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ClassDojo as a Token Economy Method

A Thesis submitted in partial satisfaction
of the requirements for the degree of

Master of Arts

in

Education

by

Danielle Andrea Cravalho

March 2019

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University of California, Riverside

ABSTRACT OF THE THESIS

ClassDojo as a Token Economy Method

by

Danielle Andrea Cravalho

Master of Arts, Graduate Program in Education
University of California, Riverside, March 2019
Dr. Austin Johnson, Chairperson

This proposed study aims to investigate the effectiveness of ClassDojo compared to a paper-pencil token economy method among students identified with emotional and behavioral disorders. Token economies are reinforcement procedures that can be implemented using a variety of modalities; thus, the purpose of this proposed study is to investigate the use of ClassDojo as a token economy, a free online program that is widely used in the classroom setting. An ABAB design will be used to measure the rate of reinforced social and academic behavior, academic engagement, and off-task behavior. In addition, the adherence and quality of administering the token economy (i.e., treatment integrity), and social validity will be measured. It is hypothesized that the use of ClassDojo will produce: higher rates of reinforcement for social and academic behavior, higher rates of academically engaged behavior, lower rates of off-task behavior, and the teacher, staff, and students will rate ClassDojo more favorably compared to the paper-pencil method.

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ClassDojo as a Token Economy Method

      Within the American education system, there is an emphasis to improve outcomes for students with disabilities. The Education of All Handicapped Children Act passed in 1975, requires that students with disabilities are provided an individualized, appropriate, free public education in the least restrictive environment, wherein services are assessed in order to evaluate the effectiveness of efforts to educate students with disabilities (Pub. L. No. 94-142, § 601). Amendments to the Education of All Handicapped Children Act later changed the act's name to the Individuals with Disabilities Education Act (IDEA), and amendments to the act emphasized the improvement of educational outcomes for students with disabilities (Jacob, Decker, & Lugg, 2016). Specific educational services provide the opportunity for students identified with an emotional and behavioral disorder (EBD; sometimes referred to as an emotional disturbance or serious emotional disturbance) to receive services that make an effort to improve academic, behavioral, and post-school outcomes; however, longitudinal studies have indicated that students with EBD make relatively small gains in academic achievement, social interactions, and long-term adult outcomes (Bradley, Doolittle, & Bartolotta, 2008). Data from these studies provide valuable information to evaluate access to services and program effectiveness (Bradley, Henderson, & Monfore, 2004).

      Students with EBD may demonstrate inappropriate types of behavior and they may not have the necessary skills to build or maintain satisfactory interpersonal relationships with peers or teachers, which adversely affects their educational performance (IDEA, 2004). These students typically meet the criteria for an emotional

disturbance (ED), defined by federal special education law, and they receive special

education and related services under this disability category. Characteristics of the

condition include one or more of the following over a long period of time: an inability to

learn that cannot be explained by intellectual, sensory, or health factors; an inability to

build or maintain satisfactory interpersonal relationships with peers or teachers;

inappropriate types of behavior or feelings under normal circumstances; a general

pervasive mood of unhappiness or depression; and a tendency to develop physical

symptoms or fears associated with personal or school problems. This also includes

children with schizophrenia and excludes children who are socially maladjusted (IDEA,

2004). Broadly, these characteristics include presentation of maladaptive internalizing

and/or externalizing behaviors among children with an emotional disturbance. Within the

academic literature, EBD and ED are used interchangeably. For consistency, EBD will be

used to encompass students who have a clinical diagnosis and/or a school classification

of an emotional and behavioral disorder, unless a given study used a specific term, in

which case that term will be reported.

Statement of Problem

In recognition of ensuring that students with disabilities receive a free and

appropriate public education, national studies provide data on the outcomes of youth with

disabilities and raise awareness of the impact of IDEA on access to services and student

achievement (Bradley et al., 2004; Wagner, Blackorby, & Hebbeler, 1993). Three major

studies have shown that students with EBD face the worst outcomes in comparison to all

other disability categories: the National Longitudinal Transition Study (NLTS), National

Longitudinal Transition Study-2 (NLTS2) and Special Education Elementary

Longitudinal Study (SEELS; Bradley et al., 2004; Wagner, Kutash, Duchnowski, &

Epstein, 2005). Students with EBD experience poor school performance, poor social

integration, high absenteeism, and they are more likely to drop out of school compared to

the general population (Wagner, 1995).

Academic Performance

Low academic achievement among students with EBD is a common

characteristic, as IDEA defines the disorder as one that negatively affects school

performance. While most schools provide secondary students with ED access to the

general education curriculum, 16.9% (*SE* = 3.6) of these students have no curriculum and

more than one third of students with ED in general education classes (37.5%, *SE* = 5.8)

do not receive modifications (Wagner, Newman, Cameto, Levine & Marder, 2003). In

addition, general education teachers serving students with ED reported being unaware of

specific accommodations and supports identified in the students' individualized

education program (IEP). Based on the data regarding academic services, it may be no

surprise that students with ED are the least likely to receive mostly A and B letter grades

in secondary school compared to the other IDEA disability categories (Wagner et al.,

2003). However, these students perform closer to grade level in reading and mathematics

than any other category of students with disabilities. Based on standardized assessment

performance, students with ED receive average scores from 84 to 93 on standardized

assessments of reading, mathematics, social sciences, and science (Wagner, Newman,

Cameto, & Levine, 2006). Although students with an emotional and behavioral disorder

tend to have higher reading and math abilities than other students with disabilities (e.g., students with learning disabilities), they are much more likely to demonstrate poor social skills which influence academic achievement and they are more likely to experience negative consequences for behavior at school (Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000).

Social Integration

In general, the NLTS and NLTS2 data demonstrate that high school students with EBD are more likely to be disconnected from school and less engaged. They are among the least likely to belong to clubs or social groups at school; however, parent reports indicate students with EBD frequently see friends outside of school (Wagner, 1995; Wagner et al., 2003). Students with EBD are less likely to have positive feelings about school which may explain why they are less likely to attend school on a regular basis. On average, students with EBD missed 18 to 20 days of school each year in high school, which is the highest rate of absenteeism among all categories of students with disabilities (Wagner, 1995). High absenteeism, low rate of school group membership, and high rates of affiliation with friends outside of school can indicate a student's disconnectedness from school and one's education (Wagner, 1991; Wagner et al., 1993).

Students with EBD are rated as demonstrating low levels of social skills and demonstrate low levels of appropriate social behavior in the classroom. The National Longitudinal Transition Study-2 indicated that approximately 40% of students with emotional disturbances score low on the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) and 37% of students with emotional disturbances score low on a researcher

developed classroom social behavior scale (i.e., the extent to which students get along well with other students in the classroom, follow directions, and control their behavior to act appropriately in class; Marder, Wagner, & Sumi, 2003). In addition, two-thirds of students with EBD have been subject to disciplinary actions (i.e., suspension, expulsion, detention). For some students with EBD, social deficits and an inability to adapt to social norms may affect other aspects of their lives; for instance, approximately 35% of students with EBD have been arrested (Wagner et al., 2003). The cumulation of school disconnectedness and academic failure may contribute to the dropout rate of students with EBD (50%), which is the highest of any disability category (Wagner, 1991). In addition, these students are significantly less likely to attend postsecondary school compared to students with other disabilities.

School Services and Supports

Despite the identified need to support students with EBD, longitudinal studies suggest that less than half of students with EBD receive behavioral interventions or mental health services within their schools, and these students are unlikely to receive academic services such as tutoring (Bradley et al., 2008). These data indicate a lack of services for this population which potentially impact the student's access to the curriculum. An absence of academic and social supports and reactive teaching strategies may contribute to poor outcomes for students with EBD.

As mentioned above, students with disabilities should be provided with individualized, appropriate, free public education in the least restrictive environment. Educators and other service delivery providers have the opportunity to decide the types of

services implemented and should make informed decisions based on data to effectively serve students identified with EBD (Bradley et al., 2008). The initial identification of behavioral deficits (i.e., internalizing and externalizing behaviors) that impact academic success indicate the need for program training and the implementation of effective interventions for students with EBD. Peacock Hill Working Group (1991) summarized seven supports that all students with EBD should receive based on findings across empirical studies: systematic, data-based interventions; continuous assessment and monitoring of progress; provision for practice of new skills; treatment matched to problem; multi-component treatment; programming for transfer and maintenance; and commitment to sustained intervention.

Interventions. Systematic, data-based interventions refer to the importance of implementing intervention strategies systematically and consistently, and the intervention is evaluated based on data (Peacock Hill Working Group, 1991). Several interventions identified as effective for students with behavioral problems include the Good Behavior Game, class-wide and school-wide positive behavioral supports, daily behavior report cards, contingency contracting, and token economies (Perkins & McLaughlin, 2015; Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008). Token economies are reinforcement strategies that can be paired with academic and behavior interventions, and the token economy system is a widely researched and an applied intervention used to change behavior (Cooper, Heron, & Heward, 2007). The use of a token economy allows practitioners to incorporate the supports needed for students with EBD (e.g., use of treatment matched interventions with multiple components).

Assessment and progress monitoring. Behavior assessment tools allow for

continuous assessment and monitoring of student progress. These tools can be used to

collect and manage data and provide information regarding the frequency, number of

times, or the duration of time over which a student engages in positive or negative

behavior (Krach, McCreery, & Rimel, 2017). Thus, behavior assessment tools can be

used to monitor student progress during intervention and make informed decisions

regarding intervention effectiveness and outcomes. In addition, behavior assessment tools

can be used as part of a more structured intervention plan that include reinforcement

procedures, such as the token economy system (Krach et al., 2017).

Data resulting from the implementation of a token economy can provide

permanent product data (i.e., extant data; Chafouleas, Riley-Tillman, & Sugai, 2007).

Extant data poses several advantages: it is less resource intensive, contextually relevant,

and collection of data may limit reactivity. However, these data may also pose several

limitations: lack of consistent or accurate data, unknown psychometric properties, and

creating a system for interpretation may be challenging. The incorporation of behavior

assessment tools provides additional sources of data. These tools include the utilization of

standardized behavior rating scales, direct behavior rating scales, and systematic direct

observation forms. Behavior rating scales typically include tools that require a student's

parent or teacher to rate the student's behavior based on past observations (Chafouleas et

al., 2007). Examples of behavior rating scales include the Behavior Assessment System

for Children – 2 (BASC-2) and the Achenbach System of Empirically-Based Assessment.

These tools are indirect measures of behavior which are generally not considered to be

sensitive to behavior changes and they are, generally, suitable for diagnostic purposes rather than direct behavior assessment. For progress monitoring purposes, indirect measures do not provide the opportunity for frequent data collection. In general, the more frequent behavior assessment occurs, the more often data-based decisions can be made (Howell, Fox, Morehead, & Howell, 1993).

Systematic direct observation (SDO) may present the best option for data collection of student progress and continuous assessment of behavior. An observer can collect data on frequency, rate, percentage of opportunities, duration, or latency data. Systematic direct observation is useful in progress monitoring, it is highly flexible, and includes standardized procedures; however, there is the potential of observer error or drift and reactivity (Volpe, DiPerna, Hintze, & Shapiro, 2005). The Behavioral Observation of Students in Schools (BOSS; Shaprio, 2003) is an example of a direct observation tool and can be utilized to collect data on students' academic engagement, off-task behavior, and teacher-directed instruction (Shapiro, 2004). The combination of permanent product data from the use of token economies and systematic direct observation with the use of the BOSS may provide valuable data for educators to make informed, data-based decisions regarding student performance.

Literature Review

Token Economies

Token economies provide an option for teachers to promote skill acquisition of appropriate classroom and social behaviors. Praise and a token economy system are two strategies identified as effective for responding to appropriate behavior (Simonsen et al.,

2008). The token economy is a system in which students can earn or lose tokens (e.g., points) for demonstrating a desired or undesired behavior, and tokens can be exchanged for an identified back-up reinforcer (e.g., toys, activities, snacks) at the end of a specified period of time (e.g., 1 day, 1 week, etc.). A paper and pencil method can be used to record the number of allocated tokens (i.e., points) for demonstrating appropriate social and academic behaviors. In addition, token economies can be utilized as a method for assessing progress toward student's behavioral goals.

Ayllon and Azrin (1965) are cited as the first researchers to establish a model of token economies (see Kazdin, 1972; O'Leary & Drabman, 1971). In their research, Ayllon and Azrin aimed to increase and strengthen daily living skills (e.g., washing dishes, sorting laundry, self-grooming) among adults in a mental health ward using a reinforcement procedure. Generalized conditioned reinforcers (tokens) were used to provide an immediate consequence, and the tokens were later exchanged for back-up reinforcers. The reinforcement procedure made it more feasible for the psychologists to provide each person their preferred reinforcer for demonstrating the target behavior. Token economies are now commonly applied in the classroom setting (e.g., Kazdin, 1977; Kazdin, 1982; Kazdin & Bootzin, 1972; O'Leary & Drabman, 1971; Soares, Harrison, Vannest, & McClelland, 2016).

A token economy can be broken down into three major components: a specified list of target behaviors, tokens that students receive for engaging in the target behavior, and back-up reinforcers that the students obtain by exchanging the tokens they have earned (Cooper et al., 2007). Variations may be incorporated such as the type of

contingency in place (independent, interdependent, dependent group contingency) or incorporating a response cost (i.e., tokens or privileges are taken away as a punishment procedure for engaging in inappropriate behavior; Cooper et al., 2007; O'Leary & Drabman, 1971; Skinner, Williams, & Neddenriep, 2004). In addition, token economies can be used to target a variety of behaviors such as increasing or strengthening appropriate social behavior, academic behavior, or self-care behaviors.

The general procedures for establishing a token economy include: identification of observable and measurable target behavior(s) for intended change, token conditioning through verbal or nonverbal pairing, formal or informal selection of back-up reinforcers (i.e., highly preferred activities/privileges, tangibles, edibles) and tokens (e.g., chips, points, coins), establish rules/exchange schedule (i.e., how many tokens may be earned, spent, lost, when the system is in operation) and inform students of the procedure (Cooper et al., 2007; Ivy, Meindl, Overley, & Robson, 2017; Myles, Moran, Ormsbee, & Downing, 1992). Tokens are conditioned to function as reinforcers despite differences in back-up reinforcer preferences. Students can earn tokens by performing various target behaviors and teachers or designated staff consistently and immediately provide the student a token (i.e., positive reinforcement), and then the token is exchanged for the back-up reinforcer.

Several reviews, syntheses, and meta-analyses have been conducted on the token economy (e.g., Doll, McLaughlin, & Barretto, 2013; Hackenberg, 2009; Maggin, Chafouleas, Goddard, & Johnson, 2011; Soares et al., 2016; O'Leary & Drabman, 1971). Among the various behaviors targeted for change in the classroom setting, behaviors

generally fit into one of the following categories: decreases in disruptive behavior, increases in academic behavior, increases in academic achievement, or changes in other targeted behaviors such as attendance (O'Leary & Drabman, 1971). Despite the volume of literature supporting the effectiveness of token economies on those behaviors, O'Leary and Drabman (1971) discuss variables that may influence the effectiveness of the token economy.

   Limitations. Variables influencing the effectiveness of the token economy may include teacher behavior, components of the token economy, treatment integrity, and limited participant sampling (Doll et al., 2013; O'Leary & Drabman, 1971; Perkins & McLaughlin, 2015). Teacher behavior includes the teacher's use of praise. Praise is an effective method for reducing disruptive behavior when approximations to the alternative or desired behavior are praised (O'Leary & Drabman, 1971). The token should be conditioned to function as a reinforcer by direct pairing with an established reinforcer (e.g., praise) or verbal description of the reinforcement contingency (Kazdin & Bootzin, 1972). However, only slightly more than half of studies on token economies conducted between 2000 and 2015 reported token conditioning procedures (Ivy et al., 2017). This may be a component within the token economy system that is frequently neglected, indicating that effective praise may not be provided to students for demonstrating appropriate behavior. Pairing with verbal praise may also increase the reinforcing value of praise following the removal of the token economy system and subsequent generalization (Kazdin & Bootzin, 1972).

In terms of treatment integrity of the token economy, when the system is implemented incorrectly (i.e., there is a lack of treatment integrity) it can lead to situations where both teacher and student are negatively reinforced. Gunter and Coutinho (1997) discuss how students' aggressive or tantrum behavior may lead to negative interactions and the teacher may remove the task demand to escape the negative interaction. This, in turn, may teach students that demonstrating inappropriate behaviors allow them to avoid or escape task demands. In addition, the students may present as aversive stimuli for the teacher and result in avoidance behavior, limited instructional or task demands, and few positive interactions.

As a result, teacher preparation is an important aspect of effective implementation of token economies and providing teachers an intervention that is easy to implement to decrease problem behaviors (Perkins & McLaughlin, 2015). That being said, there may be concerns that token economies require substantial work for the staff that administer them. The use of paper and pencil method may present negative consequences for teachers and paraprofessionals such as increased response effort, additional paperwork, and inefficient methods for data evaluation (Krach et al., 2017). The degree to which a teacher can easily implement this token economy strategy is an issue for teachers who are busy teaching. Often, it is difficult to engage in elaborate systems that mandate data collection, token management, and intricate exchange processes (Doll et al., 2013). As a result, elaborate token economy systems may hinder treatment integrity (also known as treatment fidelity). In addition, there is empirical evidence that the level of treatment integrity affects program outcomes; however, factors

that impact implementation and treatment outcomes should be evaluated (Durlak &

Dupre, 2008).

Recent meta-analyses assessing the effectiveness of token economies indicate a

lack of treatment integrity measures being utilized which hinders the ability to evaluate

alternative explanations for treatment effects. In one research synthesis examining the

effect of token economies on assessing the effectiveness of school-based token

economies on increasing appropriate student behavior, only two of 24 included studies

included measures of treatment integrity (Maggin et al., 2011). In a second meta-analysis

on the effectiveness of token economies in public school classrooms, only 10 of the 28

included studies reported treatment integrity (Soares et al., 2016). Lack of treatment

integrity data impacts the conclusions we can make regarding the effectiveness of the

intervention; thus, changes in student behavior may be due to extraneous variables

teachers and researchers are unaware of, and implementation of the program as intended

can only be assumed. However, it is important to note that 100% implementation of a

program is rarely documented. Durlak and Dupre (2008) found that positive results have

been found with implementation levels around 60%, and it is, generally, rare when

studies reach 80% or higher of implementation. This may indicate that adaptations to

programs in the educational setting may improve outcomes, but future research is needed

to identify key components of the token economy that lead to the most effective

outcomes for students with EBD. For instance, students who engage in severe problem

behaviors in the class setting may not be affected by a token economy system that would

work for most students and adaptations to the token economy may present as more

effective (Kazdin, 1977). It is important to continuously monitor student progress with the implementation of a token economy and determine if modifications can be made to improve outcomes.

Lastly, although there are a large amount of studies supporting the use of token economies among typically developing students, there are few studies that have explicitly included classrooms composed of students with emotional, social, and behavioral disabilities (Doll et al., 2013). This presents another limitation to the use of token economies. However, a lack of identified studies with diverse student participants may be due to inadequate reporting of participant (i.e., student) characteristics (Maggin et al., 2011). In addition, the decrease in studies investigating token economies following the 1980's leaves room for further research and expansion of token economy utilization (Doll et al., 2013).

The use of a token economy to target both social and academic behaviors is a widely used strategy (Kazdin, 1982; Kazdin & Bootzin, 1972); however, as the use of technology increases in the school setting, it may be beneficial to identify efficient ways to incorporate effective reinforcement strategies and data collection methods with technology-based methods. For example, permanent product measures from technology-based interventions may promote data-based decision making and act as a measure for monitoring treatment integrity without additional teacher time and/or effort (Shulte, Easton, & Parker, 2009). With the identified need to expand the literature on the use of token economies, this proposed study aims to do so by implementing a technology-based method of the token economy to address previously mentioned limitations.

Technology and Assessment

As part of the National Activities to Improve Education of Children with Disabilities statute, state educational agencies that receive grant funds are encouraged to support the training of special education and regular education teachers to effectively use and integrate technology into curricula and instruction, to enhance learning by children with disabilities, and to effectively communicate with parents (title 20, U.S.C. § 1454). In addition, technology should be used and integrated into curricula and instruction to improve data collection, management and analysis as a means of improving teaching, decision making, school improvement efforts and accountability.

The use of technology-based methods within the classroom setting may be an effective method for data collection, evaluating student progress, problem solving, and increase adherence to intervention steps (i.e., increase treatment integrity). Specifically, Robacker, Rivera, and Warren (2016) suggest that the ClassDojo program may be utilized as a means of managing a token economy. In addition, Chafouleas et al. (2009) mention that systematic direct observation forms are time intensive; however, the BOSS electronic version may reduce response effort.

ClassDojo

ClassDojo is a free application that can be accessed through a phone, tablet, computer, or laptop that may assist in the process of implementing a token economy. The application allows teachers to create a classroom account with individual student profiles. Teachers can allocate points to the whole class or individual students for demonstrating specific skills or behaviors that are programmed into the application (e.g., being on-task,

demonstrating cooperative behavior, completion of academic tasks). The process of using ClassDojo is essentially the same system as a token economy; however, the method of distributing points is on a mobile device or computer.

From a behavioral perspective, ClassDojo can be described as a reinforcement procedure. The tokens (i.e., points allocated through the online program) function as a conditioned or generalized reinforcer and the reward or prize the student earns after accumulating a predetermined amount act as back-up reinforcers. The schedules of reinforcement can be administered using a variety of methods (e.g., fixed ratio, variable interval, differential reinforcement of alternative behavior; Ivy et al., 2017). The tokens are used to increase the future likelihood of the students engaging in appropriate behavior.

According to the ClassDojo website (https://www.classdojo.com), it is reported that the classroom management program is actively being used in 90% of K-8 schools in the United States and in over 180 countries. Despite its' popular use, few peer reviewed studies have been conducted to support its use. An initial search of "classdojo" or "class dojo," within Education Resources Information Center (ERIC) and PsycINFO, generated 18 unique hits. Among the eight peer reviewed studies, three studies included ClassDojo as a behavior management system in the classroom setting (e.g., Chiarelli, Szabo, & Williams, 2015; Homer, Hew, & Tan, 2018; Lynne, Radley, & Dart, 2017).

Studies using ClassDojo. Chiarelli, Szabo, and Williams (2015) utilized ClassDojo as a method for students to self-monitor their behavior during work station activities and guided reading time. Twenty-four Grade 1 students participated in the

study. As a class, the students and teacher identified positive and negative behaviors that would be rewarded and redirected. The teacher displayed the website on the whiteboard and monitored behavior during guided reading, workstation time, transition time, and whole class instruction. The teacher would allocate points based on students' daily behavior and once the teacher clicked the button for the demonstrated behavior, a positive or aversive sound ("ding") played from the computer. Data were collected across 8 weeks and the class was analyzed as a whole unit rather than by individual students. Results indicated that the students displayed more negative behaviors (n=135) during the first 4 weeks compared to the last 4 weeks of the study (n=51). Positive behaviors increased from an average of 67 positive behaviors per individual to 147 per individual across the two months. Although there is a lack of data before the implementation of ClassDojo, it appears that the classroom teacher was consistent at observing student behavior as the class total of recorded behaviors were similar, at 202 and 198, across the two months. In addition, a comparison group was not included which limits the methodological rigor.

Homer, Hew, and Tan (2018) utilized ClassDojo as a digital "badge-and-point" method to improve behavioral engagement and English acquisition among Hong Kong ESL elementary school children, and the program was compared to a non-digital token economy method. The study was conducted in Hong Kong, across 8 different classes. Two classes from each grade level, 1st through 4th, were included in the study. One class from each grade acted as the control group and the other class received the intervention. The intervention was implemented during either reading or speaking lessons; the 1st and 2nd grade classes received reading lessons, whereas the 3rd and 4th graders received

speaking lessons. During class instruction, students were awarded points for demonstrating positive behaviors or achieving the learning objectives; points were deducted when students demonstrated negative behaviors, such as not listening, talking and shouting. Categories of points were the same across groups (experimental and control). Points were awarded to individual students or groups of students. For example, if one student elaborated an answer, that student earned two points. If the whole class read well during shared reading, the teacher allocated one point to all students.

Badges were awarded to students who earned a certain amount of points, and the badges were in the form of a new avatar on their class page on ClassDojo. For example, the starting avatar was a green hexagon with a check mark in the middle. Once students earned 15 points, they were awarded a new avatar in a shape similar to a decagon with a smiley face in the middle. Four additional badges could be earned with the accumulation of points. Students received a physical prize once they earned the highest amount of points (i.e., 50 points). The control classes' point system was set up slightly differently than that of the experimental classes. The control classes divided the students into groups of 4 to 6 students to implement the point system. Students in the control classes still earned points based on individual performance, however, the point was allocated to the whole group. The authors of this study used a behavior chart to record the teacher's observations of the whole class's behavior during the lessons.

The results showed a significant difference in oral post-test scores between the experimental and control group students in 3rd and 4th grade; however, the students in 1st and 2nd grade did not demonstrate significant differences in reading post-test scores.

The authors note a couple potential reasons for the lack of significantly different scores: the students' younger age and the reading curriculum. The teachers reported anecdotal notes that the students made comments regarding who they were sitting next to and expressed excitement transitioning to different classrooms throughout the day. These observations may indicate additional factors that were not present among the older students who were previously exposed to these environmental factors. Additionally, the 1st and 2nd graders received English reading curriculum which focused on review and reinforcement of previously learned content rather than learning new concepts. The authors note that this may have influenced the students' academic performance. However, in terms of behavioral differences, the experimental groups demonstrated more students engaging in positive academic behaviors compared to the control groups.

Although the students were already familiar with ClassDojo as they were using it for about four months prior to the start of the study, ClassDojo resulted in providing individual-based achievement whereas the non-digital token system focused on group-based achievement. The difference in experimental classes and control classes, in terms of point allocation, set up different contingencies (individual and group contingencies) which may have influenced their performance. In addition, the authors did not report any indication of behavior levels prior to the implementation of the intervention. It can only be assumed that students across both groups demonstrated about equivalent levels of positive and negative behavior. Lastly, the authors did not analyze the data based on the exact points allocated to students during the lessons. Data was analyzed based on the behavior charts which provide similar information, but this data is based on the authors

observation of the whole class's behavior which could have led to subjective determinations.

Lynne and colleagues (2017) based their article on findings from Lynne's dissertation (2016). Lynne used ClassDojo as a means to implement the Good Behavior Game which incorporates an interdependent group contingency. Three classes (two fourth-grade classes and one first-grade class) were referred to participate in the study due to high levels of disruptive behavior and low levels of on-task behavior compared to other classes at that school. The purpose of this study was to implement the intervention to increase academically engaged behavior, decrease disruptive behavior, and increase the rate of teachers' use of praise.

The researcher utilized an ABAB withdrawal design, and during baseline there were no changes to the contingencies in place for appropriate or inappropriate behavior. During intervention, students were separated into teams and points were allocated to teams dependent on the whole group engaging in the appropriate behavior. When students engaged in minor inappropriate behaviors (e.g., talking or being out of seat without permission), the behaviors were ignored during the 20-minute period of intervention that day. Results indicated that the Good Behavior Game implemented with ClassDojo reduced disruptive behavior, increased academically engaged behavior, and there was an increase in behavior-specific praise statements delivered by the teachers.

In addition to the three peer-reviewed studies, Krach, McCreery, and Rimel (2016) conducted an exploratory study investigating the type of behavior management charts used by teachers, including the use of ClassDojo. The authors looked at the type of

data collected and the reliability of data produced from each behavior management chart. Ten teachers from schools located in the Southeastern United States participated in the study. The teachers provided material that they considered behavior management charts (i.e., ClassDojo, behavior logs, teacher-made materials, no log, or multiple types of charts). The researchers then examined differences between each type of behavior management chart. Analysis of the different tools indicated that ClassDojo provided significantly more data (i.e., record of appropriate and inappropriate behavior) and was more reliable than the other data systems reviewed. In addition, it was noted that the teachers using paper and pencil methods infrequently tracked positive behaviors and did not consistently provide ratings for all children. Findings from the discussed studies suggest further investigation of ClassDojo and how the use of data collection can be utilized to make informed decisions, increase treatment integrity, and impact behavior change among students.

Research Questions

The purpose of this proposed study is to investigate the effectiveness of ClassDojo as a technology-based method compared to a paper-pencil method for implementing a token economy system. The following research questions will be examined:

1. Is the use of a technology-based token economy more effective in increasing the frequency of reinforced social and academic behavior than a paper-pencil method of students with emotional and behavioral disorders?

2. Will students with emotional and behavioral disorders demonstrate higher levels of academic engagement and lower levels of off-task behavior with the use of a technology-based token economy compared to a paper-pencil method?

3. Does the use of a technology-based method increase treatment integrity while implementing a token economy compared to a paper-pencil method?

4. Will the teacher, staff, and students rate the use of ClassDojo as a token economy method more favorably than the paper-pencil method on measures of social validity?

It is hypothesized that the technology-based method will produce higher rates of reinforcement for social and academic behavior, higher rates of academically engaged behavior, lower rates of off-task behavior, higher adherence and quality of administering the token economy (i.e., higher rate of treatment integrity), higher rate of improvement on academic curriculum-based measures, and the teacher, staff, and students will rate ClassDojo more favorably compared to the paper-pencil method.

Method

Proposed Participants and Setting

The study will take place in a Southern California, rural city. The school district consists of 49% female students and 51% male students (Niche, 2018). The student demographics include 52% Hispanic students, 27% White students, 12% Asian students, 6% African American students, 2% multiracial students, and less than 1% Pacific Islander and Native American students (niche, 2018). Participants will include six students, three paraprofessionals, and one teacher from a pre-K through 6th grade primary

school. Students and staff within this classroom were identified as using a token economy that was monitored using a paper-pencil method. Anecdotally, the school psychologist and classroom teacher noted a lack of progress in acquisition of social and academic skills and limited decreases in problem behavior while using the token economy. This sample can be considered a convenience sample as this classroom demonstrated an identified need for investigating other methods of using a token economy within their classroom. Before the study begins, approval from the University of California, Riverside Institutional Review Board, student assent, students' guardian consent, teacher consent, and paraprofessional consent will be obtained.

All students in this classroom are identified as having an emotional or behavioral disorder and receive special education and related services under the disability category of Emotional Disturbance. One female student and five male students are enrolled in this class. All students are in the second or third grade and receive instruction in small groups throughout the day. Two of the paraprofessionals are female adults and one male adult is the third paraprofessional. The paraprofessionals support the teacher, a female adult, in instruction and behavior management.

The classroom is set up with two tables in the back of the room and one table at the front of the room for small group instruction, and the students have individual desks in the middle of the classroom. There is an empty room attached adjacent to the front of the room used for de-escalating student behavior and for students to work on academic tasks in this secluded room. In addition, there is a room connecting the student's classroom to the classroom next to theirs. This room is used for storage of additional

academic materials and back-up reinforcers. There is also a table in this room for the teachers of the connecting classrooms to provide one-on-one instruction, if needed.

The school is identified as incorporating a Positive Behavior Support (PBS) framework. This includes having school-wide Positive Behavior Interventions and Supports (PBIS). There are school-wide behavior expectations listed in a matrix which aims to set rules for the classroom, hallway, bathroom, cafeteria, and playground settings. There is a school-wide token economy in place where students can earn tokens (i.e., paper money) that can be exchanged for toys, candy, snacks, and a variety of other tangibles. The use of the school-wide token economy will not be changed from baseline to intervention to ensure the modality of implementing the classroom token economy is the only manipulation.

Dependent Variables and Data Collection

This study will consist of several dependent variables: social and academic behavior, academic engagement, treatment integrity, and social validity.

Social and academic behavior. Social and academic behaviors will be measured based on the frequency of tokens allocated to each student. During baseline, tokens are in the form of points allocated on pre-made point sheets which are currently used in the classroom. Students have the opportunity to receive tokens for demonstration of three academic behaviors: class participation, assignment completion, and homework completion. These behaviors will be defined during an initial consultation meeting with the teacher to identify the teacher's expectations. Target social behaviors are identified

according to each student's pre-determined "Target Area" and any additional "Behaviors Observed Today."

Depending on the social skill being taught each week, the "Target Area" category may include skills such as: following instructions, accepting criticism or a consequence, accepting "No" for an answer, greeting others, getting the teacher's attention, disagreeing appropriately, making an apology, sharing, listening, or asking for help. Each skill is taught varying from 3 to 6 steps. For example, following instructions is taught using four steps: look at the person, say "okay," do what you have been asked right away, and check back in. These social skills are the target behaviors that students have the opportunity to receive tokens for demonstrating. All previously taught social skills may be recorded under the "Behaviors Observed Today" category. During the intervention phases, the same target social and academic behaviors will be added to the ClassDojo interface as behaviors available for reinforcement.

Data collection for the academic and social behaviors will be based on the use of the point sheet and ClassDojo class report as a permanent product. During each phase, the data from each student's point sheet or ClassDojo profile report will be aggregated to determine the number of tokens allocated at the classroom level.

Academic engagement. Academic engagement will be measured based on active engaged time, passive engaged time, and off-task behaviors. Active engaged time is defined as times when the student is actively attending to the assigned work (e.g., writing, reading aloud, raising hand, talking to the teacher or peer about the assigned material; Shapiro, 2004). Passive engaged time is defined as times when the student is passively

attending to assigned work (e.g., listening to a lecture, looking at an academic worksheet, silently reading assigned material, looking at the teacher or board during instruction). Off-task motor behaviors can be defined as any instance of motor activity that are not directly related to an assigned academic task (e.g., out-of-seat behavior, manipulating objects, touching other students or staff, drawing or writing not related to the academic activity, turning away from the classroom instruction). Off-task motor behaviors do not include swinging feet or fidgeting while working on assigned material. Off-task verbal behaviors include any audible verbalizations that are not permitted and/or related to the assigned academic task (e.g., whistling, talking to another student or staff about topics unrelated to the assigned academic task, making inappropriate comments or remarks, calling out answers to academic problems when the teacher has not asked for an answer or permitted such behavior). Off-task passive behaviors are defined as times when the student is passively not attending to an assigned academic activity for a period of at least 3 consecutive seconds (e.g., sitting quietly in an unassigned activity, looking around the room, staring out the window, passively listening to other students talk about topics unrelated to the assigned academic activity).

Academic engagement will be directly observed, and data will be collected using the Behavior Observation of Students in Schools (BOSS) software. A momentary time sampling procedure will be used to collect data on active engaged time and passive engaged time, and partial interval recording procedure will be used to collect data on off-task motor, off-task verbal, and off-task passive behavior.

Data on academic engagement will be collected using 15-second intervals for observation of the frequency of social and academic behaviors. Each observation period will consist of approximately 20-minute sessions. Each student will be observed for 15-second intervals and a predetermined random order will be established to determine the order of student observation. This observational method is the most accurate method to establish the mean level of engagement across students (Briesch, Hemphill, Volpe, & Daniels, 2015).

Social Validity. To assess the social validity of ClassDojo as an intervention, the Usage Rating Profile-Intervention Revised (URP-IR; Chafouleas, Briesch, Neugebauer, & Riley-Tillman, 2011) measure will be used. The URP-IR measure has 29 items that provide information related to six subscales: acceptability, understanding, feasibility, home-school collaboration, system climate, and system support (Briesch, Chafouleas, Neugebauer, & Riley-Tillman, 2013). These six subscales provide information regarding potential understanding of the intervention's use within the school setting. The measure will be administered at the end of the second intervention phase.

Treatment integrity. Treatment integrity data will be collected to assess the teacher and paraprofessional's adherence to implementing the token economy with the paper-pencil method and the technology-based method and the quality in which the token economies were implemented. A researcher developed measure for each method will be established with the list of the steps for implementing the token economy and a likert scale for each step will be used to rate adherence and quality of each step. The extent to which the teacher and staff implement the intervention as planned will provide a measure

of adherence and the qualitative aspect of implementation (e.g., the teacher provided praise with enthusiasm) will provide a measure of quality of implementation (Sanetti & Kratowill, 2009).

The primary observer will directly observe the staff weekly throughout the baseline and treatment phases. The treatment integrity form will include a list of steps implementing the token economy system using the paper-pencil method and ClassDojo depending on which phase is being observed. Each step will be rated based on adherence and quality on a two to zero scale. A two indicates all components of the step was delivered in a smooth, natural manner and with appropriate verbal and non-verbal behavior (e.g., if praise is expected, the praise is delivered in a positive tone and the staff appears happy by smiling). A score of one indicates that some of the step components were delivered with some aspects of quality (e.g., the staff provide the student points, but does not verbally express praise for demonstrating appropriate behavior). A score of zero indicates the step was not delivered (e.g., the student demonstrated a target behavior such as completing an in-class assignment during the designated time and neither praise or points were delivered).

Interobserver agreement and observer training. Data collected by the primary observer (the first author) will be compared for agreement to a second observer's data for at least 20% of all observation sessions across all phases (i.e., baseline and treatment phases). The secondary observer will be a doctoral student in school psychology who has been trained in direct observation data collection and has about three years of experience in conducting behavioral observations. The second observer will be provided a 30-minute

training to review the dependent variables, data collection method, and device use to record data. Following the review of data collection method, the observers will both observe in the classroom setting. If agreement is below 90%, the primary observer will provide feedback based on areas of need. A minimum of three observation sessions will be conducted until interobserver agreement is at or above 90% agreement. Interobserver agreement will be calculated by summing the total number of agreements of occurrences and non-occurrences of behavior and then dividing that number by the total number of intervals and multiplying that number by 100. In addition, Cohen's Kappa will be calculated to demonstrate an alternate estimate of interobserver agreement that corrects for chance agreement (Kazdin, 2011).

Independent Variable

During baseline, the teacher and staff will continue to use the point sheet (i.e., paper and pencil method) to allocate tokens (i.e., points) for demonstrating appropriate social and academic behaviors. During intervention, ClassDojo will be used and accessed through the class computer and the teacher and staff's personal smartphone. The software program, ClassDojo (http://www.classdojo.com) will be implemented as the independent variable. ClassDojo will be pre-programmed to include the same academic behaviors observed in baseline (i.e., class participation, assignment completion, and homework) and the pre-determined social skills will be included as target behaviors.

Experimental Design and Procedures

A single-case, withdrawal design (i.e., ABAB; Kazdin, 2011) will be used to test a functional relationship between the dependent variables and independent variable. An

ABAB design allows researchers to examine the effects of an intervention by alternating the baseline condition (A phase), when the intervention is not in effect, with the intervention condition (B phase). The A and B phase are implemented again, and the effects of the intervention are demonstrated if student behavior improves in the hypothesized direction during the intervention phases and returns to initial baseline levels of performance when the intervention is withdrawn during the second A phase. The duration of each phase will be a minimum of one academic week to gather sufficient data across each day of the week and to have a minimum of 5 days' worth of data. Depending on the presence of a trend or excessive variability, intervention will not be implemented until each new phase appears to demonstrate relatively stable data.

Baseline. The purpose of baseline is to collect data on the current frequency and rate of reinforcement provided for student's appropriate social and academic behavior, academic engagement, academic performance, and the level of treatment integrity with the use of the paper-pencil, token economy system currently in place.

The paper-pencil method consists of using a daily point sheet utilized to implement the token economy. The first page of the daily point sheet is used to allocate points for positive academic and social behaviors. Students can earn 500 points for average levels of academic performance and 1,000 points for high levels of academic performance. Based on the teacher and paraprofessionals' (i.e., staff) initial training of the token economy, they are expected to differentiate between average and high levels of performance based on typical student performance.

The teacher and staff are expected to provide effective praise as described by the token economy system in place, and points are allocated to the appropriate category for academic or social behaviors. For example, effective praise and point allocation may be delivered with the following statements, "Steffan, you did a great job following instructions! You looked right at me, said 'Okay,' and put the books on the shelf. You've earned 500 points for following instructions." The students or staff can record the earned points on the daily point sheet, and staff are expected to initial the point sheet every time points are allocated. At the end of the day, the staff review each student's point sheet and students exchange their points for their choice of back-up reinforcers based on the amount of earned points. Back-up reinforcers include a variety of toys, snacks, and drinks. The staff are expected to transfer the number of total earned points into a teacher developed record for tracking progress. The primary observer will collect daily data on academic engagement and treatment integrity. Transition to intervention will occur until the baseline data indicate a stable rate of performance (i.e., absence of a trend and little variability). This decision will be based on the number of tokens allocated each day; in essence, the frequency of token allocation will be the unit of analysis.

Teacher and staff training. Once baseline has been established, in essence a consistent pattern of student behavior is established and stability is demonstrated, training of the intervention will begin. The teacher will set up a free account on classdojo.com or through the app on their mobile device. The teacher will then add all student names and select an avatar for each student. The teacher and students also have the option to upload their own image file using the ClassDojo website. To potentially increase student

acceptability and interest in the program, it is an option to have the students identify which avatar they would like to represent them. For additional information regarding account set up, ClassDojo.com provides step-by-step instructions as well as a "Getting Started with ClassDojo" information tutorial video. The teacher will also set up what academic and social behaviors are available for reinforcement. Academic and social behaviors will be based on the teacher's classroom expectations and the behaviors targeted on students' behavior intervention plans.

The teacher and staff will then be provided a two-hour training using behavior skills training (BST) on token economies. Although there are no specific guidelines for training necessary for implementing a token economy, efficient teacher training generally should consist of monitoring of teacher and student behavior, modeling of the desired teacher behavior, and direct feedback (O'Leary & Drabman, 1971). Behavior skills training has been shown to be an effective method for training professionals, such as teachers, to implement an intervention or train a new skill with children (e.g., Nigro-Bruzzi & Sturmey, 2010; Homlitas, Rosales, & Candel, 2014; Seiverling & Sturmey, 2012), and BST incorporates the suggested training components by O'Leary and Drabman (1971). Behavior skills training includes the following procedures: instructions, modeling, rehearsal, and feedback. The training session will be provided by the primary investigator.

The teacher and staff will be provided a handbook containing instructions about each step included in the implementation of a token economy (i.e., a task analysis) and the trainer will review each component and answer any questions. The instructions will

include specific antecedent situations, anticipated behavior of students, and the expected consequences. Next, the trainer will model how to correctly implement the token economy with role playing of real scenarios. Additional simulation video models will be supplemented to show correct implementation of the token economy in a classroom with students engaging in appropriate and inappropriate behavior. The goal of including additional video models is to model the expected behavior in a variety of ways and situations. The teacher and staff will then have time to rehearse the steps that were modeled, and feedback will be provided. Rehearsal provides the teachers and staff the opportunity to practice the expected behaviors after receiving instruction and modeling and provides the trainer the opportunity to reinforce appropriate behavior. Lastly, rehearsal allows the trainer to assess the teacher and staff's performance, provide corrective feedback, and additional praise for corrected behavior. The rehearsal and feedback components will repeat until all staff members have demonstrated how to implement a token economy several times.

Intervention. After the staff have been trained on how to use ClassDojo, the teacher and paraprofessional will begin using the technology method for allocating points. The application interface will have individual student avatars with the various behaviors added to each profile. The students will have the opportunity to earn back-up reinforcers in the same manner as in the baseline condition. A set criterion for points per back-up reinforcer will be established and students will exchange tokens for the desired tangible, edible, or privilege. The staff will have access to the student's total points earned each day through the ClassDojo website and application. The website and

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application keep track of points earned for each behavior and the data can be viewed in a spreadsheet for monitoring progress.

At the beginning of each day, the teacher will review the class expectations and rules for earning tokens (i.e., points). The teacher and staff will allocate points to individual students or groups of students if they demonstrate the target social and academic behaviors. Points are allocated through the application on each teacher and staff's mobile device or through the ClassDojo website on the classroom computer.

Withdrawal. Following the intervention phase, the ClassDojo system will be removed and the paper-pencil method will be reinstated. The teacher, staff, and students will be informed that the ClassDojo system will no longer be used and the conditions as described in baseline will be put in place. During the withdrawal phase, instruction will be planned the same as the intervention phase; however, instead, the teacher will use the paper-pencil method to allocate points.

Intervention. This phase will be a replication of the first intervention phase.

Expected Results

Data Analysis

Visual analysis of the data will be used to examine the extent of significant changes in token allocation across phases. The level, trend, variability, immediacy of the effect, overlap and consistency of data patterns across similar phases will be examined to assess the effects of the token economy using ClassDojo compared to the paper-pencil method (Kazdin, 2011; Kratochwill et al., 2011). The level of the data provides a measure of mean performance within the given phase. The average performance or level across

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each phase will be compared. The overall trend indicates an increasing or decreasing data path. Trend will be taken into consideration to identify relative changes in reinforced social and academic behavior. Variability within the intervention phase may indicate lack of control in influencing the dependent variable. The extent to which there is high variability needs to be taken into consideration as there are many factors that may influence behavior in the school context. Overlap will be evaluated based on the proportion of data in one phase (e.g., intervention) that overlaps with data from the previous phase (e.g., baseline). The smaller the proportion of overlapping data points is interpreted as a more convincing demonstration of effect. Lastly, consistency of data will be examined based on the extent to which there is consistency in the data patterns from each intervention phase and baseline and withdrawal phases (i.e., phases with the same conditions). The greater the consistency of data among phases with the same conditions can be interpreted as more likely to represent a causal relation. Additional analyses, such as an effect size estimation, will not be conducted due to the lack of agreed-upon methods or standards for effect size estimation. Although several quantitative methods have been developed and proposed, each method may present flaws (Kratochwill et al., 2010). For instance, the conversions may not be valid, and some indices do not take into account trends among the data.

Social and academic behaviors and treatment integrity will be graphed based on the permanent product data from the point sheet or ClassDojo profile report and the treatment integrity protocols to observe any differences in data across phases. Academic engagement will be graphed separately using direct observation data from the BOSS

measures and academic performance probes can be included in this graph. Lastly, social validity will be calculated as the overall mean item rating on each subscale: acceptability, understanding, feasibility, home-school collaboration, system climate, and system support.

Ideas for Discussion

Based on the results of the intervention, findings will be described and implications for practitioners will be provided. Limitations to the study will be discussed as well. Potential limitations may include lack of control of the instructional activities. Lastly, directions for future research will be provided.

References

Ayllon, T., & Azrin, N. H. (1965). The measurement and reinforcement of behavior of psychotics. *Journal of the Experimental Analysis of Behavior*, *8*, 357-383.

Bradley, R., Doolittle, J., & Bartolotta, R. (2008). Building on the data and adding to the discussion: The experiences and outcomes of students with emotional disturbance. *Journal of Behavioral Education*, *17*, 4–23. https://doi.org/10.1007/s10864-007-9058-6

Bradley, R., Henderson, K., & Monfore, D. A. (2004). A national perspective on children with emotional disorders. *Behavioral Disorders*, 29, 211–223.

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

Briesch, A. M., Hemphill, E. M., Volpe, R. J., & Daniels, B. (2015). An evaluation of observational methods for measuring response to classwide intervention. *School Psychology Quarterly*, *30*(1), 37.

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological science*, *11*(4), 302-306.

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

Chafouleas, S.M., Riley-Tillman,T.C., & Sugai, G. (2007). *School-Based Behavioral Assessment: Informing Instruction and Intervention.* New York: Guilford.

Chiarelli, M., Szabo, S., & Williams, S. (2015). Using classdojo to help with classroom management during guided reading. *Texas Journal of Literacy Education*, *3*, 81–88. Retrieved from https://eric.ed.gov/?id=EJ1110950

ClassDojo. (2018). ClassDojo (Version 4.34.0) [Website and mobile application software]. Retrieved from https://www.classdojo.com/

Coon, C. R., Escandell, V. A, Coon, K. B., & Green, J. C. (1976) Using an academic peer interaction contingency with emotionally disturbed children. *The Journal of Experimental Education*, *44*, 17-20, DOI: 10.1080/00220973.1976.11011531

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied Behavior Analysis* (2nd ed). Upper Saddle River, NJ: Pearson.

Doll, C., McLaughlin, T. F., & Barretto, A. (2013). The token economy: A recent review and evaluation. *Australian Journal of Basic and Applied Sciences / International Network for Scientific Information; INSInet*, *2*(1), 131–149.

Education for All Handicapped Children Act of 1975 (Pub. L. No. 94-142), 20 U.S.C.

Gresham, F. M., & Elliot, S. N. (1990). Social skills questionnaire. *Circle Pines, MN*.

Gresham, F. M., Sugai, G., & Horner, R. H. (2001). Interpreting outcomes of social skills training for students with high-incidence disabilities. *Exceptional Children*, *67*(3), 331–344. https://doi.org/10.1177/001440290106700303

Gunter, P. L., & Coutinho, M. J. (1997). Negative reinforcement in classrooms: What we're beginning to learn. *Teacher Education and Special Education*, *20*(3), 249-264.

Hackenberg, T. D. (2009). Token reinforcement: A review and analysis. *Journal of the experimental analysis of behavior*, *91*(2), 257-286.

Homer, R., Hew, K. F., & Tan, C. Y. (2018). Comparing Digital Badges-and-Points with Classroom Token Systems: Effects on Elementary School ESL Students' Classroom Behavior and English Learning. *Journal of Educational Technology & Society*, *21*(1), 137-151.

Homlitas, C., Rosales, R., & Candel, L. (2014). A further evaluation of behavior skills training for implementation of the picture exchange communication system. *Journal of Applied Behavior Analysis. 47*(1), 1-6.

Howell, K., Fox, S., Morehead, M., & Howell, K. (1993). *Curriculum-based evaluation: Teaching and decision making* (2nd ed.). Pacific Grove, Calif.: Brooks/Cole Pub. Co.

Individuals with Disabilities Education Act (IDEA; 1997), 20, U.S.C. § 1400

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

Individuals with Disabilities Education Act (IDEA; 2004), 20 U.S.C. § 1454

Ivy, J. W., Meindl, J. N., Overley, E., & Robson, K. M. (2017). Token economy: A systematic review of procedural descriptions. *Behavior modification*, *41*(5), 708-737.

Jacob, A., Decker, D.M., & Hartshorne, T.S. (2016). *Ethics and Law for School Psychologists, 7th Edition.* Hoboken, NJ: Wiley Publishing.

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. https://doi.org/10.1901/jaba.1982.15-431

Kazdin, A. E. (2011). *Single case research designs: Methods for clinical and applied settings* (2nd ed.). New York: Oxford University Press.

Kazdin, A. E., & Bootzin, R. R. (1972). The token economy: An evaluative review. *Journal of Applied Behavior Analysis*, *5*, 343–372. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/16795358

Krach, S. K., McCreery, M. P., & Rimel, H. (2017). Examining teachers' behavioral management charts: A comparison of Class Dojo and paper-pencil methods. *Contemporary School Psychology*, *21*(3), 267-275.

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

Lewis, T. J., Jones, S. E. L., Horner, R. H., & Sugai, G. (2010). School-wide positive behavior support and students with emotional/behavioral disorders: Implications for prevention, identification and intervention. *Exceptionality*, *18*, 82–93. https://doi.org/10.1080/09362831003673168

Lynne, S. (2016). *Implementing a positive variation of the good behavior game with the use of a computer-based program*. The University of Southern Mississippi. Retrieved from https://aquila.usm.edu/dissertations/364/

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

Marder, C., Wagner, M., & Sumi, C. (2003). The achievements of youth with disabilities during secondary school. A report from the National Longitudinal Transition Study-2 (NLTS2). *Menlo Park, CA: SRI International*.

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. https://doi.org/10.1016/j.jsp.2011.05.001

Miltenberger, R. G. (2011). *Behavior modification: Principles and procedures*. Cengage Learning.

Miura Wayman, M., Wallace, T., Wiley, H. I., Tichá, R., & Espin, C. A. (2007). Literature synthesis on curriculum-based measurement in reading. *The Journal of Special Education*, *41*, 85-120.

Myles, B. S., Moran, M. R., Ormsbee, C. K., & Downing, J. A. (1992). Guidelines for establishing and maintaining token economies. *Intervention in School and Clinic*, *27*, 164-169.

National Longitudinal Transition Study-2. (2007). Wave 2: Student school program survey (website). Retrieved from http://www.nlts2.org/data_tables/index.html

Nelson, J. R., Benner, G. J., Lane, K., & Smith, B. W. (2004). Academic achievement of K-12 students with emotional and behavioral disorders. *Exceptional children*, *71*, 59-73.

Niche (2018). Students at Corona-Norco Unified School District [Web document]. Retrieved from: https://www.niche.com/k12/d/corona-norco-unified-school-district-ca/students/

Nigro-Bruzzi, D. & Sturmey, P. (2010). The effects of behavioral skills training on mand training by staff and unprompted vocal mands by children. *Journal of Applied Behavior Analysis. 43*, 757-761.

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., & Drabman, R. (1971). Token reinforcement programs in the classroom: A review. *Psychological Bulletin*, *75*, 379.

Peacock Hill Working Group. (1991). Problems and promises in special education and related services for children and youth with emotional or behavioral disorders. *Behavioral Disorders*, *16*, 299-313.

Perkins, H. R., & McLaughlin, T. F. (2015). Classroom interventions for elementary school children with EBD: A brief review. *International Journal of Applied Research*, *1*(4), 24-29.

Quinn, M. M., Kavale, K. A., Mathur, S. R., Rutherford, R. B., & Forness, S. R. (1999). A meta-analysis of social skill interventions for students with emotional or

behavioral disorders. *Journal of Emotional and Behavioral Disorders*, *7*, 54–64. https://doi.org/10.1177/106342669900700106

Robacker, C. M., Rivera, C. J., & Warren, S. H. (2016). A token economy made easy through ClassDojo. *Intervention in School and Clinic*, *52*, 39-43.

Sanetti, L. M. H., & Kratochwill, T. R. (2009). Toward developing a science of treatment integrity: Introduction to the special series. *School Psychology Review*, *38*.

Sarokoff, R. A. & Sturmey, P. (2004). The effects of behavioral skills training on staff implementation of discrete-trial teaching. *Journal of Applied Behavior Analysis, 37*, 535-538.

Shapiro, E. S. (2004). Direct observation: manual for the Behavioral Observation of Students in Schools (BOSS). *New York, NY: Guilford Press.*

Shapiro, E. S. (2003). Behavioral observation of students in schools (BOSS). *Computer Software. San Antonio, TX: Psychological Corporation*.

Schulte, A. C., Easton, J. E., & Parker, J. (2009). Advances in treatment integrity research: Multidisciplinary perspectives on the conceptualization, measurement, and enhancement of treatment integrity. *School Psychology Review*, *38*.

Simonsen, B., Fairbanks, S., Briesch, A., Myers, D., & Sugai, G. (2008). Evidence-based practices in classroom management: Considerations for research to practice. *Education and Treatment of Children, 31,* 351- 380.

Skinner, C. H., Williams, R. L., & Neddenriep, C. E. (2004). Using interdependent group-oriented reinforcement to enhance academic performance in general education classrooms. *School Psychology Review*, *33*, 384.

Soares, D. A., Harrison, J. R., Vannest, K. J., & McClelland, S. S. (2016). Effect size for token economy use in contemporary classroom settings: A meta-analysis of single-case research. *School Psychology Review*, *45*, 379–399. Retrieved from http://www.naspjournals.org/doi/abs/10.17105/SPR45-4.379-399

Volpe, R. J., DiPerna, J. C., Hintze, J. M., & Shapiro, E. S. (2005). Observing students in classroom settings: A review of seven coding schemes. *School Psychology Review*, *34*(4), 454.

Wagner, M. (1991). *Youth with disabilities: How are they doing? The first comprehensive report from the National Longitudinal Transition Study of Special Education Students.* (SRI International, Contract No. 300-87-0054). Washington, DC: U.S. Department of Education, Office of Special Education Programs.

Wagner, M. (1995). Outcomes for youths with serious emotional disturbance in secondary school and early adulthood. *The Future of Children, 5*, 90-112. doi:10.2307/1602359

Wagner, M., Blackorby, J., and Hebbeler, K. (1993). *Beyond the Report Card: The Multiple Dimensions of Secondary School Performance of Students with Disabilities. A Report from the National Longitudinal Transition Study of Special Education Students.* Menlo Park, CA: SRI International.

Wagner, M., Kutash, K., Duchnowski, A. J., & Epstein, M. H. (2005). The special education elementary longitudinal study and the national longitudinal transition study: Study designs and implications for children and youth with emotional disturbance. *Journal of Emotional and Behavioral Disorders*, *13*, 25-41.

Wagner, M., Marder, C., Blackorby, J., Cameto, R., Newman, L., Levine, P., et al. (2003). *The achievements of youth with disabilities during secondary school.* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., Cameto, R., Levine, P., & Marder, C. (2003). *Going to school: Instructional contexts, programs, and participation of secondary school students with disabilities.* Menlo Park, CA: SRI International.

Wagner, M., Newman, L., Cameto, R., and Levine, P. (2006). *The Academic Achievement and Functional Performance of Youth With Disabilities. A Report From the National Longitudinal Transition Study-2 (NLTS2).* (NCSER 2006-3000). Menlo Park, CA: SRI International.