Fall 12-18-2020

Effectiveness of an Interdependent Group Contingency with Randomization Using the iPad

Chelsea Gyke

EFFECTIVENESS OF AN INTERDEPENDENT GROUP CONTINGENCY WITH RANDOMIZATION USING THE IPAD

A Dissertation

Submitted to the School of Education

Duquesne University

In partial fulfillment of the requirements for

the degree of Doctor of Philosophy

By

Chelsea Nicole Gyke

December 2020

DUQUESNE UNIVERSITY
SCHOOL OF EDUCATION

Department of Counseling, Psychology, and Special Education

Dissertation

Submitted in partial fulfillment of the requirements for the degree
Doctor of Philosophy (Ph.D.)

School Psychology Doctoral Program

Presented by:

Chelsea Nicole Gyke
M.S.Ed. Child Psychology, Duquesne University, 2015
B.S. Psychology, University of Pittsburgh, 2014

September 25, 2020

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Approved by:

_____, Chair
Elizabeth McCallum, Ph.D.
Associate Professor
Department of Counseling, Psychology, and Special Education
Duquesne University

_____, Member
Kara E. McGoey, Ph.D.
Professor
Department of Counseling, Psychology, and Special Education
Duquesne University

_____, Member
Ara J. Schmitt, Ph.D.
Professor
Department of Counseling, Psychology, and Special Education
Duquesne University

ABSTRACT

EFFECTIVENESS OF AN INTERDEPENDENT GROUP CONTINGENCY WITH RANDOMIZATION USING THE IPAD

By

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Dissertation supervised by Elizabeth McCallum, Ph.D.

Classroom management, although considered one of the essentials of the optimal learning experience, is often a challenge for teachers. Certain classroom management strategies, such as group contingency interventions and token economies, are evidence-based strategies to aid teachers in gaining successful management of the classroom. The utilization of Class Dojo, a popular classroom management website, as a mechanism to implement an interdependent group contingency (IGC) intervention with randomized components may increase both the effectiveness of the intervention and the social validity of the intervention when compared to a manual implementation.

Participants included students in an elementary school self-contained special education classroom and a special education teacher. Students in the classroom consisted of four male and one female students from fourth and fifth grade. The current study is an A-B-C-B single subject

design that includes a baseline phase, two intervention phases, and a maintenance phase. Data was collected by one or more trained professionals during each intervention period and the classroom teacher filled out formal and informal surveys regarding the interventions at the end of the study.

It was hypothesized that the IGC intervention would significantly decrease student disruptive behaviors along with the IGC with Class Dojo as the vehicle of implementation for the intervention and that the classroom teacher would prefer using Class Dojo over the use of a traditional paper and pencil data collection mechanism. Results were inconsistent with the hypotheses for a variety of confounding reasons. However, both intervention phases did result in a consistently decreasing trend in data points. The classroom teacher identified the use of Class Dojo as a preferred vehicle for implementing an IGC intervention and discussed her satisfaction with the classroom management system.

DEDICATION

This dissertation is dedicated to all special education professionals in the school systems who struggle on a daily basis to maintain safe and productive classroom environments with the hopes that it will lead to more information on how to better understand your students and work towards a more healthy learning environment.

ACKNOWLEDGEMENT

To my committee chair, Dr. McCallum – thank you for being there for me every step of the way through classes, supervision, and the dissertation process while at Duquesne. I cannot begin to put into words how much your constant guidance and advice has helped me to become the professional that I am today. Thank you for advocating for me when needed and helping me advocate for myself during a time when I was unsure if I could ever even finish this project without starting over a third time.

To my committee members, Drs. Schmitt and McGoey – thank you for your kind words and wisdom throughout this process as well as your commitment and dedication to helping me see to the end of this project during this difficult time in the world.

To Dr. Hoover, Leah Wells, Jennifer Skirtich, and QV staff – I have said time and again how lucky and thankful I am to have had all of you to learn from and bond with during my internship year both professionally and personally. I feel as if I learned something crucially important from each one of you during such an important time in my life that helped me grow as a school psychologist and a person in general. I will continue to look back on your advice and examples throughout my years as a school psychologist and I, to this day, haven't been able to thank you enough.

To my Mom and Dad, family and friends – From the moment I graduated high school, I knew that I could do anything that I set my mind to because of your unconditional love and support. I have grown into the professional and woman that I am today because of each and every one of you. Mom and Dad, I hope you know how much I appreciate your patience, support, and pride along my journey and how much you pushed me to get where I knew I wanted

to go. I love you both…thank you for being there for me always. Thank you, Debbie for your constant love and support and of course for always being there when we need a hand. I always think about carrying on Steve's legacy with this title and I know he would be proud. And a special thanks to my Gram Smith for watching baby Arya while I completed this dissertation paper!

To my best friend and husband, Chris – From the moment I met you, I knew that you would forever push me to reach for the stars and support me to the end of this process. You have been nothing but supportive and patient (*and at times pushy*) when I needed it the most. You've been my #1 cheerleader throughout this process and have been there for the good, the bad, and the ugly crying; as well as the late nights studying, writing, and my forever-changing busy schedule. Words can't describe how much we have been through these past ten years, but you have managed to make my education and professional career a priority every step of the way. Thanks for being my everything, sweetheart. I love you.

To my children, Christopher, Arya, and Isabella – Although I started this journey not knowing any of you, it's crazy to sit back now and realize how much all of this has been for you even if I didn't know it. Thank you, CJ, for putting up with my constantly busy schedule, studying, and paper-writing and for sacrificing family time and fun for my school work. I know it wasn't easy for you, but you have always been supportive of me and I want you to know that I really appreciate that; I love you buddy! To Arya and Isabella, Mommy loves you so much and I can't wait to see the individuals that you become and hopefully I can pass on the support and love that my family did during my educational career. Thank you for being my final reason to push to finish this project!

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Introduction

One of the most essential preconditions for a successful educational environment is adequate classroom management. Classroom management skills enable teachers to maximize students' learning in a group context instead of individually attending to each student. Although classroom management is a known effective strategy to increase meaningful academic learning, on a 2006 teacher needs survey from the American Psychological Association, teachers consistently reported a lack of support in implementing classroom management strategies (Coalition for Psychology in Schools and Education, 2006).

According to Simonsen, Fairbanks, Briesch, Myers, and Sugai (2008), the three fundamental components of good classroom management are: maximized allocation of time, the arrangement of instructional activities, and proactive behavior management. Out of the three, proactive behavior management is arguably the most difficult to accomplish successfully.

Classroom-wide behavior management interventions, which may include, but are not limited to high classroom structure, active supervision, response cards, group contingencies, and differential reinforcement, have been constructed and utilized in many different settings in order to help teachers with their proactive behavior management (Simonsen et al., 2008). Class-wide group contingency interventions have been found to be one of the most effective strategies for classroom behavior management (Simonsen et al., 2008; Stage & Quiroz, 1997). Group contingency interventions allow for individual students to contribute to the classroom's well-being. Students are or are not reinforced as a group for appropriate behavior instead of being punished individually for inappropriate behavior within a group contingency intervention (Chow & Gilmour, 2016). Chow and Gilmour (2016) found that the implementation of group contingency interventions was not only beneficial to the students, but also beneficial to the

teachers. Through the use of group contingency interventions, teachers are likely to begin focusing more attention on rewarding desired behaviors and less attention on punishing inappropriate behaviors.

Independent, dependent, and interdependent are the three main types of group contingency interventions discussed throughout the literature (Kelshaw-Levering, Sterling-Turner, Henry, & Skinner, 2000). For the purpose of this study, interdependent group contingencies will be the focus. Within interdependent group contingencies, all students in a classroom receive reinforcement contingent on the behavior of the group as a whole (Popkin & Skinner, 2003). For example, the entire class will receive 15 minutes of iPad time at the end of the day if the class average is 85% or higher on the math test. In this situation, each student's achievement helps the class to meet a collective goal in order to earn a reward. If the class average does not reach the criterion, no student is rewarded with the additional iPad time.

Keeping children engaged and motivated is also an important consideration within group contingency interventions. The use of randomization of variables (reinforcers, criteria, and target behaviors) has been added to group contingency interventions in many research studies in order to increase the effectiveness of the interventions and keep students motivated (Hawkins, Haydon, Denune, Larkin, & Fite, 2015; Kelshaw-Levering et al., 2000; Popkin & Skinner, 2003; Theodore, Bray, Kehle, & Jenson, 2001; Williamson, Campbell-Whatley, & Lo, 2009). With randomized components, students may be more likely to improve their behavior on all of the possible target behaviors because they cannot predict which reinforcer, criterion, or target behavior will be necessary to gain the reward (Hawkins et al., 2015).

In addition to group contingency interventions that have been utilized in classrooms, technological interventions have become increasingly utilized due to the increase in access and

implementation of technology in the classroom. Class Dojo, a free online application/website for teachers, allows users to create individual profiles for each student and give them points (individually or as a group) if they meet teacher-specified criteria.

The Class Dojo website (https://www.classdojo.com) reports that it is used, in some capacity, in approximately 90% of schools in the United States. Although it is difficult to ascertain the accuracy of this statistic, it is important to note that there have been very few published studies conducted to support the use of this application in the classroom. Krach, McCreery, and Rimel (2016) compared the utilization of Class Dojo and paper-pencil methods of behavioral management charts. Results of the study found Class Dojo to provide significantly more data in general and more reliable data than the paper-pencil methods. More recently, Cetin and Cetin (2018) surveyed middle school students and found that overall, using Class Dojo led students to try to display more positive behaviors and that they generally had positive opinions about the application. This study also found that The National Association of School Psychologists (NASP) emphasizes the use of evidence-based interventions when working with students. Therefore, there is a need for more empirical evidence to support such a widely-used intervention strategy. In the current study, the author aims to add to the paucity of research regarding the Class Dojo application, while adding to the research on group contingency interventions by utilizing Class Dojo as a mechanism by which a group contingency intervention is implemented.

Theoretical Basis

The theoretical basis behind the principles of group contingency interventions can be best described by Skinner's (1979) approach to behaviorism. Skinner focused on the voluntary (learned) responses to stimuli that have been conditioned by innate responses, which he named,

operant conditioning. Operant conditioning involves reinforcing a response to a stimulus in order to increase the frequency of that same response in the future. This main concept of reinforcement can be thought of as the backbone of any group contingency intervention because within the interventions, students are reinforced for appropriate behaviors and the reinforcement increases the likelihood of the behaviors happening again in the future.

The use of reinforcement within group contingency studies is one of the most important factors facilitating the desired responses. Throughout his literature, Skinner discussed the use of both primary and secondary reinforcement. Primary reinforcement satisfies innate, biological needs such as hunger, thirst, and pleasure. Secondary reinforcers were once previously neutral stimuli that have been conditioned through repeated pairings with a primary reinforcer. For example, the secondary reinforcer of school grades, by themselves, would not be reinforcing if not for the repeated pairing of good grades with feelings of pleasure/happiness. For the purposes of this study, points earned by meeting teacher-established criteria are considered secondary reinforcers.

The research literature focused on the use of interdependent group contingencies suggest that the intervention can be an effective strategy to both decrease inappropriate behavior and increase desired behavior/academic performance (Kelshaw-Levering et al., 2000; Popkin & Skinner, 2003). In 2000, Kelshaw-Levering et al. conducted a study investigating the effects of an interdependent group contingency with randomized components on student problem behaviors in a second-grade classroom. During an initial intervention phase, researchers only randomized reinforcers by having the teacher choose a random slip of paper from a jar including all possible reinforcers. In the second intervention phase, all components of the intervention (target behavior, target student, and reinforcer) were randomized by picking random slips of

paper from multiple designated jars. Across all phases, the target behaviors included four disruptive student behaviors (off-task, inappropriate vocalization, out-of-area, and noncompliance) and were recorded in 15-minute intervals using a partial interval observation procedure.

Results of Kelshaw-Levering et al.'s (2000) study suggest that the randomization of all components of an interdependent group contingency may be equally, if not slightly more, effective than the randomization of a single component. However, limitations of the study may indicate areas in which future research is needed. First, the students in the study were only observed during 15 minutes of their day, while teacher data was reported for the remainder of the intervention time. Another limitation of the study focused on the inclusion of rules being posted in the classroom when they had not initially been posted pre-intervention. Similarly, the effect of students being able to select a reinforcer out of the jar could have been individually reinforcing for some students but not for others. Researchers also suggest that future researchers be cognizant of treatment order effects and recommended varying treatment order to decrease this effect.

As discussed earlier, few research studies regarding Class Dojo have been published in peer-reviewed journals. Krach, McCreery, and Rimel (2016) sought to gain information on the types of behavioral management charts teachers use in their classrooms to track student behavior. Class Dojo was found to provide significantly more data on student behavior than other forms of behavioral management systems (e.g., paper and pencil charts). Researchers of this study indicated that the widespread use of Class Dojo yields a necessary push for future research studies evaluating its effectiveness in the classroom. Furthermore, Cetin and Cetin (2018) utilized survey data to find that the use of Class Dojo in the classroom led students to try to

display more positive behaviors and that overall, students generally had positive opinions about the application.

Previous literature has concluded that interdependent group contingency interventions are an effective classroom management strategy. However, an overwhelming gap in the research exists regarding the use of the Class Dojo system that is so widely utilized across the United States. The current study aims to add to the lack of research on Class Dojo by utilizing it as a vehicle to implement an interdependent group contingency intervention.

Research Questions

Research Question 1

Will a traditional interdependent group contingency intervention significantly decrease problem behavior in the classroom?

Hypothesis: The interdependent group contingency intervention will significantly decrease the identified problem behaviors.

Research Question 2

Will an interdependent group contingency intervention using Class Dojo with randomized components decrease problem behaviors in the classroom?

Hypothesis: The interdependent group contingency intervention using Class Dojo with randomized components will decrease problem behaviors in the classroom.

Research Question 3

Do teachers find the interdependent group contingency with Class Dojo to be an acceptable intervention?

Hypothesis: Teachers will find the interdependent group contingency intervention with Class Dojo to be an acceptable intervention.

Literature Review

Classroom Management

Classroom management is an essential skill for all teachers to learn and utilize in order to maximize their students' learning. Wang, Haertel, and Walberg (1994) conducted a meta-analysis regarding the most influential factors upon school learning and found that classroom management was among the 28 categories of the most *influential* factors. Researchers concluded that effective classroom management strategies may increase student engagement, decrease inappropriate behavior, and optimize the use of instructional time (Wang, Haertel, & Walberg, 1994).

Three fundamental components of good classroom management are maximized allocation of time for instruction, the arrangement of instructional activities to optimize engagement and achievement, and proactive behavior management (Simonsen et al., 2008). Proactive behavior management can be the most difficult of the three to accomplish. Classroom-wide behavior management interventions are utilized in many schools and classrooms in order to increase teacher control and decrease students' overall problem behaviors.

Although classroom management interventions can be utilized for all types of classrooms, the management of a class with students with emotional and behavioral disorders (EBD) is a challenging task that many teachers struggle with (Kehle, Bray, Theodore, Jenson, & Clark, 2000). Students who suffer from EBD have a difficult time sustaining attention to tasks and maintaining self-control and are subsequently more likely to be disruptive in the classroom than their regular education peers (Popkin & Skinner, 2003; Otten, 2004).

Many special education teachers are tasked with juggling individualized plans for each student as well as controlling the classroom environment in its entirety. There is a strong need

for classroom management interventions that can be effective, acceptable, affordable, and easily integrated into the curriculum in self-contained special education classrooms with students who qualify under Emotional Disturbance (ED). However, many special education teachers do not receive the proper level of support in order to effectively and accurately implement classroom management techniques, if they know of them at all (Krach, McCreery, & Rimel, 2016).

Theories of Classroom Management

Classroom management and learning have been topics of study for theorists for decades. Theorists such as Carl Rogers, Ivan Pavlov, John Watson, and B.F. Skinner gave the field of psychology theories that aid in the interpretation and prediction of *how* we learn as humans (Tauber, 1999). Not only can the principles of humanism and behaviorism guide teachers on how students learn, but also can give insight regarding how best to structure a classroom for optimal learning and classroom management.

Humanism. Carl Rogers dedicated his life's work to the study and theory of psychology and was one of the founders of the humanistic approach (Tauber, 1999). Rogers created his own person-centered approach to understanding personality and human relationships that is applicable to a wide variety of human domains. Person-centered approaches have been applied to psychotherapy and counseling, organizations, and education for decades (Tauber, 1999).

In his major work on the application of the humanistic approach to learning, *Freedom to Learn* (1969), Rogers directed his attention to teachers and other educators. In addition to his theory on the attitudes of the therapist, Rogers focused on the importance of the attitudes and perceptions of teachers and not necessarily the techniques they use in their classroom (Patterson, 1977). Rogers (1969) identified the goal of education as being the education of the "whole person," involving personal growth, the development of creativity, and self-directed learning.

These three components work together toward the ultimate goal of the "fully functioning person."

Similar to the unconditional positive regard given in a therapeutic setting, the attitude of a teacher must facilitate learning through unconditional acceptance, trust, and empathic understanding (Rogers, 1969). It is important for teachers to realize that every child is unique in his or her own way and not every child learns the same or develops in the same manner. Being able to treat children with unconditional respect enables students to trust their teacher and facilitate their own learning. Although there are no direct models of classroom management based solely on Rogers' humanistic approach, the basis of his theory has been used as the primary structure of classroom management models that focus on the individual students and teachers' attitudes towards them (Tauber, 1999).

Behaviorism. A learning theory that has become one of the most influential in the field of psychology is known as behaviorism. The concept of behaviorism differs from that of Rogers' humanism because it explains the learning of behaviors through a series of stimulus-response occurrences. When behaviorists study the learning of an organism, they focus on the external, observable behaviors instead of internal processes. Although the roots of behaviorism can be linked to philosophers such as Aristotle and Hobs, more recent psychologists have developed the theory into what it is today (Turner, 2007).

Classical Conditioning. Ivan Pavlov, initially a trained physiologist, discovered what became known as classical conditioning during the everyday feeding of his many dogs in the 1890's. Pavlov (1927) discovered that his dogs began to salivate in response to him bringing them food and that eventually, the dogs would salivate upon him solely entering the room, even if he did not have any food. Pavlov began experimenting with this stimulus-response nature of

the dogs' salivation and came to the conclusion that one can condition an innate response to any neutral stimulus.

In classical conditioning, each learned behavior begins with an unconditioned stimulus (e.g., food) that creates an unconditioned, innate, response (e.g., salivation; Pavlov, 1927). Pavlov discovered if one associates a neutral stimulus (e.g., person) with the unconditioned stimulus (e.g., food), the neutral stimulus would eventually trigger the conditioned response (e.g., salivation) independently, and therefore become a conditioned stimulus. Later experiments from Pavlov utilized different methods to achieve this same outcome, such as pairing the sound of a bell with the food.

Although Pavlov's contributions to behavioral psychology were groundbreaking, John B. Watson is considered to be the "father" of behaviorism. Watson believed Pavlov's experiments were a good example of how experimental methods could be used to observe behavioral conditioning (Watson, 1916). However, Watson's goal was the eventual application of these concepts of learning to humans. Watson's initial research focused on animals (rats, birds, rabbits, and monkeys) with the hope that he would be able to experiment with human behavior.

Watson's experiments have become famous throughout the field of psychology, but one of his most well-known studies is his work with "Little Albert" in 1920. Little Albert was an infant that Watson and his colleague Rayner worked with in order to observe conditioned emotional responses (Watson & Rayner, 1920). Watson exposed Albert to little white animals and then simultaneously exposed him to a loud, frightening noise. Albert began associating the little animals with the frightening noises and eventually began demonstrating fear, crying, and avoidance behaviors just at the sight of the animals. As expected, Watson was able to create a conditioned emotional response to a previously neutral stimulus. Although unethical, Watson's

"Little Albert" experiment has become a widely known and taught experiment in the field of psychology and behaviorism.

Operant Conditioning. Interested in what motivated people/animals to do certain things, B. F. Skinner built upon the work of former behaviorists Pavlov and Watson and sequentially founded a new approach to learning and behaviorism that had not yet been discovered (Greengrass, 2004). B. F. Skinner was an American psychologist and behaviorist that furthered the research in experimental behavioral psychology to include voluntary (non-reflexive) responses, not just innate responses to stimuli. Skinner considered his new form of conditioning "much more like most learning in daily life" (Skinner, 1979, p.89). Unlike classical conditioning, operant conditioning involves a reinforcer. A reinforcer is a stimulus that increases the frequency of the response it follows. The basic principle of operant conditioning is a response that is followed by a reinforcer is strengthened and more likely to occur again. In other words, Skinner used reinforcing stimuli to increase voluntary responses.

Reinforcement

The mechanics of operant conditioning are more complex than classical conditioning. In order for operant conditioning to be successful, the reinforcer must immediately follow the response, and must be contingent upon the response. Skinner (1938) also identified different forms of reinforcers. According to Skinner, reinforcement could either be primary or secondary. Primary reinforcers satisfy innate needs including physiological or social desires, such as food, drink, and pleasure. Secondary reinforcers, however, are previously neutral stimuli that are conditioned to be reinforcing through repeated associations with primary reinforcers. Examples of secondary reinforcers include money, grades, or tokens on a token board, because these

objects have been repeatedly associated with primary reinforcers (pleasure); therefore, the reinforcers become independently reinforcing.

In addition to primary and secondary classifications of reinforcers, reinforcement can also be positive or negative (Skinner, 1961). Positive reinforcement involves the presentation of a stimulus following a response that increases the likelihood of the response in the future. An example of positive reinforcement would be giving a student a piece of candy after he or she raises his or her hand instead of calling out an answer. In this situation, the student's response is raising his or her hand and the positive reinforcement is immediately giving him or her a piece of candy. This positive reinforcement makes the student more likely to raise his or her hand in the future because it is now associated with something pleasurable and positive.

Negative reinforcement involves the removal of a stimulus, which is usually aversive to the person, following a response to increase the likelihood of the response in the future (Skinner, 1961). For example, a mother is in line at the grocery store and her child is screaming for candy; if the mother gives the child a piece of candy (response), the child will stop screaming (negative reinforcement). Therefore, the removal of the aversive stimulus (screaming) will increase the likelihood that the mother will give her child candy in the grocery line again in the future.

Schedules of Reinforcement

Unlike Pavlov and Watson, B.F. Skinner's principles of learning more accurately describe a process of learning that can be directly applicable to a classroom setting. The utilization of positive reinforcement in the classroom can lead to an increase in positive behavior and a decrease in inappropriate behaviors. The process of when and how frequently to present reinforcement is considered a schedule of reinforcement. Reinforcement schedules are influential to both how the response is learned and to the maintenance of that response, because

the schedule of reinforcement has to be motivating enough for the subject to continue to respond (Domjan, 2009).

Ferster and Skinner (1957) demonstrated the usefulness of the reinforcement schedule using a "Skinner box," in which an animal displays a clearly defined and observable response in order to receive a food pellet. The reinforcement schedule determines the number of responses or timing needed to receive a reinforcer (Domjan, 2009). According to Skinner (1957), there are four main intermittent reinforcement schedules. The timing and number of responses required to present a reinforcer differ, along with the effect that they have on the operant behaviors.

Interval Schedules. An interval schedule is the first type of intermittent reinforcement schedule. Interval schedules require a minimum amount of time that must pass between successive reinforced responses. If the subject responds before this time has elapsed, the responses are not reinforced. Within interval schedules, the interval of time can either be fixed (a specific amount of time between each reinforcer) or variable (fluctuating amounts of time between reinforcers). Fixed interval schedules produce an accelerated rate of response when it is almost time for the next reinforcer. Variable interval schedules produce a steady rate of response because the subject cannot accurately predict when the next reinforcer will be received.

Ratio Schedules. Ratio schedules, unlike interval schedules, do not rely on the amount of time that passes, but instead upon the number of operant responses made by the subject. However, similar to interval schedules, ratio schedules can either be fixed (the required number of responses remains the same between reinforcers) or variable (required responses vary for each reinforcer). Fixed ratio schedules produce a high rate of responses until a reinforcer is received, but then immediately drop off after receiving the reinforcer until the subject begins the high rate of response again. Variable ratio schedules produce the highest and most steady rate of

responses because subjects do not know the number of responses needed to receive another reinforcer (it could be ten, it could be one).

Schedules of reinforcement for students in a classroom is without a doubt more difficult to accomplish than within a Skinner box experiment because of all the variables that teachers encounter during the day. However, Skinner's schedules of reinforcement suggest that in school settings, reinforcers must be rewarding to the students, reinforcement must follow the desired response immediately, and that different schedules of reinforcement will produce different results. In most, if not all, classroom management interventions, you can find Skinner's principles of reinforcement at the foundation.

Class-Wide Group Contingencies

Out of all evidence-based practices in classroom management, group contingency interventions have been found to be one of the most effective (Simonsen et al., 2008). Stage and Quiroz (1997) conducted a meta-analysis on interventions designed to decrease inappropriate behavior. Results found that out of 273 studies, interventions designed to decrease inappropriate behavior had an overall effect size of d= -.78; therefore, interventions were successful in reducing disruptive behavior in 78% of treated students in public schools compared to non-treated students. Cohen (1988) defines effect sizes of d=.2 as small, d=.5 as medium, and d=.8 as large. Interventions can be considered effective if they have larger effect sizes. Results also indicated that group contingencies were the most effective class-wide intervention out of all that were studied (d = -1.02). Self-management (d = -1.00) and differential reinforcement (d = -.95) were also found to be effective.

In a more recent literature analysis, Simonsen et al. (2008) also found group contingencies to be one of many effective classroom management interventions. Simonsen et al.

(2008) analyzed 10 recent classroom management texts and created a list of recommended interventions that were broken down into groups: (a) physical arrangement of classroom, (b) structure of classroom environment, (c) instructional management, (d) procedures designed to increase appropriate behavior, and (e) procedures designed to decrease inappropriate behavior. Class-wide group contingencies were among the four interventions found to increase the acknowledgement and frequency of appropriate behavior; the other interventions included specific and/or contingent praise, behavioral contracting, and token economies.

When one student is disruptive to the classroom, his or her behaviors can interfere with the learning of their classmates as well (Ling, Hawkins, & Weber, 2011). Therefore, group contingencies allow for each student to contribute to the classroom's overall wellbeing. Group contingencies consist of a group (or team) of students that work together and are reinforced for their appropriate behavior as a group instead of being reinforced or punished individually for inappropriate behavior (Chow & Gilmour, 2016).

More specifically, Chow and Gilmour (2016) identify three key components necessary for a successful group contingency intervention: establishing classroom expectations, explicitly teaching these expectations, and reinforcing only the established and taught expectations. If students meet the established expectations, they can be rewarded with small tangibles (stickers, candy, etc.) or can earn large group rewards (pizza parties, more recess time, etc.). This process allows students to feel both individually and collectively responsible for group rewards at the same time.

The utilization of group contingencies in a classroom is not only beneficial to the students, but can be beneficial to overall teacher wellbeing and behavior. After implementation of a group contingency intervention, teachers are likely to pay more attention to appropriate

behaviors and begin to decrease the frequency of punishments for disruptive behavior (Chow & Gilmour, 2016). Furthermore, group contingencies are desirable to teachers because they do not require excessive amounts of time and resources compared to most other classroom-wide interventions; a teacher only needs to provide reinforcement if the class met his or her expectations for them (Ling et al., 2011).

Independent Group Contingencies

There are three main types of group contingencies that are discussed throughout the literature: independent, dependent, and interdependent (Kelshaw-Levering, Sterling-Turner, Henry, & Skinner, 2000). In the first type of contingency, *independent,* children receive the same reinforcer as other children contingent upon their own individual performance on a set of target behavior(s) and criteria (Kelshaw-Levering et al., 2000). One example of an independent group contingency is Accelerated Reader points. In Accelerated Reader, students who read books and take quizzes earn points towards a goal. In most schools participating in the accelerated reader program, each student is held to the same criteria (e.g. 10 points per 9 weeks) and if individual students meet their goal, they may be reinforced ("Helping students," 2018).

Dependent Group Contingencies

The second type of group contingency is a *dependent* intervention. In dependent group contingencies, all students receive access to reinforcers contingent upon whether or not one individual student meets a specified criterion (Popkin & Skinner, 2003). For example, if one student in a classroom displays an inappropriate amount of aggressive behaviors, data can be collected on that student, and if he meets the criterion goal for success, the entire classroom receives a reward.

Although dependent group contingencies may work for students displaying specific target behaviors, they also have some limitations. Dependent group contingencies may lead to too much pressure on an individual student, lead to classmates' aggression or hostility towards the student, or be considered unfair because the entire group reinforcement is contingent upon only one student's behavior (Popkin & Skinner, 2003). If the student does well and gets the reward for the whole class, it can be motivating to that student, but can have harmful effects if the student does not perform to the criteria level.

Williamson, Campbell-Whatley, and Lo (2009) studied the effects of a dependent group contingency to increase on-task behaviors of high school students with disabilities. These researchers added a randomization component to the target student in order to reduce the stigma that can surround the individual student upon whom the reinforcer is contingent. Peer pressure decreased when the target student was unknown to the rest of the group. Results found that the implementation of the randomized dependent group contingency positively affected the on-task behavior for three out of six participants.

Interdependent Group Contingencies

The final type of group contingency intervention is an *interdependent* group contingency. Throughout this type of intervention, all students in a classroom receive reinforcement contingent on the average behavior of the group as a whole (Popkin & Skinner, 2003). One example of an interdependent group contingency may be that the entire class will receive 15 extra minutes of recess if the class average is 85% or higher on the spelling test.

Interdependent group contingencies can be beneficial to individual students and general classroom management for many reasons. First, interdependent group contingencies allow teachers to address the behavior of the entire class with only one intervention (Popkin & Skinner,

2003). Few other interventions are designed to target an entire classroom's behavior; interventions such as token economies and check-in/check-out systems are often individualized for select students.

Also, because the students receive reinforcement contingent upon the group's performance, this type of group contingency requires students to work together and rely on each other, unlike independent and dependent group contingencies (Kelshaw-Levering et al., 2000). As the children work together, they become less likely to target other students' individual behaviors as detrimental to the group, and also display less hostility or aggression. Additionally, during interdependent group contingencies, all students earn access to the same reinforcer which is, in itself, even more reinforcing for students who display higher levels of disruptive behaviors (Kelshaw-Levering et al., 2000). These students most likely do not gain access to rewards on a regular basis due to their problem behaviors, so reinforcement from the group contingency may help those children become more motivated to decrease their disruptive behaviors.

Randomization of Variables

Although interdependent group contingencies help to decrease the stigmatization of certain students, there can be a few limitations to their effectiveness. The first limitation of interdependent group contingencies can be a limitation of any intervention involving reinforcement. If students are not motivated by the reinforcer, the intervention will not be successful. When utilizing class-wide interventions, this limitation is heightened because every student may have a different idea of what is reinforcing to them. Some students may want extra time on the computers at the end of the day, where others may want extra time in the gym.

A second limitation of interdependent group contingencies can surround the criterion of the contingency. If a student perceives that he or she cannot meet a specific criterion, the

intervention may not have a significant effect on that student (Popkin & Skinner, 2003). For example, if students realize that it will not be possible to meet a specific criterion halfway through the day, they are going to be more likely to engage in inappropriate behaviors for the rest of the day, because they know they will not be reinforced anyway.

Another issue that arises with interdependent group contingencies is the effect that targeting only one behavior has on the intervention (Popkin & Skinner, 2003). For example, if students know that they are being reinforced for increased performance in reading, their mathematics performance may decrease while they are allocating all of their resources toward reading (Popkin & Skinner, 2003). The same can be true when working with behaviors instead of academic performance. If a student with multiple problem behaviors knows that he only needs to improve one behavior in order to be reinforced, that student may not put any effort into improving the other target behaviors.

Similar to the randomization in the Williamson et al. (2009) dependent intervention study, some researchers have added randomized components to interdependent group contingencies in order to increase their effectiveness (Hawkins et al., 2015). Therefore, variables such as reinforcers, criteria, and selected target behaviors can be randomized within the intervention in order to help control for all three of the limitations discussed (Popkin & Skinner, 2003). Students will be more likely to improve their behavior on all of the possible target behaviors because they cannot predict which reinforcer, criteria, or target behavior is necessary to earn the reward (Hawkins et al., 2015). Research in the area of group contingencies has shown that the addition of randomization makes the overall intervention more effective (Kelshaw-Levering et al., 2000).

Relevant Research

In 2000, Kelshaw-Levering et al. conducted a study to test the effectiveness of a randomized interdependent group contingency intervention on 12 students in a second-grade classroom. Researchers utilized a multiphase time-series design in which data was collected during a baseline phase, an intervention phase including randomized reinforcers, and an intervention phase in which all components were randomized. Target behaviors included four disruptive behaviors that were identified by the teacher: off-task, inappropriate vocalizations, out-of-area, and noncompliance.

Data were collected during classroom observations at random times across days and consisted of a 15-minute observation that utilized a 10-second observe, 5-second record partial interval observation procedure. Data were collected on four randomly selected students out of the 12 in the classroom and the order in which the students were observed was randomized across sessions.

The first intervention phase of the Kelshaw-Levering et al. (2000) study was designed to include only the randomization of reinforcers. The teacher began the intervention with a full explanation of what was expected of the students. Students were instructed that if they met the criterion for problem behavior reduction, a reinforcer would be drawn from a jar. The teacher chose an initial criterion of a 40% reduction in problem behaviors in order for the class to be highly likely to earn the reinforcer. The teacher divided the day into three intervals of time in which students could possibly receive reinforcers (each one hour and 15 minutes long). Although data were being collected by observers in the classroom, the teacher was responsible for collecting data to evaluate whether or not the students receive the reinforcement at the end of the time period and a data collection sheet was provided for ease of documentation.

After a return-to-baseline phase, Kelshaw-Levering et al. (2000) implemented intervention phase two where all aspects of the intervention were randomized. Students were again given rules for the intervention and the teacher described the differences between the first phase and the second. Differences included students not knowing the percentage of reduction in behavior needed to earn a reinforcer, the target behavior(s) in which they were being evaluated on, whether the entire class or an individual student would be evaluated, and if they received reinforcement, which reinforcer the class would receive. In order to avoid potential negative effects for individual students, the teacher did not reveal the name of the student that was being evaluated unless that student had met the criteria.

Results of this study indicated that during the initial baseline phase, disruptive behavior varied, but had an increasing trend (M=37.2%). The introduction of the randomized reinforcer stage of intervention resulted in a significant decrease in disruptive behavior (M=14.29%) and during withdrawal of the intervention, high rates of disruptive behavior resurfaced (M=42). The data suggest that the randomized reinforcer intervention alone was effective in reducing disruptive behavior. Following the return-to-baseline phase, the introduction of the all-components randomization phase also led to a significant decrease in disruptive behavior (M=10.6). Results indicate that the randomization of multiple components of a group contingency intervention may be just as effective, if not slightly more, than the randomization of a single component.

Similarly, Popkin and Skinner (2003) conducted a study to evaluate the effectiveness of an interdependent group contingency with randomized components. A modified multiple baseline across target behaviors design was utilized to evaluate the effects of the group

contingency intervention on academic performance on independent seatwork assignments in spelling, mathematics, and English.

The study was conducted with five students from an intact self-contained classroom for students with social-emotional disorders and their ages ranged from 11 to 14 years old. Once researchers obtained proper informed consent from the teacher, each of the students' parents, the principal of the school, the school district institutional review board, and the university institutional review board, the classroom teacher and teaching assistant were trained to implement the intervention.

During the baseline phase, no contingencies were implemented for the target academic behaviors. Students remained responsible for classwork that was determined by each student's Individual Education Plan (IEP). Students were given grades that were contingent upon their academic performance and were praised for behaviors that were seen as appropriate, as per typical classroom procedures.

Before the implementation of the intervention, students were trained during a 30-minute session and reinforcers were established. Students were told that they would be receiving rewards as a group contingent upon performance on independent seatwork assignments. Students and teachers took turns suggesting possible group rewards and acceptable rewards were written on notecards and placed in a "Rewards Box." The academic performance goal was also randomized. The teacher pulled a random notecard out of the "Goals Box."

During the intervention phase, at the end of the day, the teacher pulled a random notecard out of the Goals Box and determined whether or not students had met the criteria for that day in spelling. If students met the criteria, a reward was pulled from the Rewards Box. After nine days of implementing the group contingency in spelling, math was added as a possible target

assignment and math goals were added to the Goals Box. After nine more days of intervention identical to the first intervention phase, English performance goals were added to the Goals Box. This final intervention stage was implemented until the end of the school year.

Results were graphed and visually analyzed and effect sizes were calculated. Effect size results suggest the strongest effect for spelling (d=3.01). Mathematics (d=1.65) and English (d=.84) also yielded strong effect sizes. Student grades were also analyzed and results indicate that increases in student grades were educationally significant across all content areas.

In 2015, Denune, Hawkins, Donovan, McCoy, Hall, and Moeder conducted a study in which an interdependent group contingency intervention was implemented in an A-B-C-B-C research design with the addition of self-monitoring procedures. The aim of the researchers was to utilize an intervention that already had an evidence base (group contingency intervention) to analyze the effectiveness of the intervention with self-monitoring in increasing engagement and decreasing disruptive behaviors. Baseline data consisted of the recording of preexisting levels of student engagement and disruptive behaviors while the teacher continued her typical classroom management techniques.

The interdependent group contingency was then introduced to the students in the B phase, during their daily Language Arts period. At the beginning of each day, the teacher would review the rules and procedures of the intervention. During this phase, the teacher would check the students' behavior and rule-following at four different times throughout the period. Students had the opportunity to each earn up to four points for the collective group by (a) sitting in their seat, (b) using respectful language leading up to the check, (c) paying attention, and (d) actively completing their classroom assignment. At the end of the class period, the teacher would choose

a random criterion between 75% and 95% from a paper bag and if the students collectively met that criterion, each student would receive a reward. The B phase was conducted for two weeks.

The third intervention phase, interdependent group contingency plus self-monitoring procedures (C phase), was introduced directly after the B phase and lasted for three weeks. During this phase, the intervention procedures remained the same, but students each received data collection worksheets where they recorded their own behavior by checking 'yes' or 'no' beside each expected behavior. Students had the opportunity to check their behavior each time the teacher stopped to record behaviors.

Researchers also included three additional phases as evidence of experimental control. After the C phase, all self-monitoring procedures were withdrawn and students were reintroduced to only the group contingency intervention for two weeks (second B phase) and then the self-monitoring procedures were reintroduced (second C phase). Additionally, one week after all intervention procedures were withdrawn, data was collected to record any lasting effects on the students' engagement and disruptive behaviors while the teacher was not receiving any intervention support. Treatment integrity was measured each day using a teacher procedural checklist and if at any point during the intervention the integrity fell below 100%, observers reviewed the procedures with the teacher; this occurred only two times throughout the study. A social validity survey was also completed by the lead teacher, co-teacher, and students following the intervention.

Results of this study suggest that the students' behavior positively increased with the introduction of the group contingency intervention, but the addition of the self-monitoring procedures did not increase the effectiveness of the interdependent group contingency. Teacher ratings on the social validity survey indicated that the teacher's perception of the intervention

was overall positive. Teacher ratings ranging from 2 (disagree) to 5 (strongly agree) yielded a mean of 4.43. Student social validity surveys yielded similar results, with ratings ranging from 1 (strongly disagree) to 5 (strongly agree) and yielding a mean rating of 4.33. Researchers indicate that the overall socially validity ratings were consistent with the results of the study.

Token Economies

In Simonsen et al.'s (2008) literature review on disruptive behavior interventions, group reinforcement contingencies were grouped with token economies because a majority of the studies that were analyzed utilized a combination of both. A token economy is an intervention in which students earn tokens (which can be points, chips, etc.) contingent upon desired behavior. The tokens can then be traded-in for a reinforcer (desired items, candy, activities, attention, etc.). Token economies are based on the reinforcement principles described by B. F. Skinner and can be considered a secondary reinforcement system (Soares, Harrison, Vannest, & McClelland, 2016).

Soares, Harrison, Vannest, and McClelland (2016) conducted a meta-analysis on single-case research studies of token economies. Researchers had strict inclusion and exclusion criteria for the review of an article in the meta-analysis. Database searches began with over 1,000 articles and researchers only included 28 in the analysis. With 90 students and 88 opportunities for demonstrations of experimental control (A-B phase designs), an overall effect size of 0.82 was calculated. Moderator analyses also suggested that token economies may be more effective for children ages six to 15 than for children three to five years of age.

Behavior Management Charts

Group contingencies and token economies are mostly utilized in individual classrooms; however, these interventions can also be a part of school-wide systems of measuring student

progress. Positive Behavioral Intervention Supports (PBIS) is a model of intervention that establishes a method for providing social, emotional, and behavioral services to children within schools (OSEP, 2009). A PBIS is designed to help students at all levels of problem behavior. Within this intervention model, all students in a school receive what is called Tier 1 services that are intended to be preventative in nature and benefit students school wide. Students who are noticed to be at-risk for behavior problems may receive Tier 2 interventions that include more personalized support. At the Tier 3 level, students received intensive support to help with severe behavior problems. Group contingency interventions may be preventative in nature because they decrease the occurrence of inappropriate behaviors by reinforcing positive behaviors more frequently. Therefore, group contingencies can be utilized as a generalized Tier I support in a PBIS to help prevent more severe inappropriate behaviors for all students, or as a classroom management intervention.

In order to successfully implement a PBIS system school-wide, each tier must include data collection, implementation of research-based interventions, and determination of the proper services of the child (Krach & McCreery, 2016). Behavior management charts are a method of both data collection and management and can also be utilized to help determine reinforcements for students (Krach et al., 2016).

Data collection and management is an important task in the process of PBIS, but can be very overwhelming for a teacher. Behavior management charts are a way to keep all of the information organized to increase the effectiveness of the intervention. Data can include numeric counts of the number of target behaviors that a student displays in a certain period of time or the duration of time that a student displays a target behavior (Krach et al., 2016).

In addition to data collection and management, behavior management charts can also be used as a part of an intervention. Interventions such as token economies, behavioral report cards, and check-in/check-out all include data collection and management necessary to analyze the effectiveness of the intervention (Krach et al., 2016). Without the use of proper data collection and management tools, teachers may see no significant change in behaviors when a change would have otherwise been noticed had the right methods been utilized (Krach et al., 2016).

Class Dojo

One common tool used for tracking behavioral management chart data is the application Class Dojo, which is a free online application/website for teachers. It can be accessed through an iPad/tablet, on a computer, or using a smartphone. According to the website (https://www.classdojo.com), the Class Dojo application is used in 90% of schools in the United States for grades kindergarten through 8 and have over 35 million users. The application was ranked among the top 100 sites and applications for 2012 in the journal *Technology and Learning* (Kapuler, 2013).

Class Dojo enables teachers to create profiles for each student in their classroom and give them points if they meet teacher-established criteria. Teachers can customize a list of target behaviors for the entire class, or for each student, and keep track of individual point (Dojo points) totals and total points for the classroom as a whole. Class Dojo also offers timers, randomizers, and other unique tools that are useful for its application in this intervention. The application allows for students to pick their own avatars that will represent them, and parents are able to log in to track their child's progress. See Appendix A for screenshots of the Class Dojo website for better visualization of the layout.

Although Class Dojo is becoming increasingly popular across the United States, there is extremely little empirical evidence to support the use of this application in the classroom. Cetin and Cetin (2018) surveyed middle school students and found that overall, using Class Dojo led students to try to display more positive behaviors and that they generally had positive opinions about the application. Researchers also concluded that students in lower grades (5th, 6th, and 7th grade students had more positive opinions about the application than 8th grade students).

Previously, Krach, McCreery, and Rimel (2016) conducted a research study designed to add to the empirical support for Class Dojo as a behavioral management chart. The researchers examined types of behavioral charts utilized by ten teachers in a Title I elementary school. Analysis indicated that teachers either used no data chart, their own, or Class Dojo. Results indicated that among the other behavioral management chart systems, Class Dojo provided significantly more data and the most reliable data than any other system included in the study. Moreover, the use of Class Dojo was suggested to be superior to other behavioral management charts used by the teachers.

Although Krach et al. (2016) analyzed the use of Class Dojo as a behavioral management chart, this application is also ideal for the implementation of an interdependent group contingency with multiple randomized components and a token economy element. Dadakhodjaeva (2017) conducted a dissertation study for the fulfillment of the requirements for the degree of Doctor of Philosophy where Class Dojo was used as the vehicle of implementation for a widely known and evidence-based intervention called the Good Behavior Game. This study concluded that the Good Behavior Game with the use of Class Dojo effectively decreased disruptive behavior in the classroom as well as increased academic engagement.

In regards to an interdependent group contingency, Class Dojo would be beneficial for the intervention because the Dojo point system is already built in, there is a method of randomization for target students and target behaviors, and it is already being used in many schools across the United States. Class Dojo, due to technological advances, may be easier for teachers to implement and is hypothesized to make students more engaged in the intervention. Thus, the purpose of this paper will be to evaluate the effectiveness of using the Class Dojo application as the main implementation tool for an interdependent group contingency intervention, while modeling the design of Denune et al.'s (2015) study.

Summary

Classroom management, although considered one of the essentials of the optimal learning experience, is often a challenge for teachers. Certain classroom management strategies, such as group contingency interventions and token economies, are evidence-based strategies to aid teachers in gaining successful management of the classroom. The core foundation in each of these strategies lies in the concept of reinforcement. Skinner's concepts of operant conditioning and reinforcement yielded a solid foundation for why these interventions are successful at increasing appropriate behavior and decreasing disruptive behavior in classroom settings.

More specifically, interdependent group contingencies, as discussed by Kelshaw-Levering et al. (2000), Popkin and Skinner (2003), and Denune et al. (2015) resulted in significant decreases in disruptive behavior by motivating students to work collectively to receive reinforcement. The utilization of Class Dojo, a popular classroom management website, as a mechanism to implement an interdependent group contingency intervention with randomized components may increase both the effectiveness of the intervention and the social validity of the intervention when compared to a manual implementation of the intervention. The

current study seeks to provide evidence to support these hypotheses and to begin to establish an evidence-base regarding the effectiveness of Class Dojo in the classroom.

Method

Participants

Participants were selected from a public-school district outside of Pittsburgh, Pennsylvania. After obtaining necessary Institutional Review Board (IRB) permission, teachers and administrators were informally surveyed to identify a classroom that would benefit from this type of classroom management intervention.

Participants in the current study included students in an elementary school self-contained special education classroom and a special education teacher. Students in the classroom consisted of four male and one female students from fourth and fifth grade. The classroom teacher was a female in her second year of teaching special education students at a public-school district outside Pittsburgh, Pennsylvania. This classroom was selected due to significantly high levels of disruptive behavior reported by the classroom teacher, school principal, and the school psychologist. All students qualified for special education under either the categories of Specific Learning Disability or Emotional Disturbance and had Individualized Education Plans (IEP). Disruptive behaviors reported by the teacher included the following: being off task during instruction/independent work, not managing words appropriately to teachers and/or peers, non-compliance with work/work refusal, and arguing with teachers and/or peers.

Measures

Behavioral Observation Form

Student disruptive behaviors in the classroom were measured directly using a behavioral observation form constructed by the lead researcher. The observation form included an

operationalized definition of disruptive behavior, as well as a table to collect the data in an organized manner. A copy of the behavior observation form can be found in Appendix B.

Treatment Integrity Checklist

Treatment integrity was measured during 25% of the intervention periods. The treatment integrity checklist was designed by the lead researcher. Examples of items on the checklist included "the teacher reminded the students of the class rules at the beginning of the class period," "the teacher tallied the total number of points the students earned at the end of the class period," and "the reward was given immediately." An independent observer checked off each item on the list as the teacher performed it. Checklists were tailored specifically to each intervention phase (group contingency intervention and group contingency using Class Dojo). A copy of the treatment integrity checklist can be found in Appendix C.

Social Validity Survey

Social validity of the study was measured using a social validity survey constructed by the lead researcher. The survey included questionnaire items with Likert-scale options indicating the teacher's and students' level of agreement or disagreement with the question statements. A copy of the social validity survey can be found in Appendix D. Social validity was also informally analyzed through a series of open-ended questions that the classroom teacher completed as well as frequent discussions between the lead researcher and the teacher. These questions can also be found in Appendix D.

Research Design

The current study used an A-B-C-B changing conditions design to measure the effects of an interdependent group contingency intervention and the interdependent group contingency with the addition of Class Dojo components on the level of class-wide student disruptive

behaviors during one period of the school day. Each phase of the study is described in detail below.

Independent Variables

The independent variables in the current study were interdependent group contingencies using randomized components with and without the tablet application Class Dojo. Each independent variable was implemented separately in phases B and C of the study.

Dependent Variable

The primary dependent variable in the current study consisted of student disruptive behavior. The operational definition of disruptive behaviors included not managing words, being off-task, non-compliance, and arguing. *Not managing words* was operationally defined as calling out, saying inappropriate things to each other or to the teacher, or saying things that disrupt the classroom. *Off-task* was operationally defined as not following directions, not completing work, or falling behind on the lesson. *Non-compliance* was operationally defined as work refusal, not following directives within 3 verbal prompts, or engaging in distracting behaviors to avoid work. *Arguing* was operationally defined as negative interactions and/or communications with teachers and/or other peers. These four behaviors were chosen because they aligned with the students' classroom rules. Although each of these types of disruptive behavior was coded separately of the behavior observation form, they were all considered together as one dependent variable, *disruptive behavior*.

Baseline and intervention data were collected on disruptive behavior using a classroom observation form. This form was constructed by the researcher to increase the reliability of the observations and was utilized in the classroom to record the frequency of disruptive behavior. The operationalized definition of each subcategory of disruptive behavior was indicated on the

observation form to remind observers of the behaviors they were recording. Observers consisted of the lead researcher and three other observers who were trained school psychologists and school faculty. The additional observers were trained by the lead researcher on the observation protocol and data collection and observed the lead researcher before engaging in their own observations.

Observation sessions lasted for 15 minutes during the same portion of the intervention period every day. The 15 minutes sessions were broken into 15-second intervals and partial interval recording was used. Partial interval recording involves recording any interval in which the dependent variable occurred at any point during the interval as an occurrence of the behavior. During each observation period, an observer sat in the rear of the classroom and observed students one-by-one, systematically, going in order around the classroom. Once all students had been observed for one interval each, the observer would start at the beginning of the room and cycle through the students again. During each interval, the observer recorded whether the observed student displayed any disruptive behavior during any portion of the interval. If any subcategory of the operational definition of disruptive behavior had occurred during a 15-second interval for a student, the interval was marked as an occurrence.

Procedures

All data collection was conducted during the same mathematics period of the school day from 3:00-3:45 in the afternoon.

Baseline Phase (A)

The baseline phase spanned the course of five weeks and data were attempted to be collected every day. Data was collected during a 15-minute observation session per day of the students' mathematics class, using a partial interval recording procedure identical to the

procedure just described. The baseline data were collected during regular classroom instruction with no intervention implementation and the teacher was instructed to continue using her every-day classroom management techniques, which included the use of a points system and the use of a token economy system where students could trade in cards they earned for good behavior for individual rewards/objects.

Traditional Interdependent Group Contingency (B)

This intervention phase began with a teacher consultation in which the lead researcher explained the group contingency intervention and Class Dojo and trained the teacher in how to effectively implement each intervention component. The next step in the intervention phase included a 15-minute session in which the teacher explained to the students what the intervention was and how it would be implemented in concordance with their regular classroom rules.

During the initial intervention period, the teacher read from a script written by the researcher that explained to students that they would have four opportunities to earn points throughout the class period if they were following the class rules (the script can be found in Appendix E). Classroom rules were also displayed on a poster board at the front of the room for all students to see. The amount of time between each opportunity would be random but would range from 8-12 minutes per interval (totaling four opportunities during the 40-minute class period). Students were told they could individually earn one point for each classroom rule (e.g., manage your words, stay on-task, complete your work, be nice to teachers and peers) that they were following.

The classroom teacher explained that at the end of the class period, she would choose a slip of paper from a jar that included random criterion percentages and if the students collectively met that percentage of points for the day, each student would earn a reward.

Percentages were calculated by adding up the total number of points students earned during the period and dividing it by the total number of possible points (depending on the number of students present in class that day). If they met the chosen percentage criterion, a second slip of paper would be chosen at random from a jar containing classroom rewards (e.g., time outside, snack reward, bring a friend to the gym, etc.).

After explaining the entire intervention procedure to the students, the interdependent group contingency intervention began. At the beginning of each intervention period (one full class period), the teacher reminded the class of the classroom rules and set a timer for a randomly selected period of time. Interval times were randomized by the researcher utilizing an online number randomizer from eight to twelve minutes in order for students to not be able to anticipate when the rule checks would occur. Every time the timer went off, the teacher conducted checks to see if each student was following each classroom rule. The teacher recorded each child's points on a teacher data collection sheet (Appendix F). Students were not explicitly told if they did or did not earn a point at each time interval; instead, students were told at the end of the class whether they collectively met the criterion. Within an interdependent group contingency, the purpose of the intervention is for students to work together as a group to earn points instead of being individually reinforced at each time increment. Students had the opportunity to check their own point progress through their own Class Dojo account, but the teacher did not inform the students verbally.

At the end of the class period, after the fourth check, the teacher tallied the total number of points the students earned throughout the class period and the total possible number of points and divided the points earned by the points possible to get a percentage. The teacher then randomly chose a criterion from the criteria jar and announced to the class whether they met their

criterion for the period. If the class earned the reward, the teacher chose a random reward from the jar and immediately gave it to the class. If the reward was not earned, the teacher would remind the students that they would have another chance to earn a reward during the next intervention period.

Interdependent Group Contingency using Class Dojo (C)

After six intervention periods using the interdependent group contingency, the Class Dojo component was introduced. Intervention procedures were exactly the same as during the interdependent group contingency phase, except Class Dojo was utilized as a vehicle for the intervention implementation. At the beginning of the first class period during the Class Dojo phase, each student was allowed to create his or her own "monster," a cartoon character that would represent him or her on the Class Dojo website. The teacher continued to go over classroom rules at the beginning of each period and would set the timer on Class Dojo for the designated time interval (eight to twelve minutes, determined by a random number generator) to alert her that it was time for a check. Students' points were recorded on Class Dojo under their name. Criterion and rewards were still chosen at random by choosing a slip of paper out of the corresponding jar.

Withdrawal of Class Dojo Component (B)

After six class periods of the implementation of Class Dojo as a vehicle for the interdependent group contingency, the teacher withdrew the use of Class Dojo and continued implementing the intervention using the paper data collection methods until the end of the school year was near and no other intervention sessions were able to be implemented.

Treatment Integrity

Throughout the intervention, observers directly recorded treatment integrity on a procedural checklist designed by the lead researcher during each intervention phase. During the intervention, if the treatment integrity fell below 100%, the lead researcher planned to review the intervention procedures with the teacher and clarified questions and concerns. Treatment Integrity never fell below 100%; therefore, a review was not needed.

Interobserver Agreement (IOA)

Interobserver agreement (IOA) was calculated for 25% of all observation sessions and was calculated for each individual intervention phase. Interval by interval agreement was calculated across all variables using the following formula: Agreement = agreement/(agreement + disagreement) ×100%. The IOA percentages ranged from 78-100 with an average IOA of 89%.

Data Analysis

The data collected during the intervention was graphed and visually analyzed for level, trend, and variability across phases and within phases. The effect size, or magnitude of a treatment effect, can be reported in many ways (Cohen, 1988). According to Cohen, one of those ways is to report the percent of nonoverlap of the treated group's scores with the non-treated group's scores (in this case, the baseline). The percentages of non-overlapping data (*PND*) can be found among the descriptive statistics in Table 1. Additionally, social validity data was reported to determine whether the teacher found the interventions both with and without the Class Dojo app acceptable.

Research Question 1

Will a traditional interdependent group contingency intervention significantly decrease problem behavior in the classroom? In order to effectively answer this research question, the data

was graphed and visually analyzed. A percentage of non-overlapping data was calculated to determine the effectiveness of the intervention on the levels of dependent variable.

Research Question 2

Will an interdependent group contingency using Class Dojo with randomized components intervention decrease problem behaviors in the classroom? In order to effectively answer this research question, the data collected was graphed and visually analyzed. A percentage of non-overlapping data was calculated to determine the effectiveness of the intervention on the levels of dependent variable.

Research Question 3

Do teachers find the interdependent group contingency with Class Dojo to be an acceptable intervention? Mean and mode ratings were calculated from the teacher social validity survey and qualitatively analyzed. Answers from the teacher open-ended questions survey were also reported and discussed in the discussion section.

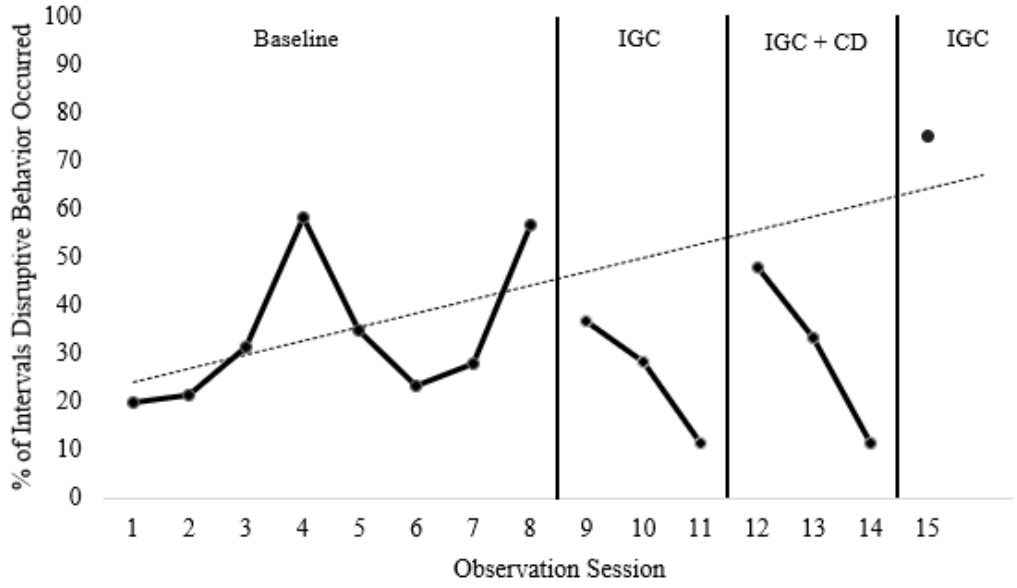
Results

Disruptive Behavior

The study lasted approximately eight weeks and data was attempted to be collected every day. Due to circumstances such as classroom environment (described in detail within the discussion), student trips, scheduled days off, etc., data was collected on a total of 15 days. A graphic representation of the percentage of intervals with disruptive behavior across phases can be found in Figure 1. During baseline data collection, data was highly variable with no discernable trend, but overall, students demonstrated undesirable levels of intervals with disruptive behavior (M=34.3%). Descriptive statistics summarizing the data can be found in Table 1.

Figure 1

Percentage of Intervals with Disruptive Behavior Across Observation Session



Note. The trendline shown in the graph is the baseline trendline added for comparison of the possible trend in disruptive behavior had the interventions not been implemented.

Table 1

Disruptive Behavior Summary Statistics

Phase	Number of Sessions	Mean % Intervals with Disruptive Behavior	*PND* Compared to Baseline
Baseline	8	34.3	N/A
IGC	3	25.5	12.5
IGC + CD	3	30.97	33.3
IGC	1	75	100

With the implementation of the IGC, there was an immediate decrease in intervals with disruptive behavior with a slight decrease in average percentage overall from baseline (*M*=25.5%). During this intervention phase, only 12.5% of data did not overlap with data from the baseline phase. Throughout the IGC phase, there was a consistent and decreasing trend in intervals with disruptive behavior.

After implementation of the IGC + CD, the average percentage of disruptive behavior increased to 30.96%, but was still lower than the baseline average (34.3%). The percentage of non-overlapping data during the IGC + CD phase was 33.3 when compared to baseline data. During the IGC + CD phase, there was a dramatic, decreasing trend in intervals with disruptive behavior. However, during the return to IGC phase (single session), there was an immediate increase in intervals with disruptive behavior (75%).

Social Validity

The classroom teacher completed a social validity survey at the conclusion of the study as well as a series of open-ended questions. Overall, the teacher found the use of Class Dojo highly acceptable with a mean Likert-scale score of 4.8 (agree) and a mode score of 5. Scores ranged from 4 (somewhat agree) to 5 (strongly agree), which indicates that the teacher found the intervention a positive experience.

Discussion

This study explored the effects of interdependent group contingency and use of Class Dojo on classroom disruptive behavior. It was hypothesized that the interdependent group contingency intervention would significantly decrease student disruptive behaviors both with and without the use of Class Dojo as well as that the classroom teacher would prefer using Class Dojo over the use of a traditional paper and pencil data collection. Results were inconsistent with the hypotheses for a variety of confounding reasons. However, both intervention phases did result in a consistently decreasing trend in data points. The classroom teacher identified the use of Class Dojo as a preferred vehicle for implementing an IGC intervention and discussed her satisfaction with the classroom management system.

A baseline phase has two main purposes. The first purpose is to allow the researcher to gain an understanding of current performance levels on the variable being measured so that intervention data can be compared to it. The second purpose for a baseline phase is to give the researcher a better understanding of the environment, the dependent variable, and important information about how the two interact (Richards, Taylor, & Ramasamy, 2014). The baseline phase of the current study provided crucial information about the environment (special education classroom containing EBD students), the level of the dependent variable (how variable the behaviors were), and how the two interacted.

At the onset of the study, the researcher had a difficult time obtaining returned parent permission forms. This process took 6-8 weeks to complete before the researcher and classroom teacher were able to begin the study. Parent permission was not able to be obtained for one out of 6 students in the classroom after numerous attempts of various methods of contact with the parent to explain the study and try to obtain permission. It was decided to begin the study with the exclusion of this student in order to be able to have enough weeks left in the school year to complete the study. During the first two observation sessions, student data was not able to be kept track of individually, which would not have allowed for individual student data graphs to be visually analyzed. It was then decided that data would be aggregated together into one graph for analysis.

The baseline data phase spanned the course of five weeks. Data were to be collected every day over the course of only two weeks, however many incidents occurred where data was unable to be collected and/or the intervention was unable to be implemented. Consistent with previous research on the classroom environment of special education classrooms and classes containing students with emotional/behavioral disorders, the classroom environment would

frequently become volatile and aggressive (Popkin & Skinner, 2003). On several occasions, students were dispersed to their regular education rooms or a crisis would occur, and the teacher would have to stop the implementation of the intervention in order to attend to the student in crisis.

At what was thought to be the end of the baseline data collection phase, the class was unexpectedly split in two with an additional special education teacher due to severe aggression that manifested between students. This decision was made by school district personnel to try and decrease instances of aggression and violence between peers by keeping them separated. The lead researcher, dissertation chair, and committee members agreed that the study could still be conducted in the different classrooms at the same time and that data could be aggregated. It was agreed that an additional two baseline data points would be gathered to document behavior while the students were separated. However, after the additional baseline data were collected, the students went back to all being in one room, so there was no longer a need for individual classrooms.

In addition to days where data could not be collected, for the purpose of consistency, observation data from days where not all 5 students were present in the classroom were removed from the final data points in the results of the study. It was determined that the dynamic between the students that were in the classroom at the time would skew the data for that observation period. For example, the class consisted of two specific students who did not get along with one another and they would frequently be disruptive to each other and to the entire classroom; if one or both of the students were not in the classroom at the time of the observation, the percentage of intervals where disruptive behavior occurred would significantly decrease. These data points were not considered an accurate representation of the typical classroom environment.

A review of the previous literature on the use of interdependent group contingencies reveals extensive evidence to support their use as an effective classroom management intervention (Simonsen et al., 2008; Stage & Quiroz, 1997). It was hypothesized in the current study that the levels of disruptive behavior would significantly decrease upon the implementation of the IGC intervention due to its extensive research base. However, many variables arose throughout data collection that may have had a confounding effect on the results of the study.

The first IGC phase lasted a total of two weeks and data was again attempted to be collected every day during those two weeks. Similar to the baseline circumstances, the classroom environment during this phase was chaotic and students were frequently sent back to their regular education classrooms and the intervention was not able to be implemented consistently during those two weeks. These circumstances may have led to the data being inconsistent with the data trends from previous interdependent group contingency studies.

Data graphs from both the Denune et al. (2015) and Kelshaw-Levering (2000) studies yielded a more dramatic, immediate decrease in disruptive behavior upon the implementation of the IGC as well as significantly higher percentages of non-overlapping data compared to baseline. Throughout both studies, the interventions were implemented consistently over the intervention period; whereas in the current study, the intervention was not consistently implemented and sometimes students would participate in one or more math periods where no intervention was used. The inconsistency of the implementation may have had a significant impact on the results of the study. It is believed that had the intervention been implemented consistently, the results may have been more consistent with those of previous studies.

Despite the troubling circumstances that arose during the first IGC phase, the trend in data points still yielded both an immediate decrease in disruptive behavior as well as steadily

declining levels of disruptive behavior across the phase. When compared to the increasing trend in the baseline data shown by the trendline in Figure 1, these results support the hypothesis that the IGC intervention may significantly decrease overall disruptive behaviors. It should also be taken into consideration that had the intervention been implemented more consistently, data may have reflected an even more significant decrease in the dependent variable.

It was hypothesized that the implementation of the IGC using Class Dojo as the vehicle for data collection would also significantly decrease the levels of disruptive behavior in the classroom. Previous research on the use of Class Dojo as a data collection tool yielded positive results in decreasing undesirable behaviors (Dadakhodjaeva, 2017). Similar to the results of that study, Class Dojo was a successful vehicle of implementation for the intervention. Visual analysis of the current data yields an almost identically rapid and steady decrease in disruptive behaviors to the traditional IGC phase. Also similar to the IGC phase, IGC + CD phase data points significantly overlapped with the baseline data points, although with slightly fewer overlapping points than the IGC alone condition.

Although significant overlap in data points may confound the results, it should also be taken into consideration that the *PND* statistics were calculated using the mean percentage of disruptive behavior during the baseline phase. The data points in this phase varied significantly. However, when a trendline was added visually to the graph, an increasing trend appeared. On the other hand, during both intervention phases, there was a very steep and steadily decreasing trend in the dependent variable. This occurrence suggests that both interventions were effective in decreasing levels of disruptive behavior in the classroom, even though *PND* results may not support this observation.

Towards the end of the school year, the classroom teacher attempted to keep the researcher informed on schedule changes; however, teacher-researcher miscommunication occurred on many days, which in combination with classroom crises, led to the inability to collect data on a total of eleven days. Therefore, only one data point was able to be collected for the second B Phase.

During this final phase (return to IGC), there was a steep, immediate increase in disruptive behavior, which is inconsistent with the previous literature discussed earlier. The single data point for the second IGC phase was collected a few days before the end of the school year and, as discussed earlier, the classroom environment was increasingly tense and challenging. Students may also have had difficulty focusing on their schoolwork due to nearing the end of the school year. During this time of the year, there are many field trips and celebrations as well as a decrease in the intensity of classroom instruction. These circumstances may explain why the final data point falls above the baseline trendline. It should be noted, though, that on this last day of intervention implementation, there *was* classroom instruction and the students had the same expectations on their performance that they had during the previous intervention periods. These circumstances could be a possible explanation for the significant increase in disruptive behavior during the final IGC phase, as it was only two days following the end of the IGC + CD phase.

Results from the teacher social validity survey provide evidence for use of Class Dojo as a vehicle of implementing an interdependent group contingency intervention in a special education classroom with high levels of disruptive behavior. The classroom teacher completed a social validity survey at the conclusion of the study. Overall, the teacher found the use of Class Dojo highly acceptable with a mean Likert-scale score of 4.8 (agree). In the Denune et al. (2015)

study, it was noted that the teacher social validity Likert-scale item scores ranged from 2 to 5; whereas in the current study, teacher scores ranged from 4 (somewhat agree) to 5 (strongly agree), which indicates that the teacher found the intervention a positive experience.

As discussed earlier, the end of the study coincided with the end of the school year. At the time of the conclusion of the study, the lead researcher was not able to collect student social validity surveys as originally planned. Therefore, no student data was collected regarding the use of Class Dojo or the interventions. The availability of this data may have added to the hypothesis that the IGC using Class Dojo would be a positive experience for students and teachers.

In addition to the formal assessment of social validity, the informal information gathered from the teacher was also highly positive. The classroom teacher described using Class Dojo as "a quick way to record behavior data, which is important when working with a variety of students and behaviors." Class Dojo was also recognized as an acceptable vehicle for IGC implementation due to the application holding students accountable as a group instead of individuals and students enjoyed being able to keep track of their own points from their own devices.

The teacher found the use of Class Dojo efficient in her classroom because she was easily able to keep track of the points on the application on her iPad in the middle of class without disruption to her instruction or the students. With the use of the traditional intervention, there was a lot more paperwork involved, and it was more difficult to utilize in the middle of class. The teacher stated that "Class Dojo was one of the easiest apps to use for behavior management/data collection…it engages the students and provides reports for teachers instantly."

Implications for Practice

The current study yielded many positive implications for practice and for the use of both interdependent group contingencies and the use of Class Dojo in the classroom. Results also gave us insight into the dynamics of a classroom with students with EBD and ways to structure interventions for them. First, during the implementation of both intervention phases, there was a steady decrease in disruptive behavior. These results produce positive evidence for the use of IGC in the classroom as well as the use of Class Dojo as a vehicle of implementation for IGC. As discussed earlier, IGCs have a very strong evidence base supporting their implementation as an effective classroom management strategy. When the use of Class Dojo as a vehicle of implementation was introduced to the intervention, data yielded an almost identical decreasing trend in disruptive behavior. These results suggest evidence for the addition of Class Dojo to an IGC intervention.

Second, these results also suggest that students may perform better when there is a single structured and consistent intervention in place in the classroom. Within both intervention phases, there was a significantly steady decrease in the trend of disruptive behavior; whereas, data during the baseline phase was extremely variable with an overall increasing trend. The baseline phase consisted of no consistent structured intervention for the students (although the teacher did have some contingencies and token economy systems in place, they were not implemented consistently). Interestingly, during the first period of each new phase, there was an immediate spike in the level of disruptive behavior. These observations suggest that students may prefer the structure of one intervention, rather than the change in routine that a new intervention may bring. Teachers should take these findings into consideration when deciding upon their classroom management strategies – students may respond more positively to a single structured

environment where they know exactly what to expect versus an environment where there is no set structure or one where the structure changes frequently.

Limitations

Significant limitations of the study arose during the intervention phases. Throughout the study, many deviations from the original plan of methodology occurred and were documented. These deviations ultimately ended with the inability to finish all phases originally planned for the intervention, and the failure to collect student acceptability rating forms.

Throughout phases B and C, there were many days where a behavior crisis occurred, and students were dispersed among their general education classrooms during the designated period in order to keep all students safe. The teacher and classroom staff members were occupied with the crises during those times. On these days, the intervention was not implemented and, therefore, data was not collected. Furthermore, a significant increase in extreme aggression between peers was noted during the remainder of the school year, which led to an inability to complete all intervention phases before the school year ended, as students were no longer in class together.

The classroom teacher described the circumstances in her classroom as "an atypical year…the quantity and severity of behavior problems was highly elevated due to the number of students with behavior problems [EBD] and the group dynamic when they were together." The above described dynamics, however, are not unusual for self-contained special education classrooms with students with EBD. As discussed by Popkin and Skinner (2003), such students often have difficulty regulating their emotions, which leads to a significant increase in disruptive behaviors and aggression between peers and with teachers. These circumstances are a possible explanation for the significant amount of variability within the data, particularly during the

baseline phase, which was the longest phase. These varying data points show the consistent inconsistencies within a special education classroom with EBD students.

A second limitation, touched upon earlier, was the inability to obtain baseline data that was not variable in nature. This occurrence did not allow for significant data to be reported. Intervention data was compared to the baseline data, yet as Richards, Taylor, and Ramasamy (2014) state, it is important for the baseline data to provide a foundation to which the intervention data can be compared. The variability of the baseline data made comparisons with the subsequent intervention phase data difficult.

A third limitation involved the failure to obtain student acceptability ratings. In previous research, student data was collected on the social validity of the interventions that were put into place (Denune et al., 2015; Kelshaw-Levering et al., 2000). Being that these interventions are designed to aid students in maximizing their ability to learn in the classroom, it would have been helpful to gain their assessments of the intervention, both with and without the use of Class Dojo. It would also have been beneficial to the researcher to gain insight, after the implementation of the intervention, regarding whether the students would have preferred sticking to the original intervention conditions rather than moving to the new condition. As discussed earlier, it is hypothesized that student disruptive behavior may have spiked between intervention phases due to the frequent inconsistencies common to classrooms containing students with EBD.

Future Research

Due to the significant disruption to the methods of the study, these results may not be an accurate representation of the effectiveness of an interdependent group contingency and using Class Dojo as a vehicle of implementation. There is extensive literature on the effectiveness of interdependent group contingencies (Denune et al., 2015; Kelshaw-Levering et al., 2000; Popkin

& Skinner, 2003) as well as growing evidence of both the effectiveness and acceptability of using Class Dojo (Dadakhodjaeva, 2017; Krach et al., 2016).

Therefore, future studies may aim to recreate the proposed methods of this study while taking into consideration the limitations the researcher encountered. First, studies should begin earlier in the school year to allow for the possibility of needing more time than proposed to complete the study. Classroom environment is another variable that should be carefully looked at prior to the beginning of the study; any classrooms with known severe behaviors or frequent crises would not be a prime candidate for an intervention study like this due to their increased unpredictability which leads to inconsistency in the implementation of the interventions. A classroom where students remain in that classroom would also be ideal, which would allow for the interventions to be consistently implemented every day (students would not have the opportunity to be back within their regular education classrooms), and also individual data should be collected for each student to allow for individual data graphs and analysis. Future studies should also be sure to allot time for collecting student social validity data to gain more insight into what the students think of these interventions and the use of Class Dojo.

Further research should not only aim to replicate this study while trying to control for some of the limitations, but also add to the emerging evidence base for the use of Class Dojo due to its popularity in classrooms across the nation. Results of this study were able to provide positive information for teachers and fellow researchers on the effectiveness of interdependent group contingency interventions and especially those in a special education classroom, but there is still a need for more significant findings. During the current study, many aspects of Class Dojo were not investigated due to the structured limitations of the interdependent group contingency. Class Dojo features such as randomization of students, individualization of student behaviors to

track, the use of both the positive and negative points systems, as well as the parent features of Class Dojo could be useful for teachers in a special education setting to help manage their classroom environments.

Summary

Classroom management, although considered one of the essentials of the optimal learning experience, is often a challenge for teachers. Certain classroom management strategies, including group contingency interventions, are evidence-based strategies that aid teachers in gaining successful management of the classroom. The current study is the first to propose Class Dojo, a popular classroom management web-based tool, for use as a mechanism for implementing an interdependent group contingency intervention for improving student behavior within EBD classrooms. Further research is needed to provide more robust evidence of the effectiveness of Class Dojo for use as a vehicle for implementation of group contingency interventions.

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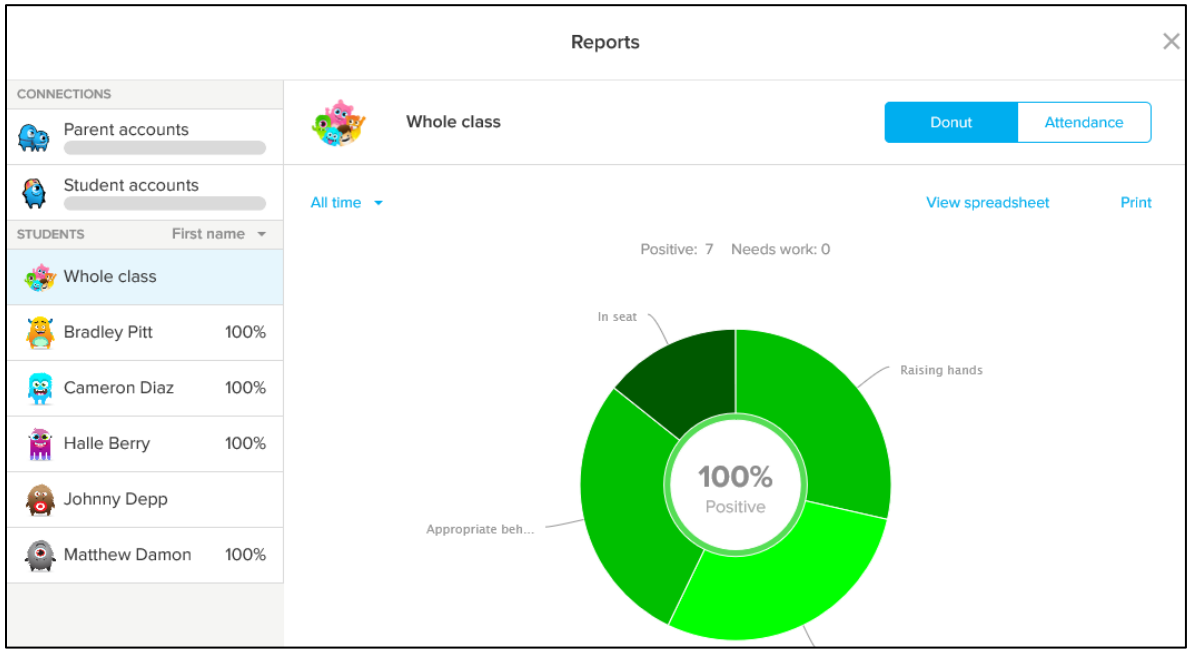
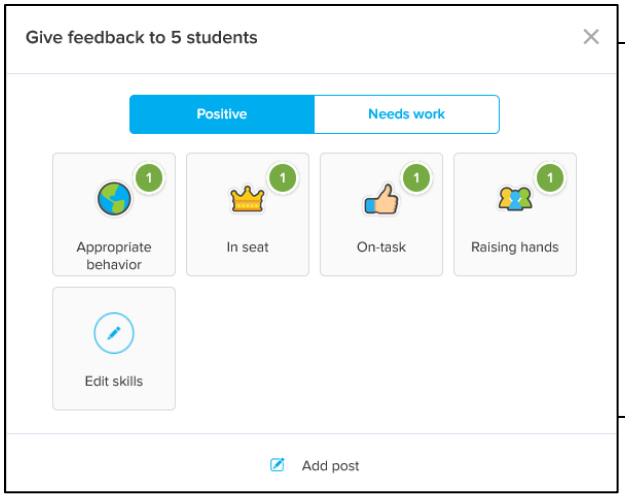
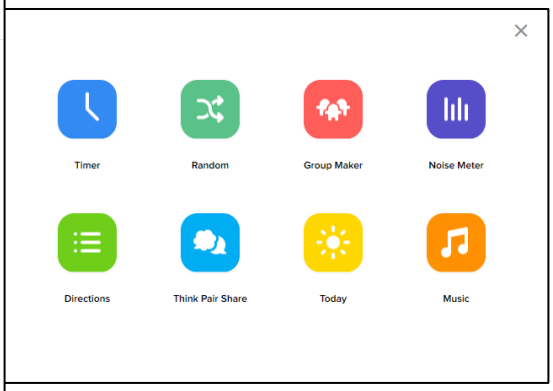
Appendix A

Screenshots of a Class Dojo Classroom from a Teacher's Perspective







Appendix B

Behavior Observation Form

Observer Name _____ Date _____

Observation Time Start _____ AM PM Observation Time End _____ AM PM

Operationalized Definition for Disruptive Behavior:
Managing Words – calling out, saying inappropriate things to each other or to teacher, making noises, disruptive to the class
Off-task – not following directions, not completing work, falling behind in the lesson
Non-compliance – work refusal, not following directives within 3 verbal prompts, distracting behaviors to avoid work
Arguing – negative interactions/communications with teachers and peers

Time Ending	Behavior?	Time Ending	Behavior?	Time Ending	Behavior?	Time Ending	Behavior?
0:15		4:00		7:45		11:30	
0:30		4:15		8:00		11:45	
0:45		4:30		8:15		12:00	
1:00		4:45		8:30		12:15	
1:15		5:00		8:45		12:30	
1:30		5:15		9:00		12:45	
1:45		5:30		9:15		13:00	
2:00		5:45		9:30		13:15	
2:15		6:00		9:45		13:30	
2:30		6:15		10:00		13:45	
2:45		6:30		10:15		14:00	
3:00		6:45		10:30		14:15	
3:15		7:00		10:45		14:30	
3:30		7:15		11:00		14:45	
3:45		7:30		11:15		15:00	

Comments (any information regarding the setting or events during the observation period that may be helpful in explaining observation results):

Appendix C

Treatment Integrity Checklist

Interdependent Group Contingency Phase (B)

Observer Name_____ **Date**_____

During the observation of the intervention period, pay particular attention to the following intervention methods. If the teacher completes a step, mark "Y" for yes; if the teacher does not complete a step, mark "N" for no.

1. The teacher reminded the students of the class rules at the beginning of the class period.	Y	N	N/A
2. The teacher set a timer to go off in 10-minute increments.	Y	N	N/A
3. At each 10-minute increment, the teacher stopped what she was doing to check student behavior.	Y	N	N/A
4. The teacher marked student behavior on the given data sheet.	Y	N	N/A
5. The teacher tallied the total number of points the students earned at the end of the class period.	Y	N	N/A
6. The teacher chose a random criterion from the jar.	Y	N	N/A
7. The teacher explained to the students the amount of points they earned, the criterion they needed to meet and whether or not they met the criterion for a reward.	Y	N	N/A
8. The teacher chose a random reward from the reward jar.	Y	N	N/A
9. The reward was given immediately.	Y	N	N/A
10. The teacher reminded students that they would have an additional opportunity to earn a reward during the next intervention period.	Y	N	N/A

Treatment Integrity Checklist

Interdependent Group Contingency + Class Dojo Phase (C)

Observer Name_____ **Date**_____

During the observation of the intervention period, pay particular attention to the following intervention methods. If the teacher completes a step, mark "Y" for yes; if the teacher does not complete a step, mark "N" for no.

1. The teacher reminded the students of the class rules at the beginning of the class period.	Y	N	N/A
2. The teacher set the Class Dojo timer to go off in 10-minute increments.	Y	N	N/A
3. At each 10-minute increment, the teacher stopped what she was doing to check student behavior.	Y	N	N/A
4. The teacher gave points to each student on the Class Dojo website based on their behavior.	Y	N	N/A
5. The teacher checked the total number of class points on Class Dojo at the end of the intervention period.	Y	N	N/A
6. The teacher chose a random criterion from the jar.	Y	N	N/A
7. The teacher explained to the students the amount of points they earned, the criterion they needed to meet and whether or not they met the criterion for a reward.	Y	N	N/A
8. The teacher chose a random reward from the reward jar.	Y	N	N/A
9. The reward was given immediately.	Y	N	N/A
10. The teacher reminded students that they would have an additional opportunity to earn a reward during the next intervention period.	Y	N	N/A

Appendix D

Teacher Social Validity Survey

Interdependent Group Contingency + Class Dojo

The purpose of this questionnaire is to obtain information that will aid in the evidence-base regarding the use of Class Dojo in the classroom.

Please circle the number that best describes your agreement or disagreement with each statement using the scale below.

1= Strongly Disagree	2 = Somewhat Disagree	3 = Neutral	4 = Somewhat Agree	5 = Strongly Agree

1. This would be an acceptable intervention for the problem behaviors in my class.	1	2	3	4	5
2. Most teachers would find this intervention appropriate for behavior problems.	1	2	3	4	5
3. This intervention proved effective in changing the overall problem behavior in my class.	1	2	3	4	5
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5
5. The problem behavior in my class is severe enough to warrant use of this intervention.	1	2	3	4	5
6. I would be willing to use this intervention in the classroom setting in the future.	1	2	3	4	5
7. This intervention would not result in negative side effects for children in my class.	1	2	3	4	5
8. This intervention would be appropriate for a variety of children and classrooms.	1	2	3	4	5
9. This intervention is consistent with those I have used in classroom settings.	1	2	3	4	5
10. The intervention did not interfere with the structure/flow of my class.	1	2	3	4	5
11. Class Dojo was easy to use.	1	2	3	4	5
12. I liked the procedures used in this intervention.	1	2	3	4	5
13. My students enjoyed using Class Dojo for this intervention.	1	2	3	4	5
14. Overall, this intervention was beneficial for my classroom.	1	2	3	4	5

Open Ended Interview Questions

1. How long have you been a special education teacher?

2. During this specific intervention period, there were a lot of challenges in your classroom (student behavior, classroom dynamics, staffing, etc). Is this typical or atypical compared to your previous experience with teaching in a special education classroom? Please explain.

3. Do you believe that Class Dojo is an acceptable monitoring system for classroom behaviors and/or goals? Why or why not?

4. Was Class Dojo a successful vehicle for implementing a group contingency? Why or why not?

5. Did you find Class Dojo easy to use? Why or why not?

6. Do you believe your students enjoyed Class Dojo? Why or why not?

7. Was using Class Dojo an efficient way of collecting data in your classroom? Why or why not?

8. What are the challenges of implementing an intervention like this in a special education classroom with students qualified under Emotional Disturbance?

Appendix E

Phase B Script

"Starting today, we will be using a new classroom reward system where everyone will work together to earn group rewards. There will be four classroom rules to follow and I will be checking your behavior at four random times during the class period. You can earn one point for each rule that you are following during that check. Each of you will have the chance to earn up to 16 points during math class and we will add everyone's points up together to see if we meet our goal for the day. We will choose our daily goal out of this jar and if we meet the chosen points goal, we will get to choose a group reward from the jar instead of going to the gym like we always do. Sometimes you are not all in the same classroom during math class, so on those days, we will still keep track of everyone's points and come together at the end of class to add them together to see if you met your points goal. The idea is to work as a group to earn points, so everyone needs to do their best to contribute to the group. The four rules are going to be posted on the wall every day. They are:

1. Manage your words.
2. Stay on-task.
3. Follow adult directions.
4. Use nice words with classmates and teachers.

I will be randomly checking your behavior four times during the class and each time I check, you can earn one point for each rule you are following, so you should try to follow the rules during the entire period in order to earn the most points towards the group reward. If the class doesn't meet the points goal for the day, we will still go to the gym as always and there is always the next day to try to earn as many points as possible to earn a reward.

The rewards that we are going to be able to earn include:

1. Game time
2. Free choice time
3. Computer time
4. Bring a Friend to the Gym
5. Lifesavers/Jolly Ranchers
6. Time to play outside

Can you guys think of any other rewards you would like to earn?"

[If they do, you can add them to the jar]

Appendix F

Teacher Data Collection Form

Date: _____

Operationalized Definitions for Disruptive Behaviors:
Managing Words – calling out, saying inappropriate things to each other or to teacher, making noises, disruptive to the class
Off-task – not following directions, not completing work, falling behind in the lesson
Non-compliance – work refusal, not following directives within 3 verbal prompts, distracting behaviors to avoid work
Arguing – negative interactions/communications with teachers and peers

Randomized times to set timer for data collection during class: 8, 12, 10, 8

First time period:

	Managing Words	On-task	Compliant	Not Arguing	
Student 1:					
Student 2:					
Student 3:					
Student 4:					
Student 5:					
Total Points:					

Second time period:

	Managing Words	On-task	Compliant	Not Arguing
Student 1:				
Student 2:				
Student 3:				
Student 4:				
Student 5:				

Total Points:					

Third time period:

	Managing Words	On-task	Compliant	Not Arguing	
Student 1:					
Student 2:					
Student 3:					
Student 4:					
Student 5:					
Total Points:					

Fourth time period:

	Managing Words	On-task	Compliant	Not Arguing	
Student 1:					
Student 2:					
Student 3:					
Student 4:					
Student 5:					
Total Points:					

Total Number of Points Earned:

Total Number of Points Possible:

Chosen Random Criteria:

Did the students meet the criteria? Y or N

If Yes, Chosen Random Reward: