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Effects of a Token Economy on a Student with Autism Exhibiting Disruptive Behavior in a General Education Classroom

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Abstract

The Centers for Disease Control and Prevention defines autism spectrum disorder (ASD) as a

developmental disability that can cause significant social, communication, and behavioral

challenges; and estimates that one in 68 children in the United States are affected by it (CDC,

2014). This prevalence rate is much higher than that of prior decades and has led to trends and

factors related to educational programs that include an increase in the inclusion of students with

ASD in general education classrooms. For this reason, it is crucial that teachers have access to

efficient, teacher-friendly, and research-based interventions for students with ASD in the general

education environment. One strategy that has been implemented in many different settings to

influence behavior is a token economy system. The purpose of the current study was to examine

the effectiveness of a token economy in decreasing disruptive behavior displayed by a student

with ASD in a fourth-grade general education classroom. Using an ABAB single subject design,

results showed that the student's disruptive behavior was at an increased level during the initial

baseline condition; decreased as the intervention was introduced; returned to an increased level

during the second baseline condition; and decreased again once the intervention was reinstated.

Furthermore, the student's behavior continued to stay at decreased levels during a maintenance

phase.

The Centers for Disease Control and Prevention (CDC) defines autism spectrum disorder (ASD) as a group of developmental disabilities that can have a significant impact on social interaction, verbal and non-verbal communication, and behavior (CDC, 2014). It is estimated that one in 68 school-aged children are diagnosed with ASD in the US, it is four times more prevalent in boys than girls, and affects people of all ethnicities, races, and social classes (Al-Shammari, Daniel, Faulkner, & Yawkey, 2010; CDC, 2014). The prevalence rate is much higher than that of prior decades and has led to trends and factors related to educational programs that include an increase in the inclusion of students with ASD in general education classrooms, the use of invalidated interventions by teachers and parents, and issues related to the preparation of teachers and other professionals to serve students with ASD (Simpson & Myles, 2008). For these reasons, it is crucial that teachers have access to efficient, teacher-friendly, and research-based interventions for students with ASD in the general education classroom.

Characteristics of Students with ASD

ASD is usually characterized as involving deficits in social interaction along with repetitive behaviors and obsessive interests (Al-Shammari, et al., 2010). This includes the inability to effectively communicate or to express and appropriately regulate emotions. These characteristics may lead to maladaptive behaviors that are used as coping methods, which cause problems in the individual's school, personal, and social life. The CDC reports that it is typical for students with ASD to struggle socially and may not understand how to make friends or be interested in making friends; may have difficulty following social norms and picking up on social cues; often have difficulty communicating; and is common for people with ASD to have delayed speech or language skills, echolalia, and/or trouble following or participating in a conversation (CDC, 2015). Not only do they struggle with the verbal aspect of communication,

but often do not pick up on nonverbal social cues and have difficulty reading body language. People with ASD strive for routine, and even the smallest change in schedule can result in meltdowns, tantrums, or a loss of control. Behaviors can range from lining up toys or objects to self-stimulating, aggressive, or self-injurious behaviors (CDC, 2015). For students with ASD, these behaviors can often affect the child's and fellow students' ability to learn, their relationship with peers, and their likelihood of placement in the least restrictive environment (LRE).

ASD affects all people differently with different levels of severity. Some students with ASD are very high functioning and display very few characteristics of the disorder while others may display more characteristics in more different ways. Because autism is a spectrum disorder, behaviors and challenges will vary from student to student. It could be that the student has difficulty raising their hand, staying in their seat, and following the rules of conversation when interacting with peers. It could also include hitting, spitting, harming themselves, or harming others. The behavior is dependent on the student, the reason for the behavior, and where they fall on the spectrum. ASD is characterized by a triad of social, communication, and imagination and behavioral impairments (Simpson & Myles, 2008). A person diagnosed with ASD could be affected by one or more of the impairments in varying levels of severity. This is what makes autism a spectrum disorder, and thus different for every person with ASD.

IDEA, Inclusion, and Students with ASD

One of the main principles of the Individuals with Disabilities Education Act (IDEA) is students should be placed in the least restrictive environment (LRE). The law states that students with disabilities should be educated with non-disabled peers to the maximum extent appropriate, whether they are in public or private institutions. Under this law, the child can only be removed

from the inclusive setting and educated in a special class or school if the nature or severity of the child's disability prevents the child from receiving an adequate education, even with the support of supplemental aids (Individuals with Disabilities Education Act, 2004, sec. 612(a)(5)). For students to receive services under IDEA, they must be diagnosed with at least one of thirteen disabilities, of which ASD is included.

As of 2011-2012, the National Center for Educational Statistics reported that 455,000 students with ASD were receiving support through IDEA, with 39% of students with ASD spending 80% or more of a school day in a general education classroom, 18.2% spending 40-79%, and 33% spending less than 40% of their time with non-disabled peers. Research has shown that there are several benefits to including students who have disabilities (specifically those with ASD) with their non-disabled peers. These benefits can include increased engagement and social interactions, higher levels of social support, both giving and receiving, larger friendship groups, and a more developmentally advanced individual education plan (IEP) goals than students who are in self-contained classes (Harrower & Dunlap, 2001).

While IDEA allows for some students with ASD to be educated in a general education classroom, maladaptive behaviors such as tantrums, aggression, and noncompliance can justify the removal of an ASD student from the general education class and into a more restrictive environment (Strain, Wilson, & Dunlap, 2011). In a more restrictive, self-contained classroom, a student with ASD will receive more individualized attention with a teacher who is trained to help assist students with their academic and behavioral challenges. However, the student loses the social and educational benefits of the general education class. A student with ASD in a general education setting can benefit from seeing typical peers model age appropriate behaviors. When surrounded by typically developed peers, students with ASD can be held to the same

expectations as their peers, which can have an impact on student's motivation to offer more opportunities to improve than what would be found in the special education setting. A student's social and communication skills can dramatically increase in the general education environment because they are surrounded by responsive communication partners. Some parents and professionals view inclusion as an intervention tool for students with ASD, as it provides opportunities for social interactions and increases independence and social responsibility (Sansosti & Sansosti, 2012).

One problem with inclusive general education settings is that the teacher rarely has any experience or training working with students with disabilities. Research has shown that general education teachers often demonstrate a substantial lack of knowledge about ASD (Segall & Campbell, 2012). Without additional trainings to support this population, teachers often feel unsupported and under qualified to work with the special education population (Davis, 2013). In order for ASD students to succeed in a general education environment, teachers must adapt their teaching to assist these students. For this to occur, teachers must not only have knowledge of ASD, but also the research based teaching strategies to benefit a student with ASD both academically and behaviorally. General education teachers are much more likely to be open to inclusion when they have the training and resources to accommodate a student with ASD in the classroom (Davis, 2013). In addition, teachers who have more knowledge and training regarding behavioral problems not only claim a higher self-efficacy, but are also more adaptive to students with challenging behaviors and the stress that comes with having those behaviors in the classroom (Segall & Campbell, 2012).

Research has also shown that there are certain teacher variables that are important to successful inclusion (Segall & Campbell, 2012). A teacher's disposition and behavior has a large

influence on how both the ASD student and the typically developed students respond to the inclusion. Students with ASD tend to respond better when teachers are predictable and consistent. Because students with ASD often lack social skills, teachers must teach both social skills as well as academics (Segall & Campbell, 2012). The success of the inclusion of a student with ASD in a general education classroom can be partially determined by the attitude that the general education teacher has regarding inclusion. The attitude of the administrators of that teacher can also impact the teacher's opinion (Segall & Campbell, 2012). If a student with ASD is in a general education classroom with a teacher who has a very negative outlook on inclusion, he or she is going to be reluctant to modify their teaching, behavior plans, and classroom activities to benefit that student, which could make it difficult for the student to succeed.

Token Economy

There are several different research proven behavior strategies that can be implemented by a general education teacher to decrease a problem behavior. One strategy that has been implemented in many different settings to influence behavior is a token economy system. The principle behind a token economy system is delivering a token when an appropriate target behavior is displayed and then exchanging the accumulated tokens for a valued reinforcer (Soares, Harrison, Vannest, & McClelland, 2016). This links the tokens to the meaningful reinforcer, which turns the tokens into a generalized reinforcer that is linked to the positive target behavior (Maggin, Chafouleas, Goddard, & Johnson, 2011). Token economies can be adapted to fit the needs of the participant(s), and because of their flexibility it can be user friendly in a variety of settings. The flexibility and practicality of a token economy intervention makes it an intervention that could be beneficial for students with ASD and practical for a general education teacher to implement.

Token economies have been used for university students, prison inmates, industrial work employees, psychiatric patients, and residential treatment centers (Tarbox, Ghezzi, &Wilson, 2006; Soares, et al., 2016). Specifically, in an educational setting, a token economy has been successful for students with emotional behavior disorders, specific learning disabilities, intellectual disabilities, attention deficit hyperactive disorder, and schizophrenia (Soares, et al., 2016). When specifically used with children with ASD, token economies were proven to increase verbal and printing skills, attending, spontaneous questioning, verbal interactions, and food consumption (Fiske, et al., 2015). However, there has been little research done on whether a token economy system is effective for students with ASD in a general education classroom.

A literature review conducted by Matsin and Boisjoli (2009) evaluated the effects of a token economy on individuals with ASD and/or developmental disabilities across 16 different studies, both group and single case experimental designs. These studies were across a variety of settings, including schools, homes, summer camps, group homes, hospitals and a developmental center. The ages of participants ranged from four to eighteen. While the token economy was reported to have a positive effect on social, behavioral, and academic areas, only approximately 8% (approximately 13) of their participants were children with ASD, and approximately 91% (approximately 151) were children with an intellectual disability (Matsin & Boisjoli, 2009).

Adcock and Cuvo (2009) investigated the effectiveness of a token economy system on the academic performance of three students with ASD in a general education classroom. When the student answered a question correctly, praise and a token were delivered. After three tokens, the participant was given access to the backup reinforcer for two minutes. During baseline when the token economy was not used the participants performed in the 0-20% range. When the token

system was being implemented, the participants reached at least 80% and either maintained or exceeded that for the remainder of the study (Adcock & Cuvo, 2009).

Tarbox et al. (2006) conducted a study on the effects of a token economy on attending in a student with ASD. This student was a five-year-old male who was attending a day program for young children with disabilities at the time of the study. Attending was defined as making eye contact with the tutor for at least three seconds. This study showed that implementing the token economy system was effective in increasing the attending in a student with ASD. During baseline, the participant's attending was variable, ranging from 0% to 90%. When the token economy was removed, the participant's attending dropped to 0%, but then returned to 100% when it was implemented again (Tarbox et al., 2006).

Reinforcement Assessment

For a token economy to be successful, a back-up reinforcer that the student will exchange tokens for must be established. The reinforcer chosen must be strong enough that the student will show the desired behavior to earn it. Reinforcers can vary from student to student, so it is important that the reinforcers are individualized (Gillis & Pence 2015). To discover what the student will work for, a reinforcer assessment can be given. This can be done by simply asking the teacher, parents, and/or student what they are willing to work for. When this is done, several reasonable options can be presented to the student, and the student can choose the option that appeals the most to them that they are motivated to work for. If the reinforcer does not change the student's behavior, it is not a strong enough reinforcer. The effectiveness of the token economy system is largely effected by the strength of the back-up reinforcer, which makes the reinforcer assessment an essential part to developing the token economy intervention.

Because disruptive behaviors can cause a student with ASD to be removed from the general education classroom to a more restrictive setting, researching the effects of a token economy in decreasing disruptive behaviors of an ASD student in the inclusive classroom is important. More students with ASD are being placed in the general education classroom, but there is little to no research on effective behavior intervention strategies that can be implemented to help with a student with ASD's behavior. For both the teacher and student to be successful in the general education environment, it is essential that they have effective, research based strategies. The purpose of this study is to demonstrate the potential effectiveness of token reinforcement in decreasing disruptive behaviors displayed by a fourth-grade student with ASD in a general education classroom.

Method

Participants and Setting

The participant of this study, Jake, is a nine-year-old white male diagnosed with ASD. He spends an hour and a half each day in the special education resource classroom for social skills instruction. He spends the rest of the time in the general education fourth grade classroom. Jake's general education class consists of 25 students, eight of which have disabilities ranging from emotional behavior disorders, specific learning disabilities, and ASD. He is with this class for math, reading, writing, science, social studies, related arts, and recess. He receives an hour and a half of social skills instruction in the resources room. Throughout the day there is an instructional aid that provides support for Jake and the other students with disabilities. She comes infrequently throughout the day, and is not in the room consistently. Jake moved to this school from out of state about two weeks into the school year. At the time of the study, the general education teacher reported that he was displaying disruptive and verbally aggressive

behaviors. He would often yell, scream, or cry when asked to complete work or when there is a change in schedule. He would also curse, make aggressive threats, and lie on the floor to avoid doing his work.

The student's general education teacher responsible for implementing the intervention has been teaching for eighteen years. She is the inclusive class for the fourth grade. Every student with an IEP in the fourth grade who is placed in a general education classroom is in her homeroom. She has had this role several times before, but this is the first time in five years being the inclusive teacher on her team. She is a National Board Certified teacher with a master's degree in literacy. Because the fourth-grade classes are departmentalized, she is responsible for all science instruction. Jake's special education resource teacher has been teaching for seven years, five in the general education setting and two in the ECE setting. She has a bachelor's degree in elementary education, and a master's degree in learning behavior disorders.

The setting for the study was a fourth-grade general education classroom in a public elementary school in a rural, southeastern city. In the 2015-2016 school year, the school was classified as "needs improvement" based on the accountability performance testing. The school has a total of 586 students enrolled, with 65.5% of the student population being white, 20.5% Hispanic, 8% African American, 5% two or more races, and less than one percent of American Indian, Alaska Native, and Asian. 55% of the students receive free or reduced lunch. 12% of the students receive special education services. The school is categorized as a Title 1 eligible school.

The intervention was implemented during the one hour science period in the beginning of the day and was provided by the general education teacher. This time was chosen because the general education teacher stated Jake was exhibiting the highest number of disruptive behaviors during this class. The teacher continued with her regular classroom management system (red,

yellow, and green lights) during the time of the study. The other students in the class, especially those sitting next to Jake, were helpful and supportive of him. He typically had an aide that would sit next to him for majority of the class time. Jake also has a white board that he draws on during teacher instruction or free time. There are two students from the emotional behavior disorder class, and the EBD teacher is also in the room at times and provides support to Jake if needed.

Independent variable

The independent variable was a token economy system. A laminated token chart was placed on Jake's locker located approximately five feet behind him so it could be easily viewable without causing a distraction.   The token chart included a statement "what I am working for" with an image of his reinforcer on the top and six Velcro spots at the bottom (see fig. 2 for an example of the token chart). If the student did not display any disruptive behaviors at the end of a 10-min interval, the teacher placed a Velcro token on his token chart. If the student displayed a disruptive behavior, then he did not earn a token. If the student earned four out of the six tokens, he received access to the reinforcer.

Dependent Variable

Based on observations and the teachers report, disruptive behavior was defined as a) talking or making noises at during instruction or without raising his hand that are a disruption or distraction to the teacher or other students; b) getting out of seat or area without permission; c) playing with non-work related or approved objects causing a distraction for peers or teacher; d) cursing or making aggressive threats to teacher or other students; e) refusing to participate or follow instructions when asked. Talking out or making noises without raising hands could include but is not limited to: crying, yelling, talking about things not related to the activity, or

making noises with mouth or body parts that causes a disruption. If the student went five seconds between talking out or making noises, a new talk out was recorded. Out of seat or area was defined as the student getting out of his seat without permission or going ten feet outside his designated area. During class, the student has a stuffed cat that sits with him on his desk and a white board that he draws on. Both are approved non-work-related objects, so when he was using these it was not marked as playing with non-work related objects. However, if he had his math materials out, other toys, or books not related to science, it was considered playing with non-work related objects. The student's verbally aggressive behavior was defined as cursing or making threats to his teacher or other students. Refusing teacher request was defined as protesting work or other activities when asked by the general education teacher or an instructional aid.

Data Collection

Data collection was conducted during science instruction, each session lasting 60 minutes. Disruptive behavior was measured using frequency recording. The observer marked a tally in the section that corresponded with the following disruptive behavior: a) talking or making noises at during instruction or without raising his hand that are a disruption or distraction to the teacher or other students; b) getting out of seat or area without permission; c) playing with non-work related or approved objects causing a distraction for peers or teacher ; d) cursing or making aggressive threats to teacher or other students; e) refusing to participate or follow instructions when asked. See appendix b for the data collection observation form.

Reinforcer Assessment

To identify reinforcing items for the student, a reinforcer assessment was conducted. Before implementation of the study, the student's general education teacher and special

education teacher were asked what would be appropriate reinforcers. The special education teacher had asked the student's mother in the beginning of the year and she suggested time on the computer. Additionally, his special education teacher had found that he works for smarties, positive phone calls home, and cheese Ritz Bitz. He also brings several stuffed animals to school in his backpack, so it was suggested that he may be interested in play time with his stuffed animals. Each reinforcer was placed on an individual card with the name of the reinforcer and a picture. When explaining to the student the intervention, he was shown his reinforcer options and received a brief explanation of each to ensure that the student understood what he was choosing.

Procedural Fidelity and Inter-Observer Agreement

Interobserver agreement (IOA) was conducted for at least 20% of the overall observations. Agreement was calculated by taking the number of agreements and dividing it by the number of agreements plus disagreements and multiplying by 100. The percentage of agreement across all phases was 89.4%. Procedural fidelity was also conducted for at least 20% of the intervention sessions using a teacher fidelity checklist that is aligned with the procedures of the token economy (see appendix a for procedural fidelity checklist). During the procedural fidelity observation, the observer marked if each step was completed (+), not completed (-), or not applicable (N/A). The number of observed teacher behaviors were recorded and divided by the total number of observed teacher behaviors possible and multiplied by 100. Results of the procedural fidelity data showed that the teacher completed 47 of 59 steps, which is 80%.

Experimental Design

This study employed an ABAB reversal design (Gast, 2010). Data were collected before the initial intervention to establish a baseline (Baseline 1). When baseline data were stable for at least three consecutive sessions, the intervention was implemented (Intervention 1). When a

specified criterion of at least five data points of a decreasing level or trend were established during the first intervention, the intervention was removed (Baseline 2) and data were evaluated to see if the dependent variable returned to or returned close to the initial baseline condition. When the data were stable for at least three consecutive sessions during the second baseline, the intervention was implemented again (Intervention 2). After data were collected in the second intervention, changes in the dependent variable were compared to not only the data in the second baseline condition but also to see if the data returned to or close to the data in the first intervention.

Procedure

  Baseline 1. Baseline data were collected for five sessions until a stable rate was established. During this phase, the student received no component of the intervention. The teacher implemented the typical method of classroom management, which consisted of a red, yellow, and green light system.

  Intervention 1. After the baseline was established, the teacher was trained on how to implement the token economy system by the researcher conducing the study. The training session included examples of his behaviors that earn and do not earn the token; when she would give or not give Jake a token; how to use the token chart; and how to work the timer that she will wear. The teacher was also notified that if the student earned the reinforcer, it must be given immediately after the science class.

  Prior to implementing the intervention, the teacher sat with Jake and explained to him how the token economy would work. When explaining to the student how he would earn tokens, the teacher gave a description of disruptive behaviors which included examples and non-examples. She explained that if he goes ten minutes without a disruptive behavior, then he would

earn a token. If not, he will not receive a token or any sort of acknowledgement. If Jake earned four out of six tokens, he would receive access to his chosen reinforcer immediately following science class.

During the intervention, a laminated token chart was placed on Jake's locker located approximately five feet behind him so it could be easily viewable without causing a distraction. The token chart included a statement "what I am working for" with an image of his reinforcer on the top and six Velcro spots at the bottom. The teacher had a GYMBOSS© digital timer set to vibrate at 10 min intervals. If the student did not display any disruptive behaviors at the end of the ten-minute interval, she would place a Velcro token on his token chart. If the student displayed a disruptive behavior, then he did not earn a token. The teacher continued teaching and the next ten-minute interval began. It is important to note that the teacher was instructed to use her best judgment to determine if a disruptive behavior was displayed in the 10-minute interval. If the student earned four out of six tokens during the sixty-minute class, he would gain access to his reinforcer. While she was implementing the intervention, she continued with her normal teaching and classroom management system, which consisted of a red, yellow, and green light system.

Baseline 2. This phase was identical to the original baseline phase. The components of the intervention were discontinued and the teacher returned to the original method of classroom management.

Intervention 2. The second intervention was identical to the first intervention phase. If the teacher determined the student went ten minutes without displaying a disruptive behavior, he received a token. If not, the teacher will not receive a token and continue teaching. If he earned four out of the six tokens, he received his reinforcer at the end of class.

Maintenance. Approximately three months following the completion of the second intervention phase, a maintenance phase was implemented. Data was collected on student disruptive behavior and teacher fidelity for two sessions.

Social Validity

An adapted version of the Intervention Rating Profile-15 (IRP-15; Martens, Witt, Elliot, & Darveaux, 1985) was used to assess the teacher's acceptability of the intervention. At the conclusion of the study, the teacher completed the profile by indicating their degree of agreement or disagreement with 15 statements using a 6-point likert scale with ranges from 1 (*strongly disagree)* to 6 (*strongly agree)* (see Table 1). A Total score was obtained by summing all items with a higher score indicating a higher acceptability (range = 15-90). The internal consistency of this instrument was reported to be .98. (Martens et al., 1985)

Results

Table 1 displays the mean percentages and range of Jake's disruptive behaviors including the various behaviors that were defined as disruptive behavior. Jake exhibited a total of 218 disruptive behaviors throughout the study; with 160 occurring during the baseline phases and 40 occurring during intervention phases. Talking or making noises during instruction accounted for 158 (74%) of all disruptive behaviors. This included 130 (81%) during baseline phases and 28 (70%) during intervention phases. This was followed by playing with non-work related objects, which accounted for 34 (16%) of all disruptive behaviors. This included 11 (7%) during baseline phases and 5 (13%) during intervention phases. The third highest disruptive behavior exhibited by Jake was refusing teacher's request followed with which accounted for 15 (7%) of all disruptive behaviors. This included 11 (7%) during baseline phases and 4 (10%) during intervention phases. Being out of seat was the fourth highest disruptive behavior, which

accounted for 9 (4%) of all disruptive behaviors. This included 8 (5%) during baseline phases and 1 (2.5%) during intervention phases. Verbal aggression was the disruptive behavior Jake exhibited the least, accounting for only 2 (.92%) of all disruptive behaviors and only occurring during the intervention phase.

Figure 1 depicts the frequency of disruptive behaviors across all phases of the study for Jake. There was an immediate drop in the number of disruptions from the last data point of both baseline conditions to the first data point of both intervention conditions. There was an 8.3% overlap percentage (1/9 x 100 = 11%) between the second baseline phase and the second intervention. During the initial baseline phase (5 sessions), Jake displayed a mean frequency of 20.6 disruptive behaviors (range 17 - 25). During the first intervention phase (5 sessions), he displayed a mean frequency of 6.2 disruptive behaviors (range 1 - 11) which is a decrease of 14.4 disruptive behaviors from baseline. During the second baseline phase (4 sessions), Jake displayed a mean of 17.75 disruptive behaviors (range 15 – 24) which is an increase of 11.5 disruptive behaviors. When the second intervention phase was re-established (4 sessions), he displayed a mean frequency of 5.25 disruptive behaviors (range 0 - 14), which is a decrease of 12.5 disruptive behaviors from the second baseline and slightly lower than the first intervention phase. During the maintenance phase (2 sessions), he displayed a mean frequency of 3 disruptive behaviors (range 2 - 4), which is a decrease of 2 disruptive behaviors from the second intervention phase.

Results of the IRP-15 are displayed in Table 2. With regard to the teacher's ratings of the intervention using the 6-point likert scale, the overall score was 77 of 90 with items ranging from 4-6. Items with the higher scores indicated the teacher strongly agreed that the child's needs were severe enough to warrant use of this intervention; she will continue to use the token economy in

the classroom setting; she liked the procedures used in the token economy; and the token economy was beneficial for the child. Items with lower scores indicated the teacher slightly agreed that the token economy did not result in negative side effects for the student and the token economy was consistent with those I have used in classroom settings.

Discussion

Research has demonstrated that inappropriate or disruptive behavior can be decreased through a token economy system and results from this study support and extend this by using a token economy system with a student diagnosed with ASD in the general education classroom. Results of this study indicate implementing a token economy had a positive effect on decreasing the disruptive behavior of a student with ASD in a fourth-grade general education classroom. Experimental control was demonstrated when the student's disruptive behavior decreased only after the intervention was introduced and increased only when the intervention was absent. The low percentage of overlap between data collected during baseline and intervention phases provides additional evidence of the effectiveness of this approach in decreasing disruptive behavior. Furthermore, the continuance of low disruptive behaviors during the maintenance phase adds to the social validity of the intervention.

In the beginning of the intervention, the teacher reported aggressive, disruptive outbursts from the student. He would often scream and cry to avoid work, and taking a test would cause tantrums of him crying and laying on the ground. These behaviors were present during the baseline, and the behaviors were still elevated during the first few days of the token economy. He was, however, more aware of his behavior and whether he was earning the tokens or not. When he earned a token, he would silently cheer to himself, but would place his hand over his mouth to

avoid yelling out. The first two days of the intervention Jake did not earn his reinforcer, but when he began having access to the reinforcer, the number of disruptive behaviors dropped significantly. When he did not earn it one day, he got upset and cried for a few minutes, but then was able to gather himself and go to his next class. His disruptive behaviors stayed low, and even when he did not earn access to the reinforcer, he did not have tantrums or meltdowns. When the token economy was removed, his disruptive behaviors increased again. They were slightly lower than the original baseline, but still higher than the intervention phase. The highest point was on pajama day, and Jake had forgotten to wear his pajamas. This caused several disruptions (24) during his science class, and according to his teacher, disrupted his entire day. Even on days that he did not have severe meltdowns, his number of disruptive behaviors were still elevated compared to the behaviors during the intervention. When the intervention was reintroduced, his behaviors immediately dropped, and stayed down for the most part.

One of Jake's triggers is when he hears something about loading buses. In the mornings and afternoons, he takes his stuffed cat to the bus lot and they count the buses, see which buses are there and which are missing, and waves to them as they arrive and leave. Previously, he had had a severe tantrum when they announced for a class to load the buses for a field trip over the intercom. Because of this reaction, the office does not announce "load the buses" over the intercom. Instead, they tell people going on a field trip to report to the office to leave. This occurred one day during the second intervention phase. Jake was doing well and was not disruptive, but the student next to him was picking on him. He stomped on his foot twice, which Jake ignored. However, the student then proceeded to tell Jake that the students that were called over the intercom were going to load buses. He told Jake this several times and Jake got increasingly upset, which lead to almost 12 disruptive behaviors in the span of approximately

one minute. After he was calmed down and the student next to him was removed from the class, he only had three disruptive behaviors following that. The following day, Jake's disruptive behaviors returned down, only totaling five disruptive behaviors.

To determine what Jake was willing to work for, a reinforcer assessment was used. Each day before the intervention was implemented, Jake chose his reinforcer from five reinforcers determined through the reinforcer assessment. He chose the same reinforcer each day (playing with his stuffed animals), but by allowing him a choice, it ensured that the reinforcer that was chosen was a sufficient reinforcer for him, and something that he would work for. If his reinforcer preference changed and he was not able to choose another one, the intervention would become ineffective because the reinforcer would no longer be acting as a reinforcer. By reevaluating the reinforcer each day, satiation was avoided and the reinforcer remained effective in changing Jake's behavior. It is also important to note that Jake needed to earn four out of six tokens to gain access to his reinforcer. As his disruptive behaviors decrease and he earns the reinforcer more regularly, the criteria should increase and the reinforcement will be faded.

Implications for Teaching

This study has implications not only for general education teachers, but also for students with ASD in the general education setting. Because it was able to decrease Jake's disruptive behaviors, he was able to stay in the classroom more, his general education teacher did not have her teaching disrupted, and the other students in the class were not disrupted nearly as often by his outbursts. These factors allowed him to remain in the general education setting, and to have the opportunity to reap the social and educational benefits that a general education setting offers. This intervention was also easily implemented by the general education teacher. She could

implement it with no special education training, and was able to continue with her normal routines while the intervention was in place. Because of the decrease of Jake's disruptive behaviors resulting from the intervention, she was able to spend less time on redirections and more time on teaching and assisting students. She found the intervention appropriate for his disruptive behaviors, and possibly appropriate for other students. This could result in the intervention being used in other general education classrooms for students with ASD or students with disruptive behaviors.

The general education teacher who implemented the intervention was satisfied with the intervention method. Not only did she find it successful for the student's behaviors, but she also strongly agrees (6 on a 6 point likert scale) that she will continue to use it in her classroom and that the overall intervention was beneficial for the child. She found it easy to implement, and saw Jake's behavior changed as a direct result of the token economy system. When collecting data during the intervention phase, Jake was having several disruptive behaviors as the result of another student. The EBD teacher took his chart down because she did not believe he would earn his reward. When speaking to the general education teacher about this, she was frustrated that it was removed during class, and wanted it to be put back up. The following day she put it back on Jake's locker, and Jake came into the class saying that he was going to use his chart. His behavior was exceptional that day and he was able to go to the principal's office to get a pencil as a reward. Following several snow days, Jake came into the classroom and threw his backpack and lunchbox on the floor and kicked his locker. His teacher told him that his chart was starting at that moment, and his behavior immediately improved and he earned his reward.   When returning for the maintenance phase three months later, the teacher was still using the token economy system. She no longer uses the timer, but still gives him a token after approximately ten

minutes if he has not shown a disruptive behavior. His behaviors remained low for the two days that data was collected for maintenance. His teacher reported that another teacher had asked if Jake was still in the class. She had not heard him in so long that she thought he had been removed from the class. His general education teacher reported the difference that she has seen in him, calling him a completely different student from the beginning of the school year. Recently (four months after the conclusion of the study), the token chart went missing off Jake's locker. His general education teacher created a new one out of construction paper to keep using the intervention. This study showed that a token economy can be effective in decreasing a student with ASD's disruptive behaviors in the general education classroom. The fact that his teacher is still using the token economy shows that not only does she think it is effective, but also that it was easily implemented and managed.

Limitations and Future Research

There are limitations that should be considered when interpreting the results. The primary limitation is that there is only one teacher participant and one student participant in the study, which makes generalization difficult. Future research should investigate using a token economy with multiple participants in different general education classrooms to generalize this study. The second limitation is in regard to the implementation of the intervention. The general education teacher was permitted to use her own judgement on whether the student earned the token and there were times when the researcher determined the student did not exhibit a disruptive behavior during the interval, but would not earn a token. Future research should consider a stricter or different criterion that the teacher uses when determining if the student earns a token or not. This could allow for more consistency between when the student earns the token and when he does not. However, this could also make the intervention more difficult for the general education

teacher to implement. The third limitation involves the dependent variable chosen for the study. This study only addressed disruptive behaviors. While the disruptive behaviors of this particular student decreased as a result of the intervention, student engagement was measured. He often drew on a whiteboard, which was an approved activity, but caused him to disengage from the lesson. Even if he was not drawing or disrupting the class, he did not seem to be interested in what was being taught and needed to be prompted to complete work. Future research to extend this study could address on task behavior, class participation, or other areas of concern. For this particular student, the next step would be to address the time spent on task. However, if a different target behavior is addressed, some elements of the intervention may need to be altered. The fourth limitation is related to the measurement procedure used to assess the dependent variable, disruptive behavior. Although it may be appropriate for assessing behaviors identified as disruptive behavior such as talking out and making noises; it may not have been as appropriate to measure behaviors such as out of seat.

A student with ASD can reap many benefits from being educated in the general education classroom with typically developed peers. However, if the student exhibits disruptive behaviors that prevent them or other students from learning or the teacher from teaching, this can be reason to remove them from the general education setting. The number of students with ASD in the general education classroom is increasing, and for these students to remain in the LRE, it is essential that teachers have research based strategies to reduce inappropriate behavior. The intervention used in this study was easily implemented by a general education teacher, economical, and teacher friendly. The simple procedures of a token economy system are practical for a general education teacher to implement and can be used to decrease disruptive behaviors.

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Table 1. *Mean Frequency [and Range] of Student Disruptive Behavior*

	Disruptive Behavior					
	Talking Out/ Making Noises	Out of seat	Verbal Aggression	Refusing Teacher Request	Playing w/non-work related objects	Total
	M [Range]	*M* [Range]	*M* [Range]	*M* [Range]	*M* [Range]	*M* [Range]
Baseline	14.6 [7 - 21]	1.6 [0 - 5]	0 [0 - 0]	1.4 [1 - 3]	4.8 [1 - 11]	20.6 [17 - 25]
Intervention	4.4 [1 - 10]	0 [0 - 0]	0.4 [0 - 2]	0.8 [0 - 2]	0.6 [0 - 3]	6.2 [1 - 11]
Withdrawal	14.25 [1 - 10]	0 [0 - 0]	0 [0 - 0]	1 [0 - 2]	1.25 [0 - 3]	17.75 [15 - 24]
Intervention	1.2 [0 - 3]	0.2 [0 - 1]	0 [0 - 0]	0 [0 - 0]	0.4 [0 - 1]	5.25 [0 - 14]

Table 2. *Teacher Acceptability of Intervention*

Item	Rating
This was an acceptable intervention for the child's disruptive behavior.	5
Most teachers would find this intervention appropriate for behavior problems other than disruptive behaviors.	5
This intervention proved effective in changing in the child's disruptive behavior.	5
I would suggest the use of this intervention to other teachers.	5
The child's needs were severe enough to warrant use of this intervention.	6
Most teachers would find this intervention suitable for the needs of this child.	5
I will continue to use this intervention in the classroom setting.	6
This intervention did not result in negative side effects for the student.	4
This intervention would be appropriate for a variety of children.	5
This intervention was consistent with those I have used in classroom settings.	4
The intervention was a fair way to handle the child's disruptive behavior.	5
This intervention was reasonable for the needs of the child.	5
I liked the procedures used in this intervention.	6
This intervention was a good way to handle this child's disruptive behavior.	5
Overall, this intervention was beneficial for the child.	6

Note. 6 = strongly agree; 5 = agree; 4 = slightly agree; 3 = slightly disagree; 2 = disagree; 1 = strongly disagree

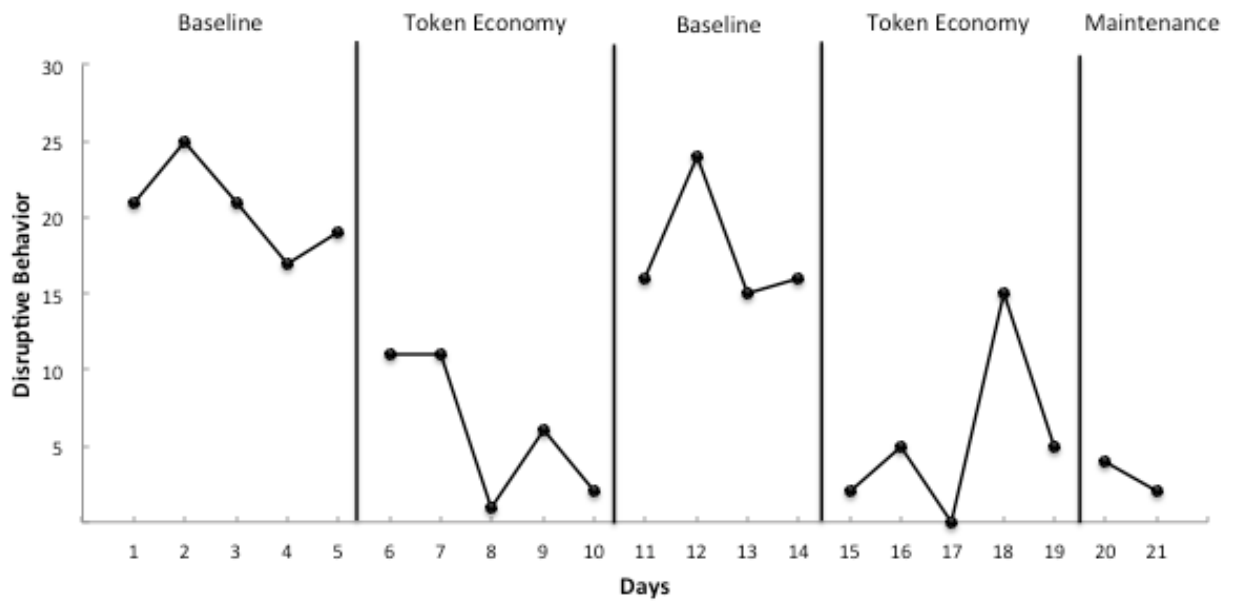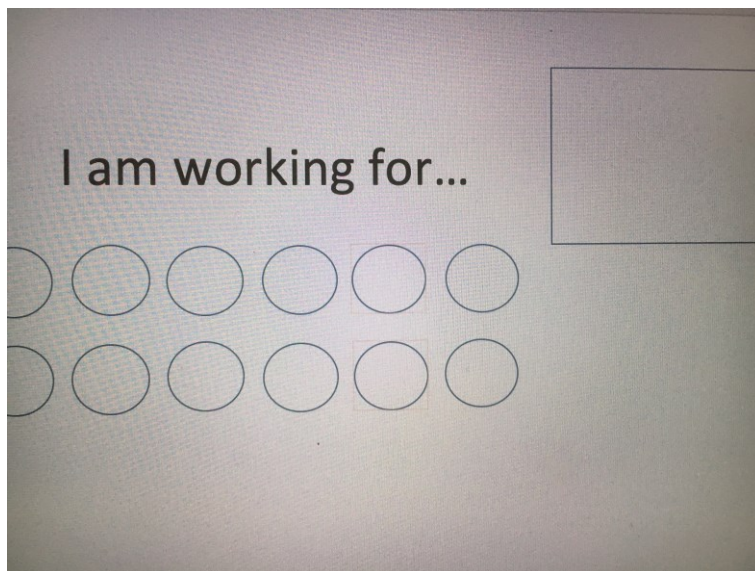Figure 1. *Effects of Token Economy on Jake's Disruptive Behavior*

Figure 2. *Token Chart used During the Intervention.*

Appendix A

TEACHER FIDELITY CHECKLIST

Observer: _____   Observation Date: _ _ / _ _/20_ _
                                              Month   Day   Year

Reliability Observation?   ☐ Yes ☐ No

	+/-	Notes:
1. Chart is attached student's locker.		
2. Picture of reinforce is attached to chart.		
3. Teacher starts the timer at the beginning of the lesson.		
4. If the student does not display disruptive behavior at end of interval, teacher gives token within 1 minute of timer prompt.		
5. If the student displays disruptive behavior at end of interval, teacher does not give token.		
6. If student received at least 4 tokens at the end of session, the teacher gives access to the reinforcement.		
7. If student receives less than 4 tokens at the end of session, the teacher will does not give access to reinforcement.		

+ = completed
- = not completed
N/A = not applicable

Appendix B

TOKEN ECONOMY OBSERVATION FORM

Observer: _____

Observation Date: _ _ / _ _ / _ _ _ _   Reliability Observation? ☐ Yes ☐ N
           Month Day Year

Start Time: _ _ **:** _ _ ☐ AM ☐ PM   Stop Time: _ _ **:** _ _ ☐ AM ☐ PM
         Hour Minutes   Hour Minutes

Directions: Tally number of occurrences

Disruptive Behavior

Talking Out/Making Noises

Total

Out of Seat

Total

Verbal Aggression

Total

Refusing Teacher Request

Total

Playing with non-work related objects

Total