2014

A Comparison of the Effectiveness of a Token Economy System, a Response Cost Condition, and a Combination Condition in Reducing Problem Behaviors and Increasing Student Academic Engagement and Performance in Two First Grade Classrooms

Britta Leigh Fiksdal
Minnesota State University - Mankato

A Comparison of the Effectiveness of a Token Economy System, a Response Cost Condition, and a Combination Condition in Reducing Problem Behaviors and Increasing Student Academic Engagement and Performance in Two First Grade Classrooms.

Britta L. Fiksdal

A Dissertation Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Psychology

School Psychology

Minnesota State University, Mankato

Mankato, Minnesota

May 2014

A Comparison of the Effectiveness of a Token Economy System, a Response Cost Condition, and a Combination Condition in Reducing Problem Behaviors and Increasing Student Academic Engagement and Performance in Two First Grade Classrooms.

Britta L. Fiksdal

This dissertation has been examined and approved by the following members of the dissertation committee.

_____

Daniel Houlihan, Ph.D., Advisor

_____

Kathy Bertsch, Ph.D., Committee Member

_____

Kevin J. Filter, Ph.D., Committee Member

_____

Teresa Wallace, Ph.D., Committee Member

_____

Date

Copyright

Dedication

This dissertation is dedicated to my incredibly supportive and understanding fiancé, Brett, and my family who have been there for me no matter what throughout my doctoral training. They have provided me with both emotional and financial stability to complete this journey and shown me that I can make my dreams come true. Their confidence in me is priceless and has meant the world to me.

I also want to thank my advisor, Dr. Houlihan, for his endless support throughout my training. Several hours have been dedicated to this project and it could not have been completed without his expertise and guidance. I have enjoyed working with him and am honored to have had him as my mentor.

Table of Contents

List of Figures

Abstract of the Dissertation

A Comparison of the Effectiveness of a Token Economy System, a Response Cost Condition, and a Combination Condition in Reducing Problem Behaviors and Increasing Student Academic Engagement and Performance in Two First Grade Classrooms.

By

Britta L. Fiksdal

Doctor of Psychology in School Psychology
Graduate School of Psychology
Minnesota State University, Mankato, 2014
Carlos Panahon, Ph.D., Chair

Previous research has shown that token economy systems and response cost procedures are effective in reducing disruptive behaviors in classrooms and increasing academic engagement. Few studies have compared the effectiveness of combining these two classroom management techniques, examined academic performance, and directly observed academic engaged time. The current study compared the effectiveness of four conditions: baseline, response cost procedure, token economy system, and a combination condition among two, first grade classrooms in a small town in central Wisconsin using direct observation and permanent product of a three question quiz. Behaviors assessed included problem behaviors in the classroom, academic engaged time, academic performance, and student and teacher preference. An alternating treatments design was utilized in which one of the four conditions were employed each day during the math lesson in a randomized predetermined order.

CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

Token economies have a long history of changing behaviors among humans. Lancaster started the trend with the use of tickets within large classrooms in the early 1800's followed by the use of cherries and cakes in the early 1950's to teach Latin and Greek to children (Lancaster, 1805; Skinner, 1966). One of the first therapeutic applications of a token economy was delivered by Avendano Carderera in 1959 who gave a ticket to children for good behavior (Rodriguez, Montesinos, & Preciado, 2005). Staats and colleagues applied a token economy system to a student with reading problems in the late 1950's. These studies indicate that token economies have been used for quite some time to modify behavior. However, despite the research indicating its effectiveness, token economies are not currently used as often as they could be in schools (Matson, & Boisjoli, 2009).

Token Economies

Token economy systems are when participants earn tokens contingent on certain behaviors which are then exchanged for predetermined backup reinforcers at a later point in time. The main element to a token economy system is that the tokens are delivered contingent on a specific behavior and linked to meaningful reinforcer(s) (Kazdin, 1977; Wolery, Bailey, & Sugai, 1988). Ayllon and Azrin wrote a book in 1968 titled, The Token Economy, which emphasized the effectiveness of using token economies with children with developmental delay as well as various problematic behaviors. The book also discussed the effectiveness of implementing a token economy system with typically

developing children. The majority of research evaluating the effectiveness of token economies was conducted between the 1960s-1980s however; until recently the number of studies between then and now has been minimal (Matson & Boisjoli, 2009).

A token economy system, when applied correctly, shares many of the same features of other behavior modification interventions (Hall, 1979). They typically consist of a list of instructions for the individuals involved, including: the target behavior(s) that will and/or will not be reinforced, a method to ensure the token is contingent on behavior which allows the token to become a reinforcing stimulus, and a set of rules that explain how, when, and under what conditions the tokens can be exchanged for the backup reinforcers (O'Leary, & Drabman, 1971). In a token economy, points or tokens are delivered contingent on a target behavior over a specified period of time. After a certain time interval has passed, the students can exchange the number of tokens they have for backup reinforcers. The size of the backup reinforcer should be in relation to the number of tokens the individual earned and are exchanging. There are many advantages to token economy systems such as; bridging the gap between a target response and the backup reinforcer, maintaining performance over an extended period of time until the backup reinforcer can be delivered, and allowing behavior to be reinforced at any time. Token economies are also less likely to be affected by satiation and can provide a visual reminder of the progress or lack of progress the student has made regarding their behavior (Kazdin, & Bootzin, 1972).

Within a token economy, the token is a stimulus that signals the delivery of a backup reinforcer at a later point in time. The token can be any object that can be easily

delivered, easily kept, and easily exchanged. Some advantages of using a tangible reinforcer include: tokens are portable, no maximum exists, the number of tokens can represent the amount of reinforcement, they are durable and can be used continuously, devices can be used to automatically deliver tokens contingent on behavior, the physical characteristics of the token can be standardized or personalized, and can be made to be indestructible (Kazdin & Bootzin, 1972). In some cases, natural reinforcement of teacher praise and attention will not be effective in changing classroom behavior, in these situations, token economies are often times found to be effective. Token economies are most effective when there are multiple backup reinforcers as opposed to one reinforcer. By having a large variety of backup reinforcers to choose from, it is less likely students will become satiated and the chances of each student finding at least one item that functions as a reinforcer is increased (O'Leary, & Drabman, 1971).

The first step in a token economy is to identify a target behavior and developing an operational definition. After the target behavior is identified, tokens must be made, backup reinforcers need to be gathered, and rules regarding delivery and exchanging of tokens must be developed. Next, the tokens must be established as secondary reinforcers for the backup reinforcers. When establishing the tokens as reinforcing, it is important to go through a practice with students in which they are told and shown how to earn tokens, the rules for exchanging, and then allow them to exchange the tokens for a reinforcer so they have access to the contingency (Kazdin, & Bootzin, 1972).

Research studies have found that, in part because of the flexibility of the different features, token economies have been effective in reducing problem behavior and

increasing positive behavior in a variety of subjects under a variety of different conditions and with multiple behaviors (Kazdin, 1982; O'Leary, & Drabman, 1971). A review of the literature conducted by Matson and Boisjoli (2009), found that token economies have been used successfully for different behaviors such as remaining in seat, increasing attention, increasing appropriate verbalizations and social skills, and increasing self-help skills, decreasing inappropriate call-outs in class, decreasing aggressive behaviors, decreasing disruptive behaviors within class, increasing academic behaviors such as completing homework assignments, increasing test performance, increasing academic engaged time and academic performance, and increasing academic accuracy. Token economies have been successful for multiple subjects as well including; children with developmental delay, cognitive deficits, autism, ADHD, emotional and behavioral problems, conduct disorders and typically developing children. They have also been used with adults with psychiatric diagnosis, legal offenders, employees, and teachers. Token economies have been administered by multiple individuals such as parents, teachers, school psychologists, employers, doctors, nurses, and clinical psychologists.

While there are a multitude of studies published proving the effectiveness of token economy systems at reducing problem behaviors and increasing positive behaviors in classroom and school settings, systematic evaluations of the experimental literature to validate the use in schools have not been completed recently. Maggin and colleagues conducted such a literature review to evaluate the quality of research designs used to determine whether or not token economy systems are, in fact, an evidence based

intervention for behavior management in both classroom and school settings (Maggin, Chafouleas, Goddard, & Johnson, 2011). The study used four questions to guide their review of the literature which included looking at What Works Clearinghouse (WWC) standards, student characteristics and intervention features, statistical summaries of treatment effects, and methodological strengths and weaknesses. After their initial search, they started with a total of 834 articles to be screened for retrieval, 118 articles made it past the initial inclusion screening, 36 articles were considered potentially relevant, and 24 studies were included in the synthesis. The reasons for exclusions included: ineligible intervention, ineligible dependent variable, ineligible population, ineligible design, irretrievable data, and not an intervention study. Of the 24 studies, there were a total of 90 cases of which 67 of them used students as the unit of analysis and 23 used the classroom as the analysis. Additionally, of the 25 studies, only four different single subject designs were used: reversal (n = 15), AB (n = 5), multiple baseline (n = 3), and ABA (n = 1). Overall, according to WWC standards, there is currently insufficient support for token economies as an evidence based classroom management strategy mainly due to methodological rigor of the current studies. However, when you take into account all of the studies, token economy systems were found to be effective as both a classroom management system and individual behavior intervention program for three of the four effect sizes calculated through significant improvement in student functioning as a result of introducing token economy systems in the classroom.

Response Cost

Response cost is a punishment procedure that has been used in school settings to effectively change behavior (McGoey, & DuPaul, 2000). Originally, response cost referred to changing the work required to emit a behavior, in other words changing the cost of the behavior to affect the rate of that behavior (Weiner, 1962). The use of response cost in the school settings is somewhat different from the original definition. In a school setting, the incorporation of a response cost includes taking away tokens or points contingent on problem behaviors. Typically these tokens are given noncontingently at the beginning of a time interval, lesson, or session and the student gets to keep them as long as they do not engage in any of the problem behaviors. At the end of the time period, they can exchange the tokens they have left for backup reinforcers. Response cost is a punishment based system whereas a token economy is reinforcement based (Kazdin, 1972; Pace, & Forman, 1982).

Response cost is not the same as extinction or time-out. Extinction is the withdrawal of reinforcers maintaining an undesirable behavior and time-out is removing the student from a reinforcing environment contingent on undesirable behavior. Response cost is not extinction because you are not removing the functional reinforcer for problem behavior, instead you are withdrawing secondary reinforcers contingent on undesirable behavior. Response cost is not time-out because you are not removing the student from the environment. Instead, they stay in the classroom and lose a token contingent on problem behavior. Response cost is different from a token economy in that you do not receive tokens contingent on desirable behavior, instead, the tokens are given

noncontingently in the beginning of a time interval and are taken away contingent on problem behavior. Whatever amount of tokens the student has left is then exchanged for backup reinforcers at a specified time (Kazdin, 1972).

A review of the literature shows response cost procedures have been found effective for multiple individuals within classroom settings such as developmental delay, cognitive delay, emotional and behavioral problems, and students with academic difficulties. A variety of behaviors have also been changed drastically with response cost procedures including out of seat behavior, calling out in class, off task behavior, disruptive behavior, academic performance, smoking, and weight loss. Most studies that have examined the recovery of suppressed behaviors through response cost have found that the behavior does not recover when the contingency is withdrawn (Kazdin, 1972).

Typically, punishment procedures have been associated with side effects such as escape and avoidance behaviors along with emotional consequences. Previous studies have indicated that escape behaviors are not associated with response cost like it is with the delivery of aversive stimuli. Also, there have been no negative emotional consequences reported with response cost procedures (Litenberg, 1965). It is likely that these negative side effects are not associated with response cost because the removal of a positive reinforcer (token) is not as aversive in magnitude compared to the delivery of an aversive stimulus (Schmauk, 1970). Current research has not focused on emotional consequences as much as reducing problem behaviors.

Combination of Token Economies and Response Cost

Some researchers and classroom teachers have combined token economy systems with response cost procedures. In these classroom management techniques the individual is able to earn points contingent on desirable behavior and can also lose points contingent on undesirable behavior. At the end of the interval, the tokens they have left can be exchanged for backup reinforcers (Weiner, 1962). One advantage to this combination procedure includes the ability to provide tokens contingent on a behavior that is completely unrelated to the behavior in which the tokens are taken away. Response cost used to be used quite frequently within token economy systems, however, a more recent review of the literature suggests that it is not used as often in school settings as it used to be and neither are token economy systems (Matson, & Boisjoli, 2009).

There have been multiple research studies on the effectiveness of token economies, response cost procedures, and combination procedures in reducing problem behaviors among human subjects. The first token economy system to be used in a larger classroom setting was in 1967 by O'Leary and Becker. The classroom consisted of 17 students all of whom had emotional and behavioral disturbances. After the introduction of the token economy, disruptive behavior decreased significantly from 76% of intervals during baseline to 10% during intervention. O'Leary and colleagues (1969) also conducted a token economy system with seven students in a second grade classroom all of whom exhibited disruptive behaviors. The implementation of the token economy system reduced disruptive behaviors significantly compared to baseline rates. A token economy system was used to reduce violent behavioral outbursts and loud noise among

psychiatric patients (Winkler, 1970). A review of token economy systems within classroom behavior found that many behaviors were successfully increased such as being quiet, hanging up coats, sitting at their desk, academically engaged, completing a task, following instructions, and facing the front of the class and teacher (Kazdin, & Bootzin, 1972). More recently, Kahng and colleagues (2003) provided tokens contingent on eating certain amounts of food and eating novel food for a four year old girl diagnosed with pervasive developmental disorder with food refusal.

Siegel and colleagues (1969) used a response cost procedure to reduce speech disfluencies among normal-speaking college ages students. Four females and one male participated in the study at the University of Minnesota. Results indicated the procedure was very effective at suppressing disfluencies during spontaneous speech. They used money as the backup reinforcers for the points they earned throughout the speech. A response cost procedure was used to reduce problematic behaviors among delinquent soldiers (Winkler, 1970). Response cost procedures have also been used to reduce aggressive statements, tardiness, and specific word usage among three delinquent boys (Phillips, 1968). Phillips and colleagues (1971) studied the effectiveness of a response cost procedure on delinquent youths in Achievement Place. Results indicated that point loss contingent on problem behavior produced significant increases in desirable (incompatible) behaviors such as promptness, completing quizzes, saving money, and keeping a clean bedroom. A study conducted by Pace and Forman (1982) found that a response cost procedure was effective for 55 second graders enrolled in a Title -1 program in a low socioeconomic status neighborhood school. Results indicated the fines

associated with the response cost procedure was effective in reducing disruptive behaviors such as out of seat, inappropriate vocalization, being noisy, touching other people's property, and aggression.

More recently, in 2004, Conyers and colleagues compared the effectiveness of a response cost condition with differential reinforcement of other behavior on reducing disruptive behaviors among 25 students in a preschool classroom. Disruptive behavior decreased from 64% of intervals to 5% for the last six sessions of the response cost procedure. Initially, differential reinforcement of other behavior resulted in a more drastic decrease of disruptive behavior but over time disruptive behaviors increased to 27% of intervals. Therefore, the response cost condition maintained lower rates of disruptive behavior more effectively than differential reinforcement of other behavior.

McLaughlin and Malaby (1972) compared the effectiveness of a token economy system and a response cost condition with a classroom containing 25-27 fifth and sixth grade students. In the Point Loss phase the teacher removed points contingent on problem behaviors. In the Quiet Behavior Point phase students earned points contingent on desirable behaviors that were incompatible with an ineffective learning environment. Results indicated that both were effective in reducing problem behavior and increasing desirable behavior. McGoey and DuPaul, (2000) compared the effectiveness of a token economy system and response cost procedure in reducing inappropriate social behaviors, off task behavior, following rules, and tantrumming among four preschool students diagnosed with ADHD. Results showed little difference between the two interventions in

the ability to change behavior. Both the response cost and token economy conditions resulted in a decrease in problematic behaviors compared to baseline rates.

While a number of studies have focused on reducing problem behaviors among individuals, a number of studies have focused on changing academic behaviors such as studying, staying on task, completing homework assignments, and completing tests as well. A review of the literature shows that response cost and token economy systems have been effective for a wide variety of school age populations such as developmental and cognitive delay in summer school programs and hospital settings, teenage students and elementary students, a small child with Phenylketonuria (PKU), and children with autism and social skills deficits (Matson, & Boisjoli, 2009).

In 1965, Birnbrauer, Wolf, Kidder, and Tague found that a token economy system resulted in higher levels of accuracy on homework and increased rates of studying overall for 15 children diagnosed with cognitive delay compared to baseline in which no token economy was employed. A study conducted in 1968 compared noncontingent reinforcement to contingent reinforcement using a token economy system. The study showed that noncontingent reinforcement was not as effective in changing and increasing study behavior among the 12 preschool children with above average intelligence compared to the token economy system (Bushell, Wrobel, & Michaelis, 1968). Wolf and colleagues found that a token economy system was effective in increasing report card grades and regular classroom assignments along with language, reading, and arithmetic performance when a token economy system was employed for students in a remedial education elementary classroom (Wolf, Guiles, & Hall, 1968). Walker and colleagues

conducted a study that assessed a token economy system on task-oriented behavior for six children all with average or above average functioning but were described by their teachers as being disruptive and hyperactive. Results showed the percentage of on-task intervals increased from an average of 39% of intervals during baseline to an average of 90% of intervals during the token economy condition (Walker, Mattson, & Buckley, 1969).

Panek (1970) compared a response cost condition to a token economy system for learning word associations among patients diagnosed with schizophrenia. Subjects included 32 male patients between the ages of 30-77 years old who have lived in the hospital between 2-38 years. Patients were split into two groups; response cost group or token economy groups. Results showed an increase in word association for both groups of patients. Therefore, this study showed no difference between reward based and punishment based programs for learning word associations and neither condition resulted in generalization to new words. Broden, Hall, Dunlap, and Clark (1970) first implemented a token economy condition and then a combination response cost and token economy condition while assessing study rates among seventh and eighth grade students who were all behind their peers academically by at least one year. In the token economy condition, the researchers noticed an increase in study behavior during the token economy system in which students earned one extra minute of lunch contingent on appropriate study behaviors. While study behavior increased from 29% of intervals during baseline to 74% of intervals during the token economy condition, the researchers were disappointed to see the study behaviors did not generalize to times of the day in

which the token economy was not implemented. Therefore, the researchers implemented a combination condition in which students were able to earn the points contingent on appropriate study behaviors but could also lose those points contingent on problem behaviors. After the introduction of this condition, appropriate study behavior increased to an average of 80% of intervals throughout the entire day indicating greater generalization for the combination condition.

A study conducted in 1972 by Kaufman and O'Leary showed it was possible to increase reading behavior and task engagement using both a response cost condition and a token economy condition among 16 students living in a psychiatric hospital. Their study indicated that while both were effective in increasing reading and task engagement skills, there was not a significant difference between the two conditions.

Iwata and Bailey (1974) compared the effectiveness of a token economy and response cost condition on student's academic and social behaviors among 15 students in a special education classroom. The students were divided into two different groups and each group experienced both the token economy and response cost conditions throughout the study. Results showed that the average number of problem completed by students during the token economy and response cost conditions showed a slight increase compared to baseline rates, accuracy remained similar throughout the entire study, and off task behavior reduced significantly for both conditions compared to baseline. This study also assessed whether or not students preferred one condition over the other. Therefore, the last phase of the study involved the students being allowed to pick if they participated in a response cost condition or a token economy condition. Results showed

there was no significant pattern of preference between the two conditions. In fact, four students consistently chose the token economy system, five students consistently chose the response cost condition, and the remaining six students switched back and forth between the two conditions.

Other studies have assessed teacher, parent, and student preference for response conditions and token economy systems. In general, techniques that focus on increasing positive behaviors have been rated higher and as more acceptable compared to techniques that have focused on reducing negative behaviors with the exception of response cost techniques (Frentz, & Kelley, 1986). Little and Kelley (1989) assessed treatment acceptability for five different parenting techniques: response cost, rewards for good behavior, timeout with spanking, spanking alone, and timeout alone. Results indicated parents rated response cost as the most acceptable and it was rated high on the Parent's Consumer Satisfaction Questionnaire. Reynolds and Kelley (1997) assessed treatment acceptability of a response cost procedure using the Intervention Rating Profile – 15 and a 6-point Likert scale. Results showed prior to treatment the teachers had rated response cost as a favorable classroom management technique. After the teacher's employed a response cost procedure in their classroom, their ratings increased and teachers rated it as a highly acceptable treatment. A study conducted in 1998 examined the treatment acceptability among mothers who have children who exhibit disruptive and problem behaviors. The techniques assessed included: differential attention, over-correction, positive reinforcement, response cost, spanking, and time-out. The conclusion of the study showed mothers rated positive reinforcement the highest followed by response cost

and time out. Differential attention, overcorrection, and spanking were rated the lowest by mothers (Jones, Eyberg, Adams, & Boggs, 1998). A similar study conducted in 2007 showed similar results in which response cost, token economy, and time out were rated as the most acceptable and overcorrection, ignoring, and differential attention were rated lower (Pemberton, & Borrego, 2007). McGoey and DuPaul (2000) noted that teachers found the response cost condition to be more acceptable and chose to implement it within their classroom during the choice condition.

Florida Pilot Study

A pilot study was conducted in the spring of 2012. The school was located in a small suburb of Orlando Florida in a low socioeconomic neighborhood. The majority of the students were bilingual speaking English and Spanish. The majority of the parents spoke Spanish and only two parents had received an education higher than High School. The teacher had been referred for the study due to behavior problems in her classroom. The teacher, Mrs. C, was a certified fourth grade teacher who had five years of teaching experience. The subjects in the study included 22 children in a fourth grade general education classroom. The classroom included 14 boys and 8 girls with an average age of 9 years old. Three students were not included in the study, one student was on an IEP that included an individualized token economy system that the team did not want changed, a second student's parents did not provide consent for their child to participate, and a third student entered the classroom half way through the study. Therefore, a total of 19 students participated in the study. Using methods identical to the current study, the data showed contrasting results to the earlier studies conducted.

In the pilot study, data showed an increase in academic engagement during the Combination and Token Economy conditions and lower levels of academic engagement during baseline and Response Cost conditions. Lower rates of disruptive/problematic behavior was observed during the Combination and Token Economy conditions compared to the baseline and Response Cost conditions. With regards to Academic Understanding, the highest understanding occurred during the Combination condition. Data from the student survey shows students favorite conditions were the Token Economy and Combination conditions, their least favorite conditions were baseline and Response Cost, the condition that made it easiest to learn was the Combination condition, the condition in which learning was rated as the hardest were the Response Cost and baseline conditions, and students preferred to continue the Combination condition in the future. Data from the teacher survey shows Ms. C preferred the Token Economy and Combination conditions, she reported students appeared more anxious and problem behaviors were higher during baseline and Response Cost, and she will be administering Token Economy or the Combination strategy in the future.

Some limitations to the pilot study included the small sample size of only one class with one teacher who was in charge of teaching the class and delivering tokens during each condition. Therefore, the strategies were not administered as rigorously as if multiple adults were in the classroom. Lastly, the classroom was video recorded making observing students difficult at times if they walked out of view of the camera. Future research is important to clarify which classroom management strategy is the most beneficial for increasing student academic engagement and performance as well as the

most efficient for reducing problematic behavior in the classroom. Most of the studies showing Response Cost as being just as effective if not more effective were conducted in the 1970s and 1980s. The demographics of our students have changed since then, therefore creating a need to validate current classroom management strategies commonly used among teachers.

Purpose of the Current Study

The purpose of the present study is to update the literature as well as compare the effectiveness of three classroom management strategies; response cost, token economy, and combination of response cost and token economy. The study will assess the ability of the three conditions to reduce problem behaviors, increase academic engaged time, increase academic performance, and identify teacher and student preference. Additionally, the study was designed to enhance the research showing support for token economy systems as an empirically based behavior management intervention for both individuals and classrooms in the school setting and to meet the methodological features of single-case design studies set for by Kratochwil and colleagues (2002; 2010). These five features include: 1. Operational definitions if all variables and settings, 2. Replication of effects, 3. Collection of treatment integrity data, 4. Collection of interobserver agreement/reliability data, and 5. Collection of social validity data. It is hypothesized that both the Token Economy and Combination conditions will result in higher academic engagement rates and lower problem behavior rates compared to Response Cost and Baseline conditions. Additionally, it is hypothesized that students will have higher academic performance in the Token Economy and Combination conditions

compared to the Response Cost and Baseline conditions. Furthermore, it is hypothesized that both students and teachers will report preferring Token Economy and Combination conditions over Response Cost and Baseline conditions.

CHAPTER II

METHODS

Participants

The subjects in the current study included two first grade classrooms in an elementary school located in a small town in West-Central Wisconsin. The teachers were referred for the study due to behavior problems in the classroom that required the teacher to stop their instruction or class activity at least three times on average per lesson. In the first classroom, the teacher was a veteran with more than 20 years experience at the elementary level (teacher C.S.). This classroom had 16 students total during Math class with one student receiving special education support during instruction for emotional and behavioral needs. In the second classroom, the teacher was a newer teacher with less than three years experience at the elementary level (teacher S.M.). This classroom had 14 students total during Math class with one student receiving special education support as needed for emotional and behavioral needs and two students receiving academic support through English as a Second Language instruction as needed during independent seatwork.

Students in C.S. classroom were between 80-95 months old with an average age of 86.3 months old. Ninety-four percent of the students were Caucasian and 1% of the students were Hispanic. Students in S.M. classroom were between 80-92 months old with an average age of 85.71 months old. Sixty-nine percent of the students were Caucasian, 30% were African American, and 1% was Asian.

Dependent Measures

Data on problem behaviors were collected via frequency counts from directly observing the classroom each day. Problem behavior was defined as exhibiting any behaviors or audible vocalizations that were disruptive, interfered with learning, or impeded instructional delivery. Specific examples include fidgeting, drawing on self, talking out, and disruptive interaction with peers that interfered with learning, leaving the assigned instructional area, and making audible vocalizations not related to the instructional task such as singing, humming, or talking back.

Data on academic engaged time was collected via momentary time sampling with 15 second intervals from directly observing the classroom each day. Observers recorded each student in a systematic order for a total of 25 minutes. Academic engagement was defined as the student looking at materials, raising hand, working on tasks that the teacher specified, and/or engaged in communication with peers or teacher that is relevant to the task at hand.

Data on academic performance was collected through analyzing the permanent product of a three question quiz each student completed at the end of each math lesson. The quiz included either multiple choice or true/false questions covering the material from the current lesson and was developed by the teacher prior to the start of the lesson.

Student and teacher preference was assessed at the end of the study by asking both the teachers and the students questions about the different conditions. Students were individually interviewed and asked which was their favorite condition and why, least favorite condition and why, and which condition they would like their teacher to

implement next week. Teachers were sent an email with questions asking them which procedure they liked administering best and why, which procedure they liked administering least and why, if they noticed their students behaving better or academically engaged more during any of the conditions, if they noticed their students misbehaving more or academically engaged less during any of the conditions, what they liked about the different strategies, what they did not like about the different strategies, what were some advantages to the different strategies you used, what were some of the disadvantages to the different strategies you used, if you could make any changes what would they be, which one would you be most likely to do in the future and why, which one would you be least likely to do in the future and why.

Independent Measures

The independent measures of the current study were the different classroom management strategies employed by the teacher. An alternating treatments design was used throughout two phases. During the first phase, the teacher alternated between all four conditions; the baseline condition, response cost condition, token economy condition, and combination condition each day throughout the week for four weeks. The order was randomly assigned to control for any history and sequence effects. During the second phase, the teacher alternated between the two conditions found to be the most effective at reducing problem behaviors and increasing academic engagement in their classroom during the first phase. The order of the two conditions was randomly assigned to control for any history and sequence effects. The study concluded with each teacher

employing the classroom management strategy that was the most effective at reducing problem behaviors and increasing academic performance in their classroom.

Procedure

Pre-Baseline. Prior to data collection, the researcher gained IRB approval for the study and located two teachers interested in participating in the study. The researcher and teachers discussed what they considered to be academically engaged as well as operationally defined the problem behaviors they had witnessed in their classrooms. Along with IRB approval and teacher approval, the researcher also obtained consent from the superintendent, school principal, and each student's parents.

Baseline. During baseline, the teacher started the lesson by giving the students the following instructions, *"During today's math lesson, you will not be given any tokens nor will you be able to lose any tokens. I still want you all to be on your best behavior."* The teacher then taught the lesson as normal, without delivering any type of tangible reinforcement contingent on behavior. At the end of the lesson, the teacher transitioned the kids to the next activity since there were no tokens for students to exchange.

Token Economy. During this condition, the teacher started the lesson by giving the students the following instructions, *"During today's math lesson, you will have the opportunity to earn a token for "good" behavior. When you earn a token, I will place it in your name slot on the wall or name card located at your desk depending on where we are in the classroom. Your tokens cannot be taken away right now, you can only earn them for good behavior. At the end of the lesson you can exchange your tokens for either a hand stamp or piece of candy from the reward box."* The teacher then started the lesson

as normal and delivered tokens to students contingent upon desirable behavior. When delivering a token, the teacher briefly stated what behavior the student was earning the token for (e.g., “I like the way you are reading quietly in your seat.”). The teacher continued to deliver tokens throughout the math lesson for the day. At the end of the lesson, the teacher allowed students to exchange their tokens. The magnitude and size of the reinforcer was determined by the number of tokens the student had earned to exchange.

Response Cost. During this condition, the teacher started out the lesson by giving the students the following instructions, *“During today’s math lesson, each of you will be given five tokens in your name slot on the wall or name card located on your desk depending on where we are in the classroom. Each time you misbehave, I will come and take a token away. You cannot earn tokens back today; you can only keep them if you do not engage in any problem behaviors and follow classroom expectations and rules. At the end of the lesson you can exchange whatever tokens you have left for hand stamps or candy in the reward box.”* The teacher then gave each student five tokens and started the lesson as normal. Throughout the lesson, anytime a student engaged in problem/disruptive behavior (as identified in the problem behavior definition list) the teacher went over to the student and quietly took away a token from their name slot or card and told the student why the token was being taken away (e.g. “I do not like the way you are twirling your book, instead you should be reading chapter 4.”). The teacher continued to take away tokens throughout the math lesson contingent on problem behaviors. At the end of the lesson, the teacher allowed students to exchange whatever

tokens they had left. The magnitude and size of the reinforcer was determined by the number of tokens the student had left to exchange.

Combination Condition. During this condition, the teacher started out the lesson by giving the students the following instructions, *"During today's math lesson, you will have the opportunity to earn tokens for "good" behavior. When you earn a token, I will place it in your name slot on the wall or name card located on your desk depending where we are in the classroom. Your tokens can be taken away if you engage in any problem behaviors. So throughout math today, you can earn tokens for good behavior AND you can get your tokens taken away for bad behavior. At the end of the lesson you can exchange however many tokens you have for hand stamps and/or pieces of candy in the reward box."* The teacher then started the lesson as normal and delivered a to students contingent on good behavior with a brief, quiet description of what behavior the student was earning the token for (e.g. "I like the way you are reading quietly in your seat.") and took away tokens contingent on inappropriate behavior with a brief, quiet description of what behavior the student was getting the token taken away for (e.g., "I do not like the way you are singing and looking around instead of reading your book."). The teacher continued to deliver and take away tokens throughout the math lesson. At the end of the math lesson, the teacher allowed students to exchange their tokens. The magnitude and size of the reinforcer were determined by the number of tokens the student had left to exchange.

Token Exchange. The tokens students earned were exchanged at the end of each math lesson. Students were not able to keep the tokens or save them across sessions to

control for the effects of saving tokens for larger reinforcers at a later time. Students who had 5 or more tokens at the end of math class exchanged them for three items, students who had 3 or 4 tokens exchanged them for 2 items, students who had 1 or 2 tokens exchanged them for 1 item, and students who did not have any tokens at the end of the math lesson were unable to receive any items. Items consisted of a hand stamp or a piece of candy from the reward box. Students had the option of two different hand stamps that were switched out on a weekly basis. Adults throughout the school are aware that students earn stamps on their hand for positive/good behavior and often ask students about the stamps and provide positive social praise. Additionally, students are encouraged to go home and tell their parents what they did to earn a hand stamp. Students had the option of many different pieces of candy from small suckers to soft pieces of candy such as Starbursts to hard pieces of candy such as Jolly Ranchers. Students were not able to eat the candy in school, they had to put the candy in their mailbox to go home with them at the end of the day. If a student had 5 or more tokens at the end of math class, they could pick three items; therefore, they could pick three hand stamps, or three pieces of candy, or two hand stamps and one pieces of candy, or two pieces of candy and one hand stamp. Choice of backup reinforcers was a focus in the study to reduce satiation and maintain the reinforcing efficacy of the tokens.

Data Analysis. The data collected for this study was visually analyzed on a weekly basis to check for student performance and effectiveness of the different management strategies. Visual analysis was also used to determine which two strategies were most effective at reducing problem behaviors and increasing academic engagement

in each classroom for implementation during phase two and which was the most effective for implementation during the final phase.

Inter-Rater Reliability. Inter-rater reliability was collected and analyzed on 33% of sessions. Inter-rater reliability was collected on problem behavior occurrences in the classroom, academic engagement among students in the classroom, academic performance scoring of the three question quiz, and treatment fidelity.

Treatment Integrity. Treatment integrity was assessed by recording the number of steps in each classroom management strategy the teacher successfully carried out such as correctly reading the instructions to the class at the beginning of each math lesson dependent on the condition for the day, delivering/removing tokens contingent on student behavior dependent on the condition for the day, allowing students to exchange tokens at the appropriate rate at the end of each math lesson, and ensuring each student took a teacher developed 3 question objective quiz at the end of each math lesson. The number of steps the teacher missed was subtracted from the number of total steps that should have been completed and divided to determine the percentage of steps accurately completed. This was conducted for 100% of the math lessons and analyzed daily. If the teacher reached the minimum criterion of 100% of steps successfully completed she was given positive verbal attention and praise, if the teacher missed one or more of the steps she was sent an email with the steps she missed and a meeting would have been scheduled to further discuss the steps missed and conduct a booster training session.

CHAPTER III

RESULTS

Academic Engagement

Results from the study show both Token Economy and Combination conditions were more effective at increasing student engagement during math for both classrooms. As can be seen from figure 1, student academic engagement during Math lessons for classroom C.S. was higher during both the Token Economy and Combination conditions compared to the Response Cost and Baseline conditions during Phase 1. Students were academically engaged between 75% and 80% of the time with an average of 77% of the time academically engaged during baseline, 94% - 95% of the time with an average of 95% of the time academically engaged during Token Economy, 82% - 85% of the time with an average of 85% of the time academically engaged during Response Cost, and 90% - 94% of the time with an average of 93% of the time academically engaged during the Combination condition throughout Phase 1 (see figure 2). Results from the second phase of the study showed Token Economy was slightly better at increasing student engagement during math compared to the Combination condition for C.S. classroom. Students were academically engaged between 94% - 97% of the time with an average of 95% of the time during Token Economy compared to 90% - 92% of the time with an average of 91% of the time academically engaged during the Combination conditions. The final phase of the study consisted of only the Token Economy condition in which students were academically engaged between 95% - 98% of the time with an average of 96% of the time (see figures 1 & 2).

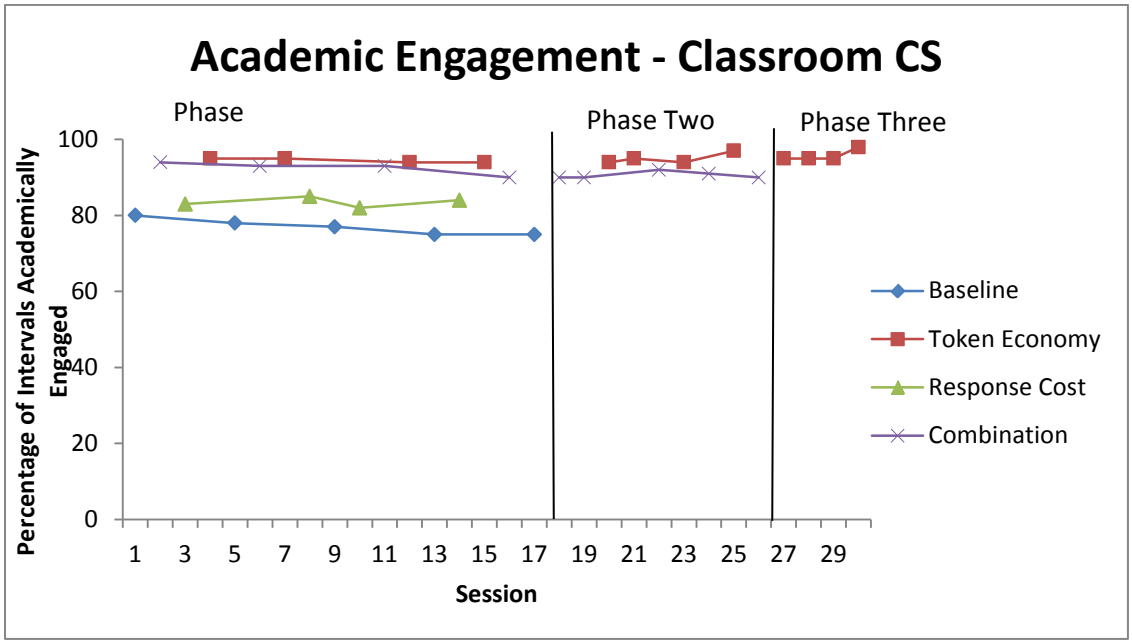


Figure 1. Percent of intervals students were academically engaged in C.S.' classroom during the Token Economy, Response Cost, Combination, and Baseline conditions across the three phases.

.

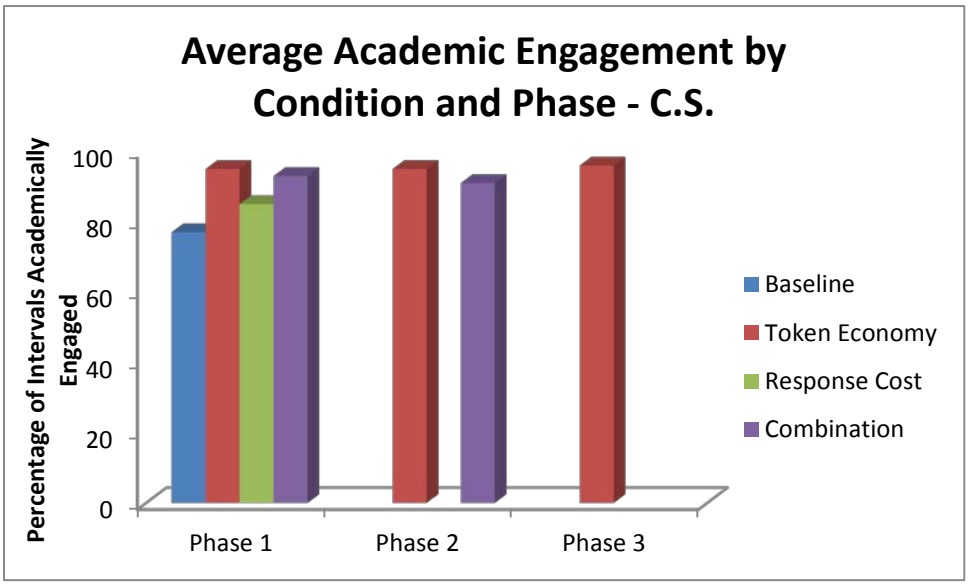


Figure 2. The average percentage of intervals students were academically engaged by condition across the three phases for C.S.' classroom.

As can be seen from figure 3, student academic engagement during Math lessons for classroom S.M. was higher during both Token Economy and Combination conditions compared to the Response Cost and Baseline conditions during phase 1. Students were academically engaged between 73% - 80% during Baseline with an average of 76% academically engaged, between 89% - 94% during Token Economy with an average of 93% academically engaged, between 79% - 84% during Response Cost with an average of 81% academically engaged, and between 90% - 94% during the Combination condition with an average of 91% academically engaged during phase 1 (see figures 1 & 2). Results from the second phase of the study showed Token Economy was slightly better at increasing student engagement during math compared to the Combination condition for S.M. classroom. Students were academically engaged between 94% - 96% of the time during Token Economy with an average of 95% of the time and between 88% - 91% of the time during the Combination condition with an average of 90% of the time academically engaged. The final phase of the study consisted of only the Token Economy condition in which students were academically engaged between 93% - 97% of the time with an average of 96% of the time (see figures 1 & 2).

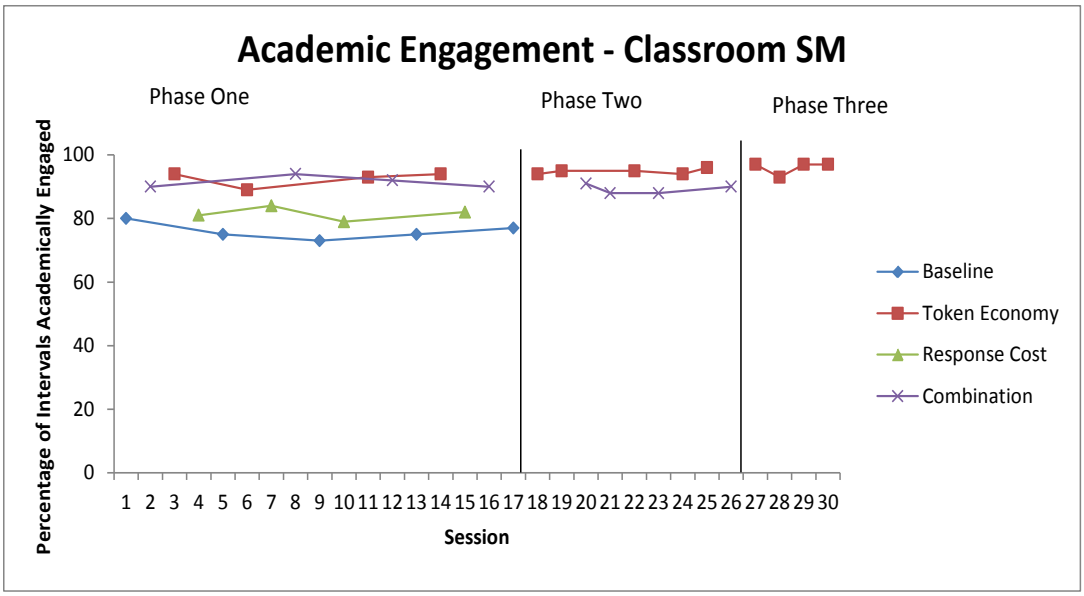


Figure 3. Percent of intervals students were academically engaged in S.M.'s classroom during the Token Economy, Response Cost, Combination, and Baseline conditions across the three phases.

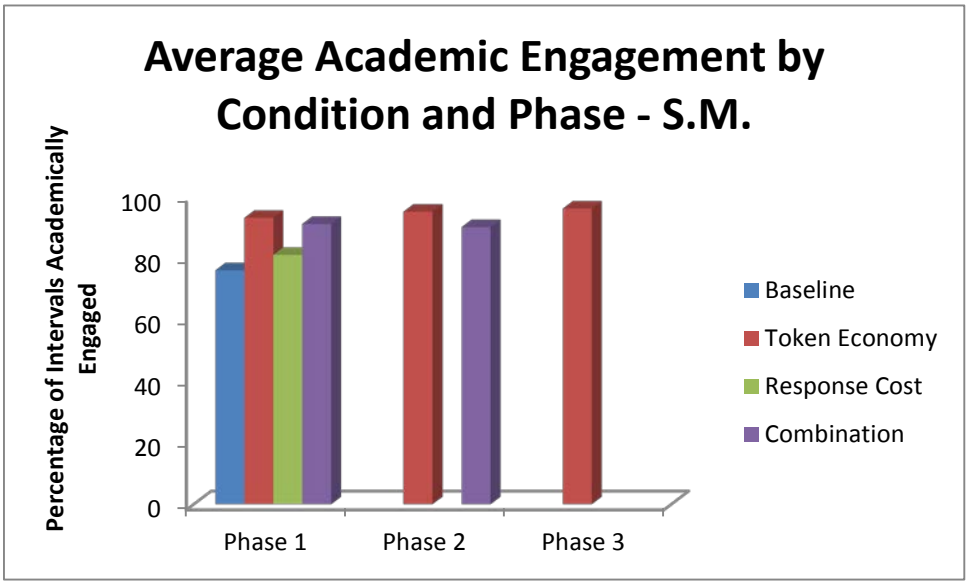


Figure 4. The average percentage of intervals students were academically engaged by condition across the three phases for S.M.'s classroom.

Table 1

Percentage of Non-Overlapping Data Points Among Conditions for Academic Engagement by Classroom

	Academic Engagement			
Classroom:	**Condition(s)**	**Compared to:**	**Effect Size**	**Descriptor**
C.S.	Token Economy, Combination, Response Cost	Baseline	100%	Highly Effective
	Combination, Token Economy	Response Cost	100%	Highly Effective
	Response Cost	Baseline	100%	Highly Effective
	Token Economy	Combination	Phase 1 = 25% Phase 2 = 100%	Phase 1 = Ineffective Phase 2 = Highly Effective
S.M.	Token Economy, Combination, Response Cost	Baseline	100%	Highly Effective
	Combination, Token Economy	Response Cost	100%	Highly Effective
	Response Cost	Baseline	100%	Highly Effective
	Token Economy	Combination	Phase 1 = 0% Phase 2 = 100%	Phase 1 = Ineffective Phase 2 = Highly Effective

Table 1 shows that all three conditions, Token Economy, Combination, and Response Cost were highly effective compared to the Baseline condition at increasing academic

engagement in both classrooms. Additionally, Token Economy and Combination conditions were Highly Effective compared to the Response Cost condition at increasing academic engagement in both classrooms. Lastly, Token Economy was not more effective compared to the Combination condition at increasing academic engagement during the first phase for either classroom, however, during the second phase, Token Economy was highly effective at increasing academic engagement compared to the Combination condition.

Disruptive Behavior

Results from the study show both Token Economy and Combination conditions were more effective at decreasing the rate of disruptive behaviors during math for both classrooms compared to the Response Cost and Baseline conditions during phase 1. As can be seen from figures 5 and 6, the rate of disruptive behavior for C.S. classroom ranged from .92 – 1.2 behaviors per minute during the baseline condition with an average of 1.04 behaviors per minute. During the Token Economy condition, disruptive behavior ranged from .16 - .32 behaviors per minute with an average of .22 behaviors per minute. During the Response Cost condition, disruptive behavior ranged from .52 - .88 behaviors per minute with an average of .72 behaviors per minute. During the Combination condition, disruptive behavior ranged from .12 - .4 behaviors per minute with an average of .15 behaviors per minute. Results from the second phase of the study show that Token Economy was slightly better at decreasing the rate of disruptive behavior for C.S. classroom compared to the Combination condition. According to figures 5 and 6, disruptive behavior ranged from .12 - .2 behaviors per minute during Token Economy

with an average of .15 behaviors per minute compared to .24 - .32 disruptive behaviors per minute during Combination with an average of .28 behaviors per minute. The final phase of the study consisted of the Token Economy condition for C.S. classroom. Disruptive behaviors ranged from .12 - .13 behaviors per minute with an average of .13 behaviors per minute.

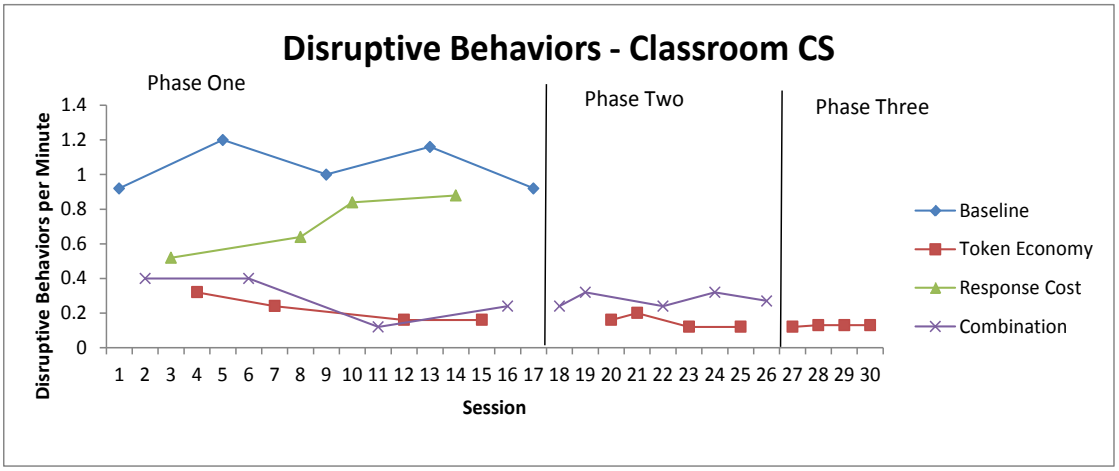


Figure 5. Rate of disruptive student behaviors per minute during the Token Economy, Response Cost, Combination, and Baseline conditions for C.S.' classroom across the three phases.

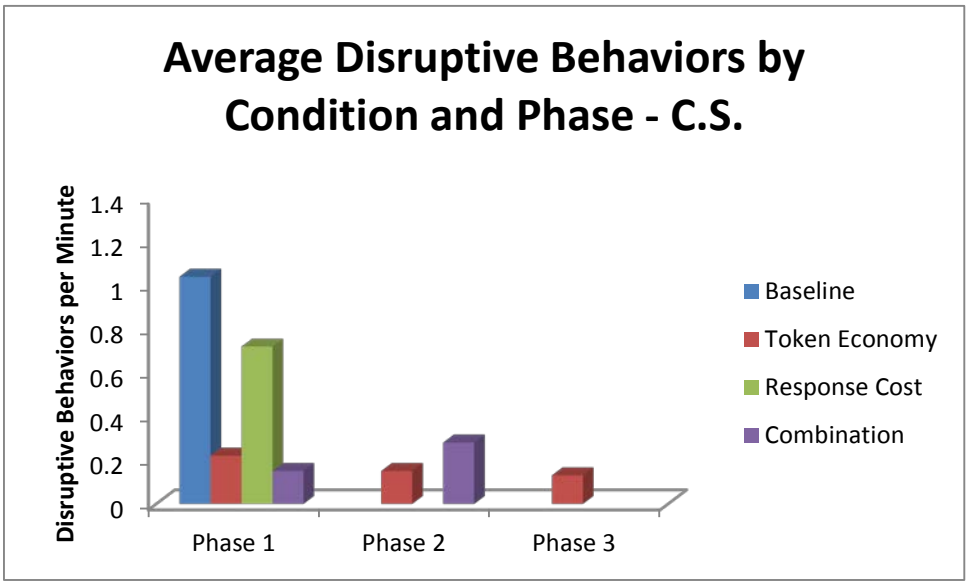


Figure 6. Average rate of disruptive student behaviors per minute by condition across the three conditions for C.S.' classroom.

As can be seen from figures 7 and 8, the rate of disruptive behavior for S.M. classroom ranged from 1 – 1.24 behaviors per minute during baseline with an average of 1.12 behaviors per minute during phase 1. During the Token Economy condition, disruptive behavior ranged from .16 - .28 behaviors per minute with an average of .21 behaviors per minute. During the Response Cost condition, disruptive behavior ranged from .6 – 1.08 behaviors per minute with an average of .8 behaviors per minute and during the Combination condition, disruptive behavior ranged from .24 - .52 behaviors per minute with an average of .35 behaviors per minute. During the second phase of the study, results showed that Token Economy was slightly better at reducing the rate of disruptive behavior among students during math compared to the Combination condition. According to figures 7 and 8, the rate of disruptive behaviors ranged from .16 - .24 behaviors per minute during Token Economy with an average of .19 behaviors per

minute while the rate of disruptive behaviors ranged from .27 - .36 behaviors per minute for Combination with an average of .3 behaviors per minute. The final phase of the study consisted of the Token Economy condition for S.M. classroom. Disruptive behaviors ranged from .12 - .26 behaviors per minute with an average of .16 behaviors per minute.

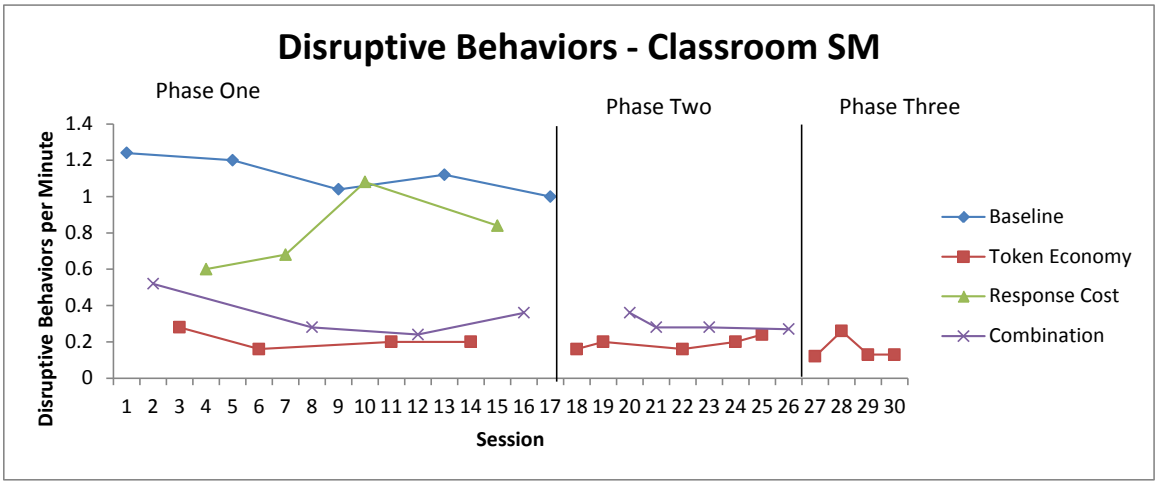


Figure 7. Rate of disruptive student behaviors per minute during the Token Economy, Response Cost, Combination, and Baseline conditions for S.M.'s classroom across the three phases.

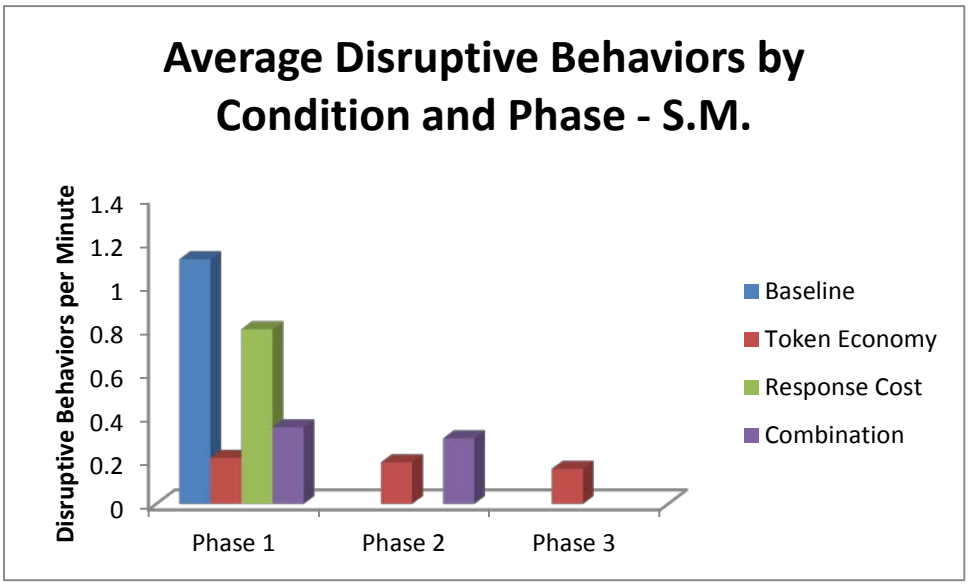


Figure 8. Average rate of disruptive student behaviors per minute by condition across the three conditions for S.M.'s classroom.

Table 2

Percentage of Non-Overlapping Data Points Among Conditions for Disruptive Behavior by Classroom

	Disruptive Behavior			
Classroom:	**Condition(s)**	**Compared to:**	**Effect Size**	**Descriptor**
C.S.	Token Economy, Combination, Response Cost	Baseline	100%	Highly Effective
	Combination, Token Economy	Response Cost	100%	Highly Effective
	Response Cost	Baseline	100%	Highly Effective
	Token Economy	Combination	Phase 1 = 0% Phase 2 = 100%	Phase 1 = Ineffective Phase 2 = Highly Effective
S.M.	Token Economy, Combination, Response Cost	Baseline	94%	Highly Effective
	Combination, Token Economy	Response Cost	100%	Highly Effective
	Response Cost	Baseline	89%	Moderately Effective
	Token Economy	Combination	Phase 1 = 88% Phase 2 = 100%	Phase 1 = Moderately Effective Phase 2 = Highly Effective

Table 2 shows that all three conditions, Token Economy, Combination, and Response Cost were highly effective compared to the Baseline condition at decreasing problem behaviors in both classrooms. Token Economy and Combination conditions were Highly Effective compared to the Response Cost condition at decreasing problem behaviors in both classrooms. Response Cost condition was highly effective at reducing problem behaviors compared to the Baseline condition in C.S. classroom but was only moderately effective in S.M. classroom. Lastly, when looking at Token Economy compared to the Combination condition, there was no difference during phase 1 in C.S. classroom, however during phase 2 Token Economy was highly effective. For S.M. classroom, during phase 1 Token Economy was moderately effective and during phase 2, Token Economy was highly effective compared to the Combination condition.

Academic Performance

Results from the study show that, on average, Baseline and Token Economy conditions were slightly better at increasing Academic Performance compared to Response Cost and the Combination conditions for C.S. classroom (see figure 10). During phase 1, academic performance ranged from 1.78 points to 2.91 points during Baseline with an average of 2.37 points. During Token Economy, academic performance ranged from 1.88 points to 2.81 points with an average of 2.35 points. During Response Cost, academic performance ranged from 1.93 points to 2.62 points with an average of 2.22 points and during the Combination condition, academic performance ranged from 1.81 points to 2.27 points with an average of 1.99 points. During the second phase of the study, Token Economy resulted in slightly higher Academic Performance scores

compared to the Combination condition with a range of 2.27 to 2.31 points (average = 2.3 points) compared to a range of 1.75 to 2.53 points (average = 2.1 points). During the final phase of the study, only the Token Economy condition was delivered and academic performance ranged from 1.84 – 2.8 points with an average of 2.32 points (see figures 9 & 10).

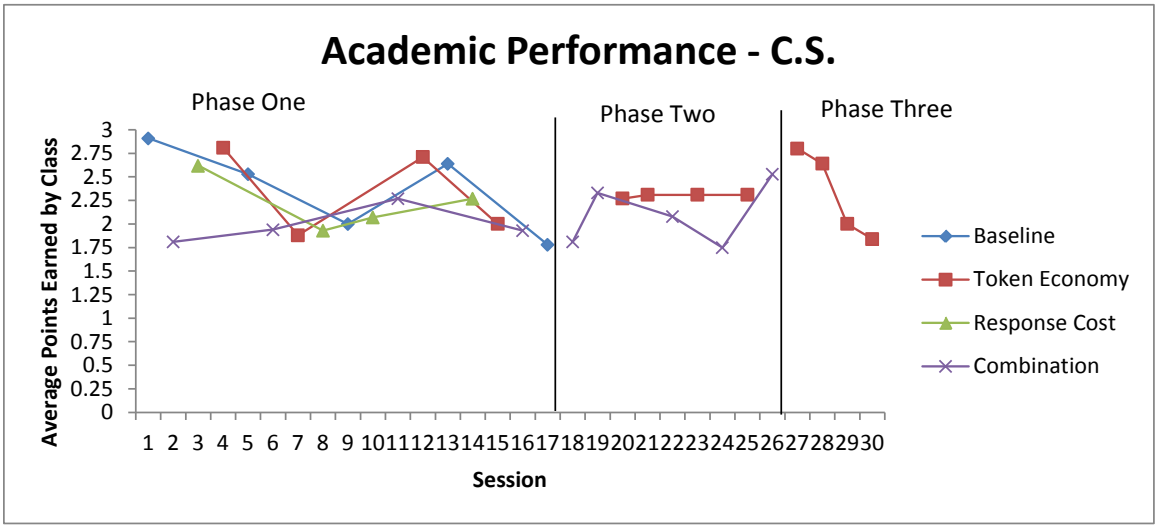


Figure 9. Academic performance as measured by average class points earned on a three point quiz given to students daily during the Token Economy, Response Cost, Combination, and Baseline conditions across the three phases for C.S.' classroom.

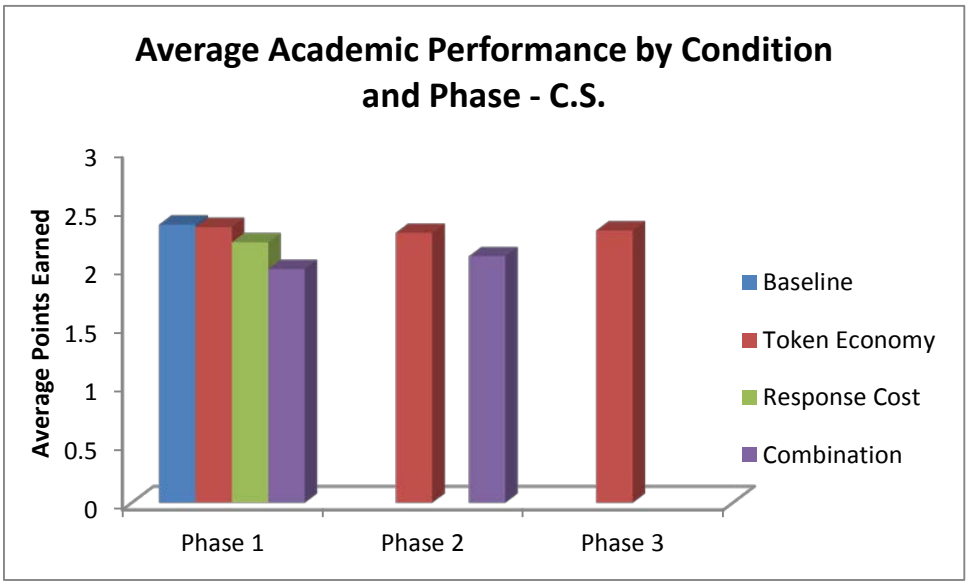


Figure 10. Average academic performance as measured by average points earned on daily three point quiz by condition across the three phases in C.S.' classroom.

Results from the study show that, on average, Token Economy and Response Cost conditions were slightly better at increasing academic performance compared to the Baseline and Combination conditions during phase 1 for S.M. classroom (see figure 12). During phase 1, academic performance ranged from 2.2 points to 2.82 points during Baseline with an average of 2.43 points. During Token Economy, academic performance ranged from 2.36 points to 2. 85 points with an average of 2.59 points. During the Response Cost condition, academic performance ranged from 2.28 points to 2.93 points with an average of 2. 6 points and during the Combination condition academic performance ranged from 2.07 points to 2.39 points with an average of 2.29 points. During the second phase of the study, Token Economy resulted in slightly higher academic performance scores compared to the Combination condition with a range of 2.31 – 2.69 points (average = 2.59 points) compared to a range of 2.31 – 2.85 points

(average = 2.51 points). During the final phase of the study, only the Token Economy condition was delivered and academic performance ranged from 2.58 – 2.91 points with an average of 2.78 points (see figures 11 & 12).

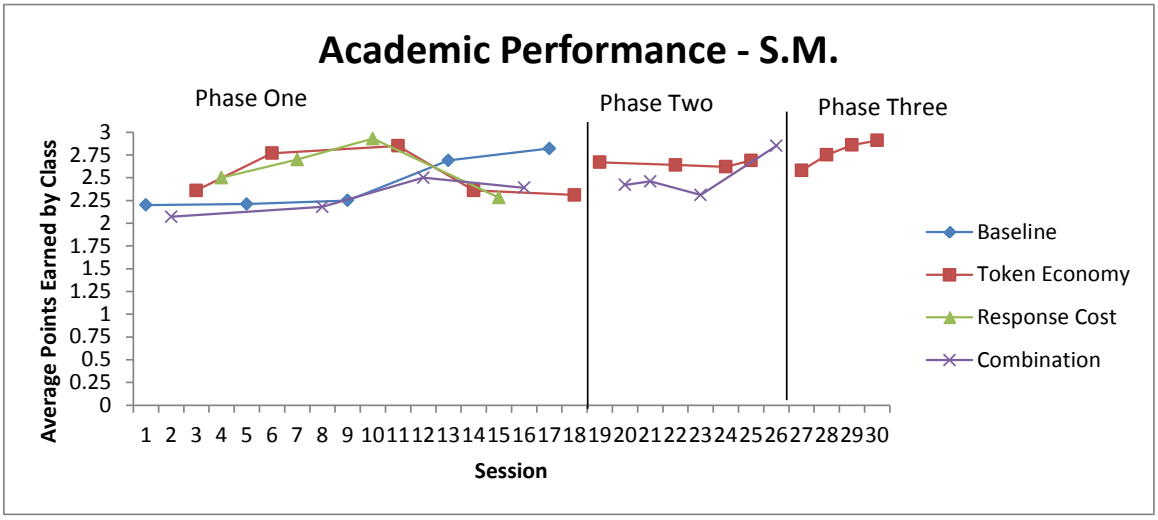
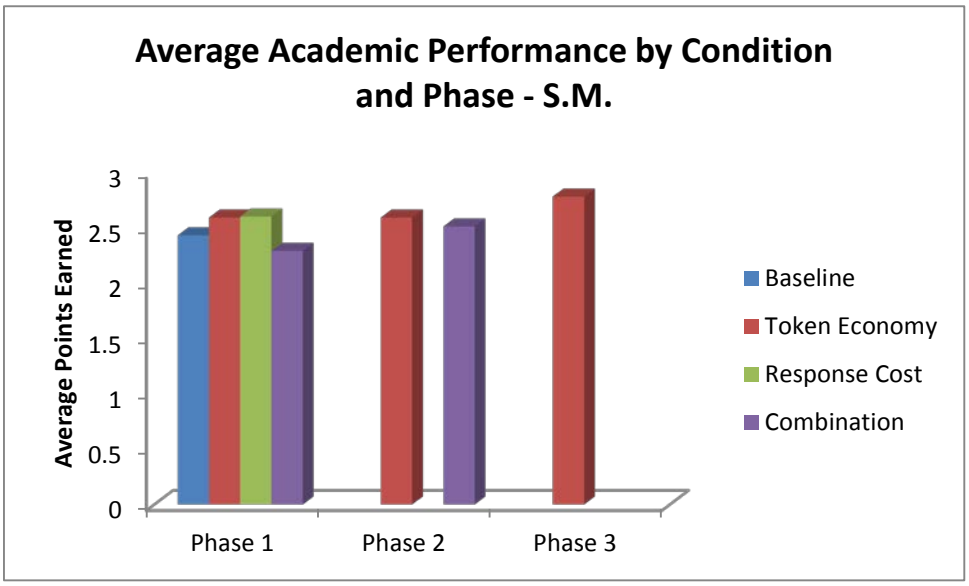


Figure 11. Academic performance as measured by average class points earned on a three point quiz given to students daily during the Token Economy, Response Cost, Combination, and Baseline conditions across the three phases for S.M.'s classroom.



.

Figure 12. Average academic performance as measured by average points earned on daily three point quiz by condition across the three phases in S.M.'s classroom.

Table 3

Percentage of Non-Overlapping Data Points among Conditions for Academic Performance by Classroom

	Academic Performance			
Classroom:	**Condition(s)**	**Compared to:**	**Effect Size**	**Descriptor**
C.S.	Token Economy, Combination, Response Cost	Baseline	0%	Ineffective
	Combination, Token Economy	Response Cost	17%	Ineffective
	Response Cost	Baseline	0%	Ineffective
	Token Economy	Combination	Phase 1 = 25% Phase 2 = 0%	Phase 1 = Ineffective Phase 2 = Ineffective
S.M.	Token Economy, Combination, Response Cost	Baseline	12%	Ineffective
	Combination, Token Economy	Response Cost	0%	Ineffective
	Response Cost	Baseline	11%	Ineffective
	Token Economy	Combination	Phase 1 = 25% Phase 2 = 0%	Phase 1 = Ineffective Phase 2 = Ineffective

Table 3 shows that none of the conditions, Token Economy, Combination, Response Cost or Baseline were moderately or highly effective at increasing academic performance in either classroom.

Student Preference

Results from the individual student interviews for C.S. classroom showed that students favorite condition was Token Economy (n = 11) followed by Combination (n = 3), Response Cost (n = 1), and Baseline (n = 0). Students least favorite condition was Response Cost (n = 8) followed by Baseline (n = 5), Token Economy (n = 1), and Combination (n = 1). The condition most students wanted their teacher to implement in the future was Combination (n = 8) followed by Token Economy (n = 6), Baseline (n = 1), and Response Cost (n = 0). One student was absent the day of the individual interviews.

Results from the individual student interviews for S.M. classroom showed that students favorite conditions were Combination (n = 6) and Token Economy (n = 6) followed by Response Cost (n = 0), and Baseline (n = 0). Students least favorite condition was Baseline (n = 7) followed by Response Cost (n = 4), Token Economy (n = 1), and Combination (n = 0). One student was not sure which condition was their least favorite and did not provide an answer to this question. The condition most students wanted their teacher to implement in the future was Combination (n = 6) followed by Token Economy (n = 5), Response Cost (n = 1), and Baseline (n = 0). One student was absent the day of the individual interviews.

Teacher Preference

Results from the individual teacher interviews found that, overall, both teachers found advantages of the classroom management strategies on student behavior compared to the baseline condition. Teacher C.S. reported Response Cost was the easiest condition to administer because she was able to set it up ahead of time and only take away tokens when students were not meeting her expectations, therefore, it took the least amount of time away from delivering instruction. Additionally, her students do not sit in one spot throughout the lesson, and so less interaction with the tokens made the lesson run more smoothly. C.S. reported the Combination condition was the hardest to administer because of the amount of time it took to carry out. With her students moving throughout the classroom during the lesson, she had to wander around the room to where the tokens were located to remove/deliver tokens contingent on behavior for each student which took more time and resulted in the lesson running less smoothly. With that said, C.S. reported she felt her students were less engaged during the Response Cost condition compared to the Token Economy and Combination conditions. She believed this was because once the tokens were gone, her students knew there were no more opportunities to earn them back even if they fixed the problem. When asked which condition she will most likely implement in the future, C.S. reported she would likely implement the Combination condition because it aligns closely with her behavior management philosophy. She reported she is least likely to implement the Response Cost condition in the future because the students have nothing to work for once they lose their tokens.

Teacher S.M. reported she liked administering the Combination Condition the most because she felt like she had more control of her class. They were able to earn tokens for appropriate behavior but she could also take away tokens for inappropriate behavior. S.M. felt this encouraged her students to promote positive behavior during the entire lesson. S.M. reported Response Cost as the condition she liked administering the least because she did not like the idea that once her students had all of their tokens taken away they had nothing to work for. She felt she had students who viewed losing all of their tokens as being, "out of the game," and no longer needed to try or engage in good behavior. S.M. noticed her students behaved better and were more academically engaged during all three of the classroom management strategies compared to the Baseline condition but she felt of the three (Response Cost, Token Economy, Combination), her students were more disruptive and less academically engaged during the Response Cost condition. When asked which condition S.M. is most likely to implement in the future, she reported that her students loved the Token Economy condition and also seemed to like the Combination condition which was her favorite. She reported she is currently implementing the Combination Condition during Math class and plans to use all three, but primarily the Combination and Token Economy conditions, throughout her teaching lessons as she feels they will be helpful. S.M. reported she is least likely to implement the Response Cost condition in the future because she wants to encourage positive, respectful behavior in her classroom. With Response Cost, she felt she was focusing mainly on negative behavior and not able to recognize the positive behaviors as much as she wanted to.

Throughout the individual teacher interviews, both teachers mentioned advantages and disadvantages to participating in the study as well as changes to the strategies they would consider in the future. C.S. reported the strategies were similar to strategies she had employed in the past with her students, although she had never actually used tokens. One of the advantages of the study then was the experience with tokens. One of the disadvantages to the study was getting used to handing out and taking away the tokens. It made her ability to teach at her regular pace much harder, particularly at first. This issue was compounded by the fact that her students move around from their desk to multiple different floor areas throughout the classroom during instructional time making a central location for tokens to be housed impossible. Implementation would have been easier if it would have been throughout the day instead of concentrated into the Math lesson. C.S. reported another advantage was the opportunity to try the different classroom management strategies in her classroom, particularly because some of them aligned so nicely with her classroom philosophy. It gave her new strategies that were similar to her previous strategies but with a new twist. C.S. reported the tokens were much easier to manage when the students were at their desks working compared to on the floor because the tokens could be housed on their name trays. C.S. reported she would also change the number of tokens required for exchange because she went through quite a bit of candy.

S.M. reported a number of student, classroom, and teacher advantages to the study. She felt her students were more engaged and eager to learn because a new strategy was used each day, her students were listening more and therefore learning, her students enjoyment of math class increased, and students practiced following the rules of being

respectful, responsible, and safe. S.M. reported she had a more positive, working classroom environment and a more manageable classroom. She also reported fewer classroom behavior disruptions overall, increase in academic engagement, and the ability as a teacher to encourage positive behaviors. S.M. reported student, classroom, and teacher disadvantages as well. She worried some of her students might have felt anxiety/pressure about whether or not they were going to lose a token. She also worried that after time, her students would have gotten tired of candy and stamps as a reward and lose motivation and that handing out the prizes at the end of math time took time. Additionally, at times, she lost focus of the lesson, particularly in the beginning when she was getting used to each of the different conditions because she was focusing so much on whether or not she should be delivering or taking away a token from a student. S.M. reported she liked being able to use the different strategies each day to evaluate which worked best for her students and she particularly liked how two of the three focused on positive behaviors. She felt that many of her current classroom management tools focused on poor behaviors rather than positive behaviors so she was happy to add two more tools to her toolbox that focus on reinforcing positive behaviors. Like C.S., S.M. reported at times she found it hard to hand out/take away the tokens due to the students moving around the room and having a central location for the tokens to be housed was not possible. One change she would think about would be to sometimes have students start with five tokens and sometimes have them start with zero tokens for the Combination condition.

Treatment Fidelity

Treatment fidelity was collected for 100% of the sessions on the instructions given to the class, tokens handed out according to the correct schedule/condition, the exchange of tokens at the end of math class, and the administration of the three point quiz. Both teachers had 100% fidelity for all four treatment components across all sessions throughout the three phases.

Inter-rater Reliability

Inter-rater reliability was collected for 33% of the sessions for each of the classrooms. The mean total agreement for academic engagement for C.S. classroom for all sessions was 98.3%, ranging from 95% - 100%. The total agreement for disruptive behavior for C.S. classroom for all sessions was 100% along with the total agreement for treatment fidelity and the grading of the three point quizzes. The mean total agreement for academic engagement for S.M. classroom for all sessions was 98.2%, ranging from 93% - 100%. The total agreement for disruptive behavior for S.M. classroom for all sessions was 100% along with the total agreement for treatment fidelity and the grading of the three point quizzes.

CHAPTER IV

DISCUSSION

Overall, the results from this study are similar to the results of the pilot study conducted in Florida with both Token Economy and the Combination conditions being the most effective at increasing academic engagement and decreasing disruptive behavior in the classroom compared to Response Cost and Baseline conditions. Additionally, students' favorite conditions were Token Economy and Combination conditions and their least favorite conditions were Response Cost and Baseline. In both studies, the students wanted their teacher to implement the Combination condition in the future over the other three conditions.

The findings of this study are interesting because previous studies have found little to no significant difference in the ability of these different classroom management strategies to reduce problem behaviors (Kaufman & O'Leary, 1972; McGoey & DuPaul, 2000; McLaughlin & Malaby, 1972) while the current study found a difference between the conditions. Both Token Economy and Combination conditions were more effective at reducing disruptive classroom behaviors compared to the punishment based Response Cost condition. The results of the current study also showed a difference between the conditions for academic engagement. While some previous studies have shown little to no difference between the punishment based Response Cost conditions and the reward based Token Economy strategies (Kaufman & O'Leary; Panek, 1970) at increasing academic engagement, the current study showed that the reward based condition, Token

Economy, and Combination conditions were more effective at increasing academic engagement in students during math class.

Additionally, previous studies have shown support for Response Cost to be the preferred or "accepted" classroom management strategy among educators and parents (Frentz & Kelley, 1986; Little & Kelley, 1989), however, the current study shows support for the Token Economy and Combination conditions. While C.S. reported the Response Cost condition was the easiest to implement, she stated it was also the condition in which her students were the least academically engaged. Additionally, she reported in the future, she is most likely to implement the Combination condition and least likely to implement the Response Cost condition. S.M. had a similar viewpoint although she said the Combination condition was her favorite condition and Response cost was her least favorite to administer. Like C.S., S.M. reported her students were the least academically engaged during the Response Cost condition and not only is she more likely to implement both the Combination and Token Economy conditions in the future, she is currently implementing the Combination condition during Math.

The students in the current study clearly preferred the Token Economy condition and Combination condition over the Response Cost and Baseline conditions. Some of the reasons why they preferred Token Economy included, "You can't lose them, you can only earn them," "I like earning them and not getting them taken away," and "You can't get them taken away," "I like earning them." Some of the reasons stated why they preferred the Combination condition included, "You start with 5 and you can lose and earn so you do not have to be so good," "because you earn and lose and you start with

some," "I just like it so much," "You can get them taken away but you can earn them again," "Because you start with 5 and you can earn more," and "Because when you make a mistake and you get them taken away you can earn it back again if you do ok." The student who said Response Cost was their favorite condition said it was because, "You do not have to earn any, you just keep the ones you have or get them taken away." Some of the reasons students said Response Cost was their least favorite condition included; "You can't earn them back once you lose them," "I don't like getting them taken away," "The teacher takes mine away," "Because mine always get taken away," "They can get taken and you can't get them back," and "Can only get them taken away but you can't earn them back no matter how hard you try." Some of the reasons students said Baseline was their least favorite condition included; "Because I like candy and you don't get candy," "No tokens," "You can't earn tokens," "You can't earn candy or stamps," "I like tokens and want them," "Because we start with none and end with none," "Because we don't get any candy and no tokens," and "Because we have no tokens." The student who said Token Economy was their least favorite said it was because, "You have to be like an 'angel' to get a token." The other student who said Token Economy was their least favorite and the student who said Combination was their least favorite was unable to provide an answer for why. Unlike the pilot study, the researchers were unable to ask students which condition(s) made it easier/harder for them to learn and why due to the age of the students and their limited ability to self-report.

The current study sought to address the methodological weaknesses of previous studies assessing Token Economy systems as evidence based classroom management

strategies for reducing problem behaviors among students. This study addressed the methodological weaknesses by: collecting and analyzing treatment fidelity, social validity, and interobserver agreement data. Additionally, the study met the requirements for a sound methodological design such as including a baseline, having a minimum of three data points per condition and phase, and operationally defining the independent and dependent variables (Kratochwill et al., 2002; 2010).

Although the pilot study found a difference between the conditions for academic performance using the 'Paws up for Understanding' self-assessment, the current study did not find a clear distinction between the conditions. Each time a new math topic or skill was introduced, student performance on the three point quiz decreased and gradually increased throughout the unit until it was complete and the next topic or skill was introduced again. Therefore, one limitation to the current study was that history effect may not have been controlled for as tightly as planned for measuring academic performance with the three point quiz.

A second limitation to the study was the limited settings assessed. The conditions were only assessed during the math lesson each day for each teacher and only for first grade. A larger, more diverse sample size and longer session length would be beneficial for future studies, particularly to see if the trend of student and teacher preference for Token Economy and Combination conditions continue and to determine if these two conditions are more effective at increasing academic engagement and reducing disruptive behavior in the classrooms compared to the Response Cost and Baseline conditions.

A third limitation to the study was the administration of the tokens within each condition. The teacher was responsible for delivering/removing tokens contingent on student behavior along with teaching her class. Therefore, at times, the tokens were not administered as rigorously as they could have been if someone were in the classroom with the sole responsibility of watching student behavior and manipulating tokens contingent on student behavior.

APPENDIX A:

CONSENT AND ASSENT FORMS:

1. Teacher Consent Form
2. Principal Consent Form
3. Parent/Guardian Consent Form
4. Student Assent Form (Ages 6-9)
5. Student Assent Form (Ages 10-13)
6. Agency Consent Form
7. Agency Letter of Intent

Teacher Consent Form

Informed Consent

We are interested in conducting a research project with teachers in your school district. At this time, it is our prospect to train teachers to use three different classroom management procedures; response cost, token economy, and a combination of response cost and token economy. Data on the instances of problem behaviors as well as academic performance will be recorded and analyzed through visual analysis of the data. The teachers we are requesting to work with are those working in elementary schools teaching children in general education classrooms.

This proposed research project is in association with the School Psychology Doctoral Program of Minnesota State University, Mankato and has passed the human subject's research review. Participation in this study is voluntary, and refusal or withdrawal from the study, at any time, will involve no penalty to participants in the study nor will it impact any current or future relationship with Minnesota State University Mankato. Dan Houlihan, Ph.D. is supervising this research, which is being proposed by Britta Fiksdal, M.A., School Psychology Graduate Student. If there are any questions, feel free to call Dr. Houlihan at (507)389-6308 or Britta Fiksdal at (507) 450-1828. The IRB case number for this study is: 538290-1

The following is a description of the research we are requesting to perform (See Teacher Manual below for additional details):

It is our desire to obtain the consent of teacher(s) within your school district in order to obtain data from their classrooms during four different classroom management conditions; response cost, token economy, a combination of token economy and response cost, and a control baseline condition. Data on the instances of problem behaviors exhibited as well as academic performance will be collected and compared to see if there is a difference in effectiveness between the conditions. Research has shown that response cost is just as effective in reducing problem behaviors as token economies and token economies that incorporate response cost systems. The specific purpose of our research is to compare the effectiveness of academic performance between the four conditions along with problem behaviors. Each teacher will be collecting their own data on problem behaviors and academic performance for their class on a separate data sheet and reporting to the researchers on a daily basis. In light of this research, it is our prospect that this information aid researchers in proposing future areas of research and may prove valuable in the training of teachers and classroom management.

At no time will we record any behavior of the children in the classroom or an individual who has not consented to our observation. In addition, no identifying information

regarding the students will be taken and any identifying information about the teachers will be kept in our secured research lab in a locked cabinet. Students will be assigned a number id by the teachers; therefore, data given to the researchers will not have any identifying information.

Each of the teachers who agree to participate in our study will be asked to give formal consent to the observation of them in their classroom. With agency and teacher consent, the study should take approximately two months.

It is anticipated that the teachers and students of the classroom(s) involved will not experience any harmful affects whatsoever from participating in this study. In this respect, in no way would any information gained from the observation be used in a judgmental manner toward the teacher(s) or be shared with the public in a judgmental manner. Additionally, data will be analyzed by Dr. Houlihan and students associated with our research team in the School Psychology Doctoral Program at Minnesota State University, Mankato who will be trained in proper methods of informed consent and confidentiality. All consent forms and data will be stored in a locked cabinet in a locked closet in the School Psychology clinic on campus under the care of Dr. Daniel Houlihan.

We intend to complete this study this winter and anticipate working with your school. We appreciate your time in considering working with us on this endeavor. Again, please feel free to contact Dr. Houlihan at (507)389-6308 if you have any questions. If you have questions regarding the rights and treatment of human subjects participating in research studies, you can contact the Dean of Graduate Studies, Dr. Barry Ries at (507) 389-2321.

We would greatly appreciate you working with us and request that you complete the below form giving permission for schools in your district to participate in our research.

Sincerely,

Dan Houlihan, Ph.D.
Professor and Director of School Psychology

Britta Fiksdal, M.A.
Doctoral Graduate Student

I have read the above description of the research study on Teacher/Student Interaction to be conducted by Dan Houlihan, Ph.D. in conjunction with students from the School Psychology Doctoral Program at Minnesota State University, Mankato.

I give consent for researchers associated with this study to naturalistically observe me in my classroom.

Teacher's Name (Print): _____Title: _____
School: _____Grade/Classroom: _____
Level of Education Licensure:_____

Teacher's Signature_____Date_____

Participant Code #:_____

Principal Consent Form

Dear _____, Date_____

We are interested in conducting a research project with teachers in your school district. At this time, it is our prospect to train teachers to use three different classroom management procedures; response cost, token economy, and a combination of response cost and token economy. Data on the instances of problem behaviors as well as academic performance will be recorded and analyzed through visual analysis of the data. The teachers we are requesting to work with are those working in elementary schools teaching children in general education classrooms.

This proposed research project is in association with the School Psychology Doctoral Program of Minnesota State University, Mankato and has passed the human subject's research review. Participation in this study is voluntary, and refusal or withdrawal from the study, at any time, will involve no penalty to participants in the study nor will it impact any current or future relationship with Minnesota State University Mankato. Dan Houlihan, Ph.D. is supervising this research, which is being proposed by Britta Fiksdal, M.A., School Psychology Graduate Student. If there are any questions, feel free to call Dr. Houlihan at (507)389-6308 or Britta Fiksdal at (507) 450-1828. The IRB case number for this study is: 538290-1

The following is a description of the research we are requesting to perform:

It is our desire to obtain the consent of teacher(s) within your school district in order to obtain data from their classrooms during four different classroom management conditions; response cost, token economy, a combination of token economy and response cost, and a control baseline condition. Data on the instances of problem behaviors exhibited as well as academic performance will be collected and compared to see if there is a difference in effectiveness between the conditions. Research has shown that response cost is just as effective in reducing problem behaviors as token economies and token economies that incorporate response cost systems. The specific purpose of our research is to compare the effectiveness of academic performance between the four conditions along with problem behaviors. Each teacher will be collecting their own data on problem behaviors and academic performance for their class on a separate data sheet and reporting to the researchers on a daily basis. In light of this research, it is our prospect that this information aid researchers in proposing future areas of research and may prove valuable in the training of teachers and classroom management.

At no time will we record any behavior of the children in the classroom or an individual who has not consented to our observation. In addition, no identifying information regarding the students will be taken and any identifying information about the teachers will be kept in our secured research lab in a locked cabinet. Students will be assigned a number id by the teachers; therefore, data given to the researchers will not have any identifying information.

Each of the teachers who agree to participate in our study will be asked to give formal consent to the observation of them in their classroom. With agency and teacher consent, the study should take approximately two months.

It is anticipated that the teachers and students of the classroom(s) involved will not experience any harmful affects whatsoever from participating in this study. In this respect, in no way would any information gained from the observation be used in a judgmental manner toward the teacher(s) or be shared with the public in a judgmental manner. Additionally, data will be analyzed by Dr. Houlihan and students associated with our research team in the School Psychology Doctoral Program at Minnesota State University, Mankato who will be trained in proper methods of informed consent and confidentiality. All consent forms and data will be stored in a locked cabinet in a locked closet in the School Psychology clinic on campus under the care of Dr. Daniel Houlihan.

We intend to complete this study this winter and anticipate working with your school. We appreciate your time in considering working with us on this endeavor. Again, please feel free to contact Dr. Houlihan at (507)389-6308 if you have any questions. If you have questions regarding the rights and treatment of human subjects participating in research studies, you can contact the Dean of Graduate Studies, Dr. Barry Ries at (507) 389-2321.

We would greatly appreciate you working with us and request that you complete the below form giving permission for schools in your district to participate in our research.

Sincerely,

Dan Houlihan, Ph.D.
Professor and Director of School Psychology

Britta Fiksdal, M.A.
Doctoral Graduate Student

I have read the above description of the research study on Teacher Requests to be conducted by Dan Houlihan, Ph.D. in conjunction with students from the School Psychology Doctoral Program at Minnesota State University, Mankato. In addition, I understand that participation in this study is voluntary.

I give permission for _____ School to participate in this research study.

In addition, I give permission for the following classrooms to be contacted regarding this study:

_____

_____

_____

Principal's
Name _____ Date
_____

Parental Consent Form for Participation in Research

The purpose of this letter is to give consent for your child to participate in the research titled, "Comparing the Effectiveness of Reducing Problem Behavior and Increasing Academic performance between a Response Cost, Token Economy, and a Combination Condition" conducted by Dan Houlihan, Ph.D. (Professor of School Psychology) and Britta Fiksdal, M.A. (School Psychology Doctoral Graduate Student) in association with Minnesota State University, Mankato. Participation is entirely voluntary.

At this time, it is our prospect to train teachers to use three different classroom management procedures (token economy, response cost, and combination). Data on the instances of problem behaviors as well as academic performance will be recorded and analyzed through visual analysis of the data, however, all student information will be kept confidential and no identifying information will be shared about your student (students will be given id numbers by the teachers prior to submitting any data). Previous research shows that each of these three classroom management strategies is effective in reducing problem behavior; however, little research has focused on the effects on student academic performance. This study has been approved through the University's Institutional Review Board as well as approved by your child's school district, principal (name of principal here), and classroom teacher (name of classroom teacher here).

During the token economy condition, your student will receive tokens for exhibiting appropriate or "good" behavior. During the response cost condition, your student will receive a certain number of tokens at the beginning of the class. They will lose one token if they exhibit inappropriate or "problem" behavior. During the combination condition, your student will start with a certain number of tokens. Your student will receive tokens for exhibiting appropriate or "good" behavior and will lose tokens if they exhibit inappropriate or "problem" behavior. At the end of each class, your student can trade their tokens in for a reward. The amount or type of reward will depend on the amount of tokens your student has earned. During the baseline condition, students will not have the opportunity to lose or earn tokens. Throughout each condition, the

teacher will be delivering instruction as he/she normally would. Your student will not miss out on any educational instruction by participating in this study nor will it negatively impact their learning environment.

The results of this participation will be confidential and will not be released in any individually identifiable form. Additionally, data will be analyzed by Dr. Houlihan and Britta Fiksdal, who are trained in proper methods of informed consent and confidentiality. Data collection procedures will take place over a period of seven to eight weeks. Per district requirements, only those children with signed parent consent forms will be included in the data collection.

This proposed research project is in association with the School Psychology Doctoral Program of Minnesota State University, Mankato and has passed the human subject's research review. Participation in this study is voluntary, and refusal or withdrawal from the study, at any time, will involve no penalty to participants in the study nor will it impact any current or future relationship with Minnesota State University Mankato. Dan Houlihan, Ph.D. is supervising this research, which is being proposed by Britta Fiksdal, M.A., School Psychology Graduate Student. If there are any questions, feel free to call Dr. Houlihan at (507)389-6308 or Britta Fiksdal at (507) 450-1828. The IRB case number for this study is: 538290-1

We intend to complete this study this winter and we appreciate your consent for your child to participate in this endeavor. Feel free to contact Britta Fiksdal (507) 450-1828 or Dr. Houlihan (507) 389-6308 if you have any questions.

We greatly appreciate you working with us and request that you sign the below form giving permission for your child to participate in this research study.

Sincerely,

Dan Houlihan, Ph.D.
Professor and Director of School Psychology

Britta Fiksdal, M.A.
Doctoral Graduate Student

I have read the above description of the research study on Classroom Management to be conducted by Dan Houlihan, Ph.D. in conjunction with students from the School Psychology Doctoral Program at Minnesota State University, Mankato.

I give consent for my child to participate in this research project associated with Classroom Management.

Parent Name (Print): _____ Child Name (Print):_____

Parent Signature: _____ Date:_____

Student Assent (Ages 6-9)

Student's Name _____

My name is _____ and I am from Minnesota State University, Mankato. I will be working with your teacher on different ways to teach your class. Your teacher may be handing out tokens that can be exchanged for prizes during class. I would like you to be on your best behavior and listen to your teacher like you normally would.

During class, when the teacher hands out tokens, you can save them and exchange them for prizes at the end of the class or day. Some days you will be given tokens throughout class, other days you will be given tokens at the beginning of class, and some days there will not be any tokens. Your teacher will explain to you each day whether or not you can earn tokens. You cannot save them overnight; they must be exchanged before going home from school each day. Your teacher will be watching to see how students behave in your classroom and how well they are paying attention. You will not be taken out of your classroom at any time nor will you be asked to do anything different from the rest of your class.

After about two months of working with your classroom, I will ask you some questions about the tokens. Your answers will only be used by researchers to learn more about children like you. The teachers and other students in your school will never know your answers to the questions. Your answers will be written down and put with other children's answers. Your answers will help other teachers learn about children and the best way to teach them.

Your parent or guardian and teacher have said that it is okay for you to participate. Your teacher will be handing out tokens most days for approximately two months. If you decide that you do not want to receive tokens or you do not wish to answer the questions at the end just tell your teacher at any time. This is not a test and there are no wrong answers or behaviors. You will receive prizes when you earn and exchange tokens. These prizes will be determined by your teacher but could include items such as a pencil, piece of candy, getting to line up first for lunch, etc.

Tell your teacher or parents, if you are worried or unhappy about anything that happens during class the next two months.

_____ _____

Signature Date

Student Assent (Ages 10-13)

Student's Name _____

My name is _____ and I am from Minnesota State University, Mankato. You are being asked to be part of a research project that will help adults understand how to best teach elementary students. I will be working with your teacher on different ways to teach your class. Your teacher may be handing out tokens that can be exchanged for prizes during class. I would like you to be on your best behavior and listen to your teacher like you normally would.

During class, when the teacher hands out tokens, you can save them and exchange them for prizes at the end of the class or day. Some days you will be given tokens throughout class, other days you will be given tokens at the beginning of class, and some days there will not be any tokens. Your teacher will explain to you each day whether or not you can earn tokens. You cannot save them overnight; they must be exchanged before going home from school each day. Your teacher will be watching to see how students behave in your classroom and how well they are paying attention. You will not be taken out of your classroom at any time nor will you be asked to do anything different from the rest of your class.

After about two months of working with your classroom, I will ask you some questions about the tokens. Your answers will only be used by researchers to learn more about children like you. The teachers and other students in your school will never know your answers to the questions. Your answers will be written down and put with other children's answers. Your answers will help other teachers learn about children and the best way to teach them.

Your parent or guardian and teacher have said that it is okay for you to participate. Your teacher will be handing out tokens most days for approximately two months. If you decide that you do not want to receive tokens or you do not wish to answer the questions at the end just tell your teacher at any time. This is not a test and there are no wrong answers or behaviors. You will receive prizes when you earn and exchange tokens. These prizes will be determined by your teacher but could include items such as a pencil, piece of candy, getting to line up first for lunch, etc.

Tell your teacher or parents, if you are worried or unhappy about anything that happens during class the next two months.

_____ _____

Signature Date

Agency Consent Form

Dear _____, Date_____

We are interested in conducting a research project with teachers in your school district. At this time, it is our prospect to train teachers to use three different classroom management procedures; response cost, token economy, and a combination of response cost and token economy. Data on the instances of problem behaviors as well as academic performance will be recorded and analyzed through visual analysis of the data. The teachers we are requesting to work with are those working in elementary schools teaching children in general education classrooms.

This proposed research project is in association with the School Psychology Doctoral Program of Minnesota State University, Mankato and has passed the human subject's research review. Participation in this study is voluntary, and refusal or withdrawal from the study, at any time, will involve no penalty to participants in the study nor will it impact any current or future relationship with Minnesota State University Mankato. Dan Houlihan, Ph.D. is supervising this research, which is being proposed by Britta Fiksdal, M.A., School Psychology Graduate Student. If there are any questions, feel free to call Dr. Houlihan at (507)389-6308 or Britta Fiksdal at (507) 450-1828. The IRB case number for this study is: 538290-1

The following is a description of the research we are requesting to perform:

It is our desire to obtain the consent of teacher(s) within your school district in order to obtain data from their classrooms during four different classroom management conditions; response cost, token economy, a combination of token economy and response cost, and a control baseline condition. Data on the instances of problem behaviors exhibited as well as academic performance will be collected and compared to see if there is a difference in effectiveness between the conditions. Research has shown that response cost is just as effective in reducing problem behaviors as token economies and token economies that incorporate response cost systems. The specific purpose of our research is to compare the effectiveness of academic performance between the four conditions along with problem behaviors. Each teacher will be collecting their own data on problem behaviors and academic performance for their class on a separate data sheet and reporting to the researchers on a daily basis. In light of this research, it is our prospect that this information aid researchers in proposing future areas of research and may prove valuable in the training of teachers and classroom management.

At no time will we record any behavior of the children in the classroom or an individual who has not consented to our observation. In addition, no identifying information regarding the students will be taken and any identifying information about the teachers will be kept in our secured research lab in a locked cabinet. Students will be assigned a

number id by the teachers; therefore, data given to the researchers will not have any identifying information.

Each of the teachers who agree to participate in our study will be asked to give formal consent to the observation of them in their classroom. With agency and teacher consent, the study should take approximately two months.

It is anticipated that the teachers and students of the classroom(s) involved will not experience any harmful affects whatsoever from participating in this study. In this respect, in no way would any information gained from the observation be used in a judgmental manner toward the teacher(s) or be shared with the public in a judgmental manner. Additionally, data will be analyzed by Dr. Houlihan and students associated with our research team in the School Psychology Doctoral Program at Minnesota State University, Mankato who will be trained in proper methods of informed consent and confidentiality. All consent forms and data will be stored in a locked cabinet in a locked closet in the School Psychology clinic on campus under the care of Dr. Daniel Houlihan.

We intend to complete this study this winter and anticipate working with your school. We appreciate your time in considering working with us on this endeavor. Again, please feel free to contact Dr. Houlihan at (507)389-6308 if you have any questions. If you have questions regarding the rights and treatment of human subjects participating in research studies, you can contact the Dean of Graduate Studies, Dr. Barry Ries at (507) 389-2321.

We would greatly appreciate you working with us and request that you complete the below form giving permission for schools in your district to participate in our research.

Sincerely,

Dan Houlihan, Ph.D.
Professor and Director of School Psychology

Britta Fiksdal, M.A.
Doctoral Graduate Student

I have read the above description of the research study on Classroom Management to be conducted by Dan Houlihan, Ph.D. in conjunction with students from the School Psychology Doctoral Program at Minnesota State University, Mankato. In addition, I understand that participation in this study is voluntary and I can discontinue at any time with no penalty or negative consequences.

In signing this form, I give permission for researcher to contact school principals in the _____district to participate in this research study.

___ I do wish to receive a copy of this consent form
___ I do not wish to receive a copy of this consent form

Agency
Signature_____ Date
_____

Agency Letter of Intent

December 2, 2013

Dear Britta Fiksdal and Daniel Houlihan,

I am familiar with your research project titled, 'A Comparison of the Effectiveness of a Token Economy System, a Response Cost Condition, and a Combination Condition in Reducing Problem Behaviors and Increasing Student Academic Engagement and Productivity in Two Elementary Classrooms' and your desire to have Barron Area School District involved with it. Through talking with you and reading the Teachers Manual, I understand the role of Barron Area School District to allow you to train two of our elementary teachers in different classroom management strategies (Response Cost, Token Economy, and a Combination condition) and collect data on the frequency of problem behaviors, academic engagement, and academic productivity exhibited by the students in each class.

We have also discussed the role of the teachers and their classrooms and I am satisfied that their safety and welfare are adequately protected as described in the research protocol. In addition, I understand that this research will be carried out following sound ethical principles and that involvement in this research, for both Barron Area School District and the teachers, is strictly voluntary and guarantees the protection of participant's privacy. In particular, I understand that the investigator cannot provide me with data that might allow anyone other than the research team to identify anyone's answers unless permission has been specifically given by the subject. I agree that there will be no negative consequences for potential participants based on whether or not they choose to participate in the study. I understand what, if anything, they expect in return for participation in this research.

Therefore, as a representative of Barron Area School District, I agree to allow you to conduct your research at our agency/institution contingent on providing me with a copy of the IRB approval letter from Minnesota State University Mankato.

Sincerely,

Craig G. Broeren
District Administrator
broerenc@barron.k12.wi.us

The mission of the Barron Area School District is to ensure all students reach their dream while making a positive impact on the world.

Administrative Office: 100 West River Ave Barron, WI 54812 p: 715-537-5612 f: 715-637-5161

Barron High School p: 715-537-5627 f: 715-637-1603 | Woodland Elementary p: 715-537-5621 f: 715-637-9353
Riverview Middle School p: 715-537-5641 f: 715-637-5373 | Ridgeland-Dallas Elementary p: 715-949-1445 f: 715-949-1617
Dallas Early Learning Center p: 715-837-1180 f: 715-837-1201 | Almena Elementary p: 715-357-3263 f: 715-357-6513

APPENDIX B:

OBSERVATION FORMS AND TEACHER MATERIALS

1. Teacher Manual
2. Academic Engagement and Disruptive/Problem Behavior Observation Form
3. Academic Performance Observation Form
4. Treatment Integrity Observation Form

Teacher Manual

Implementation, Recording, and Observation

Purpose

The purpose of the study is to compare the effectiveness of a response cost condition, a token economy condition, and a combination condition for both reducing problem behavior and increasing academic behavior among fourth grade students. The procedure will involve training teachers in on three different classroom management strategies; response cost, token economy, and a combination of response cost and token economy. Data on the instances of problem behaviors and academic performance will be recorded by the teacher and analyzed by the researchers.

Implementation and Recording of Data

Problem Behavior

The observation form utilized in this study will be used to collect data regarding the instances of problem behaviors among students. The teacher will indicate when a student exhibits a problem behavior by recording which student and which problem behavior was exhibited. The different problem behaviors to be recorded will be discussed with each teacher to determine what behavior each specific teacher sees as being problematic. Additionally, the data collection sheets will be developed with the teacher to increase understanding of data collection and ensure feasibility of the data collection procedure.

Academic Performance and Understanding

Teachers will also record the percentage of time students were academically engaged using a simple likert scale that will be developed with the teacher's input prior to the study beginning. Each classroom is different and so the data collection will be tailored to each class. Currently, the teachers are doing a Paws up For Understanding at the end of each lesson. This data is already being collected by the teacher but will be handed to the researcher for academic understanding analysis. Overall, all data will be collected by the teacher and analyzed by the researchers. The Paws up for Understanding can be recorded at a later time and is already collected. The data for academic engagement will consist of the teacher simply circling a number that best corresponds with their class' engagement during the condition. The data for problem behaviors will be collected using a simple clicker counter and the number on the counter at the end of the condition will simply be written down on the top of the academic engagement data sheet. Data collection will be very short and easy for the teachers.

Conditions

During each condition the teacher will observe and record the instances of problem behavior and deliver/remove tokens depending on the condition. Each day, the teacher will implement one of the classroom management strategies and collect data for either the entire day or half of the day depending on the teacher preference and daily schedule (see below for teacher instructions).

Informed Consent and Debriefing

Teachers that will be participating have been provided informed consents. We will plan to hold update meetings as we complete each phase of the study.

Design

For the first phase, the teachers will alternate between the four different conditions throughout four weeks. The order of conditions for each week will be determined through a Latin squares design and provided to the teacher at the beginning of the study. For example, the first week the schedule could look like this: Monday implement Baseline, Tuesday implement Token Economy, Wednesday implement Combination, Thursday implement Response Cost, and Friday implement Baseline. Teachers will have the option of either implementing the condition for an entire day or half day depending on their schedule. Phase 2, weeks five through six, will consist of rotating between the two conditions that data indicates is the most effective at reducing problem behaviors and increasing academic engagement and understanding. Phase 3, the seventh week, will consist of the teacher implementing the final condition that data indicates is superior at reducing problem behaviors and increasing academic engagement and understanding. As with the first four weeks, the teacher will have the option of implementing the condition for an entire day or half day. It is important to note that during the Baseline condition, teachers will go about their teaching day as normal and only have to collect the data on problem behaviors and academic engagement and understanding. They will not have to deliver or take away tokens nor will there be tokens to exchange at the end of the session

Observer Training (see Appendix D)

Researchers involved in the study will be trained to accurately observe and code the problem behaviors identified by each teacher. First, observers will learn the operational definitions of the different problem behaviors (will be determined with the teacher based on the problem behaviors they see in their classroom). In addition to recording the occurrences of each problem behavior, academic engagement and academic understanding will also be recorded. To keep the student information confidential, the teacher will enter the names of each student with a teacher identified ID number and once the data sheet is filled out, will remove the student names from the sheet keeping only the ID numbers before sending the information to us. The teacher will be responsible for collecting data, however, data collection will be made as easily as possible by developing

the data collection sheet with the teacher to identify preferences and feasibility. The prizes that tokens can be exchanged for will be identified by the teachers.

Phase 1: Alternating Treatment between 4 Conditions Daily
For the first part of the study, the teacher will alternate between the four conditions on a daily basis. The order of conditions will be randomly assigned at the beginning of the study. See Design section above for example of weekly schedule. The four conditions will be Baseline, Token Economy, Response Cost, and Combination. See below for details on each condition.

Phase 2: Alternating Treatment between 2 Conditions Daily
Based on the data from Phase 1 of the study, the two most effective/efficient conditions will be continued and the teacher will alternate between the two conditions on a daily basis. The order of the conditions will be randomly assigned immediately following Phase 1 and before phase 2 starts. The most effective/efficient conditions will be determined by comparing the rate of problem behavior during each condition along with academic engagement and academic understanding.

Phase 3: Final Condition
Based on the data from Phase 2 of the study, the most effective/efficient condition will be continued and the teacher will implement that one condition each day for the remaining week. The most effective/efficient condition will be determined by comparing the rate of problem behavior during each condition along with academic engagement and academic understanding.

Token Economy Condition
During this condition, the teacher will start the lesson by giving the students the following instructions, *"During this lesson, you will have the opportunity to earn a token for "good" behavior. When you earn a token, I will place it in your envelope (or cup) located at your desk. Your tokens cannot be taken away right now, you can only earn them for good behavior. At the end of the lesson you can exchange your tokens for items in the reward box."* The teacher will then start the lesson as normal and deliver tokens to students contingent upon desirable behavior. When delivering a token, the teacher will briefly state what behavior the student is earning the token for (e.g. "I like the way you are reading quietly in your seat."). The teacher will continue to deliver tokens throughout the chosen lesson for the day. At the end of the lesson, the teacher will allow students to exchange their tokens for a reward. The magnitude and size of the reinforcer will be determined by the number of tokens the student exchanges.

Response Cost Condition
During this condition, the teacher will start the lesson by giving the students the following instructions, *"During this lesson, each of you will be given ten tokens in your envelope (or cup) located at your desk. Each time you misbehave, I will come and take a*

token away. You cannot earn tokens back right now; you can only keep them if you do not engage in any problem behaviors. At the end of the lesson you can exchange whatever tokens you have left for items in the reward box." The teacher will then gave each student three tokens in their envelope (or cup) located at each student's desk and start the lesson as normal. Throughout the lesson, anytime a student engages in problem behavior (as identified in the problem behavior definition list) the teacher will go over to the student and quietly take away a token from their envelope (or cup) and tell the student what they did wrong (e.g. "I do not like the way you are twirling your book, instead you should be reading chapter 4."). The teacher will continue to take away tokens throughout the condition contingent on problem behavior. At the end of the condition, the teacher will allow students to exchange their tokens for a reward. The magnitude and size of the reinforcer will be determined by the number of tokens the student has left and is exchanging.

Combination Condition

During this condition, the teacher will start the lesson by giving the students the following instructions, *"During this lesson, you will have the opportunity to earn a token for "good" behavior. When you earn a token, I will place it in your envelope (or cup) located at your desk. Your tokens can be taken away if you engage in any problem behaviors. So throughout this lesson, you can earn tokens for good behavior AND get your tokens taken away for bad behavior. At the end of the lesson you can exchange however many tokens you have for items in the reward box."* The teacher will then start the lesson as normal and put a token in student's cups contingent on good behavior with a brief, quiet description of what behavior the student is earning the token for (e.g. "I like the way you are reading quietly in your seat.") and take away a token contingent on inappropriate behavior with a brief, quiet description of what behavior the student is getting a token taken away for (e.g. "I do not like the way you are singing and looking around instead of reading your book."). The teacher will continue to deliver and take away tokens throughout the lesson. At the end of the lesson, the teacher will allow students to exchange their tokens for a reward. The magnitude and size of the reinforcer will be determined by the number of tokens the student has left and is exchanging.

Baseline Condition

During baseline, the teacher will start the lesson by giving the students the following instructions, *"During this lesson, you will not be given any tokens nor will you be able to lose any tokens. I still want you all to be on your best behavior."* The teacher will then teach the lesson as normal, without delivering any type of tangible reinforcement contingent on behavior. At the end of the lesson, the teacher will transition the kids to the next activity since there will be no tokens for students to exchange.

Academic Engagement and Disruptive/Problem Behavior Observation Form

	Day:			Subject:		Problem Behaviors:							Total PB:	
	Condition:													
Min	**:00**	**:15**	**:30**	**:45**	**Min**	**:00**	**:15**	**:30**	**:45**	**Min**	**:00**	**:15**	**:30**	**:45**
0	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**15**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**30**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
1	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**16**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**31**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
2	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**17**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**32**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
3	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**18**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**33**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
4	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**19**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**34**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
5	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**20**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**35**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
6	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**21**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**36**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
7	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**22**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**37**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
8	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**23**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**38**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
9	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**24**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**39**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
10	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**25**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**40**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
11	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**26**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**41**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
12	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**27**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**42**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
13	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**28**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**43**	AE DS DB	AE DS DB	AE DS DB	AE DS DB
14	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**29**	AE DS DB	AE DS DB	AE DS DB	AE DS DB	**44**	AE DS DB	AE DS DB	AE DS DB	AE DS DB

Academic Performance Observation Form

Date:_____ Condition:_____ Teacher:_____

Student ID	Points Earned	Class Average
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		Day Class Average =
11		
12		
13		
14		
15		
16		
17		

Additional Notes:

Treatment Integrity Observation Form

Date: _____ Condition:_____ Class:_____

Treatment Component	Correct	Incorrect	Not Observed	Additional Notes/Comments
Read Instructions for Condition – at beginning of math class				
Handed out/took away tokens contingent on behavior – according to that day's condition				
Gave students 3 point quiz at end of math class				
Allowed students to exchange tokens for backup reinforcers immediately after math class				

APPENDIX C:

DATA COLLECTION FORMS:

1. Student Preference Interview
2. Social Validity Teacher Interview

Student Preference Interview

1. Of the four conditions, which one did you like the most?
2. Why did you like that one the most?
3. Of the four conditions, which one did you like the least?
4. Why did you like that one the least?
5. Which one would you like your teacher to continue next week?

Social Validity Teacher Interview

1. Which procedure did you like administering the best? Why?

2. Which procedure did you like administering the least? Why?

3. What were some advantages of the different strategies to your students/classroom/teaching/etc.?

4. What were some disadvantages of the different strategies to your students/classroom/teaching/etc.?

5. Did you notice your students behaving better or more academically engaged during any of the conditions? If so which one(s)?

6. Did you notice your students misbehaving more or academically engaged less during any of the conditions? If so, which one(s)?

7. What did you like about employing the different strategies/participating in the study?

8. What didn't you like about employing the different strategies/participating in the study?

9. If you could make any changes to the strategies what would they be?

10. Which one would you be most likely to do in the future? Why? Are you currently implementing any of them in your classroom?

11. Which one would you be least likely to do in the future? Why?

References

Ayllon, T., & Azrin, N. H. (1968). *The Token Economy*. New York: Appleton-Century-Crofts.

Birnbrauer, J. S., Wolf, M. M., Kidder, J. D., & Tague, C. E. (1965). Classroom behavior of retarded pupils with token reinforcement. *Journal of Experimental Child Psychology, 2,* 219-235.

Broden, M., Hall, R. V., Dunlap, A., & Clark, R. (1970). Effects of teacher attention and a token reinforcement system in a junior high school special education class. *Exceptional Children, 36,* 341-349.

Bushell, D., Wrobel, P. A., & Michaelis, M. L. (1968). Applying "group" contingencies to the classroom study behavior of preschool children. *Journal of Applied Behavior Analysis, 1,* 55-63.

Conyers, C., Miltenberger, R., Maki, A., Barenz, R., Jurgens, M., Sailer, A., Haugen, M. et al. (2004). A comparison of response cost and differential reinforcement of other behavior to reduce disruptive behavior in a preschool classroom. *Journal of Applied Behavior Analysis, 37,* 411-415.

Iwata, B. A., & Bailey, J. S. (1974). Reward versus cost token systems: An analysis of the effects on students and teacher. *Journal of Applied Behavior Analysis, 7,* 567-576.

Jones, M. L., Eyberg, S. M., Adams, C. D., & Boggs, S. R. (1998). Treatment acceptability of behavioral interventions for children: an assessment by mothers of children with disruptive behavior disorders. *Child and Family Behavior Therapy, 20,* 15-26.

Kahng, S. W., Boscoe, J. H., & Byrne, S. (2003). The use of an escape contingency and a token economy to increase food acceptance. *Journal of Applied Behavior Analysis, 36,* 349-353.

Kazdin, A. E. (1972). Response cost: The removal of conditioned reinforcers for therapeutic change. *Behavior Therapy, 3,* 533-546.

Kazdin, A. E. (1977). *The token economy: A review and evaluation.* New York: Plenum Press.

Kazdin, A. E. (1982). The token economy: A decade later. *Journal of Applied Behavior Analysis, 15,* 431 – 445.

Kazdin, A. E., & Bootzin, R. R. (1972). The token economy: An evaluative review. *Journal of Applied Behavior Analysis, 5,* 343-372.

Kaufman, K. F., & O'Leary, K. D. (1972). Reward, cost, and self-evaluation procedures for disruptive adolescents in a psychiatric hospital school. *Journal of Applied Behavior Analysis, 5,* 293-309.

Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J.R., Odom, S. L., Rindskopf, D. M., et al. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website: http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf

Kratochwill, T. R., Stoiber, K. C., Christenson, S., Durlak, J., Levin, J. R., Talley, R., et al. (2002). *Procedural and coding manual for review of evidence-based interventions.* Task force on the Evidence Based Interventions in School Psychology, Sponsored by Division 16 of the American Psychological Assocation and Society for the Study of Psychology.

Leitenberg, H. (1965). Is time-out from positive reinforcement an aversive event? A review of the experimental evidence. *Psychological Bulletin, 64,* 428-441.

Little, L. K., & Kelley, M. L. (1989). The efficacy of response cost procedures for reducing children's noncompliance to parental instructions. *Behavior Therapy, 20,* 525-534.

Maggin, D. M., Chafouleas, S. M., Goddard, K. M., & Johnson, A. H. (2011). A systematic evaluation of token economies as a classroom management tool for students with challenging behavior. *Journal of School Psychology, 49,* 529 – 554.

Matson, J. L. & Boisjoli, J. A. (2009). The token economy for children with intellectual disability and/or autism: A review. *Research in Developmental Disabilities, 30,* 240-248.

McGoey, K. E., & DuPaul, G. J. (2000). Token reinforcement and response cost procedures: Reducing the disruptive behavior of preschool children with attention-deficit/hyperactivity disorder. *School Psychology Quarterly, 15,* 330-343.

McLaughlin, T., & Malaby, J. (1972). Reducing and measuring inappropriate verbalizations in a token economy. *Journal of Applied Behavior Analysis, 5,* 329-333.

O'Leary, K. D., & Becker, W. C. (1967). Behavior modification of an adjustment class: A token reinforcement program. *Exceptional Children, 33,* 637-642.

O'Leary, K. D., Becker, W. C., Evans, M. B., & Saudargas, R. A. (1969). A token reinforcement program in a public school: A replication and systematic analysis. *Journal of Applied Behavior Analysis, 2,* 3-13.

O'Leary, K. D., & Drabman, R. (1971). Token reinforcement programs in the classroom: A review. *Psychological Bulletin, 75,* 379-398.

Pace, D. M., & Forman, S. G. (1982). Variables related to the effectiveness of response cost. *Psychology in the Schools, 19,* 365-370.

Panek, D. M. (1970). Word association learning by chronic schizophrenics on a token economy ward under conditions of reward and punishment. *Journal of Clinical Psychology, 26,* 163-167.

Pemberton, J. R., & Borrego, J. (2007). Increasing acceptance of behavioral child management techniques: What do parents say? *Child and Family Behavior Therapy, 29,* 27-45.

Phillips, E. L. (1968). Achievement place: Token reinforcement procedures in a home-style rehabilitation setting for "pre-delinquent" boys. *Journal of Applied Behavior Analysis, 1,* 213-223.

Phillips, E. L., Phillips, E. A., Fixsen, D. L., & Wolf, M. M. (1971). Achievement place: Modification of the behaviors of pre-delinquent boys within a token economy. *Journal of Applied Behavior analysis, 4,* 45-59.

Reynolds, L. K., & Kelley, M. L. (1997). The efficacy of a response cost-based treatment package for managing aggressive behavior in preschoolers. *Behavior Modification, 21,* 216-230.

Rodriguez, J. O., Montesinos, L., & Preciado, J. (2005). A 19th century predecessor of the token economy. *Journal of Applied Behavior Analysis, 38,* 427.

Schmauk, F. J. (1970). Punishment, arousal, and avoidance learning in sociopaths. *Journal of Abnormal psychology, 76,* 325-335.

Siegel, G. M., Lenske, J., & Broen, P. (1969). Suppression of normal speech disfluencies through response cost. *Journal of Applied Behavior Analysis, 2,* 265-276.

Skinner, B. F. (1966). Contingencies of reinforcement in the design of a culture. *Behavioral Science, 11,* 159-166.

Walker, H. M., Mattson, R. H., & Buckley, N. K. (1969). Special class placement as a treatment alternative for deviant behavior in children. University of Oregon, Monograph No. 1

Weiner, H. (1962). Some effects of response cost upon human operant behavior. *Journal of Experimental analysis of behavior, 5,* 201-208.

Winkler, R. C. (1970). Management of chronic psychiatric patients by a token reinforcement system. *Journal of Applied Behavior Analysis, 3,* 47-55.

Wolery, M., Bailey, D. B., & Sugai, G. (1988). *Effective teaching: Principles and procedures of applied behavior analysis with exceptional students.* Boston: Allyn Bacon.

Wolf, M. M., Giles, D. K., & Hall, R. V. (1968). Experiments with token reinforcement in a remedial classroom. *Behavior research and Therapy, 6,* 51-64.