HOW EFFECTIVE IS THE USE OF DIFFERENTIAL REINFORCEMENT AND THE
TOKEN ECONOMY SYSTEM IN DECREASING DISRUPTIVE BEHAVIORS
IN ELEMENTARY AGED CHILDREN WITH AUTISM?

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ABSTRACT

This study provides research on using differential reinforcement and the token economy system, simultaneously, to determine the effectiveness of using a combination of strategies to decrease disruptive behaviors in children with autism. Participants included two children in a special day class. They were chosen based on the frequency of their disruptive behaviors. Results of the study indicate using this particular combination of behavior interventions was effective in decreasing disruptive behaviors in the two participants. Limitations of the research implicate further studies using a larger population are needed, as well as researching other combinations of behavior intervention strategies, in efforts to educate and to assist educators in the classroom.
CHAPTER 1

INTRODUCTION

Background

While studies have been completed on different behavioral strategies used for children with autism, the rise in diagnosed children is extremely prevalent. According to the Centers for Disease Control and Prevention (CDC) (2014), approximately one in sixty-eight children is now diagnosed with autism. Boyle, Boulet, Schieve, Cohen, Blumberg, Yeagrin-Allsop, Visser, and Kogen (2011) found that within the last twelve years the prevalence of autism has increased 289.5 percent. The implications of these statistics tell us that future research on autism is exceedingly important, especially in areas such as behavioral practices and strategies in the classroom.

Statement of the Problem

The purpose of this research is to determine how effective the use of differential reinforcement and the token economy system are in decreasing disruptive behaviors in elementary aged children with autism. Studies have demonstrated the rise in persons identified with autism, and with this increase in population, comes an increase in disruptive classroom behaviors, also referred to as maladaptive/challenging behaviors. Disruptive behaviors include self-injury (e.g., biting/hitting self), aggression (e.g., hitting, kicking, scratching, biting others), eloping (running from classroom unattended or from instruction area), tantrums (e.g., crying, screaming, yelling). More research on behavior and effective strategies can prove to be beneficial to teachers, students,
administrators, and parents. Mayton, Carter, Zhang, and Wheeler (2014) argue that research on a quickly growing population is imperative in all areas that are affected. There are many challenges when looking at school-based treatments for students with autism. This in mind, research for developing, finding, and recommending best practice for behavioral strategies in the classroom is a necessity.

Purpose of the Study

The literature suggests that there are a number of effective behavior strategies used to decrease disruptive behavior in children with autism. Debates among those in the field of special education exist as to which strategies are the most effective. Research indicates that Positive Behavior Strategies (PBS) and Applied Behavior Analysis (ABA) have been successful in decreasing disruptive behaviors in the classroom. Despite the evidence of efficacy for individual strategies that have been studied, the literature concludes that using simultaneous strategies to decrease disruptive behavior may be more effective than using any one strategy alone. This study will investigate the correlation between differential reinforcement and the token economy system to decrease disruptive behaviors in the classroom. Baseline data will be compared to intervention data at the end of the study to determine efficacy.

Theoretical Bases and Organization

Students enrolled at the school site in which the researcher was employed were the subjects included in the study. The population included children enrolled in a special day class who had been diagnosed with autism. Students were selected based on a
convenience sample. The purpose for including this particular group was to research which two behavioral interventions were the most effective when modifying disruptive behavior in the classroom. Children with autism can benefit from behavior modification in order to learn behaviors that are more socially acceptable, especially in a classroom.

Limitations of the Study

Illness, attendance, effects of medication (fatigue, restlessness, etc.) changes in family life (moving, separation from a family member), and population sample size were limitations the researcher encountered during the course of the study. According to the literature, research on differential reinforcement and children with developmental disabilities is generally conducted in a classroom setting or a controlled environment in order for the researcher to regulate conditions within the environment (LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010, p. 200). The results of this study indicate that differential reinforcement of alternative behaviors (DRA) and a token economy system do decrease disruptive behaviors in a classroom setting; however, because the research was conducted in a controlled setting, it is speculative whether the results would remain the same or similar in an unstructured environment. This limitation yields to future research employing this study in an unstructured and uncontrolled environment.

Definition of Terms

Applied Behavior Analysis (ABA): the science of applying what is learned from the analysis of behavior to understand the relationship between behavior and conditions.
**Differential Reinforcement**: withholding a reinforcer for one behavior and delivering them for another.

**Differential Reinforcement of Alternative Behaviors (DRA)**: reinforcement provided for the occurrence of a target behavior that is an alternative to the behavior being reduced.

**Differential Reinforcement of Other Behaviors (DRO)**: reinforcement occurring for engaging in any response other than the target behavior for a set interval of time.

**Disruptive Behaviors**: for the purpose of this study, is self-injury (e.g., biting/hitting self), aggression (e.g., hitting, kicking, scratching, biting others), eloping (e.g., running from classroom unattended or from instruction area), tantrums (e.g., crying, screaming, yelling).

**Functional Communication Training (FCT)**: a differential reinforcement procedure that is contingent upon the use of appropriate communications in order to access desired reinforcement rather than using disruptive behavior.

**Functional Behavior Assessment (FBA)**: behavioral observation and data is collected in order to understand a specific behavior by recording when a behavior is most likely and least likely to occur. The FBA helps to identify the function of the challenging behavior.

**Positive Behavioral Supports (PBS)**: a prevention and intervention approach in which the goal is to increase appropriate behaviors and adjust the learning environment to prevent disruptive behaviors.

**Token Economy System**: a behavior management system that is contingent upon the student exhibiting positive, appropriate behaviors and is later exchanged for a predetermined reinforcement.
CHAPTER 2

LITERATURE REVIEW

Behavior of children with autism can be extremely complex, and a number of different therapies and strategies can be used to increase appropriate behaviors and decrease disruptive behaviors (Douglas, 1999). Interventions and their effectiveness in creating behavior change for children who have disabilities has long been a debate among practitioners in the special education field (Gongola & Daddario, 2010). Many different strategies have been studied to find the effectiveness of the treatments, which include positive behavioral supports (PBS) and applied behavior analysis (ABA). There is a multitude of evidence-based practices within each approach, which often overlap between the two (Neitzel, 2010; Jensen & Sinclair, 2002). While there are a number of strategies used to decrease disruptive behavior in children, for the purpose of this paper, only a few of the evidence-based strategies in PBS and ABA will be discussed.

PBS is a common prevention and intervention approach and an increase of its use has been recorded in recent research. The goal of this approach is to increase appropriate behaviors and adjust the learning environment to prevent disruptive behaviors. PBS has been found to be effective in reducing behaviors and focuses on a meaningful outcome through a lifestyle change (Neitzel, 2010; Sharma, Singh, & Geromette, 2008). ABA is the science of applying what is learned from the analysis of behavior to understand the relationship between behavior and environment. Data are used to determine why a behavior is occurring, and an intervention is developed to replace or remove the target
behavior(s) (Jensen & Sinclair, 2002). Research has shown ABA to be effective in reducing disruptive behaviors typically observed in autistic individuals (Leaf & McEachin, 1999).

When a child engages in disruptive behavior that impacts his or her learning, or that of others, a functional behavior assessment (FBA) and a positive behavior support-processing plan should be completed by the Individualized Education Plan (IEP) team (Sharma et. al., 2008). According to Neitzel (2010), typically an FBA is essential in creating any behavior support system, including a PBS or ABA method, in order to see what the cause of the maladaptive behavior is. Many times, with children affected by autism spectrum disorder (ASD), communication deficits are prevalent.

Communicating wants and needs can be extremely difficult, thereby causing aggression and/or a tantrum. Teachers and other practitioners will use an FBA to identify environmental factors that may be causing the disruptive behavior. Research suggests that the use of an FBA can increase the likelihood of success when intervention is implemented (Brosnan & Healy, 2010). Before an FBA can be initiated, a target behavior must be identified and a method to record and measure the behavior created. An FBA is produced in order to understand a specific behavior by recording when a behavior is most likely and least likely to occur. The FBA helps to identify the function of the challenging behavior, which can be four different factors, sensory, escape, attention, and tangible. This will assist in the development of a positive behavior support plan individualized for the child's needs. Much work goes into creating and implementing a positive behavior support plan. The components of the plan are long-term supports that
include all members who will assist in the child’s overall health and well-being (Sharma et al., 2008). These components are: prevention strategies (cues and strategies previously used and were successful), physical structure of the classroom (plenty of workspace, move and/or remove distracting materials in the class and how to restructure the class to reduce the amount of distraction, easily accessible work materials, visual cues associated with work, a designated area where the finished work goes), and schedules in the classroom (posting group and/or individual schedules with transitions in the plan). Once the FBA is completed and discussed by the team, replacement behaviors can be properly developed and implemented (Sharma et al., 2008). Sterling-Turner, Robinson, & Wilczynski (2001) suggest that more research is needed to determine the efficacy of FBA procedures on disruptive behaviors in the classroom.

Teaching students self-management skills is one treatment technique that has been found to be effective in the treatment of children with developmental disabilities; it also allows the child to manage his or her own behavior in the absence of a treatment provider (Koegel, Koegel, Hurley, & Frea, 1992). Duttlinger, Ayres, Bevill-Davis, and Douglas (2013) investigated the use of picture activity schedules to acquire self-management skills. They found that when students are able to problem solve and use self-management strategies to regulate their behavior, they require less external support and a better quality of life in the future. Furthermore, disruptive behavior was reduced as the students became more engaged in their task. The study conducted by Koegel et al. (1992) found that disruptive behaviors decreased when self-management skills were taught through social skills. When communicative skills are learned, students responded more
consistently with their peers and conversational interactions and treatment conditions were less aversive, thus, the reduction in disruptive behaviors.

Schieltz, Wacker, Harding, Berg, Lee, Padilla Dalmau, & Ibrahimović’s (2011) research suggests that Functional Communication Training (FCT) is the most commonly used intervention for disruptive behavior. FCT is a differential reinforcement procedure that is contingent upon the use of appropriate communications in order to access desired reinforcement rather than using disruptive behavior. Schieltz et al. (2011) research found that non-targeted disruptive behaviors were reduced as much as targeted behaviors were reduced when FCT was implemented. Borrero and Borrero (2008) maintain that “decreasing one topography of behavior within a response class may also decrease other behaviors within that same response class” (p. 84). According to Mancil and Boman (2010), the effectiveness of FCT with children on the autism spectrum has been consistent. They also found a relationship with more developed speech skills and lower frequency of challenging behaviors. Mancil and Boman (2010) go on to state that “FCT consistently reduces challenging behavior and increases communication, therefore improving the quality of life for the child and parents” (p. 238).

A Social Story is a positive behavior intervention for students with autism used in ABA and PBS based treatments (Crozier & Tincani 2005). A Social Story is a short, simple story written from the perspective of the child and attempts to help ensure a child’s accurate understanding of social information for a given setting that delivers instruction on appropriate social behaviors (Crozier & Tincani 2005; Ozdemir, 2008). Social stories capitalize on the visual learning strengths of students with autism (Crozier
& Tincani, 2005) and the confirmation on the effectiveness of visual support strategies on decreasing the disruptive behavior of children with autism is verified through the growing body of literature (Ozdemir, 2008). Ozdemir (2008) and Crozier and Tincani’s (2005) findings indicate that a Social Story intervention is not only effective in reducing problem behavior but also accepted by teachers and incorporated into typical classroom routines. Teachers and parents find the stories to be an effective, user-friendly tool. Social Stories are potentially beneficial for several reasons: the stories provide concrete instruction that students can easily reference repeatedly until they master a skill (Crozier & Tincani, 2005), social stories are convenient, are unobtrusive, and may draw on a strength many children with autism may have. Ethically, the least intrusive intervention that effectively changes behavior is the best choice (Scattone, Wilczynski, & Edwards, 2002). It is agreed upon, in the literature, that without planned systematic behavioral interventions in place, properly constructed social stories were effective in decreasing disruptive behaviors in children with autism. (Ozdemir, 2008; Scattone, Wilczynski, & Edwards 2002).

However, it is noted in the literature reviewed, even though the results of the present study are very promising and previous studies have suggested social stories may be effective under some conditions, there are many unexplored variables that may aid or limit the effectiveness of this intervention for some children or for some behaviors. (Ozdemir, 2008; Crozier & Tincani, 2005; Scattone, Wilczynski, & Edwards 2002).

Differential reinforcement of other/alternative (DRO/DRA) behaviors is a strategy used in the principles of PBS. Gongola and Daddario (2010) state that differential reinforcement procedures follow Individuals With Disabilities Education Act (IDEA) of
1997 states, “the IEP team must consider positive behavioral interventions in the case of a student whose behavior impedes the student’s learning or that of others” (p. 14). DRO coincides with IDEA’s guidelines because it is evidence and reinforcement based interventions that have shown effectiveness (Gongola & Daddario, 2010). Differential reinforcement is withholding a reinforcer for one behavior and delivering them for another (Petscher, Rey, & Bailey, 2009). Research has found a few different types of differential reinforcement have emerged, and they are among the most frequently used procedures to suppress disruptive behaviors (Petscher, Rey, & Bailey, 2009). DRO is reinforcement occurs for engaging in any response other than the target behavior for a set interval of time (e.g., reinforcing a student for any other behavior other than head picking). Differential reinforcement of alternative behaviors (DRA) is reinforcement is provided for the occurrence of a target behavior that is an alternative to the behavior being reduced (e.g., reinforcing a student for squeezing a squish ball rather than picking at their head) (Gongola & Daddario, 2010). According to Gongola and Daddario (2010), DRO has been proven effective across multiple behaviors and populations to reduce stereotypic behaviors, noncompliance, and disruptive behaviors. Studies done by Petscher, Rey, and Bailey (2009) suggest DRA may be the ideal intervention in many cases because it reduces behavior and provides an appropriate option for the clients to earn valuable reinforcement when they no longer exhibit unwanted behaviors. DRA has been successful at reducing severe behaviors for many participants, while replacing the disruptive behavior with appropriate behaviors that can enhance participants’ quality of life.
According to LeGray, Dufrene, Sterling-Turner, Olmi, and Bellone (2010), disruptive behaviors negatively impact all students in the classroom, including the students exhibiting the behaviors. While the literature suggests that functional assessments and function-based interventions have little research conducted in classrooms, it has been proven effective (Gresham, McIntyre, Olson-Tinker, Dolstra, McLaughlin, & Van, 2004) Functional assessments take data on antecedent, behavior, and consequence. Function based intervention generally include extinction and differential reinforcement; DRO and DRA can be used in function-based assessments (LeGray et al, 2010). Dufrene et al. (2007) found that using a functional analysis and differential reinforcement is emerging as a beneficial intervention. LeGray et al. (2010) implied that future studies in function based differential reinforcement studies should compare DRO and DRA.

Token economy system is a behavior management system that is contingent upon the student exhibiting positive, appropriate behaviors and is later exchanged for a predetermined reinforcement. The features of the token system are aligned with that of other behavior systems (Maggin, Chafouleas, Goddard, & Johnson, 2011). Literature shows that the token economy system has been studied more vigorously with students who have intellectual disability. However, since there is an overlap with behaviors in children with intellectual disabilities and children with autism generalizability across groups is likely (Matson & Boisjoli, 2009). While Matson and Boisjoli (2009) believe that token economies have proven to be flexible and effective interventions for children with developmental disabilities, and worthy of the current day practitioner and researcher
attention for further evaluation and focus, there is still insufficient research that qualifies it as a preferred treatment for behavioral interventions with children with autism. Much of the research and studies had been conducted about 20 years ago and new research is more difficult to find. Maggin et. al. (2011) follows with “more rigorous research is needed to verify that token economies are effective management tools for increasing the rates of prosocial behaviors of students with behavioral issues” (p. 549).
CHAPTER 3

METHODOLOGY

Design of the Investigation

The investigation was designed to determine the effectiveness of using a token economy system and differential reinforcement simultaneously to decrease disruptive behaviors in elementary aged children with autism. It is an experimental design where the dependent variable is the behavior of the students and the independent variable is the intervention strategy used to decrease the behaviors. The intervention strategies, differential reinforcement protocols and token economy system, remained consistent throughout the investigation.

Differential reinforcement is defined as withholding a reinforcer for one behavior and delivering them for another. There are a few different types of differential reinforcement strategies that demonstrate the most frequently used procedures to suppress disruptive behaviors such as differential reinforcement of other behavior, differential reinforcement of alternative behavior, differential reinforcement of incompatible behavior, and differential reinforcement of low rates of behavior (Petscher, Rey, & Bailey, 2009).

Token economy system is a behavior management system that is contingent upon the student exhibiting positive, appropriate behaviors and is later exchanged for a predetermined reinforcement. The features of the token system are aligned with that of other behavior systems (Maggin, Chafouleas, Goddard, & Johnson, 2011).
Population and Sample

The sample used in this investigation was a nonprobability convenience sample. The participants were part of the researcher’s classroom. This specific sample was chosen due to the frequency and duration of disruptive behaviors displayed by the population.

Participants and Setting

Participants included two students enrolled in the researcher’s classroom who consistently exhibited disruptive behavior. The participants were selected based on the following criteria: (a) the child was enrolled in the researcher’s class, (b) consent from the child’s legal guardian(s) was provided, (c) the child’s behaviors were frequent and observable (d) the child did not have a behavior plan currently being implemented.

All data was collected during the student’s regular school day hours and over a variety of activities, including academic and non-structured activities, in the classroom. The school is located in Southern California. There were eight students in the class. All children received direct instruction and utilized token boards as part of the behavior plan implemented in the classroom. Children participating in the study were observed in a whole group and/or a small group setting while data was taken. The children were sitting in chairs that directly faced the teacher or a paraprofessional leading the small group. Paraprofessionals trained in the data taking process participated in direct instruction as well as data collection of the children. Small groups consisted of two to three children in each group and each group ran for 30 minutes; there were three small groups in the
morning and one small group in the afternoon. A university-based Institutional Review Board approved procedures in this study.

Student A was a seven-year-old Hispanic male diagnosed with autism; Student B was a six-year-old Caucasian male also diagnosed with autism. Both children were enrolled in an autism focus special day class and were English only speakers. Neither student had previously experienced a functional assessment or an individualized behavior intervention plan. Student A was enrolled in a special education classroom for three years; student B was enrolled in a special education classroom for four years prior to this study. Student A and B received speech and language as well as occupational therapy services. Student A has two siblings, one of which received speech and language services and has exited the program. Student B is an only child.

Teacher participant included one woman, who was the primary instructor in the respective classroom. Four paraprofessionals were present in the classroom, but at different times. There were two paraprofessionals in the morning and another two in the afternoon. Researcher and paraprofessionals participated in data collection throughout the day.

Table 1. Demographic Data Chart

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<th>Demographic Data Chart</th>
<th>Table 1</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Sex</th>
<th>Language</th>
<th>Years in SPED</th>
<th>Disability</th>
<th>EL Services</th>
<th>DIS Services</th>
<th>Target behaviors</th>
<th>Siblings with disability</th>
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<td>Student A</td>
<td>7</td>
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<td>M</td>
<td>English</td>
<td>3</td>
<td>Autism</td>
<td>No</td>
<td>S/L, OT</td>
<td>Tantrums, hand regard, aggression</td>
<td>1 SLD</td>
<td></td>
</tr>
<tr>
<td>Student B</td>
<td>7</td>
<td>Caucasian</td>
<td>M</td>
<td>English</td>
<td>4</td>
<td>Autism</td>
<td>No</td>
<td>S/L, OT</td>
<td>Tantrums, hand regard, aggression, self-injury</td>
<td>0</td>
<td></td>
</tr>
</tbody>
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Treatment

This study includes data for the occurrence of disruptive behaviors. Each participant was considered based on the frequency of disruptive behaviors during classroom instruction. Disruptive behaviors are defined as: crying, falling down to the floor, hitting, kicking, pinching, swiping items off the table, tantrum, eloping, hand/feet regard (flapping, inappropriate touching, shaking legs, full body shaking) and/or noncompliance (refusal to complete a task or follow through with an instruction). Tantrums included crying and one or more behaviors occurring at the same time (falling down to the floor, hitting, kicking, pinching, swiping items off the table). Each student was reported engaging in one or more of these behaviors during the school day. These behaviors were deemed disruptive due to the substantial amount of time it resulted in diverting their attention as well as others around them from direct instruction. The researcher also reported the behaviors as being disruptive to the teacher due to the fact that it diverts her attention from delivering direct instruction resulting in fewer academic trials and prompting.

Data was taken on disruptive behaviors throughout the day. A web based data system was used to record all behavior data. When intervention was implemented, hand/feet regard was taken on a ten-minute interval system for Student A and Student B throughout the school day, excluding time outside of the classroom (recess, lunch, assemblies). Any time Student A or Student B exhibited hand/feet regard (flapping, shaking legs, inappropriate touching, or full body shaking) the teacher or the paraprofessional would record that the behavior occurred within that ten minute interval.
of time. If that behavior occurred, the student would lose the most motivating reinforcement from their token board. They are on a response cost system for displaying inappropriate behavior and rewarded with tokens for appropriate behaviors. If the students are sitting with quiet hands and still feet, they are rewarded with a token as well as verbal praise for the specific appropriate behavior they are displaying.

Tantrums for both students were taken in duration. If either student was engaged in a tantrum, staff would make sure the other students, as well as Student A or B, were out of the way of any harmful activity or any item that could cause harm and wait out the tantrum. Once the student had de-escalated they were presented with their token board and the most motivating reinforcement is taken away while explaining the reason why their choice is being taken. If the student was presented with a stressor and was able to stay calm, they were immediately presented with a token as well as verbal praise such as “Wow! You kept it cool! That’s the way to handle it.” Student B also displayed self-injurious behavior when presented with a stressor. Self-injurious behavior includes biting self, banging head on the table or floor, scratching self, and/or hitting head with closed fists. If Student B was presented with a stressor, but did not display self-injurious behavior, with or without a tantrum, he would be given a token along with verbal praise such as “You kept your hands cool, way to go.”

Mouthing and eloping data was taken in frequency for Student B only. Student B had four pictures of mouths on the back of his token board. If he put anything in his mouth, other than food, a picture was removed from his board. He had four chances throughout the day to keep fingers and objects out of his mouth. Student B was rewarded
with a token every seven to ten minutes for keeping his hands and objects out of his mouth. At the end of the day, if Student B had at least one mouth picture left he had the choice of going to visit another classroom, which he found reinforcing and the teacher in the classroom gave her permission. The teachers in the classrooms had already agreed to let him visit if he had his mouth pictures and he was rewarded with verbal praise and a short break in their class. If student B lost all the mouth tokens at the end of the day, he did not get to visit the teacher of his choice. Student B also displayed elopement from the designated area of instruction at times. If he got out of his seat without asking, a choice was taken. He was given a token and verbal praise for staying in his seat at the end of each workstation.

Students A and B both exhibited the behaviors of falling down to the floor, hitting, kicking, pinching, swiping items off the table, and noncompliance when presented with a stressor (demand, denial of request). If the students displayed any of these behaviors when presented with a stressor, a choice was taken away and the instruction was presented again after a minute. The process was repeated again if the student displayed the behavior. If the student was presented with a stressor and followed through with little to no behavior a token was given along with verbal praise “You kept it so cool! Way to go!”

Data Analysis Procedures

Figure 1a depicts the results of baseline and intervention outcome data on hand/feet regard comparison for Student A. This data was collected in ten-minute intervals (approximately 20-24 intervals per day) and Student A was exhibiting hand/feet
regard behavior during 50% of the intervals per day. When intervention was introduced, Student A was rewarded with a token and verbal praise such as “Wow! You have a cool body” at approximately one minute intervals. Student A was observed to have more instances of hand/feet regard on days where he was content. One particular day, he was observed to engage in a preferred coloring activity and he would bounce up and down in his seat while coloring. When the student demonstrated hand/feet regard, the teacher would pull the most preferred reinforcement from his token board as well as provide immediate verbal feedback as to why the student lost his choice such as “Your body was not cool.” The data shows a downward trend and Student A presented a decrease in hand/feet regard from 50% of the interval data collected to approximately 21% of the interval data collected.

Figure 1b illustrates a notable decrease in noncompliance once intervention was introduced. When Student A refused to follow an instruction the first time, swiped an item off the table, and/or crossed his arms a choice was taken from his token along with immediate verbal feedback such as “You were not following directions.” Figure 1b presents a more recognizable decrease on the graph in noncompliance. Student A established 15 instances of noncompliance to zero instances over a two-day period. Figure 1c illustrates a decrease in tantrums for Student A. Student A was exhibiting approximately 60 minutes of tantrums in his school day during his baseline. When intervention was introduced, Student A’s tantrums significantly decreased. If Students A was presented with a stressor and he was able to utilize coping strategies such as deep breathing or letting it go he was awarded one to two tokens and given verbal praise such
as “You kept it so cool! That’s how you do it!” If Student A had a tantrum, which includes crying, screaming, falling to the floor, and/or swiping at items, a teacher or paraprofessional would stand nearby to ensure his safety as well as the safety of other students and wait out the tantrum. Once Student A could be directed back to his seat a choice would be pulled and verbal feedback would be given such as “Sorry, you were crying and screaming. Next time you can say, “I need a break” or “I need some help.” Student A’s data demonstrated significant improvement in the area of tantrums with a decrease of tantrums in 60 minutes of his day to 0 minutes of tantrums.

Student B had a few more behaviors that were impacting his access to curriculum. Figure 2a illustrates frequency data collected on self-injury and hand regard (inappropriate touching). Student B was observed to exhibit self-injury when he became frustrated or angry. He would bang his head on the desk, hit his head, scratch his arms, and/or bite his arms or fingers. Student B displayed self-injurious behavior up to 50 times within a day during baseline data. After intervention was introduced, Student B’s self-injurious behavior decreased to below ten instances during the last three weeks of data. When Student B was angry, frustrated, or had a tantrum and did not display any self-injurious behavior, he was given a token with verbal praise such as “You kept your hands cool. That was a good choice.”

Figure 2a also illustrates data collected on inappropriate touching throughout his school day. Student B was observed to rub or hit his lap in and around the area of his genitals. It was reported that he exhibited this behavior when he was excited. Student B displayed inappropriate touching 31 times in one day during baseline data. When
intervention was introduced, tokens would be given to Student B every two minutes with verbal praise “Your hands are on the table” or “You have cool hands and a cool body.” Student B showed a steady decrease in instances of inappropriate touching displaying only one instance of inappropriate touching at the end of data collection.

Figure 2b illustrates data collected on mouthing and eloping demonstrated by Student B. He was observed to mouth items such as his fingers, shirt, pencils, crayons, tokens, paper, or any item he had within reach that he was able to handle. At the start of baseline data, Student B displayed mouthing 32 times. When intervention was introduced, there was a sudden decrease of mouthing behavior. Student B was given five mouthing tokens on the back of his token board. If he demonstrated any mouthing he would have one of the mouthing tokens removed (response cost system). If he had at least one mouthing token left by the end of the day, he would be able to visit the classroom of a teacher he had chosen as reinforcement. He was rewarded with a token and verbal praise such as “You still have nothing in your mouth. Nice job!” Student B decreased his mouthing behavior to three times in a day at the end of the data collection.

Figure 2b also illustrates elopement. While Student B only displayed elopement six times at the most during baseline data, it was reported that this happened more frequently and was disruptive to the class especially during instruction. The last four weeks of data collections show zero instances of eloping. This behavior was not a major focus for this study because it did not occur frequently. Student B, however, was given a token and verbal praise at the end of each workstation for staying in his seat. Figure 2C illustrates data collected on tantrums and their duration for Student B. During baseline
data, Student B was observed to have tantrums that lasted up to 54 minutes. After intervention was introduced, Student B showed a steady decrease in duration of tantrums. The last four weeks of collected data recorded zero minutes of tantrums. When presented with a stressor without displaying a tantrum, Student B was given two tokens with verbal praise such as “You kept it so cool! Way to go!”
Figure 1a. Hand/Feet Regard Data Student A
Figure 1b. Noncompliance Data Student A
Figure 1c. Tantrum Data Student A
Figure 2a. Hand Regard and Self-injury Data Student B
Figure 2b. Mouthing and Eloping Data Student B
Figure 2c. Tantrum Data Student B
CHAPTER 4

RESULTS AND DISCUSSION

There are many types of intervention strategies that exist to assist educators, parents, and those involved in the lives of children with special needs, especially autism. However, it should be noted that every child is an individual with individual experiences, individual personalities, and individual behaviors. While one intervention may be successful in decreasing disruptive behaviors in one child, it may not be as effective for the next child. This study provides a unique contribution to research that includes differential reinforcement, the token economy system, and the use of a combination of strategies when implementing interventions with children displaying disruptive behaviors. The key idea is implementing a combination of strategies to discover which is most effective for each child. In this study, implementing differential reinforcement and the token economy system simultaneously has proved to be successful with the participating subjects.

Figures 1a, 1b, and 1c illustrate the steady decline in hand/feet regard, noncompliance, and tantrums displayed by Student A. While hand/feet regard depict a slow decline, noncompliant behaviors and tantrums exhibit a dramatic decrease where at the end of the data the student was displaying zero noncompliant behaviors and tantrums. During the course of the research, some coping skills were introduced and the student utilized those skills in tandem with differential reinforcement and the token economy system. This may have assisted in the success and effectiveness of the interventions.
applied. Figures 2a, 2b, and 2c illustrate steady declines in self-injury and elopement and dramatic declines in hand regard, mouthing, and tantrums. There are noticeable spikes in behavior in all areas at the middle of the intervention period. It should be noted that Student B was taking medication and his parents changed the dosage to a smaller amount, which caused spikes in behavior as his body was changing and adapting. Student B also had a major shift in his family life and moved out of his home with his mother. This major shift caused a change in his behavior as well. A spike in hand regard, self-injury, and tantrums around the same time period is illustrated in Figures 2a and 2c. It appears that these three behaviors are correlated and often happen when one or more of these behaviors are exhibited. In spite of these limitations to the study, Student B demonstrated the effectiveness of using differential reinforcement and a token economy system to decrease disruptive behaviors.

The procedures in this study were conducted in a natural classroom setting, which includes all the typical stimulus conditions such as other students, classroom décor, reinforcement, outside noise, workstations and the noise from the students and teachers in those stations. The results of this research demonstrate the effectiveness of differential reinforcement and the token economy system implemented in the most natural environment encompassing the daily distractions, routines, and events surrounding the participants.
CHAPTER 5

CONCLUSION

Summary and Proposed Solutions

In 2002, the prevalence estimates for autism and related disorders ranged from 1 in 1,000 to 1 in 500 individuals (Jensen & Sinclair, 2002). Today, the prevalence estimate, according to the Center for Disease Control (2014) is 1 in 68. This is a dramatic increase in the diagnoses of children with autism and it is extremely important to find effective strategies to support students with disruptive behaviors in the classroom. Parents and professionals have found it difficult to come to an agreement when identifying effective interventions and best practice to help children with autism (Stephens, 2005). Research supports early intervention as having long-term positive effects on behavior and an overall increase in functional skills and cognitive performance (Douglas, 1999; Jensen & Sinclair, 2002; Stephens, 2002). Studies have shown that when a child receives early intervention (directly related to ABA), typically two to three years of age, they can become indistinguishable from their elementary peers (Kimball, 2002). This is not to say that all children who receive early intervention will blend in with their peers. Early intervention is an opportunity for children to develop those foundational skills so when they become school aged they do not need to start from scratch when they first enter a classroom because they have learned how to sit for a period of time or attend to materials or tasks presented to them. These children will also have learned some basic strategies to help reduce any disruptive behaviors before entering the classroom.
Behavior/intervention packages are also possible solutions. There has been little research on using a combination of strategies, however, many studies suggest that using a number of interventions together is best practice and can be more effective in reducing disruptive behaviors than using any one strategy on its own (Barnhill, Sumutka, Polloway & Lee, 2014; Brosnan & Healy, 2011; Rooker, Jessel, Kurtz, & Hagopian, 2013). Rooker, Jessel, Kurtz, and Hagopian (2013) found that FCT in combination with other alternative interventions had a 90% decrease in disruptive behaviors. Schedules such as visual supports and structured works systems as well as other behavioral supports such as DRO, reinforcement, and DTT have been researched by Barnhill, Sumutka, Polloway, & Lee (2014) and was found to be very effective when reducing disruptive behaviors.

Implications and Recommendations

Further research is necessary in all areas of intervention. While this study by no means reveals an exhaustive list, all studies discussed have indicated that future research is essential to determine whether each strategy, is in fact, effective. Not one article suggested that, on its own, any one strategy was best practice for effective reduction of disruptive behaviors. Based on literature, no single theory or intervention works on all children with autism (Stephens, 2002). Implications, therefore, are to conduct more research in all areas individually and research a combination of strategies to determine the effectiveness of disruptive behaviors when a group of interventions, which correspond with each other, are implemented. Additional research should include a larger population. Expanding this research using more students and multiple combinations of
strategies may be beneficial to many classrooms. While success was found in this particular study, the combination of these two strategies may not be successful for all children displaying disruptive behaviors. It is necessary to discover a multitude of strategies to help these children control their behaviors and increase their quality of living as well as allow other students around them to participate in the learning process and access the curriculum. Kimball (2002) leaves us with the thought that “with time the evidence grows that we must require learning of children with autism because if left to discover things on their own, these children will only discover how to remain autistic” (p.74).
REFERENCES
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