DOES THE USE OF A TOKEN ECONOMY WORK AS WELL WITH STUDENTS WITH INTELLECTUAL DISABILITIES AS IT DOES FOR STUDENTS WITH AUTISM?

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ABSTRACT

This study sought to determine whether the use of a token economy is as effective in teaching “learning to learn” skills (i.e., attending, compliance, and imitation) with preschool-aged students with intellectual disabilities as it is with preschool-aged students with autism. This research focused on seven students, four who have been diagnosed with autism and three who have been diagnosed with intellectual disabilities. Their ages ranged from three to five years old. It was anticipated that using a token economy would increase attending, compliance, and imitation behaviors during circle times, as well as during center times, for students with intellectual disabilities as well as it does for students with autism. With the intervention, there was an increase in the desired behaviors in all areas in both students with autism and intellectual disabilities.
CHAPTER 1

INTRODUCTION TO THE STUDY

Background

Learning to learn (LTL) skills are those that afford students the ability to participate and succeed in a classroom. Students are expected to be able to enter a classroom, sit down, and pay attention to the teacher, and to complete what is expected of them. If a student is not able to sit and attend to the teacher, follow directions, or imitate what the teacher is doing, they will not be able to succeed in their endeavors independently (Leaf, McEachin, & Harsh, 1999).

In a classroom setting, children with autism and intellectual disabilities reveal characteristics that hinder learning and learning to learn skills. Such characteristics include language acquisition and behavioral difficulties and cognitive delays (American Psychiatric Association [APA], 2016; Parekh, 2017). Students with autism or intellectual disabilities are often unable to understand what is expected of them just by observing their environments. These students may need to have these skills taught directly to them. Thus, this paper explores essential LTL skills such as attending, compliance, and imitation.

Statement of the Problem

There are three characteristics of autism and intellectual disabilities that are common to both groups of individuals. One characteristic is attending to others, or knowing whom they need to be focused on. A second characteristic is complying with
instructions, especially if it is an instruction that is difficult or non-preferred. A non-preferred instruction is asking a student to do something that they are not wanting/willing to do. An example of this could be instructing a student to complete a worksheet. A third characteristic that is especially accurate for students who have ASD is imitating others in action or language (Bryan & Gast, 2000; Kirk, Gray, Ellis, Tafee, & Cornish, 2016). Applied behavioral analysis (ABA) is a leading intervention when teaching attending, compliance, and imitation (Leaf, McEachin, & Harsh, 1999). Although there are many studies focusing on ABA and autism, there are not as many studies for ABA and intellectual disabilities (Will & Hepburn, 2015).

Purpose of the Study

The purpose of this study was to determine if using a token economy increases students’ LTL skills for preschool students with intellectual disabilities as well as it does for students with autism. Tresco and Kendroski (2017) observed that a token economy helped motivate students with autism to modify their behaviors to receive reinforcement.

Fleury, Thompson and Wong (2015), and Will and Hepburn (2015), noted that there are many skills needed in order to succeed in school. The ability to attend, comply, and imitate others are amongst the skills needed. They further indicated that many of these are skills are lacking in students with both autism and intellectual disabilities. The author of this paper refers to attending, compliance, and imitation as “learning to learn” skills.
CHAPTER 2

LITERATURE REVIEW

Background of Study

Fombonne (2009) noted that “Autism spectrum disorders have become one of the most common childhood disorders, with huge personal, familial, and societal associated burden” (p. 463). According to the Diagnostic and Statistical Manual of Mental Disorders (5th ed., DSM-5), “Autism Spectrum Disorder (ASD) is a complex developmental disorder that can cause problems with thinking, feeling, language and the ability to relate to others” (APA, 2016, para 1). Research indicates that autism has been on the rise in recent decades. In 2000, one in 50 children were diagnosed with ASD each year. Today, one in 68 children are diagnosed. Boys are more affected (i.e., one out of 42) than girls (i.e., one out of 189) (Centers For Disease Control and Prevention [CDC], 2016). Race and ethnicity are not a factor in autism; however, families with lower socioeconomic status and minority children diagnosed at a later age are under-reported due to the lack of access to health care (Moulton, Barton, Robins, Abrams, & Fein, 2016).

Autism Spectrum Disorder Causes

There is also evidence that autism is genetic. Persicoa and Napolioni (2013) noted that autism can be seen as a genetic syndrome which occurs in about 10% of the population. There are three main areas of evidence to support the notion that autism could be genetic: twin studies, sibling studies, and studies of rare genetic syndromes (Geschwind, 2011).
Researchers believe that autism could be caused by environmental factors. Kim and Leventhal (2015) indicated “Diagnostic disparities in some MZ twin pairs also suggest that environmental factors contribute to both liability for and expression of autism-related traits” (Kim & Leventhal, 2015, p. 67). They further stated that the environmental factors include an increase in public awareness and broadening of the diagnostic construct. It is also possible that exposure to toxins (i.e., smoking, pollution, and medication) could contribute to the diagnosis of autism (Kim & Leventhal, 2015).

Rare genetic or medical conditions are known to be associated with autism. Geschwind (2011) stated that Joubert Syndrome, Smith-Lemli-Opitz syndrome, Tuberous Sclerosis and Fragile X, along with others, have been known to cause autism; however, they are very rare and only are associated with 1% of the ASD population. Geschwind (2011) noted that it is believed “autism was thought to fit a model in which multiple common variants, each with small to moderate effect sizes, interact with each other and perhaps in some cases, environmental factors, to lead to autism; a situation referred to as complex genetics” (p. 410).

Studies on siblings with autism have yielded interesting results. Monozygotic (MZ) twins, who come from a single egg, share 100% of their DNA, while dizygotic (DZ) twins share 50% of their DNA similarly to non-twin siblings, however they share the same uterine environment at the same time. Evidence has showed that if one MZ twin is diagnosed with autism, the other twin will be affected 36-95% of the time. However, in DZ twin studies, when one twin is diagnosed with autism, the other twin is
only affected 0-31% of the time (CDC, 2016; Geschwind, 2011; Persicoa & Napolioni, 2013).

In addition to studying twins, researchers also studied non-twin siblings. It has been determined that if one non-twin sibling has autism, the next child will be affected 2-18% of the time (CDC, 2016; Persicoa & Napolioni, 2013; Geschwind, 2011).

Extrapolating from these statistics, it indicates that both genetics and environment must play a role in the development of autism. This information, however, does not help us determine what exactly is causing this disorder.

Autism Spectrum Disorder Characteristics

To truly understand ASD, one must understand its characteristics. Characteristics of ASD include but are not limited to social deficits, communication deficits, and repetitive behaviors. (Miniscalco, Rudling, Rastam, Gillberg, & Johnels, 2013; Ratchliffe, Wong, Dossetor, & Hayes, 2015; Xavier, Bursztejn, Stiskin, Canitano, & Cohen, 2015). These characteristics hinder a students’ ability to function in a productive way in a classroom setting.

Characteristic One: Social-Emotional Understanding

Individuals with autism may have a challenging time in social situations with both peers and adults (Camargo, Rispoli, Ganz, Hong, Davis, & Mason, 2014). These social situations include initiating and responding to someone else (Camargo et al., 2014). Individuals with autism may also have trouble sustaining eye contact with others, sharing objects or sharing during activities, and showing empathy towards others Fleury,
Thompson, & Wong, 2015. Non-verbal communication is another problematic area for people with ASD. Reading social cues are hard for individuals with ASD and they may not be able to comprehend or respond to these types of communication. This inability to read social cues interact with peers/adults, and lack of empathy may contribute to their difficulty in social problem solving (Camargo et al., 2014; Fleury, Thompson, & Wong, 2015; Geschwind, 2011; Leaf, McEachin, & Harsh, 1999).

The lack of social-emotional understanding is one of the main factors differentiating children who have ASD from those who have other developmental disorders (Ratchliffe, Wong, Dossetor, & Hayes, 2015). These social difficulties in social-emotional skills could hinder a person’s ability to establish any significant, meaningful relationships. This lack of meaningful relationships could lead to detrimental outcomes including poor academic performance, peer rejection, social isolation, social anxiety, and behavioral difficulties (Camargo et al., 2014; Boyd, Odom, Humphreys, & Sam, 2010; Leaf, McEachin, & Harsh, 1999).

**Characteristic Two: Speech and Language**

There is a wide spectrum of speech and language disabilities for students with ASD. These difficulties can vary from those who have no language ability at all to those who have perfect speech intonation and articulation. Students with ASD have difficulty with social language (pragmatics), which is intertwined with their social skills (Ray-Subramanian & Weismer, 2012).

Pragmatics is “the intentional and functional use of language for communicative purposes” (Miniscalco et al., 2013, p. 370). Lack of pragmatic skills affects students with
ASD universally. Pragmatics includes: turn taking in conversations, inferencing, and beginning new topics when communicating with others. Other problematic issues that children with ASD seem to have are a lack of eye contact, joint attention, imitation skills, and interest in other’s thought and ideas (Miniscalco et al., 2013). These speech concerns are related to pragmatics but are also considered a foundation for language development and may indicate communicative disorders. Without these skills, it is difficult for children with ASD to communicate successfully with others.

The “core” language abilities that are lacking in some children with ASD are the basic abilities to form words and sentences. These are language skills that include vocabulary and syntax (Miniscalco et al., 2013). This lack of skill makes it trying for even the highest functioning child to communicate effectively with others, which in turn diminishes their ability to have social interactions with others.

**Characteristic Three: Repetitive Behaviors**

Repetitive behaviors are a third characteristic of ASD. These behaviors include repetitive motor mannerisms, preoccupation with parts of objects, inflexible adherence to non-functional routines, and preoccupation with restricted patterns of interest (Ray-Subramanian & Weismer, 2012). There are two types of repetitive behaviors: repetitive sensorimotor (RSM) and behaviors and insistence on sameness (IS) (Ray-Subramanian & Weismer, 2012).

Examples of RSM behaviors include hand, finger and body mannerisms, such as when children flap their hands while jumping or flap them in front of their eyes. It also includes using objects or parts of objects repetitively (i.e., lining up toys, spinning car
wheels, etc.) (Ray-Subramanian & Weismer, 2012). These behaviors make it a challenge for children to relate to their peers and play appropriately with them or items.

Examples of IS are difficulty with changes in routine and/or environment and ritual compulsions. For example, children who struggle with change in routine may become upset if there is an assembly during the school day, which is not typical. They may also become upset with environmental changes such as changing furniture. Therefore, insistence on sameness may make it problematic for them to conform to different activities and may make it difficult for them to concentrate on work they must complete.

Another area of repetitive behaviors that researchers are learning about are restricted interests. These include either only wanting to play with one type of toy and only wanting to talk about or learn about one subject. Children who have difficulty in this area are not able to comprehend when others do not want to play with a given item anymore, or when they do not want to talk about a certain subject and/or want engage in other areas of interests. Many children with ASD will not be able go around their own interests to engage in other areas. Restricted interests will limit the amount of social interactions that they will be able to have with their peers and make it hard for them to have true friendships (Ratchliffe, Wong, Dossetor, & Hayes, 2015).

Intellectual Disabilities Characteristics

Intellectual disabilities (ID) is defined as difficulty in “both intellectual and adaptive functioning” (Parekh, 2017). There is not a specific disease or illness that
causes ID (Harris, 2006). According to The SAGE Encyclopedia of Abnormal and Clinical Psychology (2018), there are three characteristics that help define ID:

1. Intellectual functioning that is considerably low
2. Adaptive behavior that is far below average, which is exhibited by difficulties in conceptual, social or practical adaptive skills
3. Characteristics presented before becoming an adult

Symptoms for ID include thinking and learning with developmental delays in speech, language, problem solving, behaviors, and self-care (Luckasson, 2018).

ID occurs all over the world. It is more prevalent in areas of low economic stability due to lack of prenatal care, supports for families, and an increase in infections and disease (Luckasson, 2018). Malnutrition in infants and children increases the likelihood of a child having ID. In the United States, approximately 2-3% of the population are diagnosed with ID (Luckasson, 2018). ID is categorized as mild, moderate, sever, or profound. Of those diagnosed with ID worldwide, 85% are considered mild, 10% moderate, 4% severe, and 2% profound (Harris, 2006).

ID can be caused by many different factors, some of which occur before birth. The causes which are most common are Down Syndrome, fetal alcohol syndrome, and Fragile X syndrome. Other genetic conditions such as birth defects and infections could also cause ID. Head injuries, strokes, and some infections can also cause ID in children when they are older (CDC, 2018).

Life expectancy can be shorter for some people with ID, however, thanks to improvements in healthcare, this is not always the case (Sulkes, 2018). For people with mild to moderate ID, they can be taught the basic skills to be able to be successful at
certain jobs. People with severe to profound ID are not always as lucky. They require more life-long supports from families or the community (Sulkes, MD, 2018).

History of Autism

Swiss psychiatrist and psychologist Eugen Bleuler was the first to use the word “autism.” The term autism refers to what he described as “an escape from reality.” The word “autism” or “autistic” is derived from the Greek word “auto,” which meant “self” (Holaday, 2012). The word “auto” demonstrates the belief that people with autism appear to prefer to be alone and enjoy being in their own head without appearing to desire interaction with others.

On January 8, 1800, a boy who had characteristics which appeared to be similar to those we would now identify as autism was found alone in the Aveyron region of France by Dr. Jean Itard (Xavier, Bursztejn, Stiskin, Canitano, & Cohen, 2015). He was named Victor and he had been living in complete isolation from all people and society. He was found naked and unable to speak. Itard took him to a physician who described him as an “idiot,” which meant he had no potential for being educated. Itard did not believe that to be true. He took it upon himself to work with Victor for the next four years to attempt to increase his thinking and language (Xavier et al., 2015). According to Thompson (2013), in 1802, Itard characterized the three symptoms of autism:

1. Lack of full understanding of effective use of communication
2. Lack of understanding of social cues and use of age-appropriate social skills
3. Excessive non-functional repetitive routines and behaviors, including rigid behavioral routines (Thompson, 2013, p. 82).
Dr. Leo Kanner was one of the first to document autism as a disorder in 1943. He was a leader in the field of child psychiatry and helped to found a clinic for children with psychiatric problems at John Hopkins University (Verhoeff, 2013). In 1943, Kanner observed 11 children ages 2.5 to 11 years-of-age. These children were observed as having a lack of interpersonal relationships as well as a lack of eye contact, language deficits, stereotypical behaviors, and an unwillingness to change their environments. He stated that these children had two core deficits: “extreme autistic aloneness” and “obsessive desire for the maintenance of sameness” (Xavier et al., 2015). Kanner was the first to launch the study of what is now known as autism (Thompson, 2013). He believed that there was no physical pathology in the brain which caused autism; moreover, he believed autism was caused by “refrigerator mothers,” or being raised by mothers who were ridged, cold, and unattached. This belief was accepted by psychiatrists and psychologists, which resulted in parents feeling overwhelmed by guilt (Bittleheim, 1967). In fact, according to Holaday (2012), the “refrigerator mother” theory caused many parents to blame one another and spend large amounts of money on psychoanalytic treatments for their children.

While Kanner was making his discoveries, Hans Asperger, a psychiatrist from Austria, was making similar discoveries of his own’ however his discoveries were not well known in the United States. Asperger observed four cases of “autistic psychopathy of childhood,” which he called Asperger’s Syndrome. The children he observed had “poor social and emotional relationships, idiosyncratic language use, and lack of feelings for others” (Holaday, 2012, p. 13). He also observed that some had gifts in mathematics
and natural sciences. When observing the parents of these children, he noted that some of the parents had similar personality traits as their children. Because of these observations, he hypothesized that autism could be genetic. Asperger’s approach to helping these children was through treatment and education (Holaday, 2012; Xavier et al., 2015).

Although there have been many documented cases of autism, no one was able to understand what autism really was. Researchers like Kanner and Asperger, in the 1960s and 1970s began using the scientific method, which included forming hypotheses, testing theories, and collecting data, to diagnose and treat the illness (Holaday, 2012). Using this method not only validated Kanner and Asperger’s theories, it brought to light the fact that language, or lack thereof, could be the most significant deficit for children with autism. Researchers during this time believed that autism was the combination of a global defect with integrating sensory stimuli and the inability to use and understand language normally (Verhoeff, 2013). These new empirically studied theories not only backed this theory, but also suggested that autism was not developed by profound affective withdrawal or motivational failures; instead, it was caused by a lack of understanding of spoken words, gestures, or non-verbal stimuli (Verhoeff, 2013).

During the 1960s a researcher named O. Ivar Lovaas began investigating a new intervention for autism, which became known as Applied Behavior Analysis (ABA). Lovaas studied language and its effects on behavior. As he was compiling his test subjects he visited a clinic for children with autism. It was there that he became convinced that this was the best population for his research. During this time, he referred
to a student named Beth. He spent six hours a day, five days a week with Beth working on his theories. This turned out to be the most important research of Lovaas’ life and changed, and subsequently changed the way people viewed teaching techniques for students with autism forever (Smith & Eikeseth, 2011). Starting in 1965, Lovaas published articles discussing ABA and how it could be used to work with autistic children. These articles included discussions on systems for coding behaviors and introduced the use of antecedents and consequences for behaviors. Lovaas believed that with these interventions, children with autism did not need to live in a hospital setting, but could live in their own communities (Smith & Eikeseth, 2011).

History of Intellectual Disabilities

Intellectual disabilities may have been referenced in writing which dates back to the Egyptian Papyrus of Thebes in 1552 B.C.E., and the thoughts and beliefs toward people with ID has changed throughout the centuries (Harris, 2006). From 1300 B.C.E. to 476 A.D., the Greeks and Romans believed that having a child with ID meant that they were being punished by the gods. It was common for families to comment infanticide if their child was considered intellectually disabled by leaving them outdoors, exposed to the elements. In fact, Aristotle supported this practice. He wrote, “As to exposing [to the elements to die] or rearing the children born, let there be a law that no deformed child shall be reared… if the regular customs hinder any of those born being exposed, then there must be a limit fixed to the procreation of offspring” (Harris, 2006).

During the Middle Ages (476- 1500), beliefs about the causes of ID and how to treat these people varied. Many believed ID, mental illnesses, epilepsy, and hearing
Impairments were caused by the devil. Exorcisms were performed to rid a person of the evil spirits (Harris, 2006). Others believed there was a more natural cause for these afflictions. Family, friends, employees and others assumed responsibility for these people and helped transport them to religious cites to receive cures. Court records from the 13th-17th centuries were the first to describe beliefs about brain disorders, and there are records that indicate legal incompetence. They differentiated between those with intellectual disabilities (“natural fools”) and those people with mental illnesses (“lunacy”) (Harris, 2006).

During the 17th and 18th centuries, the Age of Reason, or simply the Enlightenment began (Harris, 2006). People like Francis Bacon, Isaac Newton, and John Locke believed there should be a different approach to how people with disabilities were treated. They believed in using science. Bacon said that empirical data and research should be used when treating and understanding those with ID. In 1605, Bacon published *The advancement of learning, Devine and Humane*. In this publication, he stated his belief that intellectual disabilities were not caused by god or demons, and suggested ideas for inquiry that helped establish psychological research for centuries to come (Harris, 2006).

The 19th century brought about special education. Due to Itard’s research, a surge of interest in educating those with intellectual disabilities emerged. Edouard Seguin was one of those people. He was the first to acknowledge that intellectual disabilities and other disabilities all have the same characteristic of beginning at an early age. He not only focused on behaviors, but also included “muscular, imitative, nervous,
and reflective functions” (Harris, 2006). Seguin’s approach was referred to as the “physiological method,” which worked on sensory-motor, academic and speech, and socialization. This approach became the European standard for treatment of ID, and eventually made its way to the United States.

After making contact with Samuel Gridley Howe (who helped establish interventions for people with ID in America) when he arrived in America, Seguin wrote *Idiocy and Its Treatment by the Physiological Method*. This publication recommended training people who worked with students with ID who were unable to attend general education (Harris, 2006). In 1848, the first institution for people with ID was opened, during a time of great change and social influx of immigrants in an attempt to increase social order. During this time, the institutions were reported to have success in treatment and training and were able to release their patients back into their communities with the ability to work (Harris, 2006).

With the start of the Civil War and the recession that followed, jobs for the patients of these institutions were not as readily available. After a while, the institutions that were focused on training and rehabilitation became asylums with no expectations of returning their patients to their communities. Public opinion began to discriminate against those with ID. States continued to build asylums against the wishes of Seguin and Howe. A census taken in 1900 showed that over 11,800 people were institutionalized.

In 1905, physicians Alfred Binet and Theodore Simon created an intelligence test, known today as the intelligence Quotients or IQ test. This test was designed to determine
which children required special education. During this time, people with ID were considered to have incurable diseases. Additionally, society believed that people with ID were more likely to be criminals. The IQ tests that were originally designed to help determine which children needed specialized instruction thus become a tool to determine who was an “incurable.” IQ tests were used in prisons for prostitutes, for people with substance abuse, and for those who exhibited antisocial behaviors. It was also used as a way to discriminate against immigrants who were coming into the country (Harris, 2006).

In the 1950s, a parents group called the National Association for Retarded Children, or ARC, was formed. President John F. Kennedy increased the focus of services for those with ID and appointed a panel on Mental Retardation. This panel created 95 recommendations for people with mental retardation, including research and civil rights. These recommendations lead to many laws and amendments which increased spending to support families and new programs which would focused on medicine, education, psychology, and genetics.

Research and Signs for Autism

Lovaas believed that children who have autism that receive early intervention have much better outcomes than those who do not (Smith & Eikeseth, 2011). However, to be able to give these children early interventions, researchers needed to identify signs to look for when diagnosing children at an early age. Thus, researchers have been searching for behavioral and physiological indicators that would help in this early diagnosis.
Boyd, Odom, Humphreys, and Sam (2010) have noted early warning signs for autism, including: 1) lack of early social behaviors such as social smiling, looking at faces, and responding to one’s name; 2) lack of early communication behaviors such as producing vocalization and using a variety of gestures; and 3) lack of coordinating verbal and nonverbal behaviors such as eye contact with vocalization.

Physiological indicators are more difficult to determine. One physiological indicator that has been discussed is a child’s head circumference. Courchesne, Carper, and Akshoomoff (2003) observed that 92% of children diagnosed with autism did not have an enlarged circumference of their head at the time of birth, but within the first two years of life, their head had grown to be unhealthy large. This is due to an unhealthy enlargement of a child’s white brain matter which, in turn, increases the brain’s size (Courchesne, Carper, & Akshoomoff, 2003). The cause of this has yet to be determined.

With these early warning signs, parents and practitioners are able to provide early interventions. There are two categories for early interventions: focused intervention and comprehensive treatment models (CTMs). Focused interventions select certain goals for infants, toddlers, or families that need to be addressed. CTMs are designed to cross developmental domains for longer periods. Both, however, are designed to increase positive outcomes for children with autism (Boyd, Odom, Humphreys, & Sam, 2010).

Research and Signs for Intellectual Disabilities

Just as early intervention is important for children who have autism, it is equally important for children with ID (Sturmey & Didden, 2014). There are three primary
symptoms evidenced in individuals at a young age: slower ability to learn new information and skills, immature behavior, and difficulty with self-care (Sulkes, 2018).

Depending on the severity of the delay, some children are not diagnosed until they reach school age. These students are usually diagnosed after having difficulty with academics (i.e., reading, writing, and math). With the correct education, however, these skills can be taught (Simpson, Mizen, & Cooper, 2016).

For others, like children with Down syndrome, identification occurs at birth. Children with ID severe enough to be diagnosed before school are usually spotted because they have not met their milestones (i.e., walking and talking). If disabilities are profound enough, the child may never acquire speech and/or some or all of their motor skills (Simpson, Mizen, & Cooper, 2016).

There are also co-morbid conditions that are associated with ID. The most common conditions are atypical behaviors patterns, epilepsy, gastro disorders, and sensory impairments. Other co-morbid conditions are caused by the specific cause of their ID. For example, in Down syndrome heart defects and hyperthyroidisms are common. ID can be caused by Rubella, and deaf and blindness is common. Other co-morbid disorders that have been associated with ID are autism, attention-deficit hyperactivity disorder, and pica (Simpson, Mizen, & Cooper, 2016).

**Early Interventions for Autism and Intellectual Disabilities**

With early diagnosis comes early interventions, and an increased chance for a positive outcome. Many interventions can be used for children with autism or ID.
depending on their individual needs. Such interventions include speech and language therapy, occupational therapy, physical therapy, special education classes, and behavioral interventions (Sulkes, 2018; National Center for Learning Disabilities, 2014).

It is interesting to note that when talking about supports and behavioral interventions for children with ID, most researchers and educational sources begin to discuss autism (American Academy of Child and Adolescent Psychiatry, 2014). Thus, autism will be the main focus of suggested interventions for both persons with ID and autism.

Interventions for Intellectual Disabilities and Autism

The most common approaches in education are Individual Differences, Relationship-Based Approach (Floortime), sensory integration therapy, Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH), and Applied Behavior Analysis (ABA) (Centers for Disease Control and Prevention, 2016).

Floortime

Floortime is a play-based approach developed by a child psychologist Stanley Greenspan which can be implemented by teachers, caregivers, and families. It was Greenspan’s belief that children learn from a place of emotion. An infant develops a bond with their caregiver, which gives the child the reinforcement needed to desire that type of engagement and further their relationship. Thus, Greenspan was convinced that it is through a desire for relationship that all people learn. According to Greenspan,
Floortime allows children with ASD to develop the skills needed to increase their desire and ability to increase communication with others, and creates an upsurge emotional intelligence (Greenspan, 2006).

Kordt-Thomas and Lee (2011) suggested that there are seven basic principles to follow when implementing Floortime:

- Follow the child’s lead (Floortime should be being child-directed, not adult-directed)
- Find the child’s natural interests and mental level when joining in with the child
- Build on the child’s interests and allow the child to build upon what the caregiver has said
- Create a developmentally appropriate play environment
- Bring peers into the environment to increase communication and socialization
- Introduce other ways of playing and using materials
- The caregiver should tailor their interactions to each child since each child has different interests.

As indicated by the principles listed above, it is very important to be at the child’s level and not expect the child to come to the caregiver’s level. Caregivers need to enter the child’s world, not vice versa. However, despite the fact that Floortime has been around for 25 years, there has been little research on its validity. Because Floortime seems simple to implement, some families choose to provide Floortime in their home. However, because it is very time consuming, Floortime can be expensive for families with limited income to execute. Alternative strategies might include homeschooling,
multiple weekly playdates, and an aide for the child (if they are in school) to help support social interactions (Cartwright & Beskina, 2007).

**Sensory Integration Therapy (SI)**

Sensory integration therapy (SI) was developed by A. Jean Ayre and was intended to focus on the neurological processing of sensory information (Pfeiffer, Koenig, Kinnealey, Sheppard, & Henderson, 2011). This theory states that purposeful behaviors are interrupted in children with autism by a break down in neurological processing and integration of sensory information. This break down affects a child’s ability within social interactions, communication and self-stimulatory behaviors. Sensory integration therapy is designed to use purposeful sensory input to help the body modulate the nervous system, organize and integrate information from the environment, thus increasing adaptive responses and allowing the child to calm his or her mind and body enough to attend, socialize, and participate independently (Pfeiffer et al., 2011).

When using SI, the therapist assesses the child’s behaviors and develops a sensory profile to determine the best course of action. Typical implementation of SI combines such things as: weighted vests, being brushed or robbed with different materials/instruments, scooter board riding, swinging, and bouncing on balls or trampolines, and squeezes using blankets, pads, or pillows (Lang et al., 2012).

These techniques should be used while implementing: (a) child safety, (b) opportunities to obtain tactile, vestibular, and/or proprioceptive sensory stimulation to support self-regulation, sensory awareness, or movement, (c) appropriate levels of participant alertness, (d) challenge to postural, ocular, oral, or bilateral motor control, (e)
novel motor behaviors and efforts to organize movements in time and space, (f) preferences in the choice of activities and materials, (g) activities that are not too easy or too difficult, (h) activities in which the participant experiences success (i) support for intrinsic desire to play, and (j) a therapeutic reliance (Lang et al., 2012, p. 1005).

Although anecdotal evidence of success with SI exists, it is difficult to test its validity of the SI Intervention. Students with ASD, by nature, tend to be unresponsive, noncompliant, and are unable to engage during testing and observations. Compound this with the fact that each student’s treatment varies depending on the child’s individual needs, and it becomes difficult to link the treatments to behaviors, and ultimately to the success of said treatment (Pfeiffer et al., 2011).

The Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH)

The Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH) intervention began at the University of North Carolina in 1971. An advantage to using TEACCH is that it can be an appropriate intervention in different settings and takes into account the child’s learning needs. This intervention attempts to modify the child’s environment and materials. The goal is to develop a child’s independence by assessing his or her needs, interests, and existing skills (Sandberg & Spritz, 2012).

There are four main elements of TEACCH: physical structure, visual schedules, working systems, and task organization. Each element is designed to structure a child’s environment in order to help him or her be independent and organized. It gives children
a sense of control and understanding what is expected of them as well as what is needed next by giving them visuals of what is expected (Sandberg & Spritz, 2012).

**Applied Behavior Analysis (ABA)**

Applied Behavior Analysis (ABA) is not just an intervention for students with autism, but is a field of study based on B.F. Skinners research as well (Roane, Fisher, & Carr, 2016). Skinner believed in operant conditioning, the notion that all behavior is based on rewards or consequences. Skinner postulated that a desired behavior can be increased if the behavior is rewarded or reinforced. A mouse presented with a piece of cheese right after finishing a maze will be more likely to finish the maze again if the reward (the cheese) is presented to him. He believed that behaviors can be modified or “shaped” by identifying and reinforcing the desired behavior (Roane, Fisher, & Carr, 2016). Skinner also believed that behaviors can diminish (extinction) if the reinforcement is taken away (Skinner, 2012).

Lovaas was the first to develop an intensive ABA treatment for children with ASD and early and intensive behavioral intervention (EIBI) (Roane, Fisher, & Carr, 2016). He worked with students who were up to three years of age for an average of 40 hours a week. In a study that he published in 1987, Lavaas that with the intervention of ABA students with autism exhibited significant improvement. Out of 19 children, nine were successful in completing general education classes and were indistinguishable from their peers in the measures of IQ, adaptive skills, and emotional functioning (Leaf, McEachin, & Hart, 1999).
ABA and Reinforcement. Reinforcement is a key part of ABA because it is essential in changing behavior (Roane, Fisher, & Carr, 2016). At the beginning of an intervention, artificial reinforcement may be necessary for students to modify their behavior. Students may not find having a calm body, attending to the task at hand, or compliance motivating enough to change their own behaviors. If having a calm body, attending, or compliance were motivating, there would be no need external reinforcement. The hope is that over time, the external artificial reinforcement can be replaced by more age appropriate and natural contingencies (Leaf, McEachin, & Hart, 1999).

Reinforcement does not have to be an item that is extravagant or over the top. There are three ways to establish reinforcement for a child. The first is observing what a child choses to do or not do during free time indicates what is reinforcing for that child. For example, if the child shows interest in music, music can be used as a reinforcement. A second method can be exposure to other activities to identify new ways to reinforce the student. For example, if a child has never played with blocks, allowing them to play with blocks could result in a new reinforcement. A third way to introduce reinforcement is by pairing new items with something that is already reinforcing for the child. For example, if a student likes bubbles, the teacher can pair the bubble with an action figure to make the action figure more appealing (Leaf, McEachin, & Hart, 1999).

Leaf, McEachin, and Hart (1999) also list rules that need to be followed in order to make sure that the reinforcement is given properly. Such rules include:

1. Reinforcers should be motivating for the student and reinforcement should be contingent on what behaviors are desired.
2. Vary the reinforcement in order to limit satiation.

3. Labeling desired behaviors enables students to understand what behavior is desired which would enable present behaviors to be modified.

4. Reinforcement should be faded over time as behaviors improve.

**ABA and Token Economies.** A token economy is a positive reinforcement strategy used in ABA. It is designed to increase the likelihood of a desired behavior through reinforcement and to decrease an unwanted behavior. Tokens are given to the student as a response when the desired behavior is evident. There are many ways of using tokens— one of which is token boards (see Appendix D). Token boards are panels with Velcro glued to the surface. The teacher places the tokens on the board when the desired behaviors are exhibited. Once the board has been filled, it can be traded for the student’s desired reinforcement. This strategy not only makes it easy for the students to see their progress, it also expands the length of time that the student is required to exhibit the desired behavior (Tresco & Kendorski, 2017).

**ABA and Intellectual Disabilities.** An intellectual disorder is one that affects many aspects of a person’s being, such as their cognitive and language function as well as behavior. ABA has been used when working with children who have behavioral issues, many of which could also be categorized as ID (Will & Hepburn, 2015; Sturmey, 2014). However, there hasn’t been much research evaluating the use of ABA principles when working with other disabilities and not behaviors. Will and Hepburn (2015) stated, “Existing research utilizing an ABA approach in addressing behaviors associated with
certain neurogenetic (Down syndrome is under this heading) disorders is limited in quantity and scope” (Will & Hepburn, 2015, p. 246).

Learning to Learn Skills

When students first enter the classroom, they are expected to be able to sit, listen to the teacher, understand what is expected of them, and apply what is expected of them at that time. Students with ASD and ID, however, may have difficulty knowing all of these expectations and may not be able to understand what is expected of them because of lack of social concepts. In these early classroom experiences, they might not know when it is appropriate to talk and when it isn’t, when it is ok to get out of their seats, and when it isn’t, when to take the materials in front of them and when they need to refrain. They may even have to discover how to copy what the teacher is doing and pay attention to activities that may be difficult for them to understand. According to Leaf, McEachin, and Hart (1999), these are all skills that must be understood by student in order for them to succeed in their education.

Fleury, Thompson, and Wong (2015) described skills that are needed for successful learning as “outcomes that are related to task performance but are not directly related to task content” (p. 72). These skills include: engaging in tasks, orienting to materials, remaining in seat or activity area, and responding to instructions. They further noted that 88% of children with ASD do not show learning readiness skills when entering kindergarten, and that approximately 86% of children with ASD do not meet expectations in mathematics or literacy after their fourth-grade assessments. In addition, Ratz and Lenhard (2013) noted that in Germany, 29.3% of children with ID are not able to read at
all, 6.8% are able to read at a logographic stage. Additionally, 31.9% read at an alphabetic stage while 32% read at an orthographic stage (Ratz & Lenhard, 2013). These results indicate the importance of students having learning to learn skills to increase their success in their future educational endeavors (Fleury, Thompson, & Wong, 2015).

There are many skills that are needed for successful learning. To explore all of them is beyond the scope of this paper. Thus, the focus of this paper will be on three aspects: attending, compliance, and imitation. Additionally, these three aspects will serve as the measured dependent variables in this study.

**Attending**

For the purposes of this paper attending is defined as: 1) looking at the current activity with their eyes, 2) using materials appropriately, 3) focusing on what the teacher is saying, and 4) completing or at least attempting to complete the task given. The ability to attend, increases the likelihood of independence during school time activities. All students may occasionally find it difficult to focus on what the teacher is saying and or what they are supposed to be doing in class.

Bryan and Gast (2000) stated that “Autism is a developmental disability that is characterized by dependence on adults for staying on-task, completing activities, and transitioning between activities” (p. 554). Kirk, Gray, Ellis, Taffe, and Cornish (2016) go further, noting that “Impairments in attention are among the most common concerns for individuals with intellectual and developmental disabilities” (p. 1380). These researchers further stated that lack of attention is linked to poor cognition, academic skills, and social interactions (Kirk et al., 2016). Therefore, it is important to teach
students with autism and intellectual disabilities at a young age how to attend during classroom activities in order to insure their future educational success.

Compliance

A second focus of “Learning to Learn” is compliance. Teachers expect a student to understand that they need to comply with the teacher’s directions in order to be able to understand what is expected of them, what they are supposed to do, and how to complete the task given. Noncompliance is a precursor for future serious behavioral issue (Ray, Skinner, & Watson, 1999).

Noncompliance is also a common issue when it comes to students diagnosed with ASD and ID. Simple instructions such as “sit down,” “line up,” and “come here” could result in confusion, disorientation and even panic (Ray, Skinner, & Watson, 1999). Ducharme and Drain (2004) stated, “These behaviors often occur when the child is exposed to unpleasant or challenging conditions, such as instructional activities or academic demands” (p.163).

Compliance is an important skill to teach any student, but is even more acute with students who have been diagnosed with ASD or ID. Teaching compliance not only increases a student’s educational goals and achievements, but affects other broader aspects of the student’s life, including aggression and oppositional behaviors (Ducharme & Ng, 2012). If we teach these skills at the preschool-age level, students will be more likely to grasp what is being taught as they continue in their education.
Imitation

Imitation is a vital aspect of learning. Being able and willing to imitate what is happening around them affects all aspects of a child’s life, including language acquisition and social skills. Stewart, McIntosh, and Williams (2013) stated, “Imitation provides a fast route to skill acquisition, which would otherwise require costly trial-and-error learning” (p. 522). Meltzoff and Decety (2003) indicated that imitating the actions of others is how we learn what it is like to be like someone else and what it is like for them to be like us.

Children with autism have a difficult time relating to others (APA, 2016). This struggle makes it hard for them to imitate peers in language and in social interactions. Stewart, McIntosh, and Williams (2013) stated, “There is strong evidence that people with autism spectrum disorder (ASD) have difficulty not only with social behavior, but also with physical action, particularly, though not limited to tasks requiring imitation” (p. 522). Williams, Massarob, Peela, Bosselerb, and Suddendorf (2004) stated, “Children with autistic spectrum disorder (ASD) are well-recognized to have difficulties with elicited imitation and facial imitation” (p. 560).

Since imitation is an important aspect in acquiring social and language skills, it is logical to assume that imitation would be an important aspect in learning academic skills as well. When learning academic skills such as reading, writing, and arithmetic, students need to imitate the teacher, either by copying what the teacher is writing, following along in a book, or imitating what the teacher is saying. If students with autism or ID lack the skills to imitate, they will have a difficult time acquiring the academic skills needed to
further their education. If they are not able to acquire these skills, they will fall farther behind their typical peers adding to the separation they may already feel. Preschool children who have been diagnosed with ASD or ID need not only academic skills and understandings, but “learning to learn” skills as well.

The learning to learn skills, including attending, compliance, and imitation, are key components in learning how to learn. If these skills are taught in the preschool setting, it could enable children to increase their independence, understand what is expected of them, and comply with directions given. Applied behavioral analysis (ABA) is a behavioral intervention. The use of token boards in this intervention aims to increase desired behaviors. The author of this paper poses the question: will the use of token boards be as effective with preschool students with ID as they are with preschool students with ASD when teaching learning to learn skills? The purpose of this study, is to determine if the use of a token economy will increase learning to learn skills as well with preschools who have ID as it does with preschoolers who have autism.
CHAPTER 3

METHODOLOGY

Design of the Investigation

The purpose of this study was to determine if the use of a token economy increases a student’s learning to learn skills in students with Intellectual disabilities as it does with students with ASD. This study was a quantitative, single-subject AB design investigation. It included a one-week period to establish baseline data. A data collection sheet/form was designed by the co-investigator to track the dependent variables compliance, attending, and imitation. All data were collected during small (centers) or large group (circle) activities.

It was hypothesized that the use of a token economy would greatly increase a student’s learning to learn skills. It was further hypothesized that the increase in learning to learn skills would be equal for students with autism and students with intellectual disabilities.

The study was conducted in a southern California School in El Monte named New Lexington Elementary school. There were 337 students ranging from kindergarten to sixth grade at the time of the study. The ethnicity breakdown of the school is 80% Hispanic and 20% Asian. Of these students, 43.6% were English language learners and 92.3% received free or reduced lunches. On this campus there is a head start classroom and two preschool special education classes named Preschool Academics Language Socialization (PALS).
The intervention was conducted in the afternoon PALS class from 11:30 a.m.-3:00 p.m. There was one teacher, three aids, and 12 students in the class with ages ranging from three to five years old. Ten of the students were Hispanic and two were Asian. There were a variety of disabilities in the class including autism, speech and language disabilities, and intellectual disabilities. The class schedule included a welcome circle, lunch, calendar circle, recess, social circle, center rotations, free play, and snack.

Population Sample

The participants were chosen as a convenience sample as they are all participants are in the researcher’s classroom. Eligibility for this study was determined by students being diagnosed with either autism or having an intellectual disability, and being between the ages of three and five years old. Since the participants were minors, consent forms were given to the parents, signed and returned.

Participant A

Participant A was a 4.6-year-old male. He is Hispanic and speaks both English and Spanish. He lives with his paternal grandparents and his younger brother and sister. He was diagnosed with autism after being assessed by the regional center at the age of 2.11. He has been a client of the regional center since August 2012, and has received speech and language therapy, occupational therapy, and behavioral therapy. He was enrolled in the PALS program at El Monte School district in August of 2015.

Participant B

Participant B is a 5.5-year-old female. She is Hispanic and only speaks English. She lives with her mother and has no siblings. She was assessed by the Pre-K assessment
team at El Monte school district after being expelled by a private preschool for disruptive behaviors in October of 2015. She was then diagnosed with autism. She was placed in a regional autism class in El Monte from 2015-2016. In August of 2016, Participant B was moved to the PALS program.

Participants C and D

Participants C and D are 5.1-years-old twin girls. They are half Pilipino and half Caucasian. Their home language is English, though they also have been exposed to other languages, mainly Tagalog and Spanish. As advised by the regional center, the girls were evaluated and assessed by the El Monte Pre-K assessment team in February of 2014. They were receiving speech and language and occupational therapy from the regional center at that time. Through this assessment, they were diagnosed with autism and placed in the PALS program.

Participant E

Participant E is a 4.2-year-old male. He lives with his mother, father, maternal grandmother and four older sisters. Spanish is his primary language, though his father and siblings speak to him in English as well. He was diagnosed with Trisomy 21, or Down syndrome, at birth after being born prematurely at 35.7 weeks gestation. He received support from regional center including; speech and language, physical therapy, and occupational therapy. He was assessed by the El Monte Pre-K assessment team at the age of 2.10 years and enrolled in the PALS program on his third birthday.
Participant F

Participant F is a 4.7-year-old male. He lives with his mother and two siblings, who are 13 and 18 years old, respectively. English is his primary language. He was medically diagnosed at birth with Down syndrome and qualified for services at the regional center. There he received speech and language, occupational therapy, and physical therapy. He was referred to El Monte school district from regional center at the age of 2.11 years old. He was then placed in the PALS program.

Participant G

Participant G is a 3.3-year-old male. He lives with his mother, father and four-year-old sister. English is his primary language. He was diagnosed with microcephaly and global developmental delays. He received services from the regional center, including speech and language, occupational therapy and specialized instruction. He was referred to El Monte school district for assessment by regional center at the age of 2.11 and placed in the PALS program at the age of 3.1 years.
Table 1

Demographic Table Chart

<table>
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<tr>
<th>Participants</th>
<th>Eligibility</th>
<th>Gender</th>
<th>Age</th>
<th>Ethnicity</th>
<th>Home Language</th>
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<tr>
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<td>Hispanic</td>
<td>English</td>
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<tr>
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<td>English</td>
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<tr>
<td>Participant D</td>
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<td>Male</td>
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<td>Hispanic</td>
<td>English</td>
</tr>
</tbody>
</table>

*Note.* Developed by the author of this thesis.

Independent and Dependent Variables

For this study, the independent variable was the utilization of Applied Behavior Analysis (ABA), specifically the use of a token economy. The token economy is a tool to help modify desired behaviors including attending, compliance, and imitation. Tokens were given to students when these desired behaviors were observed. Once the board had been filled by the teacher, the student received a reinforcer such as candy, a toy, or a high five. The more students displayed the desired behaviors, the quicker they received their reinforcement, thus, modifying the behavior.

The dependent variables were the “Learning to Learn” skills including attending level (academic engaged time), compliance to the teacher, and imitation of the teacher. All dependent variables were measured during either small or large group activities.
Reinforcers Used

Materials used for this study were secondary reinforcers, a reinforcement hierarchy, a task analysis for teaching token boards, and token boards. Secondary reinforcements were those that are not necessary to live. The secondary reinforcements that were used for this study were toys, candy, and social praise. The choice of reinforcement varied depending on the desires of the respective student. A reinforcement hierarchy was developed for each student based on student’s likes and dislikes. These desires will be categorized into A reinforcers (highly desirable), B reinforcers (moderately desirable), and C reinforcers (low desirability). The teacher used this hierarchy to determine which reinforcers should be used for each participant.

How the Study was Organized

In order for the study to be effective, it was critical that students were taught about the token board and how it worked. A Task Analysis (TA) worksheet became a guide for the teacher (see appendix A). The teacher needed to check off each section of the TA before beginning instruction on a new section. An example of this is shown down in Appendix A.

The researcher used researcher-made instruments to collect the data, as shown in Appendix B. The instrument used for attending skills was whole interval recording. The length of the observation session was five minutes, which was broken down into one-minute intervals. Behaviors observed for attending were sitting calmly in the chair and looking at the teacher. The classroom aides observed each participant during that five-minute period to determine if that participant was attending during the entirety of each
minute. The aide then noted if the participant attended for each entire interval on the data form. The data were taken during one circle time and one center time every day, totaling 50 minutes a week for seven weeks. The data was then counted and the percentage of attending was documented.

Imitation and compliance were measured by a tally chart recording. Participants were given five trials during circle time and five trials during center time to comply with the teacher’s instructions or imitate an action. The aides marked each trial with a plus sign if they imitated or complied with an instruction, a minus if the desired behavior was not shown, an OT if the participant was off task, or a NR if there was no response given. Like data collection for attending, compliance and imitation data were collected during one circle and one center time a day for a total of 50 minutes a week. Data were also counted, converted into a percentage and documented.

To establish validity, the instrument was reviewed by experts and adjustments were made as needed. Reliability was established by collecting data from the same students in a short period of time to ensure similar scores.

Implementation of the Study

Baseline data on attending, compliance, and imitation were collected during circle and center time the first week of the study. The data were collected by two trained aides each day. The aides recorded data on one participant at a time during two different circles, with one aid per center. Participants were placed evenly between the centers to ensure that the aides did not have too many participants to observe and tally behavior.
To assess compliance, the researcher gave commands (e.g., “sit down”). The trained aids then marked who complied and who did not. To assess imitation, the researcher said “copy me.” The researcher then did an action for them to imitate. An aide marked if the participants imitated the action or not. This was done five times for both compliance and imitation throughout the center/circle time. To assess attending, the researcher conducted a typical circle/center time. The aide set a timer for one minute in a five-minute time period and marked if the participant attended during that time. The aide focused on one participant at a time.

Once baseline data had been determined, the researcher used week two to teach the participants how to use the token board. Each step was taught on a one-on-one basis. Progress was tracked on the TA worksheet. The token boards were not used during circle or center times until the participants were able to demonstrate that they understood. Understanding was determined by the participant handing over the token board upon completion to the teacher without prompting. This indicated that the participant understood that he/she would receive reinforcement for the completion of the board because of the desired behavior observed. Once comprehension was verified, the token boards were introduced. The researcher designed token boards that would interest each student independently by putting pictures of their favorite character on each token.

During weeks three through seven, students received tokens for the token boards based on observed desired behaviors during circle and center times only. If participants were attending, imitating, or complying, the researcher or aide placed a token on their boards and verbally praised the student with phrases such as “nice looking,” “good
following directions,” or “good copying me.” When the boards were filled, the participants received a reinforcer chosen from their reinforcement hierarchy worksheet. Participants received multiple reinforcements throughout circle/center times.

Using a non-random, single-subject quantitative research design, the researcher counted the total number of times each participant followed directions and imitated the teacher. Attending was charted by using whole interval data. The researcher further compared the data to determine if the use of a token boards effected participant behavior more with participants with autism than with participants with intellectual disabilities to establish if the effects were the same. The data were collected every day and were input into a spreadsheet to create graphs for further analysis.
CHAPTER 4

RESULTS AND DISCUSSION

Studies have shown that the use of a token economy (token boards) is an effective tool for modifying unwanted behaviors with students diagnosed with autism to modify unwanted behaviors (Leaf, McEachin, & Harsh, 1999). This study hypothesized that the use of a token economy would also modify unwanted behaviors with students with intellectual disabilities (ID).

Participants A, B, C, and D completed the full 20 weeks of the study. Participants E and G missed one day due to illness and participant F missed 7 days due to illness. Participants B, D, E, and G missed some data collection due to outside agencies coming to work with them or falling asleep during class. No apparent risks occurred during the course of this study.

During circle times, Participant A’s baseline data for attending, compliance, and imitation was erratic, ranging from 60-100%. His attending averaged 64%, imitation 76%, and compliance 84%. The combined average during circle times was 75%. Once the token board was implemented, Participant A’s data increased and stabilized, ranging from 80-100% of the time. His attending averaged 95%, an increase of 31%. His imitation averaged 97%, an increase of 21%. His compliance average was 99%, a difference of 15%.
During center times, Participant A’s baseline data ranged from 40-100%.

Attending baseline data averaged 54%. Imitation baseline data was high with an average of 92%. Compliance baseline data was also relatively high with an average of 84%.

After the token board was implemented, attending average increased dramatically to 97%, an increase of 43%. Imitation averaged 97%, with an increase of 5%. Compliance averaged 99%, an increase of 15%.
Participant B’s circle baseline data was erratic and ranged between 0-100%. Attending baseline averaged 20%, imitation baseline data averaged 48%, and compliance baseline data averaged 64%. Once the token board was implemented, Participant B’s attending average increased substantially to 87%, an increase of 67%. Participant B’s imitation averaged almost doubled to 84%. Compliance data averaged 93%, an increase of 29%.

During centers, Participant B’s baseline data ranged from 20-100%. Attending baseline data averaged 55%, imitation averaged 40%, and compliance averaged 75%. When the token board was implemented, attending data averaged 88%, an increase of 33%. Imitation averaged 95%, an increase of 55%. Compliance averaged 92%, an increase of 17%.

Figure 3. Participant B: Circle. Developed by the author of this thesis.
During circle times, Participant C’s baseline scores were low, ranging between 0-20%. Attending baseline data averaged 4%, imitation 4%, and compliance 8%. When the token board was implemented, participant C’s data increased. Attending averaged 21%, an increase of 17%. Imitation averaged 15%, an increase of 11%. Compliance averaged 21%, an increase of 13%. Although these scores could be considered low, the increase in desired behaviors still indicates the success.
During centers, Participant C’s baseline data ranged from 0-60%. Attending averaged 16%, imitation 8%, and compliance 24%. When the token board was implemented, Participant C’s averages increased. Attending averaged 73%, an increase of 58%. Imitation averaged 45%, an increase of 37%. Compliance averaged 65%, an increase of 41%.

![Participant C: Centers](image)

*Figure 6. Participant C: Centers. Developed by the author of this thesis.*

When comparing the data between circle and center times, it is interesting to note that Participant C’s overall data was higher during center times than during circle. There could be many reasons for this discrepancy. One reason is that there are not as many students together during center times as there are during circle. During circle, there could be as many as 12 students participating at once. During centers, there could be as few as five. This difference in group size could make it easier for Participant C to attend, imitate, and comply.
During circle times, Participant D’s baseline data ranged from 0-40%. Attending data averaged 4%, imitation averaged 4%, and compliance averaged 20%. When the token board was used, Participant D’s scores increased. Attending averaged 32%, an increase of 28%. Imitation averaged 19%, an increase of 15%. Compliance averaged 31%, an increase of 11%.

During center times, Participant D’s baseline data ranged from 0-80%. Attending averaged 44%, imitation averaged 12%, and compliance averaged 36%. When the token board was implemented, the scores increased. Attending averaged 58%, an increase of 14%. Imitation averaged 52%, an increase of 40%. Compliance averaged 64%, an increase of 28%.
One note that should be mentioned is that Participant D missed five days of data collection as he was working with outside agencies (speech and language, occupational therapy) during class before data could be collected. This lack of consistency makes it difficult to conclude if the token boards would have worked or not. The data may also be inconsistent as well because this participant was learning a new skill. Participant D’s baseline data was also very low, which could mean that the participant did not have imitation skills at the time the study began. The fact that the data was erratic afterwards could mean that the student’s skill was developing, but was not yet mastered. Further data needs to be collected to determine which cause is correct.

During circle times, Participant E’s scores ranged from 0-100%. Attending averaged 70%, imitation averaged 65%, and compliance averaged 75%. After the token board was implemented, the scores increased. Attending scores averaged 84%, an increase of 14%. Imitation scores averaged 81%, an increase of 6%. Compliance scores averaged 80%, an increase of 5%.
During center times, Participant E’s baseline scores ranged from 20-100%. Attending averaged 40%, imitation 67%, and compliance 40%. When the token board was implemented, some of the scores increased. Attending averaged 51%, an increase of 11%. Imitation averaged 56%, a decrease of 11%. Compliance averaged 56%, an increase of 16%. There could be many reasons for the decrease in imitation behaviors during center time for Participant E. The data indicates that there was four days with a significant decrease in imitation behaviors. Three out of the four days, all three behaviors were significantly decreased. One theory to account for the decrease is that Participant E was having a difficult time attending to the task at hand, which could make it more difficult to imitate or comply.
Participant F’s baseline data ranged from 0-80%. Attending behavior averaged 35%, imitation averaged 5%, and compliance averaged 60%. After the token board was implemented, the scores increased in all areas. Attending behaviors averaged 93% a 58% increase. Imitation averaged 78%, an increase of 73%. Compliance averaged 78%, an 18% increase.
During center times, Participant F’s baseline data ranged from 0-80%. Attending averaged 55%, imitation averaged 45%, and compliance averaged 53%. After the token board was implemented, the scores increased. Attending averaged 91%, an increase of 36%. Imitation averaged 73%, an increase of 28%. Compliance averaged 80%, an increase of 27%. Although the desired behaviors increased during both circle and center times, it cannot be fully concluded that the token economy is what changed the behaviors as Participant F missed six days during the intervention. This absenteeism makes it difficult to conclude what caused the change in behaviors.

![Participant F: Centers](image)

*Figure 12. Participant F: Centers. Developed by the author of this thesis.*

Participant G’s baseline data for circle times ranged from 0-60%. Attending averaged 36%, imitation averaged 24%, and compliance averaged 44%. After the token board was implemented, the desired behaviors increased. Attending averaged 83%, an increase of 47%. Imitation averaged 77%, an increase of 53%. Compliance averaged 75%, an increase of 31%.
During center times, Participant G’s baseline data ranged from 0-100%.

Attending averaged 53%, imitation averaged 45%, and compliance averaged 58%. After the token board was implemented, attending behavior averaged 83%, an increase of 30%. Imitation behavior averaged 84%, an increase of 39%. Compliance averaged
When comparing the total percentage of competence in Learning to Learn skills, this study showed that there was a visually significant increase in attending, complying and imitating for participants with both autism and intellectual disabilities in all the three areas. In fact, this study showed visually significant increases in desired behaviors for both groups. *Figure 15* and *Figure 16* illustrate these results.

*Figure 15.* Autism baseline and post token board implementation. Developed by the author of this thesis.
As we can see in the summary of the study results (Figure 17), participants with autism increased their total attending percentage by 37%, whereas the participants with intellectual disabilities increased their attending percentage by 29%. All participants increased their total imitation percentage by 27%. Participants with autism increased their compliance percentages by 20%, while participants with intellectual disabilities increased their compliance percentages by 16%.
CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

As previously mentioned, the Centers for Disease Control and Prevention noted that one in 68 school-aged children have been diagnosed autism spectrum disorder, and one in six students aged of three-17 years have been identified as having one or more intellectual disability (Department of Health and Human Services, 2015). This study was
designed to assess if using a token economy is as effective in increasing desired behaviors (i.e., attending, compliance, and imitation) with preschool students with intellectual disabilities as it is with preschool students diagnosed with Autism. The study has shown that the use of applied behavioral analysis (ABA), and specifically the use of a token economy, does increase desired behaviors in students who have been diagnosed with both autism and intellectual disabilities.

Although this study indicated that the use of a token economy would increase desired behaviors for students with ID, there were some limitations. First, the sample size and length of time for the study were limited. The sample population was too small (only seven students, three of whom were diagnosed with ID). Additionally, the length of the study was brief, lasting only 20 school days (one month). A larger and longer study could yield more definite results.

A second limitation was participant absenteeism which affected data collection times. One student missed seven out of the 20 days of intervention. Other students missed certain data collection times because they were removed from class by outside agencies who were also engaging the student. The amount of absences likely affected the results of this study.

Recommendations for Future Study

Future research is needed to fully understand the use of a token economy with the populations of autism and intellectual disabilities for learning to learn skills. There are several recommendations for future research based on the results of this study. The first recommendation is to increase the population and duration of the study. The researcher
further recommends increasing communicating with outside agencies to ensure that the participants in the study would not be removed during times that data is being collected. A third recommendation is to include anecdotal data that would describe whether the participant was depressed, happy, sad or even confused at the time the data was collected. Anecdotal data would clarify for the investigator whether the participant, on a particular day, is not understanding, is not feeling well, or just having a bad day. When this data is added to collected data, a more complete picture of each student would be achieved.
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REFERENCES


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APPENDIX A:

TASK ANALYSIS
APPENDIX A: TASK ANALYSIS

Program: TOKEN BOARD

<table>
<thead>
<tr>
<th>Phase</th>
<th>Date Started</th>
<th>Date Mastered</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cause and effect- Contingency drills (i.e. ring bell= primary reinforcer, turn on light= primary reinforcer).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Contingency- completion. Hands over token board as it fills up, no behavioral contingency other than slight attending.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Contingency- Behavior. Earns 1 token displaying behavioral contingency of ______</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Contingency- Behavior. Earns 2 tokens displaying behavioral contingency of ______</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Contingency- Behavior. Earns 3 tokens displaying behavioral contingency of ______</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Contingency- Behavior. Earns 4 tokens displaying behavioral contingency of ______</td>
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<td></td>
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</tr>
<tr>
<td>8. Contingency- Behavior. Earns 5 or more tokens displaying behavioral contingency of ______</td>
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</tr>
</tbody>
</table>
APPENDIX B:

BEHAVIOR DATA SHEET
APPENDIX B: BEHAVIOR DATA SHEET

DATE: __________
Data for ________ -

Attending-
Whole interval Time sampling-during 1-minute intervals for 5 minutes. Student must be sitting and looking at the teacher.

<table>
<thead>
<tr>
<th>Circle time attending</th>
<th>Centers attending</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data key
+ did the desired behavior, - did not do the desired behavior, OT= off task, NR= no response

Imitation-
Imitating what the teacher did. The SD is “copy me” or “do this”. Take data only during choral responding. 5 opportunities per circle time or center time.

<table>
<thead>
<tr>
<th>Circle time imitation</th>
<th>Centers imitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Compliance-
When a student follows a known instruction. E.g. “sit down”, “come here”, “line up” etc. only take data when the teacher asks the child independently. No corral responding. 5 opportunities per circle or center time.

<table>
<thead>
<tr>
<th>Circle time imitation</th>
<th>Centers imitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
APPENDIX C:

REINFORCEMENT CULTIVATION
APPENDIX C: REINFORCEMENT CULTIVATION

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
</table>
APPENDIX D:

TOKEN BOARD
APPENDIX D: TOKEN BOARD