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### Using ClassDojo® to Enhance School Age Students' Prosocial Behavior in a Classroom Setting

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Using ClassDojo® to Enhance School Age Students' Prosocial Behavior in a  
Classroom Setting

by

Valerie R. Forte

A thesis submitted to the College of Psychology and Liberal Arts at  
Florida Institute of Technology  
in partial fulfillment of the requirements  
for the degree of

Master of Science  
in  
Applied Behavior Analysis and Organizational Behavior Management

Melbourne, Florida  
December, 2017

We the undersigned committee hereby approve the attached thesis, “Using  
ClassDojo® to Enhance School Age Students’ Prosocial Behavior in a Classroom  
Setting,” by Valerie R. Forte.

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## Abstract

Title: Using ClassDojo® to Enhance School Age Students' Prosocial Behavior in a Classroom Setting

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Previous literature supports the use of a variety of classroom behavioral management programs to increase prosocial behaviors and decrease problem behaviors. For example, token economies, placement of classroom rules and guidelines, and providing the opportunity for students to choose the activity or subject to work on, have proven to be effective for many students; however, they can be expensive and cumbersome to manage. ClassDojo®, a classroom management system, is a type of digital token economy system that includes technology to track digital points for teacher-directed behavior. The program is free to download, simple to use, and is easily transferable between teachers and families. The present study evaluated the effects of ClassDojo® for 3 children in a classroom setting that included one participant diagnosed with Autism Spectrum Disorder and two neurotypical participants. Goals of the current study included: (1) increasing prosocial behavior, and (2) reducing disruptive behaviors. Results were

evaluated within a reversal design, and showed ClassDojo® was an effective system for classroom management across three students. All participants demonstrated improvements in prosocial behavior relative to baseline; however, disruptive behavior persisted, at near-baseline levels. Disruptive behavior decreased to near-zero levels with implementation of a response-cost, while prosocial behavior also showed improvements. Further research should test this finding with a larger number of participants that would represent a typical classroom size.

## Table of Contents

|                                     |           |
|-------------------------------------|-----------|
| <b>Introduction .....</b>           | <b>1</b>  |
| Token Economies.....                | 2         |
| The Good Behavior Game .....        | 7         |
| ClassDojo® as a Token Economy ..... | 8         |
| <b>Specific Aims .....</b>          | <b>12</b> |
| <b>Method .....</b>                 | <b>12</b> |
| Participants and Setting.....       | 12        |
| Materials.....                      | 13        |
| Design.....                         | 13        |
| Procedure .....                     | 14        |
| Observation Session.....            | 14        |
| Baseline .....                      | 15        |
| Pre-Treatment.....                  | 15        |
| Preference Assessment .....         | 15        |
| Treatment .....                     | 16        |
| Return to Baseline .....            | 16        |
| Treatment Phase Two .....           | 17        |
| Dependent Variables .....           | 17        |
| Interobserver Agreement.....        | 18        |
| Treatment Integrity.....            | 18        |
| Social Validity .....               | 19        |
| <b>Results .....</b>                | <b>19</b> |
| Social Validity .....               | 22        |
| <b>Discussion .....</b>             | <b>23</b> |
| <b>References.....</b>              | <b>30</b> |

## List of Figures

|               |    |
|---------------|----|
| Figure 1..... | 36 |
| Figure 2..... | 37 |
| Figure 3..... | 38 |

## List of Tables

|               |    |
|---------------|----|
| Table 1 ..... | 34 |
| Table 2 ..... | 35 |



List of Appendices

Appendix A.....39

Appendix B.....40

Appendix C.....41

Appendix D.....42

## Acknowledgement

I would like to acknowledge my supervisor, Dr. Ada Celeste Harvey. You have guided and supported me throughout this thesis project. You have taught me that no idea/goal is too big to tackle, and as long as you stay positive and work hard, you will accomplish anything. Your constant support and encouragement are what gave me the drive to complete a project in which I have an immense interest in. Thank you for the countless hours of editing my document and working out all of the kinks.

I would also like to thank my committee members Dr. Katie Nicholson and Dr. Scott Tilley for your informative feedback and support. Additional thanks to Victoria Ryan for assisting me with inter-observer agreement, being my go to person and for your constant support and encouragement.

Lastly, I want to thank my parents, Rose and Bill Forte, family members and many close friends who all have all given me the encouragement to never give up when things are tough and have supported me throughout my master's career. Without all of these important people in my life I would not be the person I am today and I am eternally grateful for each and every one of you.

## Dedication

*I dedicate this thesis to all of my friends and family who've supported me though out my academic journey. Specifically, my parents Rose and Bill, my brother Billy and my forever friend Kelly Schubert.*

*Thank you for your love, encouragement and support throughout my academic journey.*

Using ClassDojo® to Enhance School Age Students' Prosocial Behavior in a  
Classroom Setting

Valerie R. Forte

Florida Institute of Technology

## Using ClassDojo® to Enhance School Age Students' Prosocial

### Behavior in a Classroom Setting

For many teachers, the job of teaching diverse learners with various cultural differences, learning disabilities, or behavioral difficulties, presents unique challenges. Advancements in technology include a variety of effective, user-friendly options to improve socially important behavior in the classroom, while potentially reducing the burden of data collection and monitoring by teachers. Research shows that using technology to teach promotes student engagement in lessons, increases prosocial behavior, and potentially reduces teacher burden and burn-out (Emmer & Sabornie, 2015; Everston & Weinstein, 2006). Other enhancements in technology include the ability for teachers to share information on children's progress with parents and other caregivers in a simple format. The ease of communication further promotes skill development and generalization across settings.

The computerized application ClassDojo®, incorporates teacher-designated skills for students, allows them to design interventions, implement them, and collect data on effectiveness. The ClassDojo® model offers a unique, user-friendly interface for teachers to implement strategies that bridge evidence-based practices in behavior analysis, e.g., token economies and positive reinforcement, for all children in the least restrictive environment possible. In this paper, I provide an

overview of computerized applications in the classroom. I discuss linkages between technology and present evidence-based research findings regarding applications of token economies in schools. I evaluate whether the ClassDojo® application is user-friendly, adaptable, and effective for implementing behavioral supports in a classroom setting.

### **Token Economies**

One of the most commonly applied procedures of classroom management is the token economy. Token economies incorporate six basic components: (a) identification of target behaviors, (b) establishment of tokens as conditioned reinforcers, (c) back-up reinforcers, (d) exchange schedules, (e) setting criteria for token exchanges, and (f) determining a time and place for the exchange (Miltenberger, 2008). An optional component of a token economy involves an adjuvant response cost option, whereby a student loses tokens or points for engaging in undesired behavior. Over four decades of research demonstrate the efficacy of token systems on changing behavior in people of all ages, with and without disabilities, and across multiple settings (Kazdin, 1982; Kazdin, 1994; Kazdin & Bootzin, 1972; Matson & Boisjoli, 2009; Tarbox, Ghezzi, & Wilson, 2006) as well as infrahuman subjects (see Hackenberg, 2009).

Research shows that token economies increase academic skills, as well as prosocial behavior. Iwata and Bailey (1974) found decreases in problem behavior

with the implementation of a token system in a classroom. Fifteen elementary school students, near 10 years of age who engaged in moderate to high rates of off-task and disruptive behavior participated in the study. Pre-baseline measures included data collection on problem behavior without any programmed consequences or rule-setting. Baseline consisted of the children reviewing simple rules of the classroom and becoming familiar with a timing device to calculate intervals. During the intervention token phase 1, the teacher reviewed rules with students and explained the token system. One group earned tokens for appropriate behavior, whereas the other group lost tokens (response cost) contingent upon disruptive behavior. During a return to baseline phase, the teacher told students the token program would be discontinued for an indefinite amount of time. Following this phase, the teacher reinstated the token phase, but switched the response-earn and response-cost groups. That is, the response-earn group now lost tokens for engaging in problem behavior, and the response-cost group earned tokens for desired behavior. In the final phase of the study, the authors asked students to choose which token system they preferred, response-earn, or response cost. The results showed that in all phases when the token economy system was present, off-task behavior decreased. When the teacher withdrew the token economy, off-task behavior increased, returning to baseline levels. During token phases one and two, rule violations dropped to below 1% and off-task behavior decreased. The authors also concluded that token economies increased all arithmetic performance, and

during return to baseline phases, arithmetic performance decreased (Iwata & Bailey, 1974).

Bippes, McLaughlin and Williams conducted a study on five male juvenile delinquents ranging from 14 to 16 years old, who attended a detention facility (1986). Students ranged from “cooperative to extremely disruptive.” Reading comprehension, social behavior, and achievement test scores were examined using a between-groups design. During baseline measures, teachers implemented a token economy for some academic program skills, but it was not implemented when reading comprehension was taught. During the token economy phase, the teacher delivered points to participants only if they received a score of 80% or better on reading comprehension. For all five subjects, reading scores improved relative to baseline, during the token economy phase. Furthermore, three out of five participants also showed decreases in disruptive behavior during the token economy phase. Although results of the study appeared promising, the use of a within-subject design without a withdrawal presents a potential limitation of the findings.

In a study by Hirst, Dozier and Payne, token economies increased on-task behavior in preschool-aged children in a university-based program (2016). The study included three groups of three participants, and all but one were children without disabilities. Each session lasted 5 min. During each session, participants sat next to each other on the rug with token boards in front of them. The teacher

presented simple rules such as sitting quietly, talking only during the child's turn, keeping hands in their laps, and touching materials, before the start of the first session.

During the baseline phase, the researchers collected data on on-task behavior. Following baseline, the teacher taught the children to trade tokens for preferred items. During the treatment phase, the researchers implemented a differential reinforcement system. Each child received a token for engaging in on-task behavior during a scheduled observation. A variable momentary time sample was used when observing the children's behavior. The next intervention phase included a response-cost token system. This token board was a different color from the token board used in the differential reinforcement phase. If a child broke a rule, the teacher removed a token from the child. If the child did not have any tokens they were not able to exchange after the session.

Once each phase was completed, a choice phase was implemented. The children were called up by the teacher and asked to pick a token board they preferred to use during the lesson. The children chose the preferred token board without any peers able to see. The results showed low rates of on-task behavior during baseline, but improvements in on-task behavior in both the differential reinforcement and response-cost phases. Furthermore, results showed that more children chose the response-cost token boards over response-earn token boards.



Within a classroom token economy, teachers operate as behavior change agents, responsible for administering and removing points, tokens, or other items for students to exchange. Although token economies represent effective methods of managing behavior for many students with and without disabilities, they are not without their potential disadvantages. One of the commonly cited drawbacks to token economies involves difficulties with management of the system (Krach, McCreery & Rimel, 2016; Reitman, Murphy, Hupp, & O’Callaghan, 2004; Witt, Elliott, & Martens, 1984). Despite the effectiveness of a token economy, some researchers cite the decline of the token economy due to the complexity of implementing and monitoring the system in a classroom (Matson & Boisjoli, 2009). Teachers report that the time to track progress, award tokens, and arrange for the exchanges is both cumbersome and time-consuming. A computerized method for improving the accessibility of token systems in schools potentially benefits teachers and students by making the interface simpler, allowing teachers to track points immediately and directly, provide feedback, and broker the exchange for desired preferences. Other potential benefits include the ability of teachers to maintain documentation to prevent students from “forging” point cards or taking each other’s’ tokens. The computerized application, ClassDojo® offers an interactive mode of implementation for token systems that capitalizes on the positive effects, while reducing potential stress on teachers regarding token management.

## **The Good Behavior Game**

One current application of token economy systems is the Good Behavior Game, which has been applied to many American classrooms. In the typical procedure, the class is divided into two or more groups that compete with each other using a group contingency. Rules are set based on teacher-directed target behaviors and points are awarded to the team that breaks any of the rules during the game. At the end of the game, the team that has the least amount of points wins.

Donaldson, Vollmer, Krous, Downs, and Berard conducted a study with five different kindergarten schools located at three different elementary schools (2011). Targeted behaviors consisted of: (a) out of seat, operationally defined when participants were not sitting with their legs crossed on their spot on the carpet, (b) talking out of turn, operationally defined as any vocalization made when the participant was not called on, and (c) touching another student, operationally defined as when a student's hands or feet made contact with another peer. A non-concurrent multiple baseline design across classrooms was used to evaluate the effectiveness of the good behavior game. During baseline, teachers gave no feedback on students' target behaviors. Teachers divided each class into two different teams and explained the rules to the participants. At first, the experimenter implemented the good behavior game and then the teacher took it over after several sessions. Even though the teacher took over the game after several sessions, the teachers easily transitioned to running the game. Every time a child violated a rule,

a hitch mark was scored. Results showed decreases in the number of disruptions per minute that were emitted once the good behavior game was implemented.

Typically, prior research of the Good Behavior Game has been studied using group contingencies. Donaldson, Fisher and Kahng conducted a study using the good behavior game but instead of examining each time as a group, each child was examined. Participants consisted of students from two kindergarten classes and a first-grade class. The most disruptive students were chosen to play the good behavior game. The targeted behaviors of this study are similar to the Donaldson et. al study. The targeted disruptive behavior included out of seat, disruptive noises, and disruptive contact with other students or objects.

An ABAB reversal design was used during this study. During baseline, the teachers were to teach class as they normally would. The students were still expected to follow the general rules of the classroom. During the treatment phase, the researcher implemented the good behavior game while the teacher taught the class. Each participant earned points for good behavior and lost points for violating the rules. As a result of implementing the Good Behavior Game, disruptive behavior decreased below baseline levels.

### **ClassDojo® as a Token Economy**

ClassDojo® represents a novel approach for digitally tracking student progress on academic, social, and behavioral goals, making it especially useful for

applications of behavior analysis strategies in a busy classroom environment. The app includes an interactive, teacher-directed application that allows teachers to develop individualized and group goals for students, monitor progress, record data, and provide immediate or delayed feedback on numerous electronic platforms (Robacker, Rivera, & Warren, 2016). Teachers project information on a classroom whiteboard or transmit to computers, tablets, or smart phones. Each student selects a cartoon avatar for him or herself, represented by a monster character. The teacher then tailors interventions toward student objectives. For instance, using a classroom-wide token economy system, a teacher projects assignments, gives directions, and programs options to provide or deduct points for given responses of interest. The app also includes timer features with sounds to prompt students to start or stop tasks, as well as to signal points earned or deducted.

ClassDojo® also enhances communication capabilities between teachers and other authorized parties within school or home settings. Teachers can use the app to e-mail parents or other permitted parties regarding a child's progress. The streamlined interface of ClassDojo® potentially allows teachers to simplify empirically validated, behavior analytic practices such as token economies, behavioral contracts, and individualized programming goals. Furthermore, the use of an application like ClassDojo® complements the ideals set forth in the Individuals with Disabilities Education Act adopted in many American schools to extend special education to students with disabilities (IDEA, 2004). ClassDojo®, a

free digital token economy system, potentially brings together two essential components of an educational program— evidence-based practice, and IDEA, to help all students access a free appropriate public education in the least restrictive environment possible.

ClassDojo® offers many potential benefits for classroom management and is available for free to teachers. Current estimates indicate ClassDojo® is used in two out of every three public schools in the United States (ClassDojo, 2016). ClassDojo® merges the strategies of token economies and technology in a user-friendly format. A few potential benefits regarding the utility of the app for a classroom token economy include: (a) individualized or classroom-wide behavior goals, (b) simplification of token delivery or deductions electronically, (c) visual appeal of the app to potentially engage students, and (d) improving communication between families and teachers (Robacker, Rivera, & Warren, 2016).

One potential benefit of ClassDojo® relates to establishment of classroom and individualized rules using a token economy. Using the app, a teacher presents behavioral and academic expectations at the beginning of the school day on a screen and refer to them throughout the day. For instance, teachers using ClassDojo® direct students to look at the classroom rules, point out each student's corresponding avatar, and discuss the expectations of all students. Teachers or teachers' aides can also provide individualized directions discreetly to students

needing further supports on individualized goals. Teachers can also discuss requirements to earn, or lose tokens, depending upon the type of system used.

Using ClassDojo® throughout the day, teachers can reinforce positive behavior unobtrusively and immediately as students work on individual or cooperative academic, social, and behavioral goals. The automated format allows teachers, or aides to provide immediate (or delayed, if preferred) feedback on student compliance with expectations by clicking each student's avatar, or group avatars to award or deduct points on a screen. ClassDojo® incorporates many similarities to a typical classroom token system, but its automated format allows for simpler behavior tracking by clicking a remote to award or deduct tokens.

Another benefit of ClassDojo® lies in its visual appeal, which represents a form of “gamification” of the technology of token systems. Students can customize their own “monster,” and view points by each avatar. In a survey conducted by Singer (2014) regarding students' perceptions of ClassDojo®, the majority of them reported they liked the app, and some said it reminded them of a video game. Many of the potential benefits of ClassDojo® remain unexplored, and future research should potentially elucidate its feasibility and effectiveness for classroom settings.

The ClassDojo® app also facilitates communication between teachers and families. Using the app, teachers post information to on on-line portals for parents to access throughout the day. Another option includes parental options for text messaging or e-mails regarding their child's progress. For instance, parents decide

if they want to be contacted when their child earns below a specific grade, or if their child earns or loses behavior points. The teacher posts pictures of his or her students during the course of the day with permission from parents, as well as announcements. The simplicity of the electronic model of communication allows teachers to connect with parents who have computers, tablets, or smart phones rapidly, and eliminates the need for a weekly newsletter that is sent home. Another feature of ClassDojo® that enhances communication is that it is available in 35 languages, potentially closing the gap between non-English speaking parents and teachers.

### **Specific Aims**

The purpose of this study was to evaluate the effects of ClassDojo® as a digital token economy in an early education setting. The intervention was implemented with three children with and without disabilities. The goal of the program was to reduce problematic behaviors and increase prosocial behavior in a small classroom social skills program.

## **Method**

### **Participants and Setting**

Participants were recruited from a university based clinic's social skills wait list, or current children who participated in social skills groups. Specific behavioral

targets were selected based on behaviors that were observed during the day before the start of baseline. This study included three students, who ranged from eight to eleven years old. Sessions were held in a classroom setting at the center two to three times a week for an hour. Participants were taught various social skills lessons.

Amanda was a typically developing 8-year-old female who was enrolled in third grade at a private school. Ashton was a 9-year-old male with a diagnosis of Autism Spectrum Disorder. Avery was a typically developing 7-year old male who was enrolled in second grade at a local private school.

## **Materials**

The researcher used a computer, projector iPad®, or other smart device compatible with ClassDojo®, various books and materials to teach appropriate lessons. The researcher also provided preferred items for students, identified through a preference checklist of items, based on input from the parents and students. The items selected by the participants were chosen by trading accumulated points earned during the token economy phases of the study.

## **Design**

This study included an ABCAC withdrawal design. Baseline (A) involved no programmed consequences for the participants' behavior. This phase continued



until the data showed stability for a minimum of three consecutive points without changes in variability, level, or trend. Treatment (B) involved programmed consequences, using a token economy system plus ClassDojo®, which is explained in more detail later. Treatment (C) involved programmed consequences, using a token economy system plus ClassDojo® with an added response cost component. The researcher awarded points following a response-earn token economy system and reinforcing three simple rules regarding on-task, desired academic, and behavioral performance. Implementation of the token system with ClassDojo® occurred two to three times a week, Monday through Friday in the token economy phase. Following stable performance across three consecutive data points, the teacher then withdrew the token economy + ClassDojo® system once performance stabilized. Finally, the teacher reinstated the token economy + ClassDojo® system to observe effects on student's performance.

## **Procedure**

**Observation Sessions.** The researcher observed one session prior to the baseline phase. During this session, the researcher observed and recorded various classroom behaviors. These behaviors consisted of talking out, raising a hand and waiting to be called on. The researcher then developed operational definitions for each of the behaviors that were targeted during the study. During this observation,

the researcher decided to target the following behaviors, raising a quiet hand, attends while others are speaking, eye contact and disruptions.

**Baseline.** During the baseline phase the researcher observed and recorded the frequency of appropriate and inappropriate social behavior. There were no contingencies in place during this phase. Any disruptive behavior was considered a violation of the classroom rules. There was no classroom management contingency in place.

**Pre-Treatment.** After baseline data collection, the teacher notified participants of all rules, e.g., “children will raise a quiet hand when answering a question”. Following statement of the rules, the researcher explained how ClassDojo® worked and how participants could earn points for demonstrating positive and pro-social behavior. Next, the researcher role played each desired behavior. Some examples of the target behavior included, awarding a point every time he or she raised a hand, or participated when a question was asked.

At the start of the treatment phase, the researcher told the participants they could exchange points collected for preferred items in the token store at the end of each day. The items the participants chose ranged in point values. For instance, highly preferred items such as chocolate or candy cost more points than stickers, pencils, or small toys.

**Preference Assessment.** Before implementation of the treatment phase, students completed a survey to rank potential preferences to place in a treasure box.

Preferences included small items and toys (e.g., tops, cards, pencils, pencil grips, erasers etc.) and chocolate and candy.

**Treatment.** During the treatment phase, token economy + ClassDojo® was implemented to reinforce three simple rules for each child. All targeted behaviors were individually based on each participant's behavior, and/or classroom rules (e.g., raising your hand, staying in your seat, etc.). At the start of the treatment phase, the researcher told participants they could exchange the points collected for preferred items in the token store. Participants were able to cash in points to earn backup reinforcers from the treasure box daily. The volume on the computer was turned on so each child was notified when a point was awarded on ClassDojo®. A projection of the application was also displayed on the board. Once stable data were recorded across all participants, for three consecutive sessions, the treatment phase was withdrawn. Because stable data across all participants engaging in disruptive behavior was unstable, a response cost, which is taking away points, was implemented for the participants engaging in the disruptive behavior. Talking out of turn resulted in the participant who engaged in that behavior to lose a point.

**Return to Baseline.** This baseline phase was identical to the first baseline phase. The number of appropriate versus inappropriate social behavior in the classroom setting was recorded. Any disruptive behavior was considered a violation of the rules. There were no programmed consequences during this phase.

**Treatment Phase Two.** This treatment phase was identical to the second treatment phase. A token economy plus ClassDojo® and an additional response cost was implemented to reinforce the same three simple rules that were previously implemented. All targeted behaviors were individually based on the participant's behavior.

### **Dependent Variables**

All targeted behaviors were selected and individualized based on each student's behavioral goals. *Raising a quiet hand* was operationally defined when the participant raised a hand to answer a question or when he or she made a statement. Instances were scored when the participant's hand was raised and he or she was not talking until the teacher called on the child. When the researcher scored occurrences of this behavior, if the child talked while his or her hand was raised, a minus (-) was recorded, if the child did raise a quiet hand, a (+) was recorded. The participant had to *attend while the other participants spoke*. This was operationally defined as the participant's head oriented toward the child who was speaking. Data were recorded as frequency of occurrences and frequency of non-occurrences. *Eye contact* was operationally defined as when the participant looked at the person he/she was speaking to. Data were recorded as frequency of occurrences and non-occurrences. *Disruptions* were operationally defined as when the participant talked out of turn, when the participant misused materials, if the participant walked 1 m

away from the table without permission, emitted any non-compliant statements when asked to complete a task or asked a question, or when the participant's body was oriented away from peers. Data were recorded as frequency of occurrences. Table 1 describes occurrences and non-occurrences of behavior. The teacher scored instances of desired behavior every 10 min by clicking a remote control to add points to each child's avatar on the screen.

### **Inter-observer Agreement**

Three independent observers collected data on the four dependent variables, for each of the three participants. Data was collected via video recordings, following a training session to ensure reliability across observers. Inter-observer agreement was calculated using interval by interval agreement, which was calculated by the number of intervals agreed divided by the number of intervals agreed plus the number of intervals disagreed multiplied by one hundred. IOA was collected for 34.2% of sessions, with an average of 86.2% reliability. IOA averaged 83.3%, 86.7%, and 88.7%, for Amanda, Ashton and Avery respectively. The range for all participants was from 77.5% to 97.5%.

### **Treatment Integrity**

A video camera was placed in an unobtrusive area of the classroom, to record all sessions, for the calculation of treatment integrity purposes. The

components of running a classroom session were outlined so an observer could score integrity of the sessions. For baseline sessions, the components scored were (1) withholding reinforcement if behavior occurred, and (2) not allowing participants to exchange points for the treasure box. During all treatment phases, the following components were scored; (1) the teacher went over the rules at the start of each day, (2) points were awarded for following the rules, and (3) the students were allowed to exchange points for items in the treasure box. Treatment integrity was scored during 34.2% of sessions with an average of 94.4% integrity. Treatment integrity ranged from 66.7% to 100%.

### **Social Validity**

The experimenter distributed questionnaires to parents, teachers, and students about their experiences with ClassDojo® as a measure of social validity. Questions related to the feasibility, effectiveness, and acceptability of the application. Questionnaires were individualized for adults versus children respondents at the end of the study.

### **Results**

Figure 1 depicts the results of a preference assessment after the first phase of baseline sessions were completed. Each participant scored five items on a Likert Scale from one, (the participant did not like the item), to five, (the participant loved

the item). Children used their ratings to evaluate five items—chocolate, lollipops, pool toys, sports toys, and pencils and erasers.

Figure 2 depicts the percentage of occurrence of prosocial behavior for Amanda. Raising a quiet hand, making eye contact with the individual she was talking to, and looking at the student who was talking were recorded during baseline and treatment phases. Frequency of disruptions were also recorded during 10-min sessions. During baseline Amanda exhibited an average of 12.7 disruptions per 10-min session. She engaged in prosocial behavior for on an average of 72.9% of sessions. Once the token economy and ClassDojo® phase was implemented, the average frequency of disruptions decreased to 8 disruptions, and she engaged in prosocial behavior on an average of 85.4% of sessions of prosocial behavior per 10-min session. Since disruptions were still considered to be moderately high, the next phase implemented was a ClassDojo® plus token economy with response cost phase. During this phase, the average frequency of disruptions per 10-min session decreased to 2.6. She also engaged in an average of 89.3% of prosocial behavior per session. When returning to baseline, Amanda engaged in an average of 59 disruptions and an average of 37.9% of prosocial behavior per 10-min session. When ClassDojo® plus token economy with response cost was implemented the second time, Amanda engaged in an average frequency of 2.6 disruptions and an average of 86.5% of prosocial and positive behavior per 10-min session.

The result of Figure 3 depicts the percentage of occurrence for prosocial and positive behavior for Ashton. Raising a quiet hand, making eye contact with the individual he was talking to, and looking at the student who was talking were all behaviors that were recorded during baseline and treatment. Frequency of disruptions were also recorded during the 10-min sessions. During baseline Ashton had an average of 17 disruptions per 10-min session. Prosocial behavior occurred during an average of 59.4% of sessions. Once the token economy and ClassDojo® phase was implemented, the average frequency of disruptions decreased to 7.2 disruptions per session, and he engaged in prosocial behavior for 79.9% of the 10-min session. Since disruptions were still considered to be moderately high, the next phase implemented was a ClassDojo® plus token economy with response cost phase. During this phase, Ashton averaged only 1 instance per 10-min session, and he engaged in prosocial behavior on average in an average of 82% per session. After the return to baseline, Ashton engaged in an average of 37.7 disruptions and an average of 43.3% of prosocial behavior per 10-min session. When ClassDojo® plus token economy plus a response cost were implemented for the second time, Ashton engaged in an average frequency of 1 disruption and an average of 89.3% of prosocial and positive behavior per 10-min session.

Figure 4 depicts the percentage of occurrence for prosocial behavior for Avery. Raising a quiet hand, making eye contact with the individual he was talking to, and looking at the student who was talking were all behaviors that were



recorded during baseline and treatment. Frequency of disruptions were also recorded during the 10-min sessions. During baseline, Avery exhibited an average of 33.8 disruptions per 10-min session. He engaged in prosocial behavior on average of 48.7% of sessions. Once the token economy and ClassDojo® phase was implemented, the average frequency of disruptions decreased to 18.6 disruptions and 79.1% of occurrences of prosocial and positive behavior per 10-min session. Since disruptions were still considered to be moderately high, the next phase that was implemented was a ClassDojo® plus token economy plus a response cost phase. During this phase, the average frequency of disruptions Avery engaged in per 10-min session was 4.7 and engaged in an average of 81.1% of prosocial behavior per session. When reverted back to baseline, Avery engaged in an average of 38.3 disruptions and an average of 62.4% of prosocial behavior per 10-min session. When ClassDojo® plus token economy plus a response cost were implemented for the second time, Avery engaged in an average frequency of 1 disruption and an average of 85.6% of prosocial behavior per 10-min session.

### **Social Validity**

Two different social validity surveys were administered, one to the parents and one to the participants. Each survey consisted of a simple dichotomous rating scale. Ratings consisted of either a smiley face meaning they liked it, or a sad face meaning they did not like it. The results indicated that each participant thought

ClassDojo® was fun, they liked that they were able to view his or her own monster on the board/ They also liked that they were able to earn points for good behavior, that they were able to exchange the points at the end of each day for various items in the treasure box and the toys that were included in the treasure box.

The parent survey consisted of a Likert scale. This scale ranged from one, (do not agree) and five (strongly agree). All parents scored ratings of 5, indicating that their child enjoyed earning points for good behavior. They also gave ratings of 5, indicating they strongly agreed that they liked having the ability to track their child's progress online and also rated 5, that they liked having the opportunity to communicate with the teacher through the application.

## **Discussion**

The present investigation represents the first evaluation of ClassDojo® as a digital token economy in elementary-aged children in a small group format. Using ClassDojo® as a token economy resulted in improvements in prosocial, and reducing problematic behavior, with the best effects shown following implementation of an added response-cost component. The findings of this study align with prior research demonstrating the effectiveness of token economies in school settings (Kazdin, 1982; Kazdin, 1994; Kazdin & Bootzin, 1972; Matson & Boisjoli, 2009; Tarbox, Ghezzi, & Wilson, 2006).

The initial intervention phase for all participants included ClassDojo® as a token economy with a response-earn component only, and although all three participants demonstrated increases in prosocial behavior above baseline levels, they did not show substantial decreases in disruptions relative to baseline. This finding is supported by other literature on the need for response-cost procedures to reduce problematic behavior in a token economy. Similar to findings by Iwata and Bailey (1974), and Hirst, Dozier, and Payne (2016), the addition of a response-cost component to the ClassDojo® token system resulted in greater improvements in prosocial and problem behavior.

For all participants, ClassDojo® plus a response cost procedure was an effective and simple intervention to increase prosocial behavior that resulted in concomitant decreases in problem behavior. Participants continued to earn points for demonstrating prosocial, positive behavior, but in the added response-cost phase, the teacher deducted points for each instance of problem behavior. Following implementation of the response-cost procedure, all three participants showed decreased variability and lower frequency of disruptions.

The implementation of the response cost component resulted in maintenance of prosocial behavior, and corresponding decreases in problem behavior relative to baseline phases as well as response-earn only phases. Furthermore, once response-cost was implemented, prosocial behavior slightly increased to higher rates than when the original intervention was implemented.

Disruptions for all participants decreased to lower rates than evidenced during the response-earn phase alone. Further investigation of the ClassDojo® application is warranted in new settings and with other types of learners.

ClassDojo® offers a unique experience for children in a classroom setting, but is also is easy for teachers to implement. Students experience a gamification aspect of a classroom management system to hold their attention while simultaneously reinforcing prosocial behavior and decreasing unwanted disruptive behaviors in the classroom. The customization possible with ClassDojo® allows teachers to reinforce students' positive behavior and reduce inappropriate or undesirable behavior using a digital token economy. Added benefits of the program include its ease of transfer between teachers or from home to school. Furthermore, the teacher can move around the classroom wirelessly to distribute points.

Regarding social validity measures, all parents in this study indicated they appreciated having access to the parent page to track points allocated to their children. The improved communication between home and school represents an important linkage for many families. ClassDojo® offers a social network, whereby teachers can post statements or pictures with captions about classroom events. Parents can also message the teacher directly on the application instead of emailing the teacher. The teacher receives a notification instantly that he or she has a message and can respond quickly to parent questions.

It is interesting to note that while returning to the baseline phase, the rate of disruptions reversed and increased beyond the first baseline phase. Furthermore, the percent of occurrences of prosocial behavior decreased below the initial baseline phase. In this reversal, participants learned points were no longer available. During the withdrawal phase, incidents of out-of-seat and calling out behavior increased. Implementation of a third baseline phase was considered, but ruled out because of the magnitude and frequency of emotional responding in the prior return to baseline phase.

ClassDojo® plus the token economy aligns well with previous token economy research. Based on a thorough review of the research literature, the present study represents the first example of a digital token economy in a classroom setting to date. Furthermore, the addition of a response cost component may be needed to accomplish student goals regarding reductions of problem behavior. The finding that response cost within a token economy functions as an adjuvant component to a response earn token economy is supported by prior research. According to Hirst, Dozier and Payne (2016) children engaged in higher rates of on-task behavior when a response-cost component was implemented within the token economy. In addition, the authors surveyed participants and found that a response-cost component was preferred by most of the children instead of a response-earn only token system. This study lines with the findings of the current

study. For both studies, a response cost yielded better results than a response-earn only token economy system.

The present investigation demonstrated beneficial results for all three participants, including increases in raising a quiet hand, looking at the person who was speaking, and looking at the person to whom the participant was speaking. Results of the study are preliminary, and a few limitations exist that must be noted. First, only three children participated in this study, a sample size much smaller than many typical classrooms. Furthermore, the density of reinforcement was high—a fixed-ratio 1 schedule (i.e., whereby each instance of a response resulted in earning or losing a point). Future investigations might include a larger sample size, and thinning of the schedule of reinforcement in a typical classroom. Future research is not limited to just a classroom environment, but could also be conducted in other community settings, due to the flexibility of the app. For instance, sportsmanship on a playing field, or appropriate behavior on jobsites represent just a few future options.

A few limitations also exist with the current research project. First, during the withdrawal phase, some students engaged in emotional responding. Although this was an anticipated effect of the temporary removal of the intervention, it is important for teachers to evaluate before considering a withdrawal design with a token economy system. For this project, the withdrawal phase was necessary for demonstrating stimulus control of the programmed intervention. Second, on a

dense schedule of reinforcement, any missed opportunities to award points may result in emotional responding. During one session for Avery, the experimenter missed an instance of appropriate behavior. When the point was not awarded during the session, he engaged in disruptive behavior. Treatment integrity represents a critical strategy when implementing token systems. In the present study, the use of a time-based schedule may have improved the accuracy of treatment integrity, and reduced reactivity. Using leaner schedules of reinforcement will be necessary for teachers who record data on multiple students at a time. A third limitation involves the small sample size. Because of the limited class size of this preliminary study, it was not possible to poll multiple teachers or aides on their acceptability ratings for the token economy system to address a commonly cited limitation of token economy systems.

In summary, ClassDojo® demonstrated beneficial effects on increasing social behavior and reducing problematic behavior in three young children with and without disabilities. The effects on reducing problem behavior were only observed with an additional response cost component. The application of the ClassDojo® potentially mitigates some resistance to implementation of a token economy system noted by other authors (Krach, McCreery & Rimel, 2016; Reitman, Murphy, Hupp, & O'Callaghan, 2004; Witt, Elliott, & Martens, 1984) due to its ease of use for awarding and deducting points, giving feedback to students immediately or in delayed format. The app potentially also allows for easier communication between

teachers and families. Future directions include expansion of the ClassDojo® app to a larger classroom setting, and with other types of learners.



## References

- Bippes R., McLaughlin, T.F., & Williams, R.L., (1986). A classroom token system in a detention center: Effects for academic and social behavior. *Journal for Remedial Education and Counseling*, 2, 126-132.
- ClassDojo- <https://external.classdojo.com>
- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). Applied behavior analysis. New Jersey: Merrill-Prentice Hall.
- Emmer, E.T. & Sabornie, E.J. (Eds.) (2015). *Handbook of classroom management* (2nd ed.). New York: Routledge.
- Cipani, E. & Schock, K. (2007). Functional behavioral assessment, diagnosis, and treatment: A complete system for education and mental health settings. (2nd ed.). New York: Springer.
- Donaldson, J. M., Vollmer, T. R., Krous, T., Downs, S., & Berard, K. P. (2011). An Evaluation of the good behavior game in kindergarten classrooms. *Journal of Applied Behavior Analysis*, 44(3), 605-609. DOI: 10.1901/jaba.2011.44-605
- Flower, A., McKenna, J. W., Bunuan, R. L., Muething, C. S., & Vega, R. (2014). Effects of the good behavior game on challenging behaviors in school settings. *Review of Educational Research*, 84(4), 546-571. DOI: 10.3102/0034654314536781

- Hirst, J., Dozier, C., & Payne, S., (2016). Efficacy of and preference for reinforcement and response cost in token economies. *Journal of Applied Behavior Analysis*, 49, 329-345.
- Individuals with Disabilities Education Improvement Act of 2004*, Pub. L. No. 108-446.
- Ingersoll, R. (2001). Teacher turnover and teacher shortages: An organizational analysis. *American Educational Research Journal*, 38, 499-534.
- 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.
- Kazdin, A., & Bootzin, R. (1972). The Token Economy: An Evaluative Review. *Journal of Applied Behavior Analysis*, 5, 343-372. DOI: 10.1901/jaba.1972.5-343.
- Kazdin, A. (1982). The Token Economy: A Decade Later. *Journal of Applied Behavior Analysis*, 15, 431-445. DOI: 10.1901/jaba.1982.15-431
- Kazdin, A. E. (2012). Behavior modification in applied settings. (7th ed). Waveland Press: Long Grove, IL.
- Kidron, Y., & Fleischman, S. (2006,). Promoting adolescents' prosocial behavior. *Educational Leadership*, 63, 90-91.

- Krach, S. K., McCreedy, M. P., & Rimel, H. (2016). Examining teachers' behavioral management charts: A comparison of Class Dojo and Paper-pencil methods. *Contemporary School Psychology*, 1-9.
- Lincoln, J., (2001). Marketing educator internet adoption in 1998 verses 2000: Significant progress and remaining obstacles. *Journal of Marketing Education*, 23, 103-116.
- 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.
- Miltenberger, R. G. (2008). *Behavior Modification: Principles and Procedures*. (6th ed.). Belmont, CA: Wadsworth Publishing.
- Nytimescom. (2016). Nytimescom. Retrieved 19 July, 2016, from <http://bits.blogs.nytimes.com/2014/11/17/classdojo-a-tale-of-two-classrooms/?r=1>
- Reitman, D., Murphy, M. A., Hupp, S. D. A., & O'Callaghan, P. M. (2004). Behavior change and perceptions of change: Evaluating the effectiveness of a token economy. *Child and Family Behavior Therapy*, 26, 17-36.
- Robacker, C. M., Rivera, J. R., & Warren, S. H. (2016). A token economy made easy through ClassDojo. *Intervention in School and Clinic*, 52, 39-43.

- Tarbox, R. S. F., Ghezzi, P. M., & Wilson, G. (2006). The effects of token reinforcement on attending in a young child with autism. *Behavioral Interventions, 21*, 155-164.
- Witt, J. C., Elliott, S. N., & Martens, B. K. (1984). Acceptability of behavioral interventions used in classrooms: The influence of amount of teacher time, severity of behavior problem, and type of intervention. *Behavioral Disorders, 9*, 95–104.

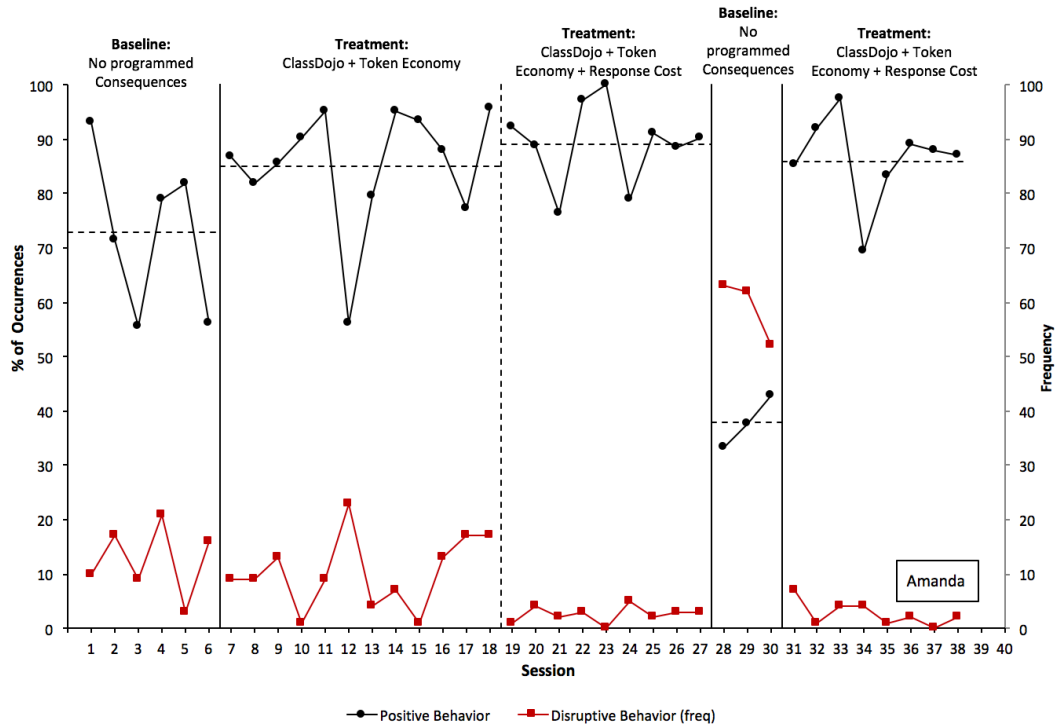
Table 1. *This table depicts all operational definitions of prosocial behavior targeted with examples and non-examples of each behavior.*

| <b>Target Behavior</b>            | <b>Operational Definition</b>  | <b>Examples</b>  | <b>Non-Examples</b>   |
|-----------------------------------|--|--|---|
| Raising a Quiet Hand              | When raising a hand to answer a question or make a statement. The participant's hand should be raised and he or she should not talk until the teacher calls on that participant. | When the teacher asks a question, the participant raises his or her hand without talking. The participant does not call out until the teacher calls on that child. | The teacher directs the question at the student. "Avery when was a time that you felt happy?" Avery answers this question without having to raise his hand. |
| Attends While Others are Speaking | The participant's head is oriented toward the child who is speaking at least once while the other child is speaking.   | The participant's head should be turned to face the speaker.   | The participant's is looking at a peer who is not talking.  |
| Eye Contact                       | The participant looks at the person he/she is speaking to or looks at the person who asked the question/ initiated the conversation at least once.                               | When the participant is talking to someone he or she should be facing them and looking in the direction of the person they are talking to.                         | When the participant is reading from a worksheet or from the board.   |

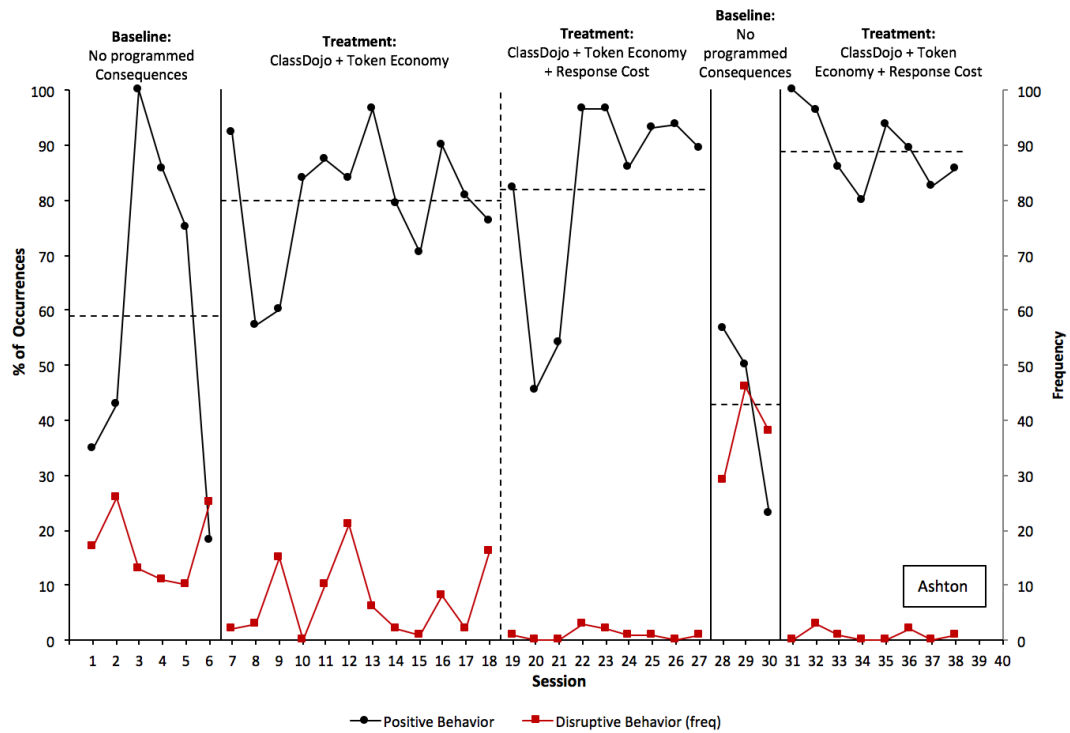
Table 2. *This table depicts all operational definitions of disruptive behavior targeted with examples and non-examples of each behavior.*

| <b>Target Behavior</b>                    | <b>Operational Definition</b>   | <b>Examples</b>   | <b>Non-Examples</b>   |
|---|---|---|---|
| Talking Out of Turn                       | The participant talks when he or she was not called on.                 | The participant is talking without raising a hand.  | The teacher directs the question at the student “Avery, when was a time you felt happy?” Jim answers the question without having to raise his hand. |
| Misuse of Materials                       | The participant uses materials inappropriately.                         | The participant pokes holes in the paper.   | The participant folds a piece of paper as instructed.   |
| Walking Away from Table                   | The participant walks away from the table when not instructed to do so. | The participant gets up to walk across the room.  | The participant asks to go to the bathroom and then gets up and walks to the bathroom.  |
| Saying Any Non-Compliant Statement When   | The participant says, “No”, “I don’t want to” etc.                      | The participant says they do not have to answer the question or says this I s stupid when he or she is asked a question by the teacher. | When the teacher asks the participant I f he or she wants something the participant says “No”   |
| Body Oriented Away from Peers and Teacher | The participant’s body is not oriented toward his or her peers.         | The participant is sitting with his or her body turned away from the teacher and peers.   | The participant turns around to look at the clock.  |

## Figures

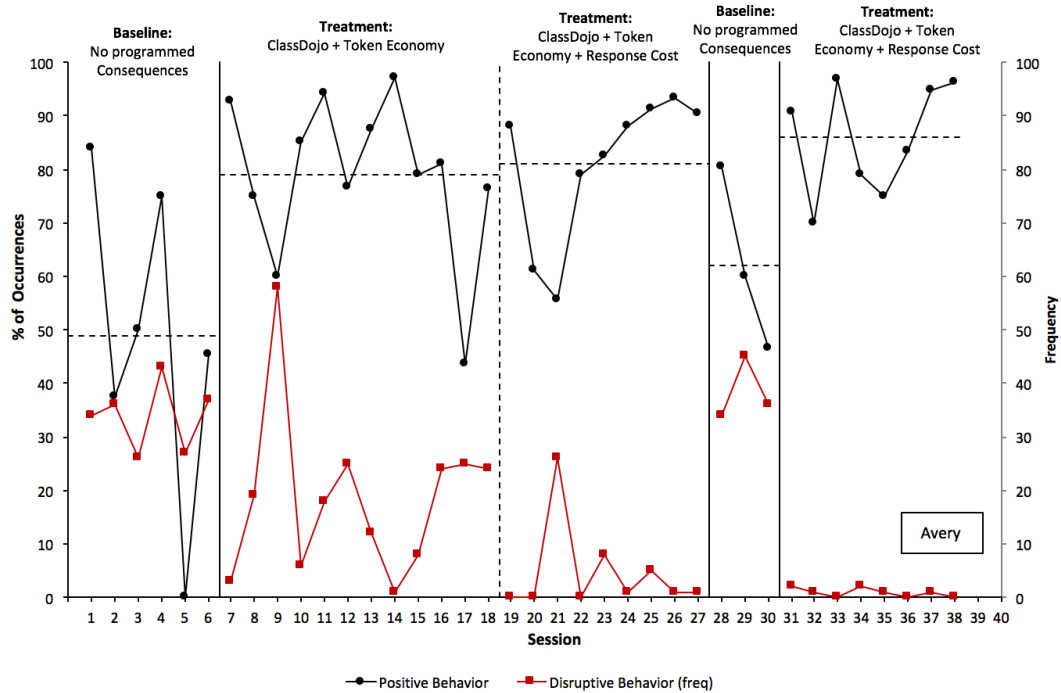


*Figure 1.* The above graph depicts the results for Amanda. The black circles represent prosocial behavior. The horizontal dashed lines represent the mean level of responding. The red squares represent the frequency of disruptive behavior. On the left y-axis is percent of occurrences of prosocial behavior; the right depicts the frequency of disruptions.



*Figure 2.* The above graph depicts the results for Ashton. The black circles represent positive behavior. The horizontal dashed lines represent the mean level of responding. The red squares represent the frequency of disruptive behavior. On the left y-axis is percent of occurrences of prosocial behavior; the right depicts the frequency of disruptions.





*Figure 3.* The above graph depicts the results for Avery. The black circles represent positive behavior. The horizontal dashed lines represent the mean level of responding. The red squares represent the frequency of disruptive behavior. On the left y-axis is percent of occurrences of prosocial behavior; the right depicts the frequency of disruptions.

## Appendix A

The information presented below represents the preference assessment questionnaire distributed to all participants prior to the start of treatment sessions.

Please rate the following items. These items will be in the treasure box.

1 being you do NOT like it  
3 being you think it's okay  
5 being you love it.

\_\_\_\_\_ Chocolate

\_\_\_\_\_ Pencils & Erasers

\_\_\_\_\_ Lollipops

\_\_\_\_\_ Pool Toys

\_\_\_\_\_ Sports Toys

## Appendix B

The information below depicts the cost of the backup reinforcers available in the treasure box.

# Dojo Rewards



|            |  |
|------------|--|
| 2 points   | Pencils, Kisses  |
| 5 points   | Pencils with Erasers, Ice Cream Erasers, Kit Kats,                               |
| 10 points  | Gel Pens, Ring Pops, Push Pops,  |
| 15 points  | Stamps, Bottle Pops, Juice Drop, Flowers, Airheads                               |
| 25 points  | Football   |
| 40 points  | Sticks of gum  |
| 50 points  | Big Candy, Hubba Bubba Gum, Pringles,  |
| 75 points  | Cotton Candy   |
| 100 points | Balls, Car, Space Ship, Baseball Bat, Darts Game, Basketball Game, Football Game |



## Appendix C

The information below depicts the social validity questionnaire distributed to the participants.

Color the smiley face if you liked it and color the sad face if you did not like it.

1. I thought ClassDojo was fun.



2. I liked seeing my own monster.



3. I liked earning points for good behavior.



4. I liked exchanging my points for the treasure box.



5. I liked the toys in the treasure box.



## Appendix D

The information below depicts the social validity questionnaire distributed to the participants' parents.

Please fill out and return the following survey about ClassDojo.

1. My child enjoyed earning points for good behavior.

|             |   |   |   |                |
|-------------|---|---|---|----------------|
| Don't Agree |   |   |   | Strongly Agree |
| 1           | 2 | 3 | 4 | 5              |

2. I liked having the ability to track my child's progress online.

|             |   |   |   |                |
|-------------|---|---|---|----------------|
| Don't Agree |   |   |   | Strongly Agree |
| 1           | 2 | 3 | 4 | 5              |

3. I like having the opportunity to communicate with my child's teacher through the app.

|             |   |   |   |                |
|-------------|---|---|---|----------------|
| Don't Agree |   |   |   | Strongly Agree |
| 1           | 2 | 3 | 4 | 5              |