosen by the teacher (McHugh et al., 2016). The researcher determined the observation and intervention implementation periods through discussion with the selected teacher; these occurred during academic periods English/Language Arts and Social Studies in which classwide instruction, independent seatwork, and small group work occurred.

As the intervention was a classwide, Tier 1 intervention, passive guardian consent was assumed for all students in the class for participation in the intervention. The researcher attempted to obtain guardian consent for each child in the class as the social validity data was intended to be completed by all participating students (Appendix C). The researcher did not obtain social validity data from students who do not have consent information. The researcher obtained guardian consent for 35 of 55 participating students. The research team collected observational data on all children in the class. Demographic data on each class’s make-up were derived from the teacher, via the principal, without guardian consent.

Signed informed consent was obtained from the teacher participant prior to the beginning of data collection (Appendix D). In addition, signed informed consent was obtained from the legal guardian of each target student prior to the screening observation (Appendix B). The teacher nominated the target student as a particular student who displayed higher levels of DB than their peers. The nominated student was required to meet the same inclusion criteria that was required from the class (i.e., ≥30% of DB during the screening observation) before being selected as the class's target student. From this selection, the researcher excluded students with an emotional disturbance, intellectual disability, autism spectrum disorder, or developmental disabilities in the determination of the target student. Due to the transfer of classroom of the originally selected target student for Class 2, an additional target student was selected. This resulted in an abbreviated collection of baseline data for Target Student 2 as classwide baseline data had already been gathered and the school year was drawing to a close. The researcher included children with disabilities and/or on Tier 3 in classwide data collection. All students (target students included) received the same intervention and reinforcer; only data collection procedures addressed the selected target students in effort to determine the classwide intervention's effect on an individual student.

All classes were comprised of students between the ages of 7 and 9 years of age. Classes ranged in size between 18 and 19 students. Class 1 included 9 girls and 9 boys. 50% (9) of students were White, 33% (6) were Black, 11% (2) were of mixed-race, and 6% (1) were Hispanic. 5 students received special education services while 2 students were in the gifted program. No students received Tier 3 services for behavior. Class 1 met during the early morning (9:15 – 10:15). The target student for Class 1 was male and

White. He displayed no struggles in academic areas and was in the gifted program; however, his behaviors were disruptive as they consisted of out of area and verbal disruptions.

Class 2 included 10 girls and 8 boys. 50% (9) of students were White, 28% (5) were Black, 17% (3) were of mixed-race, and 6% (1) were Hispanic. 2 students received special education services while 4 students were in the gifted program. No students received Tier 3 services for behavior. Class 2 met during the early afternoon (12:35 – 1:15), after lunch. The target student for Class 2 was female and Black. Her behavior was disruptive as it was passively off-task, out of area, physically and verbally disruptive, and noncompliant. Days before baseline began, she began receiving Tier 2 interventions for behavior (check-in/check-out and a daily behavior report card) and Tier 3 interventions for the academic areas of reading and math.

Class 3 included 7 girls and 12 boys. 74% (14) of students were White and 26% (5) were Black. 3 students received special education services while 4 students were in the gifted program. No students received Tier 3 services for behavior. Class 3 met during the late morning (11:40 – 12:35), after lunch. The target student for Class 3 was female and Black. She displayed no difficulties in academic subjects and was in the gifted program; however, her behaviors were largely passively off-task and noncompliant, causing difficulty with task completion and resulting in poor work.

The teacher participant was a 35-year-old White female. She was in her thirteenth year of teaching. Her pre-existing classroom interventions included: ‘table points’ (in which points were awarded based on unclear behavior expectations, the potential for

response cost and the potential for weekly reward, and competition between other classes) and PBIS schoolwide ‘bucks’ and rewards.

Materials

Preference Assessment Survey

In addition to brief instructions, the preference assessment survey consisted of a space for the teacher’s name, the class period, and thirteen items and activities that the teacher believed to be reinforcing to her classes. These items included: free time to talk with a classmate, listening to music, candy, an extra art project, fun pens, bubbles, a dance party, extra recess time, extra time on the computers, the teacher reading a story to the class, a short movie, flexible seat choice, and a nature walk. The questionnaire was identical for each class; however, the chosen reinforcer was based on each class’s results.

Teacher Script

The researcher provided the teacher with a script prior to the implementation of the first Behavior BINGO intervention (see Appendix F). The script contained step-by-step instructions for the Behavior BINGO intervention, including announcing the Behavior BINGO time frame in which the game was to be played, an explanation of the BINGO board and the objective of the game, the required behaviors needed to earn pieces, an explanation of the containers and slips, and an opportunity for students to ask questions. At the beginning of each intervention session, the teacher used the script to introduce the Behavior BINGO intervention to the class. This script contained an introduction to the Behavior BINGO intervention and a review of the rules and expectations.

Teacher Data Sheet

In addition to the script, the researcher provided the teacher with a data sheet (see Appendix G). The data sheet contained the operational definitions of AEB and DB, a location to indicate which student was observed, and if the student was engaged in AEB or DB at the time of the teacher's observation.

MotivAider®

The MotivAider device provides a tactile prompt via vibration on a fixed schedule. The research team set the MotivAider device at a fixed two-minute interval so that the class had adequate opportunities to earn BINGO slips. The teacher wore and utilized the MotivAider throughout the intervention to signal when to draw a name slip and to observe the respective student's behavior.

Behavior BINGO Board

The research team provided a Behavior BINGO board (22" x 28") that contained 25 equal-sized squares (4" x 4" each): at the top of the board were the letters B-I-N-G-O while the 25 squares were numbered one through 25. Each numbered square had a square of Velcro attached. The teacher publicly posted the BINGO board in the front of the classroom for easy viewing. The teacher determined exactly where the board was posted based on her preference and classroom setup.

Container and Slips

The researcher provided a container with laminated slips numbered 1 - 25 and five "students' choice" slips (roughly 3" diameter each). In addition, the researcher provided an additional three containers, one containing laminated slips with each student's name (about 0.5" x 2" each), one containing laminated slips each with a

possible reinforcer (e.g., one slip contained "extra recess," another contained "chips"; about 0.5” x 2” each), and one that collected the earned slips (a 2 qt. clear container). The container that contained the earned slips sat in the front of the classroom near the Behavior BINGO board.

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

At the conclusion of the study, the teacher completed the Usage Rating Profile-Intervention, Revised (URP-IR; Chafouleas et al., 2011; Appendix L) to assess the social validity of the Behavior BINGO intervention. This rating scale uses a 6-point Likert scale with each item rated from 1 (strongly disagree) to 6 (strongly agree) on various elements of the intervention. The URP-IR consists of 29 items falling under six factors: acceptability, understanding, family-school collaboration, feasibility, system climate, and system support. Higher scores on the URP-IR indicate favorable perceptions of the social validity of an intervention. A factor analysis conducted by Briesch et al. (2013) yielded a coefficient alpha of .84 across all factors (each factor's coefficient alpha ranging from .72 to .95), suggesting adequate internal consistency across all subscales. In addition, the Root Mean Square Error of Approximation (RMSEA) was .09 and the comparative fit index (CFI) was .96, values being over the recommended .1 for RMSEA and .95 for CFI, both indicating that the factor was a good fit. All factor loadings were statistically significant and all interfactor correlations were also significant, except for family-school collaboration and feasibility; and acceptability and system support. In addition, variance components for each factor were statistically significant.

Children's Usage Rating Profile (CURP)

Students whose parents provided consent completed the Children's Usage Rating Profile (CURP; Briesch & Chafouleas, 2009; Appendix M) to assess the students' social validity of the Behavior BINGO intervention. This rating scale uses a 4-point Likert scale with each item rated from 1 ('I totally disagree') to 4 ('I totally agree') to evaluate students' perceptions of Behavior BINGO and its usability. The CURP includes 21 items that fall into three subscales: Personal Desirability, Feasibility, and Understanding. Higher scores on the CURP indicate that a student found an intervention to be desirable, feasible, and understandable. Analyses of the CURP found high internal consistency, with the Personal Desirability factor producing an α of 0.92, the Feasibility factor producing an α of 0.82, and the Understanding factor producing an α of 0.75.

Dependent Measures and Data Collection

Dependent Measures

Academically Engaged Behavior

Phase changes were based on the primary dependent variable of AEB. AEB was operationalized as both active and passive engagement. Active engagement was defined as the student engaging in task-related vocalizations with teachers or peers as appropriate, written assignments, or typing on the computer. Passive engagement was defined as the student's eyes oriented toward the teacher or assignment and listening to the teacher and peers who were speaking for class purposes, raising his or her hand, and looking at any task-related materials.

Disruptive Behavior

After an interview with the teacher, the researcher developed an operational definition for DB. The DB operational definition included inappropriate vocalizations (i.e., talking without teacher permission, shouting out, singing, or making other noises not related to the task), off task (i.e., gaze oriented toward persons, objects, areas of the classroom, or materials that were not task-related/designated by teacher; head placed on desk), out-of-seat (i.e., child's buttocks breaking contact with his or her seat without teacher permission for at least 3 seconds, child not in his or her designated area), noncompliance (i.e., physically or verbally refusing to complete an instruction delivered by the teacher), aggression (i.e., making forceful contact with another's body in a hitting, kicking, pinching, punching, or biting manner with hands, feet, or mouth), and playing with objects (i.e., manipulating any object without teacher permission and not task-related). It should be noted that the research team did not code playing with objects if the student was also engaged in AEB simultaneously (such as playing with a pencil or pen while facing the teacher or task materials). Observers applied this modification in effort to create a dichotomous variable. Further, many individuals can engage with materials while performing physical manipulations of objects (i.e., "fidgeting"; da Câmara et al., 2018).

Data Collection

Data was gathered via momentary time-sampling on an individual fixed rotation two to five times a week throughout the duration of the study (see Appendix H). Momentary time-sampling was utilized as research indicates that this is a more accurate representation of behavior compared to partial- and whole-interval recording procedures

and reduces observer error (Green et al., 1982; Radley et al., 2015). Observation periods were 20-minutes in length with observation intervals 10-seconds in length. The research team calculated the percentage of intervals in which AEB and DB occurred by dividing the sum of intervals in which AEB or DB occur, respectively, by the total number of observation intervals, and multiplying by 100. Data were calculated separately for classwide and target student behavior.

Observation sessions were divided into 10-second intervals, with each new interval being announced via an audio recording. At the end of each interval, the observer looked at a student in the rotation and recorded the observed behavior of that student in that moment (e.g., Apter et al., 2010). In a predetermined order, the observer observed each student in the classroom. After observing the target student, the observer started with a particular student, then observed the target student, then the next non-target student, then the target student, and so forth.

Per the teacher's request, she never implemented the intervention in multiple classrooms on the same day. As such, the intervention was implemented for Class 2 while baseline was being gathered for Class 3. Similarly, the intervention phase was completed for Class 2 when the intervention phase for Class 3 began.

Experimental Design, Phase Change Decisions, and Data Analysis

A non-concurrent multiple baseline design across classrooms was utilized to experimentally evaluate the effects of Behavior BINGO on students' display of AEB and DB. Phases included baseline and Behavior BINGO. This experimental design met evidence standards for single-case design as delineated by the What Works Clearinghouse (WWC; 2020). According to WWC, multiple baseline designs require a

"minimum of six phases with at least three data points per phase" (p. 80) to Meet Standard With Reservations (see "Limitations and Future Directions" regarding Target Student 2's baseline data). Phase changes occurred from baseline phases when classwide levels of AEB were low and stable, while treatment was discontinued after levels of AEB were increased and stable.

The researcher analyzed data using visual analysis and effect size calculations. The researcher graphed observational data on students' AEB and DB to examine trend, level, variability, overlap of data points across adjacent phases, immediacy of effect, and consistency within data patterns (Horner et al., 2005). In addition, the researcher calculated effect sizes using Baseline Corrected Tau for classwide and target students, resulting in six total effect sizes (Tarlow, 2017). Baseline Corrected Tau was calculated using a free online calculator (Vannest et al., 2016); the online calculator suggested an adjustment to accommodate trends in baseline, if necessary. Baseline Corrected Tau utilizes the following criteria: <0.2 is a small effect size, 0.2-0.6 is a moderate effect size, 0.6-0.8 is a large effect size, and 0.8-1.0 is a very large effect size (Vannest et al., 2015).

Procedure

Screening Observation

Prior to beginning the study, the researcher screened each class to ensure levels of AEB were at or below 70% during the screening observation and levels of DB were at or above 30% (McHugh et al., 2016). All classrooms met inclusion criteria. The data obtained from the screening observation was kept as the first baseline datum for each classroom and target student.

Baseline

During baseline, the teacher implemented her typical classroom management techniques (see Appendix K). The researcher provided no feedback and no Behavior BINGO materials. The researcher collected data as previously described from an unobtrusive location within the classroom.

Preference Assessment

After the researcher gathered baseline data, the researcher and teacher discussed and created a list of relevant and appropriate reinforcers for each class. Using this information, the researcher created a preference assessment (see Appendix E). Students completed the preference assessment survey after baseline data were collected to identify reinforcers to be used during implementation of the intervention. The preference assessment survey required students to rank order a list of seven out of the possible 13 rewards. The researcher calculated the three highest ranked reinforcers by counting the frequency of each item rated 1, 2, or 3. The item with the highest number of 1's, 2's, and 3's became the possible reinforcer options. The results for each classroom differed. The research team placed slips containing the name of each of the three reinforcers in the "Rewards" container for each class to use when the Behavior BINGO criterion was met.

Teacher Training

After baseline data were gathered, the researcher trained the teacher on the implementation of Behavior BINGO. With the help of the researcher, the teacher developed operational definitions of the target behaviors (AEB and DB). The researcher instructed the teacher on the procedural steps of how to play Behavior BINGO, on the various containers and slips, and the MotivAider use. During instruction, the researcher

modeled the target behaviors and the procedures for Behavior BINGO. The researcher then provided opportunities for the teacher to practice implementing the intervention with the MotivAider and to practice identifying the target behaviors. Then, the researcher provided feedback and additional opportunities to practice to the teacher. During training, an additional observer completed the teacher training procedural integrity checklist (see Appendix I) to ensure that all elements of the intervention are taught.

Behavior BINGO

Before the game began on each day of intervention implementation, the teacher used the teacher script (see Appendix F) to introduce and explain the Behavior BINGO game to students. The teacher then started the MotivAider device to vibrate at the two-minute interval. When the MotivAider vibrated after the set interval, the teacher randomly selected a student's name from the "Names" container and silently and discreetly observed the selected student for AEB. If the student was displaying AEB, the teacher indicated "AEB" on the teacher data form (see Appendix G), randomly drew a slip from the "Numbers" container and put the slip in the empty container in such a way that students were able to see that a slip was earned but did not have a clear indication of how many slips were still needed to achieve BINGO. The teacher did not say anything to the selected student regarding meeting the criteria. If the randomly selected student did not meet the criteria, the student's name was re-entered into the "Names" container and the teacher indicated "DB" on the teacher data form. This process continued until the end of the intervention session.

At this time, the teacher stopped students' work, pulled the number slips out of the container with earned numbered slips, read each number slip aloud one-by-one, and

covered the square that corresponded with the number on the slip. When a “students’ choice” slip was pulled, the teacher briefly polled the class to determine which open square on the board to cover. If a vertical, horizontal, or diagonal line of five squares was completed on the BINGO board, BINGO was achieved. The teacher pulled a random slip from the "Rewards". The teacher immediately presented the reinforcer to the entire class. If BINGO was not achieved, the teacher did not present a reinforcer but briefly let the class know what behaviors were observed that prevented the slips from being earned. This was done in a general manner, such that no single student was singled out in order to prevent blame and ostracization. The teacher reset the game for the next implementation of the intervention at the end of the class period.

Social Validity

When the intervention phase was completed, students with parental consent completed the CURP (Briesch & Chafouleas, 2009; Appendix M). The CURP was administered via paper and pencil during the same class period in which the intervention was implemented, but after observations were concluded. The researcher was not present during the administration. During each class’s administration of the CURP, all students who had been granted consent were present and completed the rating scale. The teacher completed the URP-IR (Chafouleas et al., 2011; Appendix L) after data collection had been concluded for Class 3 and all other elements of the study had been concluded. It is important to note that a data collection error occurred and only the first page of both the CURP and URP-IR were administered. This occurred due to an error in copying and was unable to be amended (see “Limitations and Future Directions”).

Interobserver Agreement

Interobserver agreement (IOA) was calculated for at least 30% of all observation periods across all study phases for each classroom. Observers included school psychology doctoral students who had received training in direct observation. Observers were trained on the operational definitions and coding procedures to a 90% agreement criterion. Training consisted of practice observations with feedback from the primary researcher. If less than 90% IOA was obtained during training, observers were retrained on operational definitions and observation methods; this took place prior to data collection. IOA data collection involved a primary and secondary observer sitting in an unobtrusive area of the classroom while collecting data on student behaviors (see Appendix H). The IOA calculation of the dependent variables consisted of dividing the number of agreed intervals with AEB or DB by the total number of intervals (agreed and disagreed) and multiplying the quotient by 100. IOA for classwide behaviors averaged 96% during baseline (range = 96-100%) and 94% during intervention (range = 90-100%). IOA for the target students averaged 96% during baseline (range = 90-100%) and 94% during intervention (range = 88-100%). Sessions in which an IOA over 90% could not be agreed upon were followed by a brief retraining on operational definitions with examples and non-examples of behaviors.

Procedural and Treatment Integrity

Procedural Integrity

A procedural integrity checklist (see Appendix I) was used during the teacher training prior to the intervention phase. The procedural integrity checklist consisted of all the steps necessary to accurately train the teacher on the Behavior BINGO procedures.

The teacher training procedural integrity checklist included items that indicated that the definitions AEB and DB were taught during the teacher training, as well as provided examples of each to the teacher. In addition, the procedural integrity checklist included items that indicated that the teacher was taught the Behavior BINGO procedures, a list of materials that were used in the intervention, the Behavior BINGO criteria, and the use of the MotivAider and other materials. A second observer gathered data on procedural integrity during this training with the procedural integrity checklist. The procedural integrity was 100%. Due to only one teacher being involved in this study, only one training session was required. IOA equaled 100%.

Treatment Integrity

Observers completed treatment integrity checklists (see Appendix J) that consisted of all steps necessary for accurate implementation of Behavior BINGO during each phase of the study, for 100% of sessions. A second observer used treatment integrity checklists to assess and evaluate the presence or absence of correct implementation during all phases of the study, for at least 30% of each phase in each classroom, following single-case design standards as set by What Works Clearinghouse (2020). IOA data collection for treatment integrity consisted of dividing the number of agreed upon steps by the total number of steps and multiplying the quotient by 100. The researcher provided feedback and a brief re-training to the teacher after the one implementation session in which a score of 100% was not received. The Behavior BINGO treatment integrity checklist included items that indicated that the teacher announced the start of the Behavior BINGO game, wore the MotivAider device, scanned the appropriate students for AEB, pulled number slips at random and placed them in the correct container, read

each slip from the earned slip container and covered the corresponding square, the teacher pulled a slip from the "Rewards" bag if criteria were met, and provided immediate access to reinforcement for the entire class. Treatment integrity fell below 80% one time during Class 2's implementation of the intervention. The researcher conducted a brief follow-up training with the teacher reviewing the procedure for Behavior BINGO and answering any questions. Treatment integrity was 100% during all other observation sessions, across classrooms (M = 99.4%, range 78-100%).

CHAPTER III - RESULTS

Class 1

As depicted in Figure 1, the percentages of AEB and DB are displayed at the classwide level. Baseline levels of AEB for Class 1 were stable across data collection (*M* = 75%, range = 62-83%). No trend was observed. Baseline levels of DB for Class 1 were stable with no trend observed (*M* = 25%, range = 17-27%). Intervention levels of AEB, for Class 1, resulted in an increasing trend. Although the first data point overlapped with baseline levels, the upward trend was indicated within three data points (*M* = 89%, range = 78-100%). Some variability occurred; however, only two data points overlapped with baseline levels. Class 1's intervention levels of DB resulted in a decreasing trend, with only the first data point overlapping with baseline levels (*M* = 11%, range = 3-22%). No immediate effect was observed. Table 1 displays the effect sizes for Class 1. Overall, the intervention had a large effect on both AEB (Tau = 0.771, *p* = 0.028) and DB (Tau = -0.771, *p* = 0.028).

Class 2

Baseline levels of AEB for Class 2 were variable and depicted an increasing trend (*M* = 79%, range = 63-93%) while baseline levels of DB for Class 2 depicted a decreasing trend (*M* = 21%, range = 7-37%). Intervention levels of AEB, for Class 2, resulted in no observable change (*M* = 88%, range = 90-92%) as all data points overlapped with baseline; data were stable. Class 2's intervention levels of DB also were stable with no trend visible (*M* = 12%, range = 8-20%). All data points overlapped with baseline data. No immediate effect was observed. Table 1 displays the effect sizes for

Class 2. Overall, the intervention had a moderate effect on AEB (Tau = 0.571, $p = 0.104$) and DB (Tau = -0.571, $p = 0.104$).

Class 3

Baseline levels of AEB for Class 3 were stable across data collection, depicting a slight increasing trend ($M = 82\%$, range = 68-90%). Baseline levels of DB for Class 3 were stable with a slight decreasing trend observed ($M = 18\%$, range = 10-32%). Intervention levels of AEB, for Class 3, resulted in an increasing trend. Although one datum overlapped with baseline levels, a positive trend was indicated ($M = 93\%$, range = 83-100%). Some variability occurred. Class 3's intervention levels of DB resulted in a decreasing trend, with only the first data point overlapping with baseline levels ($M = 7\%$, range = 0-17%). An immediate effect was displayed in Class 3. Table 1 displays the effect sizes for Class 2. Overall, the intervention had a large effect on both AEB (Tau = 0.822, $p = 0.014$) and DB (Tau = -0.822, $p = 0.014$).

Target Student 1

As depicted in Figure 2, the percentages of AEB and DB are displayed at the student level. Baseline levels of AEB for Target Student 1 were variable across data collection and had a negative trend ($M = 60\%$, range = 38-70%). Baseline levels of DB for Target Student 1 were variable with a positive trend observed ($M = 40\%$, range = 30-62%). Intervention levels of AEB, for Target Student 1, resulted in an immediate effect ($M = 82\%$, range = 73-97%). Some variability or overlap occurred, and no trend was observed. Target Student 1's intervention levels of DB resulted in an immediate effect with no overlap of data ($M = 18\%$, range = 3-27%). Variability occurred, and no trend was observed. Table 2 displays the effect sizes for Target Student 1. Overall, the

intervention had a very large effect on both AEB (Tau = 1.00, $p = 0.005$) and DB (Tau = -1.00, $p = 0.005$).

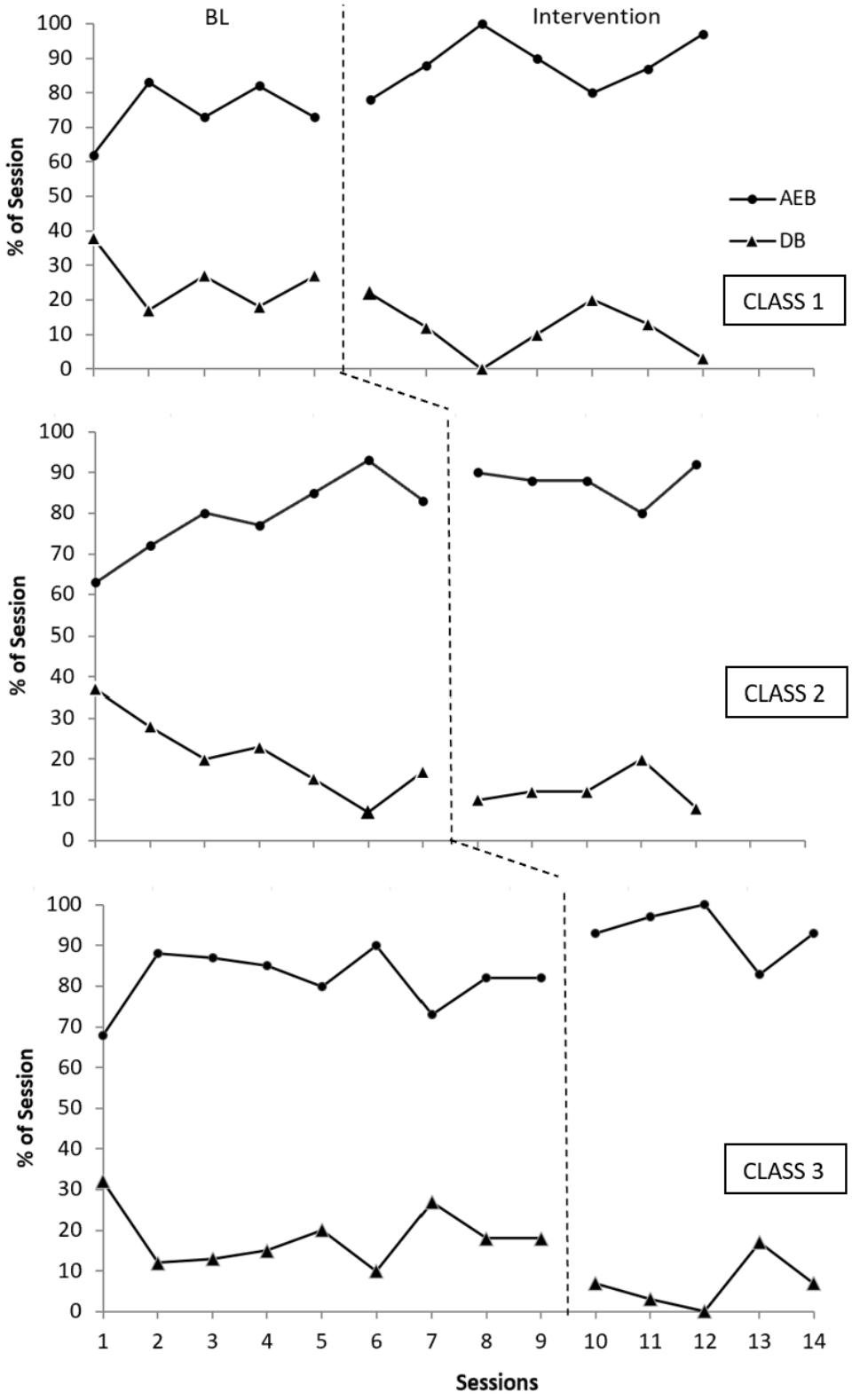

Figure 1. Classwide Levels of AEB and DB.

Table 1 *Classwide Means and Ranges with Effect Size Calculations*

	Baseline, *M* % (range)	Intervention, *M* % (range)	Tau-*U*	*p*
Class 1				
AEB	75 (62 – 83)	89 (78 – 100)	0.771 (large)	0.028
DB	25 (17 - 38)	11 (0 – 22)	-0.771 (large)	0.028
Class 2				
AEB	79 (63 – 93)	88 (80 – 92)	0.571 (moderate)	0.104
DB	21 (7 – 37)	12 (8 – 20)	-0.571 (moderate)	0.104
Class 3				
AEB	82 (68 – 90)	93 (83 – 100)	0.822 (large)	0.014
DB	18 (10 – 32)	7 (0 – 17)	-0.822 (large)	0.014

Target Student 2

Baseline levels of AEB for Target Student 2 were variable and depicted a positive trend (*M* = 70%, range = 42-90%) while baseline levels of DB for Target Student 2 depicted a negative trend and variable data (*M* = 30%, range = 10-58%). Intervention levels of AEB, for Target Student 2, resulted in no observable change and large amounts of variability (*M* = 74%, range = 50-93%). Target Student 2's intervention levels of DB also were variable with no observable trend (*M* = 26%, range = 7-50%). 80% of intervention data points for both variables overlapped with baseline data. No immediate effect was observed. Table 2 displays the effect sizes for Target Student 2. Overall, the intervention had a small effect on both AEB (Tau = 0.067, *p* = 0.882) and DB (Tau = -0.067, *p* = 0.882).

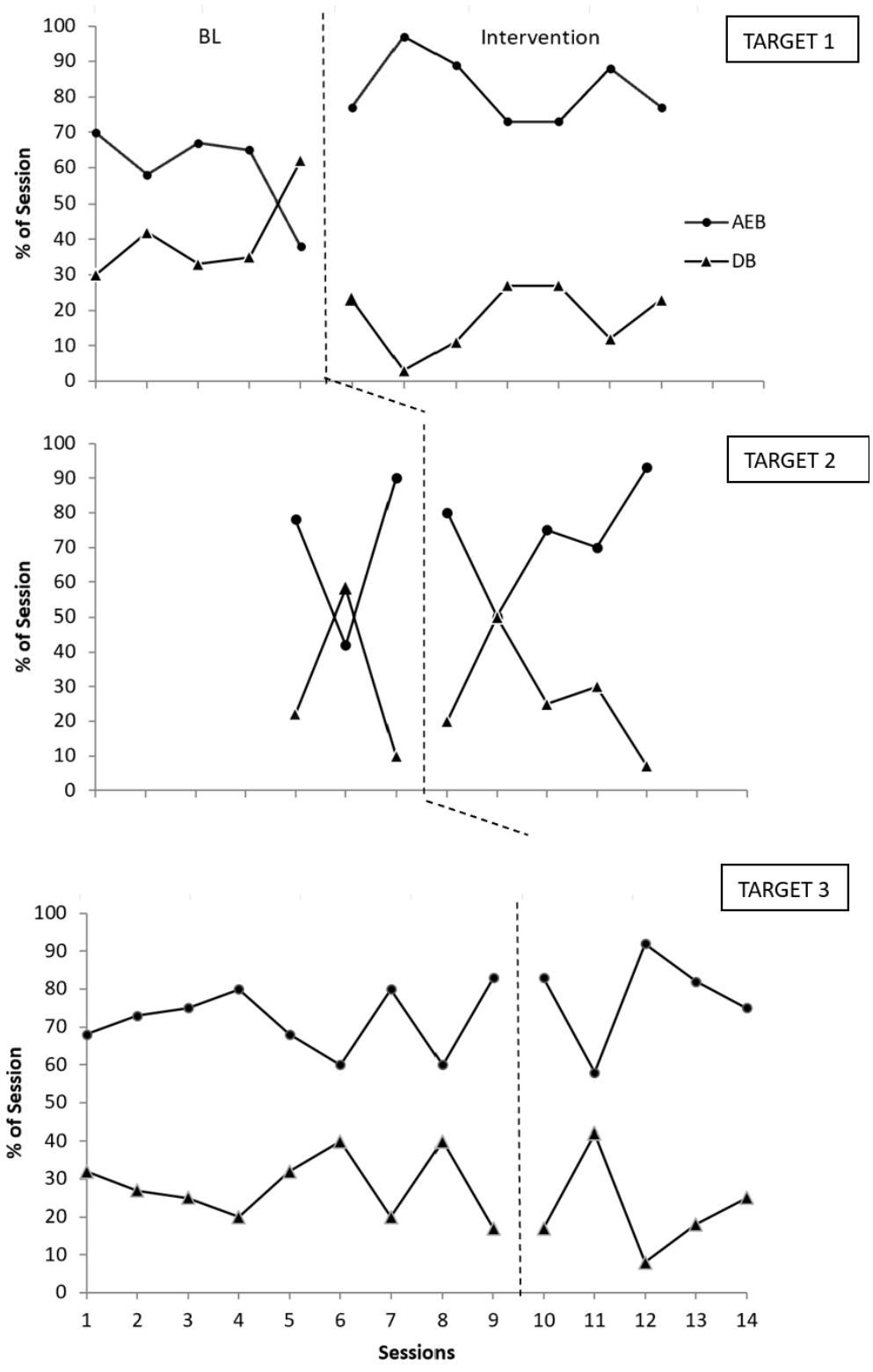

Figure 2. Target Student Levels of AEB and DB.

Target Student 3

Baseline levels of AEB for Target Student 3 were stable across data collection, depicting a slight positive trend (*M* = 72%, range = 60-83%) while baseline levels of DB resulted in a slight negative trend (*M* = 28%, range = 17-40%). Intervention levels of AEB displayed variability and 80% of data points overlapped with baseline levels (*M* = 78%, range = 58-92%). Like AEB, 80% of DB data points overlapped with baseline levels (*M* = 22%, range = 8-42%). Variability occurred and no trend was observed. No immediate effect was observed. Table 2 displays the effect sizes for Target Student 3. Overall, the intervention had a moderate effect on both AEB (Tau = 0.378, *p* = 0.257) and DB (Tau = -0.378, *p* = 0.257).

Table 2 *Target Student Means and Ranges with Effect Size Calculations*

	Baseline, *M* % (range)	Intervention, *M* % (range)	Tau-*U*	*p*
Target Student 1				
AEB	60 (38 – 70)	82 (73 – 97)	1.00 (very large)	0.005
DB	40 (30 – 62)	18 (3 – 27)	-1.00 (very large)	0.005
Target Student 2				
AEB	70 (42 – 90)	76 (50 – 93)	0.067 (small)	0.882
DB	30 (10 – 58)	26 (7 – 50)	-0.067 (small)	1.882
Target Student 3				
AEB	72 (60 – 93)	78 (58 – 92)	0.378 (moderate)	0.257
DB	78 (17 – 40)	22 (8 – 42)	-0.378 (moderate)	0.257

Social Validity

Due to a data collection error in which only the first page of each social validity measure (i.e., URP-IR, Chafouleas et al., 2011; CURP, Briesch & Chafouleas, 2009) was administered and completed by the teacher and all of the students, the below results

should be interpreted with extreme caution. Due to the error, results were evaluated using an item analysis approach.

Teacher

The teacher completed 13 of 29 items on the URP-IR (Chafouleas et al., 2011). Factor 1, Acceptability, incorporated responses from nine items; the teacher completed five of these items. The mean answer on this factor equaled 4.8, which indicates that the teacher 'slightly agreed' with most items. The teacher completed two of three items loaded under Factor 2, Understanding. The mean score was 6, which indicates that the teacher 'strongly agreed'. The teacher completed one of three items loaded under Factor 3, Home-school collaborating. This item ("a positive home-school relationship is needed to implement this intervention") was scored a 4 'slightly agree.' The teacher completed three of six items loaded under Factor 4, Feasibility. The mean score was 3.33 indicating that the teacher 'slightly disagreed' with the feasibility of this intervention. The teacher completed one of five items loaded under Factor 5, System Climate. This item ("my administrator would be supportive of my use of this intervention") was scored a 5 'agree.' The teacher completed one of three items loaded under Factor 6, System Support. This item ("I would need additional resources to carry out this intervention") was scored a 4 'slightly agree.'

Student

Students completed 10 of 21 items on the CURP. The completed items were aggregated across classrooms. Students completed four of seven items loaded under Factor 1, Personal Desirability. The mean score was 3.23 indicating that students 'kind of agreed' with the items in this factor. Students completed three of eight items loaded

under Factor 2, Feasibility. The mean score was 1.85 indicating that students ‘totally disagree’ with the items in this factor. Students completed three of six items loaded under Factor 3, Understanding. The mean score was 3.22 indicating that students ‘kind of agreed’ with the items in this.

CHAPTER IV - DISCUSSION

DB in the classroom is becoming a more prevalent issue in schools, particularly after the return to in-person instruction following the COVID-19 pandemic (NCES, 2022). Along with increasing difficulties caused by these behavior problems, there is an increased need to instruct teachers on classroom management strategies. These behavioral difficulties are contributing to teacher burnout (Aloe et al., 2014) and attrition, particularly after the return to in-person instruction following the COVID-19 pandemic (Schmitt & deCourcy, 2022). This study investigated the effects of a Tier 1 behavior management strategy and its effects on classwide behavior and the behavior of target students.

Research Question 1: Does Behavior BINGO increase the classwide AEB and decrease classwide DB of elementary students?

The data from Class 1 indicated an increasing trend of AEB and decreasing trend of DB throughout implementation of the intervention. Although the effect was not immediate, there was an effect as demonstrated via visual analysis and calculation of the effect size (Tau = 0.771 and -0.771), suggesting that the effect for this class was not limited to statistical significance but clinical significance as well. Despite no observable change in AEB or DB in Class 2 being displayed through visual analysis, the calculation of Tau (Tau = 0.571 and -0.571), indicated a moderate effect size, suggesting that the effect may have been statistically significant but not clinically significant in this classroom. While no functional relation was detected from these data, an analysis of baseline levels of both AEB and DB indicated that there may have been a ceiling effect as intervention began despite an increasing trend of AEB and decreasing trend of DB (see

"Limitations and Future Directions" for more information) and all intervention data overlapping with baseline levels. This baseline increase in AEB may have occurred as data were collected immediately prior to Spring Break, inadvertently creating a strong reinforcer for positive behavior. In addition, the school gave a "last day of term" party on the last day of baseline collection, potentially further influencing student behavior in Class 2 (no other participating classes were being observed on this week of the study). Individual progress monitoring and resulting independent work potentially resulted in this increase in AEB during baseline data collection. The data for Class 3 suggested that the intervention created an immediate increase in AEB and decrease in DB. Although the intervention data shared some overlap with baseline levels on both variables, the data suggest a functional relation between the intervention and an increase in AEB and decrease in DB. Further, the calculation of effect size suggests that, statistically, a large effect was found (Tau = 0.822 and -0.822).

The results of this study are commensurate with those found by Collins et al. (2017) in that minor improvements in AEB and DB were observed; however, a strong functional relation was found to be lacking in two out of three classrooms. This study investigated the intervention within a novel population (elementary aged, general education, public school students). In addition, this study investigated the intervention effects during different instructional types (i.e., classwide, small group, and individual). Further, this study involved the randomized components of criteria and reinforcers, in addition to possible reinforcers being selected after a class-specific preference assessment occurred strengthening the reinforcing potential of those reinforcers.

Research Question 2: Does Behavior BINGO increase the AEB and decrease the DB of a target student?

The data from Target Student 1 indicated an increasing trend of AEB and decreasing trend of DB throughout implementation of the intervention. The increase in AEB and decrease in DB occurred immediately upon implementation of the intervention and maintained throughout the intervention, suggesting a functional relationship of this intervention on Target Student 1's behavior. In addition, there was a very large effect as demonstrated via visual analysis and calculation of a very large effect size (Tau = 1.00 and -1.00), suggesting that the effect for this student was not limited to statistical significance but clinical significance, as well. The data for Target Student 2 suggested that this intervention influenced this student's behavior little. All intervention data points of both variables overlapped with baseline levels. In addition, baseline and intervention data were variable; however, the intervention ended with an increasing trend of AEB and a decreasing trend of DB. The effect size calculation for Target Student 2 suggested a small effect on a statistical level (Tau = 0.067 and -0.067). Overall, no functional relation was determined to occur between Behavior BINGO and Target Student 2's behavior. Similar to Target Student 2, Target Student 3's intervention levels of AEB and DB overlapped with baseline levels, respectively. Moderate levels of variability were observed, and the intervention ended with a downward trend of AEB and an upward trend of DB. Despite this, the calculation of effect size suggests that, statistically, a moderate effect was found (Tau = 0.378 and -0.378). Overall, no functional relation was determined to occur between Behavior BINGO and Target Student 3's behavior.

For both Target Student 2 and 3, little to no effect was observed and much of the data gathered during intervention overlapped with that gathered during baseline. While only conjecture, it is possible that the variability of baseline data and this lack of intervention effect may have been influenced due to data collection occurring in the midst of state testing and term-end progress monitoring. For Target Student 2, who was receiving Tier 3 services for reading and math, these events may have largely impacted anxiety levels during non-testing times as well as during, as well as disruptions to the routine. Further, Tier 2 services for behavior had begun a week or so prior to baseline data collection, potentially influencing Target Student 2's behaviors. As the Tier 2 interventions were Check-in/Check-out and a DBRC, no extinction effects were anticipated; however, it is possible that Target Student 2 responded to the additional positive adult attention with increased levels of DB. Target Student 3 largely struggled with noncompliance as a result of poor attention skills and verbal off-task behaviors. Testing environments may have emphasized or pressured Target Student 3's capabilities in these areas, in effect calling attention to these behavioral difficulties for this student. Further highlighting these struggles may have been a consequent boredom with the academic work during this period as Target Student 3 was in the gifted program. While Target Student 2 was already receiving Tier 2 services for behavior, it may be the case that Tier 1 services were not sufficient to address Target Student 3's behaviors. Both Target Students may have benefited from reinforcers that were selected on an individual basis, further strengthening the motivation to meet behavioral expectations.

These results suggest that Behavior BINGO may prove more effective at addressing some types of DB (such as out-of-seat and hyperactive-type behaviors as in

the case for Target Student 1) over those behaviors more akin to inattentiveness or inappropriate vocalizations (as in the cases of Target Students 2 and 3). This may have occurred due to differences in the ease of data collection: more active types of DB (e.g., out of seat) are easier to observe than less overt types of DB (e.g., passive off-task, quiet non-compliance). The reader should also consider how much behavior needed to change before an effect could be observed. Both Target Students 2 and 3 had relatively high levels of DB throughout baseline (range: 10-58% and 17–40%, respectively) with low data points appearing as outliers, opposed to Target Student 1's highest datum (62%, range: 30-42%) appearing as the outlier. This is particularly true for the lack of effect displayed by Target Student 2's data; both Target Students 1 and 3 displayed some effect. Further research should split the DB variable into specific types of DB to determine if this intervention is more effective for certain types of DB.

Research Question 3: Do teachers involved in Behavior BINGO's implementation find the intervention to be socially valid for improving AEB and decreasing DB among elementary students?

Only one teacher participated in this study, and she completed half of the social validity scale (URP-IR, Chafouleas et al., 2011; Appendix L). Overall, her responses suggest that she found the intervention to be effective at addressing a variety of problem behaviors in her classroom; however, her responses also suggest that she found the preparation of materials to be more than minimal. Due to only half of the rating scale being administered, these findings are extremely limited and must be interpreted with extreme caution.

Research Question 4: Do elementary students involved in Behavior BINGO's implementation find the intervention to be socially valid for improving AEB and decreasing DB?

Signed consent was received for 35 out of 55 students; these students completed half of the social validity scale (CURP, Briesch & Chafouleas, 2009; Appendix M). While the findings from this study did not provide a functional relation between Behavior BINGO and an increase of AEB at the classwide or individual level, the data suggest that the intervention may prove useful for some students, as the data for Class 1 and Target Student 1 suggest. Students gave a favorable response to items related to personal desirability regarding the intervention, their personal understanding of the intervention, and the feasibility of the intervention. Ultimately, these findings should be interpreted with extreme caution as the entire scale was not completed and 20 out of 55 students did not participate in the social validity data gathering process due to no consent being provided.

Implications for Practice

Due to the impacts on student learning and instruction time (Müller et al., 2018) DB presents, behavior management strategies continue to be an area of focus for many teachers and schools (NCES, 2022). As such, research on new and current Tier 1 classwide strategies is integral as these strategies have the potential to improve the behavior of multiple students simultaneously (Little et al., 2015) and require fewer teacher resources (Little et al., 2015). This study extends the literature on Behavior BINGO as a classwide behavioral strategy. The current study's findings indicate that this teacher was able to implement the Behavior BINGO intervention with fidelity and found

the intervention effective, overall. This suggests that the intervention can be implemented by a single classroom teacher while she simultaneously engages in a variety of instructional types. The teacher's responses on the URP-IR (Chafouleas et al., 2011) support that the preparation of materials may be too time-consuming and/or costly for many teachers, particularly if the school administration is unwilling or unable to provide these resources. As the research on Behavior BINGO is in its infancy, further research is needed on its effectiveness addressing DB at the classwide and individual level among this population. While the participating teacher did not appear to struggle with the procedures related to Behavior BINGO, it may behoove future researchers to consider involving teacher's assistants or aides, or student teachers as the agents responsible for drawing the student names and number spaces, leaving the instructing teacher to the primary teaching duties.

As this was the first study of Behavior BINGO to include the observation of the intervention on a single student, no comparison with prior research can be made; however, it is strongly encouraged that future studies involving this behavior management strategy include an investigation of the intervention's effect on a target student's behavior. In addition, future studies on Behavior BINGO should consider using screening data to determine target students, as this may better indicate which students should be considered for additional observation on the intervention's effects.

Limitations and Future Directions

As with all applied research in the school setting, the natural limitations presented by testing, absences, school holidays, and end of term events impacted the gathering of the social validity data collection. Due to the end of term, the researcher was unable to

have the students and teacher complete the second half of the respective measures. It is highly recommended that future researchers consider these limitations presented by the school year when gathering data. Another limitation for the present study is that baseline for Class 2, Class 3, Target Student 2, and Target Student 3 were not found to be stable and/or did not display a decreasing trend of AEB before the intervention phase began. Particularly for Class 2, the high baseline levels of AEB presented a ceiling effect for intervention effects. This limitation leads to another limitation presented in this study: high baseline levels of AEB and low baseline levels of DB across classes. Although all classes met the inclusion criteria, it was clear from subsequent baseline data points that more typical levels of AEB fell in the high range (i.e., above 70%) and typical levels of DB fell in the low range (i.e., below 30%). Although the researcher was presented with a time-limitation for this study, impacting finding new class participants, it is recommended that future research find participants whose baseline levels of AEB regularly fall below 70%. Further, it is recommended that future research follow WWC (2020) guidelines for a nonconcurrent multiple baseline design meeting standards without reservations, particularly in regard to the minimum criteria needed per phase. These limitations decrease the internal validity of the study as the design had weaknesses and limited the potential for a functional relationship between the intervention and behavior.

Target Student 2 presented as a limitation in this study. After gathering baseline levels of AEB and DB for Target Student 2, the student was moved to a different classroom rendering the original student a non-option for this role. This created the need for a new Target Student 2. As noted above, the school calendar and testing required a fast turn-around of this selection and truncated the amount of baseline data possible for

this student. Subsequently, the researcher was unable to extend the amount of intervention sessions due to the end of the school year. If possible, it is recommended that future research delay the attrition of participants. As with applied school research, however, it is likely that the control of students by the researcher is not possible. If possible, researchers should plan ahead for possible difficulties in participant retention and schedule additional data collection sessions.

Another potential limitation of the study was that only one teacher participated. While this may have been a strength in that communication between the researcher and teacher and the history with the intervention was consistent, there may have been qualitative differences in delivery of the intervention. For example, unquantifiable differences in tone of voice, events of the day, teacher attitude, along with differences between topics and projects assigned to different classes concurrently with the intervention all may have influenced the students' behavior during the implementation of the intervention. Further, teacher biases toward certain classes or students may have existed, further affecting the teacher's presentation of the intervention and her interpretation of student behaviors, influencing her decision as to whether AEB or DB was observed. In addition, the teacher's comfort with the intervention (particularly in latter phases of Classes 2 and 3) may further have influenced her implementation of the intervention, although the individual components of the Behavior BINGO procedure remained the same (as determined by the treatment integrity checklist (Appendix J).

As with White's study (2020), this study did not include a fading procedure or a maintenance phase. Including these aspects in future research would increase the

knowledge of any lasting effects over time. Further, the findings produced could indicate a functional relation, unlike the findings of this study.

CHAPTER V - CONCLUSION

This study extended the literature on Behavior BINGO, to include elementary-aged, general education, public school classrooms. In addition, this study incorporated a randomization of criteria reward, in addition to providing feedback to students and implementing the intervention during a variety of instructional types. While the findings from this study did not provide a functional relation between Behavior BINGO and an increase of AEB at the classwide or individual level, the data suggest that the intervention may prove useful at increasing AEB for some students. These findings also support the teacher's ability to implement the intervention with fidelity without extensive corrective feedback. Further research on this intervention is needed as the effectiveness of Behavior BINGO varies across the current literature. In addition, future research should emphasize social validity as this is currently lacking.

APPENDIX A - IRB APPROVAL LETTER

Office *of*
Research Integrity

THE UNIVERSITY OF SOUTHERN MISSISSIPPI

118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below 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 regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and 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 involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER:	22-417
PROJECT TITLE:	Using Behavior BINGO to Increase Academically Engaged Behavior in a General Education Elementary School Population
SCHOOL/PROGRAM	Psychology
RESEARCHERS:	PI: Faith Hamilton Investigators: Hamilton, Faith~LaBrot, Zachary C~
IRB COMMITTEE ACTION:	Approved
CATEGORY:	Expedited Category
PERIOD OF APPROVAL:	08-Aug-2022 to 07-Aug-2023

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B - PARENT CONSENT FORM (TARGET)

Dear Parent,

My name is Faith Hamilton and I am working on my doctorate in School Psychology at University of Southern Mississippi. I am currently conducting my thesis research which will be evaluating the use of a new classroom behavior intervention. This project will be supervised by Dr. Zachary LaBrot, a faculty member of University of Southern Mississippi's School Psychology program.

If you agree to allow your child to participate in this study, he/she will continue their school day as normal. During routine classroom activities (i.e., instruction, independent seatwork, etc.), the teacher will conduct the intervention (Behavior BINGO) by providing classroom rules discussing appropriate classroom behaviors and announcing that a game will be played in the classroom. Throughout the intervention period, students' names will be randomly and discretely selected by the classroom teacher and their behavior will be observed. If the desired behaviors are observed at the time of observation, a piece on the BINGO board will be earned. If the desired behaviors are not observed, the child's name is entered for a possible opportunity for another observation; no other adverse responses are given. If enough pieces are earned by the class throughout the intervention period, BINGO can be earned by getting five across. If BINGO is earned throughout the intervention period, the class will receive a reward.

This intervention's intention is to decrease classwide levels of disruptive behavior and increase levels of academically engaged behaviors through students playing a game of BINGO, specifically, Behavior BINGO. Due to this intervention's purposes, your child's classroom was deemed to be an appropriate choice for this research due to classwide levels of disruptive behavior. Although this intervention will occur across the class, we are interested in observing your child individually. That being said, it is important to understand that no one besides the research team will know your child is receiving additional observations (i.e., your child, teacher, and peers will not know). In addition, a post-intervention questionnaire (available upon request) will be administered to students. This questionnaire will investigate your child's thoughts and feelings about this intervention.

There will be no identifying information collected during the duration of this study. In addition, all records will be kept confidential. Participation in this study is voluntary; as such, you are able to renege consent to participate at any time, by contacting the researchers through writing (please see below for contact details). The current research poses minimal risk to the participants and should not adversely affect the welfare of students.

Participation in this study may offer several benefits for the teacher and students. In addition to the teacher being trained in a new intervention technique to improve classwide behaviors, an expected decrease in inappropriate behaviors in the classroom

(and, as a result, an increase in appropriate classroom behaviors) may be seen. Observers will abide by CDC regulations for COVID-19 and, as required, will wear masks, socially distance, and disinfect surfaces while in the building.

If you should have any questions about this research project, please feel free to contact Faith Hamilton at faith.hamilton@usm.edu or Dr. Zachary LaBrot, Ph.D., at zachary.labrot@usm.edu.

If you have any questions regarding your rights as a research participant, please feel free to contact the USM Institutional Review Board at 601-255-5509. This project and this consent form have been reviewed by the Institutional Review Board at USM. This review ensures that federal regulations are followed for research projects involving human subjects. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-266-5997 or The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001. If you do not wish to have your child participate in this research study, please sign this form, and return by _____.

By signing this portion of the consent form, I acknowledge and **agree** to have my child be **observed individually**.

_____

Student's Name (please print) Date

_____

Parent/Legal Guardian Signature

By signing this portion of the consent form, I acknowledge and **agree** to have my child complete the **post-intervention questionnaire**.

_____

Student's Name (please print) Date

_____

Parent/Legal Guardian Signature

APPENDIX C - PARENT CONSENT FORM

Dear Parent,

My name is Faith Hamilton and I am working on my doctorate in School Psychology at University of Southern Mississippi. I am currently conducting my thesis research which will be evaluating the use of a new classroom behavior intervention. This project will be supervised by Dr. Zachary LaBrot, a faculty member of University of Southern Mississippi's School Psychology program.

If you agree to allow your child to participate in this study, he/she will continue their school day as normal. During routine classroom activities (i.e., instruction, independent seatwork, etc.), the teacher will conduct the intervention (Behavior BINGO) by providing classroom rules discussing appropriate classroom behaviors and announcing that a game will be played in the classroom. Throughout the intervention period, students' names will be randomly and discreetly selected by the classroom teacher and their behavior will be observed. If the desired behaviors are observed at the time of observation, a piece on the BINGO board will be earned. If the desired behaviors are not observed, the child's name is entered for a possible opportunity for another observation; no other adverse responses are given. If enough pieces are earned by the class throughout the intervention period, BINGO can be earned by getting five across. If BINGO is earned throughout the intervention period, the class will receive a reward.

This intervention's intention is to decrease classwide levels of disruptive behavior and increase levels of academically engaged behaviors through students playing a game of BINGO, specifically, Behavior BINGO. Due to this intervention's purposes, your child's classroom was deemed to be an appropriate choice for this research due to classwide levels of disruptive behavior. A post-intervention questionnaire (available upon request) will be administered to students. This questionnaire will investigate your child's thoughts and feelings about this intervention.

There will be no identifying information collected during the duration of this intervention. In addition, all records will be kept confidential. Participation in this study is voluntary; as such, you are able to renege consent to participate at any time, by contacting the researchers through writing (please see below for contact details). The current research poses minimal risk to the participants and should not adversely affect the welfare of students.

Participation in this study may offer several benefits for the teacher and students. In addition to the teacher being trained in a new intervention technique to improve classwide behaviors, an expected decrease in inappropriate behaviors in the classroom (and, as a result, an increase in appropriate classroom behaviors) may be seen. Observers will abide by CDC regulations for COVID-19 and, as required, will wear masks, socially distance, and disinfect surfaces while in the building.

If you should have any questions about this research project, please feel free to contact Faith Hamilton at faith.hamilton@usm.edu or Dr. Zachary LaBrot, Ph.D., at zachary.labrot@usm.edu.

If you have any questions regarding your rights as a research participant, please feel free to contact the Chair of USM's Institutional Review Board at 601-266-5997. This project and this consent form have been reviewed by the Institutional Review Board at USM. This review ensures that federal regulations are followed for research projects involving human subjects. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-266-5997 or The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001. If you do not wish to have your child participate in this research study, please sign this form, and return by _____.

By signing this portion of the consent form, I acknowledge and **agree** to have my child complete the post-intervention questionnaire.

_____

Student's Name (please print) Date

_____

Parent/Legal Guardian Signature

APPENDIX D - TEACHER CONSENT FORM

My name is Faith Hamilton and I am working on my doctorate in School Psychology at University of Southern Mississippi (USM). I am currently conducting my thesis research which will be evaluating the use of a new classroom behavior intervention. This project will be supervised by Dr. Zachary LaBrot, a faculty member of USM's School Psychology program. The intent of this intervention, Behavior BINGO, is to decrease classwide levels of disruptive behavior and increase levels of academically engaged behaviors through students playing a game of BINGO. Due to this intervention's purposes, your classroom was referred to be a potential participant in this research due to classwide levels of disruptive behavior.

BEHAVIOR BINGO INTERVENTION

Upon agreeing to participate, we will ask you to identify a student in your classroom who displays elevated levels of disruptive behavior in comparison to his/her classmates. After a short observation of this student and your class, if our inclusion criteria are met, we will ask you to send consent forms home for parent signatures. (For classrooms that do not meet our inclusion criteria, other supports can be provided.). Upon receipt of consent forms, a short training (15 minutes – an hour) on the intervention procedures will occur. In addition, all materials needed will be presented to you at this time.

Throughout each stage of the study, classroom observations will be conducted by the researcher or other trained undergraduate or graduate students from USM.

Before beginning the intervention, the class will complete a short preference assessment in which their desired rewards are listed and ranked; the data from these short questionnaires will be evaluated by the research team who will determine the class' preferred rewards and will supply resources, as needed. During implementation of the intervention, at intervals, you will randomly select a student's name from a container (provided) and will discreetly observe and indicate their behavior on a form (provided). If the child is engaging in academically engaged behaviors at the time of observation, a token for the BINGO board is earned. If not, the name is re-entered into the container for a chance at an additional observation. At the end of the intervention session, BINGO tokens are placed on the BINGO board according to the indicated space. If the class earned BINGO (five tokens across, down, or diagonal), a classwide reward is randomly selected from a container (provided) and given immediately (or as soon as is feasible).

At the conclusion of the study, you and the students of your class will complete a short questionnaire about the acceptability of the intervention.

POTENTIAL BENEFITS

Participation in this study may offer several benefits for the teacher and students. In addition to the teacher being trained in a new intervention technique to improve classwide behaviors, an expected decrease in inappropriate behaviors in the classroom (and, as a result, an increase in appropriate classroom behaviors) may be seen.

CONFIDENTIALITY
Names and other identifying information collected during the duration of this study will be kept confidential and will not be disclosed to anyone outside of the research team. If results of this study are shared in a public forum (e.g., publications, conferences), no identifying information will be published or shared.

PARTICIPATION
Participation in this study is voluntary; as such, you are able to renege consent to participate at any time, by contacting the researchers through writing (please see below for contact details).

RISK
The current research poses minimal risk to the participants and should not adversely affect the welfare of students or teachers. The biggest risk to you may result in mild discomfort or nervousness as you implement a new intervention. In addition, a potential change in classroom routines or scheduling may occur. Throughout the duration of the study, we are open to questions and support, as needed. In addition, please let us know if additional materials are required.

CONTACT
If you should have any questions about this research project, please feel free to contact Faith Hamilton at faith.hamilton@usm.edu or Dr. Zachary LaBrot, Ph.D., at zachary.labrot@usm.edu.

If you have any questions regarding your rights as a research participant, please feel free to contact the USM Institutional Review Board at 601-255-5509. This project and this consent form have been reviewed by the Institutional Review Board at USM. This review ensures that federal regulations are followed for research projects involving human subjects. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board at 601-266-5997 or The University of Southern Mississippi, 118 College Drive #5125, Hattiesburg, MS 39406-0001. If you do not wish to have your child participate in this research study, please sign this form, and return by _____.

By signing this consent form, I acknowledge that I have the above information, including expectations for my participation, and agree to participate in this study. I understand that my participation in the Behavior BINGO study is voluntary and that I may renege my consent to participate at any time. I understand that this study will require me to implement the Behavior BINGO intervention in my classroom at agreed upon times and classroom observations will occur throughout the duration of this study. I understand that a training session will be required before implementing this intervention. In addition, I understand that I will be required to complete a questionnaire at the conclusion of this study. Lastly, I understand that all information gathered during the course of this study will be confidential, with any identifying information remaining private.

Teacher's Signature Date

APPENDIX E - PREFERENCE ASSESSMENT

Teacher Name: _____

Class Period: _____

Write a 1-7 next to at least seven items/activities you would like to earn in this class.

With 1 being your most wanted item, 2 being your second most wanted item and so on.

_____ Free time to talk to a friend

_____ Listen to music

_____ Piece of candy

_____ Extra art project

_____ Fun pen

_____ Bubbles/Bubble party

_____ Dance party

_____ 5-10 minutes extra recess

_____ Free time on the computers

_____ Story time (teacher reads!)

_____ Short movie during lunch (in the classroom)

_____ Flexible seat choice for rest of the day

_____ Nature walk

APPENDIX F - TEACHER SCRIPT FOR INTRODUCTION TO BEHAVIOR BINGO

1) Announce to the class that they will be playing a new game called Behavior BINGO. Tell them the time period in which the game will be played.

Say**, *"Today, we will play a new game in class. The game is called Behavior BINGO. This game will be played during _____, from ___: ____ to ___: ____."***

2) Explain the Behavior BINGO board that is posted in the front of the classroom.

Say, ***"This is our Behavior BINGO board, and the goal is to fill in a row either diagonal, vertical, or horizontal by following classroom rules."***

3) Explain specific behaviors students should and should not engage in for the Behavior BINGO game. Model a few examples for the class.

Say, ***"You all will have the opportunity to earn a reward for following the rules: _____."***

4) Show students the clear container, at the front of the classroom near the BINGO board.

Say, ***"I will randomly pull slips throughout class to put in this container. These slips of paper have numbers and Students' Choice written on them. At the end of class, we will go through each slip and determine if the class made a BINGO. Make sure that you stay in your seat when a slip is drawn, as we will read them all out at the end of the game. If BINGO is earned, I will select a reward at random."***

5) Ask students if they have any questions about BINGO.

Say, "***Does anyone have any questions about Behavior BINGO?"***

Answer students' questions about the game.

APPENDIX G - TEACHER DATA FORM

Teacher: _____ Date: _____/_____/_____

Academically Engaged Behavior (AEB):
Active Engagement: Student is engaged in task-related vocalizations with teachers or peers as appropriate, written assignments, typing on a computer, or raising hand
Passive Engagement: Student's eyes are oriented toward the teacher or peer who is speaking for class purposes, toward the assignment, or looking at any task-related materials

Disruptive Behavior (DB): Student is talking without teacher permission, shouting out, singing, or making other noises not related to the task. Gaze oriented toward persons, objects, areas of the classroom, or materials that were not task-related/designated by teacher; head placed on desk. Child's buttocks breaking contact with his or her seat without teacher permission for at least 3 seconds; child not in designated area. Student physically or verbally refusing to complete an instruction delivered by the teacher. Student is making forceful contact with another's body in a hitting, kicking, pinching, punching, or biting manner with hands, feet, or mouth. Student manipulates any object without teacher permission and not task-related – *if student is still displaying AEB, do not code (e.g., clicking pen but eyes are on teacher).*

Student Name	AEB (tally)	DB (tally)
Stu #1		
Stu #2		
Stu #3		
Stu #4		
Stu #5		
Stu #6		
Stu #7		
Stu #8		
Stu #9		
Stu #10		
Stu #11		
Stu #12		
Stu #13		
Stu #14		
Stu #15		
Stu #16		
Stu #17		
Stu #18		
Stu #19		
Stu #20		

APPENDIX H - OBSERVATION FORM

Phase: BL Intervention

Observation #: _____

Observer Name: _____

Observer: 1 2

Teacher: _____

Date: ____/____/_____

Academically Engaged Behavior (AEB):

Active Engagement: Student is engaged in task-related vocalizations with teachers or peers as appropriate, written assignments, or typing on a computer

Passive Engagement: Student's eyes are oriented toward the teacher or peer who is speaking for class purposes, toward the assignment, or looking at any task-related materials

Disruptive Behavior (DB):

Inappropriate Vocalizations: Student is talking without teacher permission, shouting out, singing, or making other noises not related to the task

Off Task: Gaze oriented toward persons, objects, areas of the classroom, or materials that were not task-related/designated by teacher; head placed on desk

Playing with Objects: Student manipulates any object without teacher permission and not task-related – if student is still displaying AEB, do not code

Out-of-Seat: Child's buttocks breaking contact with his or her seat without teacher permission for at least 3 seconds; child not in designated area

Noncompliance: Student physically or verbally refusing to complete an instruction delivered by the teacher

Aggression: Making forceful contact with another's body in a hitting, kicking, pinching, punching, or biting manner with hands, feet, or mouth

AEB = _____/60*100 = _____%

DB = _____/60*100 = _____%

AEB_{Tgt} = _____/60*100 = _____%

DB_{Tgt} = _____/60*100 = _____%

IOA= _____/_____*100 = _____%

IOA_{TGT} = _____/_____*100 = _____%

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

APPENDIX I - TEACHER TRAINING PROCEDURAL INTEGRITY CHECKLIST

Teacher: _____ Observer: _____

Date: _____ Class Period: _____

Steps	**Yes**	**No**
1) Researcher reviewed AEB and provided examples and nonexamples.		
2) The researcher reviewed the use of the Behavior BINGO board, various containers, slips, and markers.		
3) Researcher explained BINGO criteria (e.g., ways in which students may or may not meet criteria).		
4) Researcher introduced the MotivAider device's use and timer functions to the teacher.		
5) Researcher provided and reviewed data sheet for teacher to record if the selected student was engaged in AEB at the end of the interval.		

Numbers of steps completed:	**/5**
Percentage of steps completed	

APPENDIX J - TREATMENT INTEGRITY CHECKLIST

Teacher: _____ Observer: _____

Date: _____ Class Period: _____

Steps	**Yes**	**No**
1) Observers sat in a non-obtrusive location in the classroom.		
2) Researcher ensured the MotivAider was functioning properly prior to the beginning of intervention session.		
3) Researcher provided all materials to teacher (MotivAider, BINGO board, containers and slips, circles).		
4) Researcher prompted the teacher to begin the intervention.		
5) Teacher introduced Behavior BINGO with the script.		
6) Teacher set MotivAider to 2-minute interval.		
7) At the intervals, teacher randomly selected student's name and observed student's behavior and: 1. teacher randomly selected a number and put in empty container at front of the classroom OR 2. teacher re-entered the student's name in the "Name" container.		
8) Teacher pulled earned number slips from corresponding container, read each aloud, and covered corresponding square on the board.		
9) If BINGO earned, teacher randomly selected slip from "Rewards" container, and presented reward to the class. (Write N/A if BINGO was not achieved.)		

Numbers of steps completed:	
Percentage of steps completed	

APPENDIX K - BASELINE INTEGRITY CHECKLIST

Teacher: _____ Observer: _____

Date: _____ Class Period: _____

Steps	**Yes**	**No**
1) Observers sat in a nonobtrusive location in the classroom.		
2) No instructions, prompts, intervention materials, or feedback regarding Behavior BINGO were provided to the teacher.		

Numbers of steps completed:	**/2**
Percentage of steps completed	

APPENDIX L - URP-IR

URP-Intervention

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

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1.	This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2.	I would need additional resources to carry out this intervention.	1	2	3	4	5	6
3.	I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4.	I understand how to use this intervention.	1	2	3	4	5	6
5.	A positive home-school relationship is needed to implement this intervention.	1	2	3	4	5	6
6.	I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
7.	The intervention is a fair way to handle the child's behavior problem.	1	2	3	4	5	6
8.	The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
9.	I would not be interested in implementing this intervention.	1	2	3	4	5	6
10.	My administrator would be supportive of my use of this intervention.	1	2	3	4	5	6
11.	I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
12.	This intervention is a good way to handle the child's behavior problem.	1	2	3	4	5	6
13.	Preparation of materials needed for this intervention would be minimal.	1	2	3	4	5	6

		Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
14.	Use of this intervention would be consistent with the mission of my school.	1	2	3	4	5	6
15.	Parental collaboration is required in order to use this intervention.	1	2	3	4	5	6
16.	Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6
17.	Material resources needed for this intervention are reasonable.	1	2	3	4	5	6
18.	I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
19.	This intervention is too complex to carry out accurately.	1	2	3	4	5	6
20.	These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
21.	This intervention would not be disruptive to other students.	1	2	3	4	5	6
22.	I would be committed to carrying out this intervention.	1	2	3	4	5	6
23.	The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
24.	I would need consultative support to implement this intervention.	1	2	3	4	5	6
25.	I understand the procedures of this intervention.	1	2	3	4	5	6
26.	My work environment is conducive to implementation of an intervention like this one.	1	2	3	4	5	6
27.	The amount of time required for record keeping would be reasonable.	1	2	3	4	5	6
28.	Regular home-school communication is needed to implement intervention procedures.	1	2	3	4	5	6
29.	I would require additional professional development in order to implement this intervention.	1	2	3	4	5	6

USAGE RATING PROFILE

CURP - Actual

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

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

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

REFERENCES

Aloe, A. M., Shisler, S. M., Norris, B. D., Nickerson, A. B., & Rinker, T. W. (2014). A multivariate meta-analysis of student misbehavior and teacher burnout. *Educational Research Review*, *12*, 30-44. https://doi.org/10.1016/j.edurev.2014.05.003

Apter, B., Arnold, C., & Swinson, J. (2010). A mass observation study of student and teacher behaviour in British primary classrooms. *Educational Psychology in Practice, 26*(2), 151-171. https://doi.org/10.1080/02667361003768518

Ashworth, E., Humphrey, N., Lendrum, A., & Hennessey, A. (2019). Beyond "what works": A mixed-methods study of intervention effect modifiers in the good behavior game. *Psychology in the Schools, 57*(2)*,* 222-246. https://doi.org/10.1002/pits.22312

Bear, G. G., & Richards, H. C. (1980). An interdependent group-oriented contingency system for improving academic performance. *School Psychology Review, 9*(2), 190-193. https://doi.org/10.1080/02796015.1980.12086550

Barrish, H. H., Saunders, M., & Wolf, M. M. (1969). Good Behavior Game: Effects of individual contingencies for group consequences on disruptive behavior in a classroom. *Journal of Applied Behavior Analysis, 2*(2), 119-124. http://dx.doi.org/10.1901/jaba.1969.2-119

Beeks, A., & Graves, Jr., S. (2016). The effects of the Mystery Motivator intervention in an urban classroom. *School Psychology Forum: Research in Practice, 10*(2), 142-156.

Bettini, E., Cumming, M. M., O'Brien, K. M., Brunsting, N. C., Ragunathan, M., Sutton, R., & Chopra, A. (2020). Predicting special educators' intent to continue teaching students with emotional or behavioral disorders in self-contained settings. *Exceptional Children, 86*(2), 209–228. https://doi.org/10.1177/0014402919873556

Bohan, C., & Smyth, S. (2023). The effect of schedule thinning on student behavior during the Caught Being Good Game. *Behavior Modification, 47*(3), 644-669. https://doi.org/10.1177/01454455221129993

Briesch. A. M., & Chafouleas, S. M. (2009). Exploring student buy-in: Initial development of an instrument to measure likelihood of children's intervention usage. *Journal of Education and Psychological Consultation, 51*(1)*,* 321-336. https://doi.org/10.1080/10474410903408885

Briesch, A. M., Chafouleas, S. M., Neugebauer, S., & Riley-Tillman, T. (2013). Assessing influences on intervention implementation: Revision of the Usage Rating Profile-Intervention. *Journal of School Psychology, 51*, 81-96. https://doi.org/10.1016/j.jsp.2012.08.006

Cariveau, T., & Kodak, T. (2017). Programming a randomized dependent group contingency and common stimuli to promote durable behavior change. *Journal of Applied Behavior Analysis, 50*(1), 121-133. https://doi.org/10.1002/jaba.352

Chafouleas, S. M., Briesch, A. M., Neugebauer, S. R., & Riley-Tillman, T. C. (2011). *Usage Rating Profile – Intervention Revised (URP-IR).* Storrs, CT: University of Connecticut.

Collins, T. A., Hawkins, R. O., Flowers, E. M., Kalra, H. D., Richard, J., & Haas, L. E. (2017). Behavior Bingo: The effects of a culturally relevant group contingency intervention for students with EBD. *Psychology in the Schools, 55*(1), 63-75. https://doi.org/10.1002/pits.22091

Collins, T. A., Hawkins, R. O., Heidelburg, K., & Hill, K. (2019). Group Contingencies. In K. C. Radley & E. H. Dart (Eds.), *Handbook of behavioral interventions in schools: Multi-tiered systems of support* (pp. 204 - 233). Oxford University Press.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied Behavioral Analysis* (3rd ed.). Pearson.

da Câmara, S. B., Agrawal, R., & Isbister, K. (2018, June 9-13). *Identifying children's fidget object preferences: Toward exploring the impacts of fidgeting and fidget-friendly tangibles.* Designing Interactive Systems Conference, Hong Kong, China.

Dart, E. H., Radley, K. C., Battaglia, A. A., Dadakhodjaeva, K., Bates, K. E., & Wright, S. J. (2016). The classroom password: A class-wide intervention to increase academic engagement. *Psychology in the Schools, 53*(4), 416-431. https://doi.org/10.1002/pits

Davies, S., & Witte, R. (2000). Self-management and peer-monitoring within a group contingency to decrease uncontrolled verbalizations of children with attention-deficit/hyperactivity disorder. *Psychology in the Schools, 37*(2), 135-147. http://dx.doi.org/10.1002/(SICI)1520-6807(200003)37:2<135::AID-PITS5>3.0.CO;2-U

Deshais, M. A., Fisher, A. B., & Kahng, S. (2018). A preliminary investigation of a randomized dependent group contingency for hallway transitions. *Education and*

Treatment of Children, 41(1), 49-64. http://dx.doi.org.lynx.lib.usm.edu/10.1353/etc.2018.0002

DiStasi, V. R., Deshais, M. A., Valdescu, J. C., & DeBar, R. M. (2023). More than just a game: A guide to using randomized group contingencies in schools. *Journal of Applied School Psychology*. https://doi.org/10.1080/15377903.2023.2196944

Donaldson, J. M., Vollmer, T. R., Krous, T., Downs, S., & Berard, K. P. (2011). An evaluation of the good behavior game in kindergarten classrooms. *Journal of Applied Behavior Analysis, 44*(3), 605-609. https://doi.org/10.1901/jaba.2011.440-605

Drabman, R., Spitalnik, R., & Spitalnik, K. (174). Sociometric and disruptive behavior as a function of four types of token reinforcement programs. *Journal of Applied Behavior Analysis, 7*(1), 93-101. https://doi.org/10.1901/jaba.1974.7-93

Ennis, C. R., Blair, K. C., & George, H. P. (2016). An evaluation of group contingency interventions: The role of teacher preference. *Journal of Positive Behavior Interventions, 18*(1), 17-28. 10.1177/1098300715577663

Fluke, S., & Peterson, R. L. (2013). *Positive behavior interventions & supports* [Strategy Brief]. University of Nebraska-Lincoln and the Nebraska Department of Education. https://k12engagement.unl.edu/Briefs/PBIS/PBIS%2010-23-2013.pdf

Green, S. B., McCoy, J. F., Burns, K. P., & Smith, A. C. (1982). Accuracy of observational data with whole interval, partial interval, and momentary time-sampling recording techniques. *Journal of Behavioral Assessment, 4,* 103-118. https://doi.org/10.1007/BF01321385

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. https://doi.org/10.1177/002246698201600110

Groves, E. A., & Austin, J. L. (2020). Examining adaptations of the good behavior game: A comparison of known and unknown criteria for winning. *School Psychology Review, 49*(1), 74-84. https://doi.org/10.1080/2372966X.2020.1716635

Groves, E. A., Najafichaghabouri, M., Seel, C. J., Fischer, S., Thomas, C., & Joslyn, P. R. (2023). A systematic review of group contingencies in alternative education settings. *Education and Treatment of Children*. https://doi.org/10.1007/s43494-023-00095-9

Hartman, K., & Gresham, F. (2016). Differential effectiveness of interdependent and dependent group contingencies in reducing disruptive classroom behavior. *Journal of Applied School Psychology, 32*(1), 1-23. https://doi.org/10.1080/15377903.2015.1056922

Horner, R. H., Carr, E. G., Halle, J., McGee, G. Odom, S. & Wolery, M. (2005) The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children, 71*(2)*,* 1052-1059. https://doi.org/10.1177/001440290507100203

Joslyn, P. R. & Vollmer, T. R. (2020). Efficacy of teacher-implemented good behavior game despite low treatment integrity. *Journal of Applied Behavior Analysis, 53*(1), 465-474. https://doi.org/10.1002/jaba.614

Joslyn, P. R., Vollmer, T. R., & Kronfli, F. R. (2019). Interdependent group contingencies reduce disruption in alternative high school classrooms. *Journal of*

Behavioral Education, 28(4), 423-434. https://doi.org/10.1007/s10864-019-09321-0

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), 523-533. https://doi.org/10.1002/1520-6807(200011)37:6%3C523::AID-PITS5%3E3.0.CO;2-W

Kleinman, K. E., & Saigh, P. A. (2011). The effects of the Good Behavior Game on the conduct of regular education New York City high school students. *Behavior Modification, 35*(1), 95-105. http://dx.doi.org/10.1177/0145445510392213

Korpershoek H., Harms T., de Boer H., van Kuijk M., Doolaard S. (2016). A meta-analysis of the effects of classroom management strategies and classroom management programs on students' academic, behavioral, emotional, and motivational outcomes. *Review of Educational Research*, *86*(3), 643–680. https://doi.org/10.3102/0034654315626799

Kowalewicz, E. A. & Coffee, G. (2014). Mystery Motivator: A Tier 1 classroom behavioral intervention. *School Psychology Quarterly, 29*(2), 138-156. https://doi.org/10.1037/spq0000030

Leflot, G., van Lier, P. A. C., Onghena, P., & Colpin, H. (2013). The role of children's on-task behavior in the prevention of aggressive behavior development and peer rejection: A randomized controlled study of the Good Behavior Game in Belgian elementary classrooms. *Journal of School Psychology, 51*(2), 187-199. https://doi.org/10.1016/j.jsp.2012.12.006

Litow, L., & Pumroy, D. K. (1975). A brief review of classroom group-oriented contingencies. *Journal of Applied Behavior Analysis, 8*(3), 341–347. https://doi.org/10.1901/jaba.1975.8-341

Little, S. G., Akin-Little, A., & O'Neill, K. (2015). Group contingency interventions with children - 1980-2010: A meta-analysis. *Behavior Modification, 39*(2), 322-341. http://dx.doi.org/10.1177/0145445514554393

Lynch, A., Theodore, L. A., Bray, M. A., & Kehle, T. J. (2009). A comparison of group-oriented contingencies and randomized reinforcers to improve homework completion and accuracy for students with disabilities. *School Psychology Review, 38*(3), 307-324. https://doi.org/10.1080/02796015.2009.12087816

Lynne, S., Radley, K. C., Dart, E. H., Tingstrom, D. H., Barry, C. T., & Lum, J. D. K. (2017). Use of a technology-enhanced version of the good behavior game in an elementary school setting. *Psychology in the Schools, 54*(9), 1049-1063. https://doi.org/10.1002/pits.22043

Maggin, D. M., Pustejovsky, J. E., & Johnson, A. H. (2017). A meta-analysis of school-based group contingency interventions for students with challenging behavior: An update. *Remedial and Special Education 38*(6), 353-370. https://doi.org/10.1177/0741932517716900

Marder, J., Thiel, F., & Göllner, R. (2023). Classroom management and students' mathematics achievement: The role of students' disruptive behavior and teacher classroom management. *Learning and Instruction, 86*. https://doi.org/10.1016/j.learninstruc.2023.101746

Mayer, G. R., Sulzer-Azaroff, B., & Wallace, M. (2014). *Behavior analysis for lasting change* (3rd ed). Cornwall-on-Hudson, NY: Sloan.

McHugh, M. B., Tingstrom, D. H., Radley, K. C., Barry, C. T., & Walker, K. M. (2016). Effects of tootling on classwide and individual disruptive and academically engaged behavior of lower-elementary students. *Behavioral Interventions, 31*(4), 332-354. https://doi.org/10.1002/bin.1447

Roberts, G. J., Mehmedovic, S., Cote, B., Wexler, J. & Strain, P. (2023). The impact of embedding behavioral supports into reading instruction for upper elementary students with reading difficulties and inattention. *Elementary School Journal, 123*(3), 457-478. https://doi.org/10.1086/723397

Mitchell, R. R., Tingstrom, D. H., Dufrene, B. A., Blake, W. B., & Sterling, H. E. (2015). The effects of the good behavior game with general education high school students. *School Psychology Review, 44*(2), 191-207. https://doi.org/10.17105/spr-14-0063.1

Müller, C. M., Hofmann, V., Begert, T., & Cillessen, A. H. N. (2018). Peer influence on disruptive classroom behavior depends on teachers' instructional practice. *Journal of Applied Developmental Psychology, 56*, 99-108. https://doi.org/10.1016/j.appdev.2018.04.001

National Center for Education Statistics (2022). *More than 80 percent of U.S. public schools report pandemic has negatively impacted student behavior and socio-emotional development.* U.S. Department of Education. https://nces.ed.gov/whatsnew/press_releases/07_06_2022.asp

Pasqua, J. L., Dufrene, B. A., LaBrot, Z. C., Radley, K., Dart, E. H., & Lown, E. (2021). Evaluating the independent group contingency: 'Mystery Student' on improving behaviors in Head Start classrooms. *Psychology in the Schools, 58*(7), 1361-1379. https://doi.org/10.1002/pits.22540

Popkin, J., & Skinner, C. H. (2003). Enhancing academic performance in a classroom serving students with serious emotional disturbance: Interdependent group contingencies with randomly selected components. *School Psychology Review, 32*(2), 282-295. https://doi.org/10.1080/02796015.2003.12086199

Radley, K. C., O'Handley, R. D., & LaBrot, Z. C. (2015). A comparison of momentary time sampling and partial-interval recording for assessment of effects of social skills training. *Psychology in the Schools, 52*(4), 363-378. https://doi.org/10.1002/pits.21829

Ré, T. C., Rieken, C. J., Brandt, J. A., Pacitto, G. O., Yepez, J. (2023). Differential reinforcement of low frequency behavior as an interdependent group contingency for children diagnosed with autism spectrum disorder. *Journal of Behavioral Education.* https://doi.org/10.1007/s10864-023-09512-w

Richardson, R. R., Crewdon, M. A., Skinner, C. H., Wheat, L. S., Martinez, J. (2021). Interdependent group-oriented contingencies: Randomly selected components to the rescue. *Teaching Exceptional Children, 54*(4), 1-11. https://doi.org/10.1177/00400599211006129

Robichaux, N. M., & Gresham, F. M. (2014). Differential effects of the Mystery Motivator intervention using student-selected and mystery rewards. *School*

Psychology Review, 43(3), 286-298. https://doi.org/10.1080/02796015.2014.12087428

Rubow, C. C., Vollmer, T. R., & Joslyn, P. R. (2018). Effects of the good behavior game on student and teacher behavior in an alternative school. *Journal of Applied Behavior Analysis, 51*(2), 382-392. https://doi.org/10.1002/jaba.455

Schmitt, J., & deCourcy, K. (2022). *The pandemic has exacerbated a long-standing national shortage of teachers.* Economic Policy Institute. https://www.epi.org/publication/shortage-of-teachers/

Shapiro, E. S., & Goldberg, R. (1986). A comparison of group contingencies for increasing spelling performance among sixth grade students. *School Psychology Review, 15*(4), 546–557. https://doi.org/10.1080/02796015.1986.12085256

Skinner, C. H., Cashwell, C. S., & Dunn, M. S. (1996). Independent and interdependent group contingencies: Smoothing the rough waters. *Special Services in the Schools, 12*(1-2), 61-78. https://doi.org/10.1300/J008v12n01_04

Skinner, C. H., Skinner, C. F., Skinner, A. L., & Cashwell, T. H. (1999). Using interdependent group contingencies with groups of students: Why the principal kissed a pig. *Educational Administration Quarterly, 35*(5)*,* 806-820. https://doi.org/10.1177/00131619921968833

Vannest, K. J., Parker, R. I., Gonen, O., & Adiguzel, T. (2016). Single Case Research: web based calculators for SCR analysis. (Version 2.0) [Web-based application]. College Station, TX: Texas A&M University. http://singlecaseresearch.org/calculators/tau-u

Tarlow, K. R. (2017). An improved rank correlation effect size statistic for single-case designs: Baseline corrected Tau. *Behavior Modification, 41*(4), 427-467. https://doi.org/10.1177/0145445516676750

Theodore, L. A., Bray, M. A., & Kehle, T. J. (2004a). A comparative study of group contingencies and randomized reinforcers to reduce disruptive classroom behavior. *School Psychology Quarterly, 19*(3), 253-271. http://dx.doi.org/10.1521/scpq.19.3.253.40280

Theodore, L. A., Bray, M. A., Kehle, T. J., & Dioguardi, R. J. (2004b). Contemporary review of group-oriented contingencies for disruptive behavior. *Journal of Applied School Psychology, 20*(1), 79–101. http://dx.doi.org/10.1300/J370v20n01_06

Tingstrom, D. H. (1994). The Good Behavior Game: An investigation of teachers' acceptance. *Psychology in the Schools, 31*(1), 57-65. http://dx.doi.org/10.1002/1520-6807(199401)31:1<57::AID-PITS2310310108>3.0.CO;2-K

Trevino-Maack, S. I., Kamps, D., & Wills, H. (2015). A group contingency plus self-management intervention targeting at-risk secondary students' class-work and active engagement. *Remedial and Special Education, 36*(6), 347-360. https://doi.org/10.1177/0741932514561865

Vannest, K. J., & Ninci, J. (2015). Evaluating intervention effects in single-case research designs. *Journal of Counseling & Development, 98*(4), 403-411. https://doi.org/10.1002/jcad.12038

Ward P., & Lee, M. (2005). Peer-assisted learning in physical education: A review of theory and research. *Journal of Teaching in Physical Education, 24*(3), 205-225. https://doi.org/10.1123/jtpe.24.3.205

Williamson, B. D., Campbell-Whatley, G. D., & Lo, Y. (2009). Using a random dependent group contingency to increase on-task behaviors of high school students with high incidence disabilities. *Psychology in the Schools, 46*(10), 1074-1083. https://doi.org/10.1002/pits.20445

What Works Clearinghouse. (2020). What Works Clearinghouse Standards Handbook, Version 4.1. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://ies.ed.gov/ncee/wwc/handbooks.

White. K. (2020). *Evaluating the effects of Behavior Bingo on students' academically engaged behaviors.* [Unpublished doctoral dissertation], University of Southern Mississippi.