A PEER MEDIATED SOCIAL INTERACTION
INTERVENTION FOR TODDLERS WITH AUTISM

A Thesis

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by
Robyn Sumiko Matsumoto

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by

Robyn Sumiko Matsumoto

Approved by:

_____________________________, Committee Chair
Dr. Kathy Gee

_____________________________, Second Reader
Dr. Jean Gonsier-Gerdin

_____________________________
Date
Student: Robyn Sumiko Matsumoto

I certify that this student has met the requirements for format contained in the University format manual, and that this thesis is suitable for shelving in the Library and credit is to be awarded for the thesis.

____________________________________, Graduate Coordinator
Dr. Bruce A. Ostertag

Department of Special Education, Rehabilitation, School Psychology, and Deaf Studies
Abstract

of

PEER MEDIATED SOCIAL INTERACTION
INTERVENTION FOR TODDLERS WITH AUTISM

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Robyn Sumiko Matsumoto

Previous research has shown that peer mediated approaches have been one of the most effective types of social intervention for school age children with autism. The present study examined the effectiveness of a peer mediated play intervention for increasing socialization skills in 3 toddlers, under the age of three, diagnosed with autism spectrum disorder (ASD). There were three male participants diagnosed with autism and each were paired with a typical peer model, either of the same age or slightly older. The data indicate that toddlers with autism can increase their joint attention, social behavior and vocalizations when paired with typical peer models who have been coached as play partners.
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Chapter 1

INTRODUCTION

The number of children with autism spectrum disorder (ASD) has increased dramatically over the past decade. Although it is not clear as to what is causing this increasing trend in diagnoses, the reality is that the earlier a child can start in an evidence based treatment program, the greater the benefits later in life. This fact makes early intervention programs for young children with autism even more critical and in high demand (Stahmer, 2007). Over the years, autism researchers have identified that early intervention is crucial for young children. A number of studies have indicated that substantial gains may be achieved when students are provided treatment at a young age (Lovaas, 1987, Strain & Cordisco, 1994; McGee, Morrier, & Daly, 1999).

According to the Center for Disease Control and Prevention (2012), autism spectrum disorders are a group of developmental disabilities that can cause significant social, communication, and behavioral challenges. In more detail, the way these individuals process information in their brain is different than other people. Deficits in social precursors include, but are not limited to: the inability to initiate and sustain eye contact and to interact and converse with others. In other words, they do not develop adaptive social skills that facilitate social interactions or group play as easily as their typical peers. Children with autism may also lack a variety of skills needed to function successfully in society (Lovaas & Newsom, 1976; DiSalvo & Oswald, 2002; Wong, et. al., 2007). For example, young children may not use toys appropriately or may not have an interest to play with toys at all. Without these initial basic play skills, children with
autism are prone to be at risk of standing out from their typical peers. In addition, deficits in functional communication leads to the inability to use language, both through listener and speaker behaviors, demonstrated in following directions, responding to their name, identifying items in the environment and expressing their wants and needs (DiSalvo & Oswald, 2002; Tsao & Odom, 2006; NAC, 2009). By addressing these areas of concerns and teaching these skills at an early stage in a person’s life, the effects of the treatment can lead to a greater chance of independence and social integration. Without intensive intervention many children with autism may not develop the adaptive skills such as play and communication that will assist them to function in society (Lovaas & Newsom, 1976; DiSalvo & Oswald, 2002).

Based on previous research and statistics surrounding the diagnosis of autism from the National Standard Project (2009), it is important to start intervention phases as early as possible. The findings from the National Standards Project include the identification of treatments that have been “established” for children with ASD. They define the term “established” as sufficient evidence to determine if a treatment will result in favorable outcomes. This report identified 11 treatments as being “established,” all of which have produced beneficial outcomes and have been proven to be an effective treatment for children with autism. These interventions include: Antecedent Package, Behavioral Package, Comprehensive Behavioral Treatment for Young Children, Joint Attention Intervention, Modeling, Naturalistic Teaching Strategies, Peer Training Package, Pivotal Response Treatment, Schedules, Self-Management, and Story-Based Intervention Package (NAC, 2009). However, there are other programs created that may
not be supported through evidence based practices. Academic Interventions, Auditory Integration Training, Facilitated Communication, Gluten and Casein Free Diets and Sensory Integrative Package are all treatments that the National Standards Project referred to as “unestablished” treatments (2009). The “unestablished” treatment means that they demonstrate very little evidence and literature, which support the effectiveness of the treatment program. This is important to know because with the growing population and children being diagnosed at earlier ages, researchers have the opportunity to more effectively and efficiently analyze the data from evidence based practices and their contributing factors that lead to a successful early intervention program and implement them early on.

Since the early 1980’s, there has been a push for inclusive practices. This trend toward inclusion involves providing an environment for children with special needs, where they have the opportunities to build friendships and have peer models for socialization (Koegel, et al., 2001; DiSalvo & Oswald, 2002; Tsao & Odom, 2006; Schertz & Odom, 2007; Boyd et. al., 2010). However, these opportunities for inclusive settings do not usually begin until the age of three, which is the age when they often begin their preschool years. The strategy to include children within their natural environment is extremely important due to the fact that children with autism are at an even higher risk for negative consequences due to their deficits to imitate, and their inability to understand social contingencies through joint attention and play activities and to interpret social initiations made by their peers (Wolfberg & Schuler, 1993).
For children with ASD, interacting with others does not always come naturally. In many cases, these children have very little interest or concern in being accepted or have a minimal desire to engage in play with their peers at all, which may require additional facilitation by either an adult or peer to participate in play interactions. This additional facilitation may also make the children with ASD stand out from their peers, which may lead to the peers not wanting to associate with them (Tsao & Odom, 2006).

Children diagnosed with autism may have a limited play repertoire, which can hinder their opportunities for successful play interactions with peers and limit their opportunities for future play with typical peers (Thomas & Smith, 2004). By creating an intervention that teaches children the topography and function of play, the opportunities to interact with their peers may increase and lead to more positive peer interactions and promote more opportunities of appropriate play for the future.

**Background of the Problem**

In 2012, the Center for Disease Control reported that autism affects 1 in every 88 American children. This is a significant increase from 2000, where the data reflected 1 in every 150 American children had autism and more surprising reflects a more than 600% increase over the past 20 years. Even more alarming, autism is more common in boys (1 in every 54) compared to girls (1 in 252). Autism has been reported to occur across all racial, ethnic and socioeconomic groups. This rise could also be a result of children being diagnosed at earlier years of life. In addition, the public awareness of characteristics of autism has also improved. Many parents are noticing some of the skill deficits such as,
delays in communication, socialization, play, and self help skills, at earlier stages in their child’s development and are seeking out early intervention (NAC, 2009).

The first five years of life are extremely important in a child’s development. During this period, they begin to trust others, first their family members and later people outside the home. They gain independence and self control and regulation, begin to take initiative for their actions, and start to assert themselves in ways that are socially acceptable by society. They also begin to notice the world around them and begin to experiment with their environment to find out what happens when relationships form. Play is a young child’s most powerful cognitive and social learning tool. Enhancing play skills in young children with autism will maximize their capacity for independent learning (Rogers, 2000).

According to Sara Smilansky (1968), there are four different types of play; a) functional; b) constructive; c) dramatic or pretend play; and d) games with rules. One thing that researchers have consistently found is that play fosters children’s development: intellectually, emotionally, socially, and creatively. During early years, children begin to engage in functional play. This is when children repeat their actions while talking to themselves. Before engaging in symbolic play, children developmentally progress through functional play, such as combining the use of toys (Lifer et. al., 1993). During the constructive play stage, children begin to put things together. Their play is purposeful and directed towards achieving a goal. Dramatic play is also often seen in toddlers when they take on a role and re-enact someone or something they have observed in the past. Lastly, games with rules require children to control their behavior to conform within an
established set of rules (Dodge, Colker & Heroman, 2002). This is a more advanced skill that may require more complex teaching.

Tilton and Ottinger (1964) compared the toy play behavior of children with autism, with intellectual disabilities and typically developing children. They found that children with autism demonstrated significantly less use of imaginary play acts compared to the children with intellectual disabilities and typically developing children. They noted that the play of children with autism tended to be limited and different in complexity and topography, when compared to children with other disabilities as well as typical children (Tilton & Ottinger, 1964). Children with autism spend much of their time engaged in solitary play. They may request items from adults (very rarely with a peer); however, do not seek out any additional information from the adult once their wants and needs have been met. The area of imitation is often times delayed, in addition to limited initiation and spontaneous functional play. A child’s ability to play appropriately can determine who will be thriving and who may be at risk in their social development. If children lack imaginary or imitative play, they are at a higher risk of failing to establish peer relationships (Yang et. al., 2003).

The play of children with ASD may look different than their peers. One reason is that they are more focused in manipulating objects compared to interacting with others. Another reason may be that children with autism do not engage in typical play behaviors because they simply do not know how to engage in appropriate play resulting in repetitive, stereotypic play behaviors. This can often lead to parents and educators concluding that these children will also be different than their typical peers (Wolfberg et.
al., 1999). Yet, it could be viewed that children with autism simply play differently and by providing them ways to learn how to play and interact with others, they can actually demonstrate their true potential.

**Purpose of the Study**

For children with disabilities, acquiring the skill set and knowledge necessary for interacting positively and successfully with peers is a challenge. Educators believe that the development of peer-related social competence should be implemented during the start of early intervention (Boyd et al., 2010). Much of the focus on play has been on preschoolers and how to increase their ability to generalize to their natural learning environments, but with children being diagnosed at an earlier age, an important area to study is infants’ and toddlers’ ways of learning to play and engage in interactive play with peers. For children with autism, a primary concern is the development of social skills in establishing and maintaining social relationships with other children and adults (Tsao & Odom, 2006). Providing appropriate opportunities for children with developmental delays to successfully interact and establish positive relationships with peers has been an overwhelming concern for families, practitioners, and researchers (Wolfberg et al., 1999). There have been numerous studies on socialization for preschoolers in school settings, but limited studies in an inclusive environment for toddlers (Odom & Strain, 1984; McGee, Almeida, Sulzer-Azaroff & Feldman, 1992; Tsao & Odom, 2006). Early interests focused on how to increase social, communicative, and play behaviors in peer groups, with access to skilled peer models and training same
age peers as intervention agents (Odom & Strain, 1984; Koegel et. al., 2001; DiSalvo & Oswald, 2002; Sperry, Neitzel, & Engelhardt-Wells, 2010).

The following study investigates the effectiveness of a peer mediated intervention for prompting socialization skills for children under the age of three with a diagnosis of autism. The study searched to answer the following questions: 1) If toddlers with ASD were paired with peer models who were coached, would they display an increase in joint attention skills? and 2) Would there be an increase in initiation and social responses?

The study aimed to increase joint attention and social skills through peer play exposure by training, preparing and motivating typical peers to engage in play with a peer with ASD. The researcher hypothesized that if children receive an intervention package which included engagement with their typical same age or slightly older peers, areas of social competence would also increase. If results indicated that peer mediated intervention at an age earlier than three years old was successful, autism intervention programs may add that component into their program designs. The more opportunities infants and toddlers have with peers may help to generalize into the preschool setting, once they turn three years of age. In addition, the increased exposure the typical peer has with a child with autism may help them be more tolerant in later years of life.

**Theoretical Framework**

Play is paramount in the development of young children. Although children with autism may have deficits in play, they should still be provided with the same opportunities for a variety of play as other children. Previous studies have found that the brain of infant and toddlers are twice as active as those of adults. Prior to turning three
years of age, children have learned at least one language, developed a sense of self, have begun to learn and understand the concepts of cause and effect, and have seen a growth in motor skills (Dodge, Colker & Heroman, 2002). This study focuses on toddlers’ social-emotional development, primarily with their interactions with peers, looking closely at receptively responding to instructions, engaging in reciprocal interactions and as stated above, cooperative play with others.

In the past, play behaviors have been described by developmental psychologists in a variety of ways. Jean Piaget looked at children’s cognitive and intellectual abilities. According to his theory, there were four stages of cognitive development that correlate with the development of play: sensorimotor, preoperational, concrete operations and formal operations. Based on this conception, the play of a child with autism may be classified in the sensorimotor stage of development. In this phase, behavior is limited to the manipulation of objects which produce sensory input (Dodge, Colker & Heroman, 2002). In typically developing children, this type of play is representative of children up to two years of age. This type of play is often a characteristic of children with autism, past the age of two, unless there is intensive training with more complex play skills. The concrete and formal operations stages typically apply to older children (Dodge, Colker & Heroman, 2002).

The work of Lev Vygotsky suggests that play develops when responses that exist in the child’s repertoire are combined with new experiences (Herron & Sutton-Smith, 1982). Children grow by not only manipulating objects, but by also interacting with adults and peers. Typical peers who demonstrate more advanced skills can also help
others grow and learn by modeling (Dodge, Colker & Heroman, 2002). Experiences and contact with familiar and novel objects and individuals may further increase the available responses in a child’s repertoire. Unfortunately, children with autism do not naturally develop a range of behaviors with respect to toys and interactions with others so they are less likely to discover unique uses for toy play when compared to their peers.

Typical children are motivated to play solely by the reinforcement they receive from the activity and the ability to play with others. They do not require any additional arbitrary reinforcers. The ability to engage in play behaviors continues to be exhibited even though there is no continuous praise each time the behavior occurs; it occurs naturally. Whereas, children with autism often initially require continuous external reinforcement until the stimulus control is transferred to the activity and the ability to engage in play with others (Leaf & McEachin, 1999). Since typical and atypical children have been shown to learn play skills in a variety of ways, researchers can use the information about how young children play to individualize play opportunities to be most effective for all children and most specifically for this study, toddlers with ASD.

Part C of the Individuals with Disabilities Education Act (IDEA) states that, “the maximum extent appropriate to the needs of the child, early intervention services must be provided in natural learning environments, including the home and community settings in which children without disabilities participate” (Baker-Ericzen, Brookman- Frazee & Stahmer, 2005). Providing an early intervention package, including teaching within the natural learning environment and with typical peer models, would allow for the most supportive learning environment for young children with special needs.
Definition of Terms

Autism Spectrum Disorder

Autism spectrum disorder is a developmental disability. Since it is a spectrum disorder, characteristics may impact one’s life in a variety of ways. Symptoms can range from social, communication, cognitive and play behaviors and may be different across each individual. Children may also demonstrate behavior excesses, which may be problematic and interfere with their daily life. There is no definite cause for autism, but with the rise in diagnoses and awareness, children are getting screened for autism at early stages of development. There are a variety of treatments for autism, however there is no known cure (NAC, 2009).

Teaching in Natural Environments

Teaching in a natural environment such as the home or community settings are typical practices for peers without disabilities. Inclusive environments include: school, child care centers, play groups, etc. that recognize the importance of having opportunities to learn from typically developing peers. During this time, the typical peer also benefits from the exchange because they learn to accept and appreciate differences in their abilities and behaviors as they interact with peers with special needs. This research will also help assist peers to be the trainers to their counterparts diagnosed with ASD. The typical peers will be trained as peer mediators (DiSalvo & Oswald, 2002).

Peer Mediated Instructions

Peer mediated instruction and intervention are defined as a set of intervention practices designed to teach typically developing peers way to positively and successfully
interact with children diagnosed with autism. These interactions are systematically taught to increase positive social interactions (Sperry, Neitzel & Engelhardt-Wells, 2010). This is an important area to focus on especially since past research have found that children diagnosed with autism may demonstrate significant delays in the areas of social skills with adults and peers. Additionally, it has been found that typical peers are more likely to interact with other typically developing peers, furthering the lack of opportunities to engage in play with children with ASD. If the typical peer does not receive a direct instruction on how or why to interact with peers with special needs, there is a fear that they will continue to stray away furthering the separation between the children (DiSalvo & Oswald, 2002).

**Joint Attention**

Another major concern with children with autism is the difficulty to engage in joint attention. Joint attention refers to the ability to share attention between objects and other people. It may include pointing to people or items in their environment, providing eye contact with people and objects, and sharing attention or interest with others (Hobson, 1989; Wong, et.al., 2007). Typically, children with ASD have difficulty responding to joint attention because it involves observing the behavior of others (Mundy et. al., 1986). Joint attention is crucial for the development of individuals and is viewed as an important component of early intervention.

**Assumptions**

This study on three individuals with autism could lead to further research on expanding peer models for toddlers. This could also lead to the development of future
programs which incorporate both early intensive behavioral treatment with opportunities for socialization with typical peers.

**Justifications**

Past research has focused primarily on inclusive practices for school age children and data on inclusive child care options for infants and toddlers are very limited. This study will address the needs for infants and toddlers. As it as been stated in past research, the first three years are important in the development of any child. If it has already been determined that children have delays in socialization, play and communication, amongst other developmental domains and are classified as “at risk” for autism, then it would be important to address these areas in programming from the start. If this research can show that the more opportunities infants and toddlers have with typical peers increase areas in which they initially demonstrated delays, then it would to be beneficial for others to provided inclusive opportunities at an earlier age. By addressing this population of children with ASD, it will help contribute to the development of a more effective inclusive program.

**Limitations**

The researcher will collect baseline data on how the selected toddlers play. When looking at the play, the researcher will pair the toddler with a peer group (three children of the same age or older). The limitations are primarily due to the small sample of participants. This study uses a single case experimental methodology. By collecting data, the researcher will then assess how peers interact together. From there, the researcher will meet with the typical peers and explain why they are here and what they are going to
do. She is going to stress the importance of including the friend or child with autism when playing. Before each visit, the researcher will train the peer group on what their roles are as peer mediators and perform a social skills lesson. This could be a limitation due to the understanding of the peer models. After the play session, the researcher will also meet with the peer group to discuss how they felt about playing with their new friend.
Chapter 2

LITERATURE REVIEW

The world provides children an environment full of opportunities to play, explore, learn and have fun. Young children especially, spend most of their time engaged in play. From the time they wake up to the time they fall asleep, they are constantly thinking, imagining, anticipating and inevitably learning. Through play, children also learn about their surroundings, about others and most importantly themselves. While children are playing they are also building relationships and interactions with adults and peers, increasing their intellectual development and facilitating their language skills (Dodge, Colker & Heroman, 2002).

Typical children learn to play with a wide variety of toys, demonstrating their function. Even the most basic of skills can be crucial in the development of higher order concepts such as problem solving and imaginary play. For young children, play is often times the most conducive context to learn a variety of skills. For children, play begins early on and continues on throughout their lives (Johnson-Martin, Attermeier, & Hacker, 2004).

The first stages of typical development include more functional, solitary or parallel play (Dodge, Colker, & Heroman, 2002). These stages of play most commonly occur during the first year of development and overtime children begin to engage in more symbolic play including seeking out the attention of others. Typical children also learn how to engage in appropriate play through observing and imitating others around them. Symbolic play can consist of a child pretending to demonstrate the use of objects in a
non-literal way. They are also seen acting out previously observed routines and behaviors within their everyday life. This could include making figurines interact with one another, role playing and other more complex imaginary play skills (Dodge, Colker & Heroman, 2002).

On the other hand, children with autism are often seen engaging primarily in solitary or parallel play for extended stages of their lives, a lot longer than their typical peers. It can be difficult for children with ASD to grasp and understand the broad concepts of functional, symbolic and interactive play. In addition, many young children with autism lack imitation skills and it is difficult to generalize what they observe in the real world (Leaf & McEachin, 1999).

Another early sign of autism in young children is their lack of functional communication skills. Many children with autism engage in inappropriate behavior excesses because they do not have the skills initially to get needs and wants met (Leaf & McEachin, 1999). Functional communication can consist of a variety of communication modalities, including vocal language, sign language and augmentative devices. Functional communication skills can take the form of vocal responses and non-vocal behaviors. Non-vocal behaviors would include gestures or one’s body language that attempts to get the attention of others through a non-vocal comment or request. This can include behaviors such as waving, sign language, and/or commonly understood hand signals (Murdock, Cost & Tieso, 2007).

Previous studies have indicated that children with autism actually prefer to engage more in functional play; whereas, typically developing children prefer to play with each
other (Strain, 1984; Bass & Mulick, 2007) and seek out the attention of the adult or peer with whom they are playing. Since very young children with autism are often not motivated to interact with their peers, this can lead to limited opportunities for them to engage in joint attention, symbolic play and communication interactions, all of which are skills necessary to socialize and play appropriately (Odom & Strain 1986; Sperry, Neitzel & Engelhardt-Wells 2010). With their limited skill repertoire in play, social and communication areas, children with autism are often even more isolated by their peers. This factor only leads to further separation since it provides even less frequent opportunities for them to engage in play. According to Samuel Odom (2005), it can be a challenge for children with autism to acquire the skills to engage in positive and successful interactions with peers. It will be even more difficult for children with autism to increase their appropriate socialization and play skills if their typical peers do not want to associate with them.

Children diagnosed with autism often display significant deficits in both their social and play behaviors. More specifically, these deficits include: joint attention skills, symbolic play behaviors and communication. The progression of all of these domains comes at early stages of development and has been shown to be important prerequisites for more complex skills later on in life (Wolfberg, 2004; Schertz & Odom, 2007).

Increasing the joint attention skills of young children with autism is crucial because it is one of the earliest skills developed for social behavior. Joint attention skills can be defined as a child showing, pointing, smiling reciprocally, and/or sharing a gaze with an object and another person (Murdock, Cost & Tieso, 2007). More specifically,
joint attention can include how a child interacts with others as well as the environment. As typical children are exposed to an array of social opportunities, they learn to cue into their peers and their environment with an overall goal to be governed by those social contingencies. Typically developing young children demonstrate these skills within the first 18 months of development. This is often a difficult concept for children with autism to grasp and generalize. When children do not display these behaviors in the first 18 months, it is often an indication of possible signs of autism (Schertz & Odom, 2007).

**Approaches to Teach Play**

Some of the critical issues for children diagnosed with autism, is their development of joint attention, symbolic play, and communication skills. The literature states that children with disabilities interact with peers significantly less and at the same time are less likely to be accepted by their typical peers of the same age (Odom, 2005). Over the years, researchers have experimented with various adult facilitated and peer mediated approaches. Both have been used extensively to provide support and lead to successful interactions. Within the field of autism, intervention strategies have been created to increase the social interactions of children with autism and their peers (Rogers, 2000; McConnell, 2002; Lee, Odom, & Loftin 2007). Many theorists in child development have also concluded that both adult-child and child-child social interactions provide the basic principles for learning and practicing important social and cognitive skills (Odom & Strain, 1986; Brown & Odom, 1995).

Some of the skills required to engage in a positive interaction include joint attention, symbolic play and communication. Children with autism have a difficult time
interpreting and understanding the behavior of their peers who may attempt to initiate some type of interaction (Wolfberg & Schuler, 1993; DiSalvo & Oswald, 2002). With lack of the ability to comprehend, children with autism do not always demonstrate the necessary skills that allow them to understand that a peer is showing interest in them and may want to interact with them. In addition, while a child with autism might actually be drawn to show interest toward a typical peer, they may not initially have the skills to approach them or know what to do to have a successful interaction (Scott, Clark, & Brady, 2000).

**Adult Directed Teaching Strategies**

Previous researchers such as Ivar Lovaas found that children with autism could be systematically taught how to engage in areas of joint attention (i.e. orient toward another person, making and sustaining eye contact) and some type of vocal responses. Lovaas (1987) found that when taught the prerequisites for social skills (i.e. joint attention, eye contact, etc) it helped children’s responding in more complex situations (Rogers, 2000; DiSalvo & Oswald 2002). Although this information was shown to be successful in teaching young children with autism social behaviors, the approach did not facilitate the generalization of the skills. In other words, although the child may respond in one environment, with limited distractions and with a few trainers, this type of structured teaching style did not always successfully prepare them for the real world (Rogers, 2000).

**Inclusion**

Over the past several decades there has been a push for inclusive school practices, in which young children with special needs are educated in classroom settings with their
typical peers. More specifically for preschool aged children, research has been conducted demonstrating the success of inclusive classroom settings for children with disabilities (Odom et al., 2004). It provides a more naturalistic teaching environment for children with ASD to learn and allows for more exposure to age appropriate peer models. By being in a learning environment with typical peers, children with autism can model their behaviors within various developmental domains, such as play, social, adaptive daily living skills and even academics. Even more so, during the preschool years, young children with autism can be provided opportunities to engage and demonstrate joint attention, play and communication skills, especially since most of the curriculum was based though play.

In a study by Tsao, Odom, Buysse, Skinner, West and Vitztum-Komanecki (2008), the researchers examined the social participation of preschool age children in an inclusive environment. The researchers found that the participants increased their positive social interactions by 11.4%. The children with disabilities were observed to be socially engaged with their peers, demonstrating approximately 11% of their time in peer directed behavior. It was also noted that when the participants with autism were engaged in social behavior it was directed towards typical peers in the classroom compared to other children with special needs.

As various authors noted, there has been a rise over the last decade in the development of naturalistic intervention approaches for children with special needs and now has become a best practice approach (Kamps et al. 1994; Odom 1995; Kohler et. al., 1997). However, even with the increased amount of opportunities for good interactions,
inclusion does not necessarily mean children with ASD will acquire skills successfully in that type of setting. First of all, the children with autism do not always display the necessary skills to engage in appropriate social behaviors when present either alone or with a group of peers (Kohler et. al., 1997). Secondly, it has been found that their typically developing peers would prefer to play with other typical children, therefore the children with autism would continue to be excluded (Koegel & Koegel 2006).

In a study by DiCarlo and Reid (2004), researchers wanted to address the first problem about how to increase the pretend play skills of children with disabilities within an inclusive setting. The treatment consisted of a responsive treatment program which increase the amount of time the children spent in the imaginary play centers; therefore increasing their pretend play repertoire. During the baseline phase, all three participants demonstrated low rates on independence with pretend play skills while in the centers, averaging 0.05 actions per minute. During the response teaching sessions, the rate of independence increased to 0.6 per minute of pretend play actions. The researchers also found that the children were also playing with a number of different toys in the response teaching program. With the increased duration of time spent in the centers with peer models available, the participants increased their ability to demonstrate appropriate pretend play actions.

Another area of push for inclusive practices was the concerns that typical peers prefer to interact with other typical peers rather than children with special needs. This separation limits the amount of opportunities peer interactions and overall generalization. It should be noted that even at the toddler age, children were aware of the differences
between their typically developing peers and the children with autism. Therefore, for children with autism, an inclusive environment alone may not be enough to increase all of the areas where they demonstrate the most significant deficits.

Researchers have found that early social rejection by peers can lead to more challenges through adulthood (Odom et. al., 2006). These authors studied the social acceptance and rejection of preschool children with disabilities. They found that 28% of the children with disabilities met the social acceptance criteria. It was noted that defining social acceptance for preschool children was difficult due to the construct of their play and overall developmental levels. Preschoolers demonstrated play very differently than older children. A preschool peer who may be of preference one day may not be the peer of choice the next. In addition, researchers also found that 28% of the children with disabilities were also socially rejected by their peers. Researchers anticipated that deficits within communication and appropriate social behaviors may have been the cause of the social rejection from the peer group. The typical peers were more likely to reject a child with special needs when placed in a peer group compared to a one to one interaction with just the child with special needs (Odom et. al., 2006).

**Peer Mediated Teaching Strategies**

Over the years studies have shown that peer mediated interventions produced higher levels of generalization and maintenance compared to adult mediated interventions (McEvoy, Odom, & McConnell, 1992; Brown & Odom 1995; Rogers, 2000). The idea of peers as trainers seemed like a more appropriate strategy for improving the social behavior of children, however finding appropriate peers was the most obvious challenge.
Prior to the early 1990’s, there were few intervention procedures aimed to specifically target peer play skills with children with autism. However, this changed over more recent years as there was an increase of awareness nationwide to create educational placements for children with autism and their typically developing peers (Yang et al., 2003). Inclusion practices became more prominent nationwide which lead to further research on environments to support appropriate interactions between children with autism and their typically developing peers.

In more recent years, the type of intervention that has an increasing trend in effectiveness is in peer initiation. This technique involves teaching typical peers, who have been selected by the teacher as model students who are known as socially competent, to initiate play with their peers with autism (Odom & Strain, 1984; Odom & Strain, 1986). With the increase in peer mediated approaches for children with ASD, this approach now represent the largest and most empirically supported intervention strategy to increase social behavior (DiSalvo & Oswald, 2002). Peer mediated approaches take the belief that by training typically developing peers how to initiate, prompt, and reinforce, just like an adult would usually do, the behaviors in both play and social skills would increase (Bass & Mulick, 2007).

In one of the earlier studies by Strain and colleagues (1979), there were two ways to approach peer mediated strategies. The first was to train a typical peer to prompt and reinforcer children with autism to engage in appropriate social interactions. The other way that peer mediated strategies were used was to have the typical peer initiate play with the child with autism. Although both methods successfully increased the child with
autism’s social responding behaviors, they did not address their ability to initiate towards their typical peers. Furthermore, even with the increased implementation procedures during the treatment phase, skills were not always generalized and the children with autism returned to baseline conditions (Koegel & Koegel, 2006). Nonetheless, in 2000, Sally Rogers explained that peer mediated interventions were proven to be beneficial for children and youth with ASD. Reasons being because this approach increased the likelihood that over time children with ASD would more readily generalize new social skills to different activities and with other peers that were not involved in the initial training. This information was even more pertinent to researchers, especially in the planning of appropriate programs created for children diagnosed with autism.

**Integrated Play Groups**

Integrated play groups (IPG) were designed to teach children with autism to increase their joint attention skills with their typical peers (Wolfberg & Schuler, 1993). This approach required children with autism and their peers to be placed in a natural play environment (i.e. home, school, community, etc.), which included an adult to facilitate the peer setting. This design was created to increase the motivation of children with autism to want to respond to their peers, in turn leading to successful interactions. By teaching in a small group environment, researchers hoped there would be an increase between the interactions between the two groups by providing more opportunities for what they called the expert players (i.e. peer models) to be exposed to successful interactions with the what they called novice players (i.e. children with special needs).
Wolfberg and Schuler’s study focused on three seven year old boys diagnosed with autism. All three participants demonstrated deficits in appropriate play skills and language was minimal (Wolfberg & Schuler, 1993). The adult would assist and encourage the typical peers to engage in play with the target children and would prompt the children with autism to attend to their typically developing peers. Once the target children demonstrated independence in their play and joint attention, skills the trainer would fade out the prompts, allowing for more natural teaching opportunities to occur. After the treatment, all of the participants displayed an increase in their play interactions with their typical peers and two out of the three engaged in more complex pretend play skills. Teachers and parents also noted that the skills targeted were also generalized across experimental settings.

Another study following the integrated play group model was conducted in Taiwan with two novice players diagnosed with autism and three expert players, which were either peers or siblings of the children with ASD (Yang, et. al., 2003). The first participant was a seven year old girl, whose intervention was conducted in her school setting. The second participant was a six year old boy who participated in a play group within his home environment. Both children initially spent most of their time engaged in solitary or parallel play and did not demonstrate the use of any symbolic or pretend play skills. The first participant demonstrated expressive communication skills about the average range based on a Chinese language test and participant two displayed skills below the average range and exhibited echolalia (Yang et al. 2003). The expert players in the first participant’s school program consisted of three typically developing peers, seven
years of age; while the second participant’s three siblings ranging from 6-8 years of age were included in his home program. All of the peers in the first participant’s play groups were selected specifically by the teacher. The teacher based the participation on their social competency and their willingness to understand, follow directions and their willingness to participate in the study. The results indicated that the first participant increased her symbolic/pretend play skills from 0% to 24% and decreased her amount of solitary play from 77% to 20% of the time. The other participant increased his symbolic/pretend play from .5% to 21% and decreased his solitary play from 25% to 8% (Yang et al., 2003). During post study interviews both participants’ parents also reported the generalization of their children’s play and social behaviors. The peers also reported that they enjoyed participating in the study and now considered the novice player as a friend.

This study represents the effectiveness of the intervention in both a school setting and in home program in Taiwan. The results were also consistent with other studies in IPG, representing the increase in symbolic or meaningful play skills and social play. The findings also supported the significance of play within a child’s repertoire and how opportunities for inclusion can increase the behavior of children with ASD and the previous perspective that their peers once had.

Through on going studies, this model has proven to demonstrate an increase in the amount of appropriate social interactions and a decrease in the amount of solitary and repetitive play (Bass & Mulick, 2007). Although the target behaviors increased during the intervention and parents initially reported the generalization of skills, some studies indicated that skills were not always maintained when the intervention was withdrawn.
due to the participants being dependent on the adult facilitator (DiSalvo & Oswald, 2002).

**Peer Buddy**

The peer buddy approach focuses on having one typically developing peer paired with one child diagnosed with ASD. This approach follows Laushey and Heflin’s (2000) stay, play, and talk method. The peer is taught to stay in the same area, play with the target children including sharing toys with one another, and talk with the children with autism, regardless if the child with autism communicated back or not. The approach, similar to other methods, requires an adult to determine a peer to be appropriate for the “peer buddy” followed by pairing them with a child with autism who they thought to be a good match. This was something that could be rotated daily depending on how well the peers did as the peer buddy. In addition, to increase a peers’ motivation to participate and engage in play with the children with autism, their name would be placed in a box to receive an additional reinforcing item at the end of the day (i.e. treat, stickers, toy). This strategy was later faded out as the peers became more willing to participate. As in many of the peer-mediated approaches the peer buddy method resulted in an increase in social interactions between children with ASD and their typically developing peers (Kamp, 1994).

Laushey and Heflin (2000) conducted a study with two five-year-old boys diagnosed with ASD. Both of the boys exhibited some basic communication skills, could read at their grade level, however they displayed deficits in their social behavior. During baseline, both boys demonstrated minimal social interaction with their peers. After using
a reversal design and assigned a peer as a buddy in the treatment, the results concluded that the children with autism demonstrated a 36% and 38% increase in their social interactions (Laushey & Heflin, 2000). Results have also indicated that there was an increase in the duration of appropriate social interactions, which was also noted to have generalized across peers. This approach has also been modified and used more frequently in a peer tutoring method for school age, higher functioning children with autism (Laushey & Heflin, 2000).

**Group-Oriented Contingency**

The group-oriented contingency (Kohler et al., 1995) was an approach that require all of the students in the classroom to engage in the same target behavior before any type of reinforcement was provided. The idea for this approach is to teach the children with autism to imitate their peers without the facilitation of an adult. A social skills component is also included in this type of teaching to increase the skill awareness of the children with ASD. One advantage of this type of approach is that the teacher could monitor the entire classroom more efficiently (DiSalvo & Oswald, 2002).

In one study, the group contingency method was used for three four year old children with ASD and six typical peers ranging from three to four years of age (Kohler et al. 1995). All of the children with autism demonstrated deficits in appropriate social interactions and only one displayed age appropriate play skills. Kohler and colleagues (1995) used a withdrawal of treatment design with an alternating baseline of social skills training and group-oriented contingency conditions. During this study, the amount of time the children with autism and their peers engaged in play increased from 28% to 65%
during the group-oriented contingency. However, the effectiveness of this program was variable. The amount of prompts from the peers ranged from 2.6 to 7.6 times during the group contingency, but when the intervention went back to baseline, the amount of peer prompts decreased back to zero. Without the peer continuously prompting, the children with autism did not maintain with their increased levels of appropriate social interactions. This indicated that even though the children increased their responding during the treatment condition, if peers did not continue with their prompt levels, the children with autism would no longer reciprocate or model the appropriate interactions. This method also required an adult to monitor the environment and prompt the peers to assist the children with autism (Kohler, 1995).

Peer Instructions in Social Interaction Strategies to Promote Interaction

Pivotal Response Training

Pivotal response training (PRT) is a technique that involved role playing to teach typical peers how to act as a trainers and how to provide reinforcement with children with autism (Pierce & Schreibman, 1995; DiSalvo & Oswald, 2002). This method address the deficits in generalization for children with ASD and provid them with the motivation to respond appropriately (Koegel, Koegel & Schreibman, 1991; Pierce & Schreibman, 1995). This procedure also removed the distraction from the adult facilitator.

Pivotal response training has been a commonly used technique. In a study performed by Pierce and Schreibman (1995), there were two participants diagnosed with autism, 10 years of age. One participant exhibited expressive communication skills at the three year five month range and receptive communication at the five year five month
range, and the other participant exhibited skills at the three year two month range in expressive communication and three year one month in receptive language, which represented scores significantly lower than their actual age range. The teacher also selected two peers within the class that were known as cooperative and friendly. During baseline, both participants demonstrated significantly low levels of social interactions. After several weeks of the pivotal response training, both participants showed increases in initiations in both play and conversations. After training, the children also generalized these skills to novel stimuli and environments and one participant was able to generalize across peer trainers (Pierce & Schreibman, 1995). In addition, their vocal communication also increased. During baseline, one participant did not engage in any vocalizations and the second participant made very minimal vocalizations. However, after the PRT training, one participant spoke in an average of three word sentences, while the other spoke up to four words within a 30 second interval.

The results in this study supported the effectiveness of PRT to children diagnosed with autism. The findings described increases in social behavior including initiations and joint attention skills, which were not actually a target skill; however both participants demonstrated independence in this skill incidentally. The authors also reported significant increases in vocal communication for both participants (Pierce & Schreibman, 1995). One important component to the PRT training was that it was taught in the natural environment. This led to further success with the transfer of skills or generalization of skills across materials, instructions and in one case, peers. Using this method, the teachers were able to train peers within a short time frame (approximately two months).
and made sure they implemented it successfully, meaning without constant adult supervision. Unlike many other peer mediated approaches, without the constant presence of a teacher or adult facilitator, the children with autism learned in a more developmentally appropriate way (Pierce & Schreibman, 1997). All opportunities to learn and develop their play and social skills were both play based and educational, just as learning should be for children. One factor to note was that the children in this study were 10 years of age. Therefore, they were able to understand their role in this training strategy. Although PRT was found to be an effective procedure it may be difficult to implement with younger children.

**Peer Initiation Training**

This method is used to teach typically developing peers various techniques on how to get the children with autism to respond by providing reinforcement for the appropriate responses. In a study by Odom and Watts (1991), the training was used with preschool children, 3 to 5 years of age. The researchers used a multiple baseline design. At baseline, all of the children with autism displayed deficits in social interactions and ranged from the 9-35 month range in communication. The typical peers were prompted by the teacher to use the initiation strategy (Odom & Watts, 1991). The results indicated that the children with autism increased their responding, but only when the teachers prompted the peers to initiate; however, it did not increase their overall initiation.

Odom and Strain (1986) conducted a comparison study of peer initiated and teacher antecedent interventions. Typical peers were trained on how to prompt and reinforce when children with autism initiated some form of interaction. They defined the
teacher antecedent approach as when the children with autism would be prompted by the teacher to interact with their peers, both requiring the presence and the prompting of a teacher. Three preschoolers diagnosed with ASD and four typical peers, which the authors referred to as confederate peers, participated in the study. All of the children with autism displayed limited vocal communication skills and minimal listener behavior skills (i.e. responding to name, receptive instructions). The results indicated that the peer initiated intervention provided consistent evidence that the approach increased the social responding for children with autism. However, the teacher was consistently prompting the confederate peer to initiate with the child with autism, making the situation contrived. Following the teacher antecedent approach, the confederate peers were more likely to engage in interactions and for an extended period of time when the children with autism approached them. The results also supported that the teacher antecedent approach may lead to increased awareness to social reciprocity between children with autism and their peers (Odom & Strain, 1986). Although both strategies increased the social behavior of the children with autism, it also required the teacher to serve as a primary element in producing successful interactions.

A concern with this approach and many others in this review is the intrusiveness of the adults. If peers depend on the adults to prompt them on when to make the initiation, the interaction is now more contrived versus captured. As they intervene, both the peer and the children with autism may stop what they are doing and attend to the teacher, which would again disrupt the possible natural interaction. Authors, Odom and Strain (1986) stated it the ability to transfer the stimulus control from one variable to
another. Although this seems like a simple solution, it can be difficult to use this approach with younger children and children with special needs.

**Sibling as Agents**

In a study by Tsao and Odom (2006), the researchers measured whether typical siblings could learn to interact with their siblings with autism, and if their interactions would increase the social behavior of children with ASD. They performed the study with four sibling dyads. All four participants were between three to six years of age and their typical siblings were between four and eleven years of age. The researchers used a single subject, multiple baseline design and the study consisted of baseline, intervention and maintenance. They modified components from various peer mediated intervention strategies including the Buddy Skills Training, Stay-Play-Talk, Play Time and Get Along with Others (Tsao & Odom, 2006). The results from this study indicated that all four participants increased their frequency of joint attention skills and most notably, two of them also remained above baseline levels in the maintenance phase. Participant one increased his joint attention percentages from 57.8% during baseline to 77.7% during intervention and the skills generalized during maintenance. Participant two displayed skills at 7.3% during baseline and 47% during the intervention phase. Participant three showed a minimal increase in his rate of joint attention skills. During baseline, he was observed to demonstrate skills at 63.1% and 64.5% during intervention and participant four displayed skills initially at 25.8% and 67.1% during intervention. In addition, when examining the children’s target social behavior during play sessions, all of the participants increased the number of social behaviors toward their siblings. The results
indicated that children with ASD responded more notably when their siblings initiated the interactions (Tsao & Odom, 2006).

By increasing typical sibling’s ability to promote, initiate and reinforce appropriate play behaviors, their siblings with autism have shown to increase their joint attention, symbolic play and communication skills. However, one area that did not increase as dramatically was that of the initiation of children with autism. For the most part, those targeted behaviors remained relatively stable from the baseline levels to intervention.

**Summary**

All of the studies investigated reported some type of increase in social responding and/or some within initiating, but there was not one program that concluded that they were able to consistently increase joint attention, symbolic play and communication skills. All of the studies that reported an increase compared those results to the child with autism’s baseline rather than to typical peers. As a result, in although the study may show an increase, the child with autism’s skills still may be less than the rate of the typical peer. The studies have all indicated an increase in the appropriate play and social skills for children diagnosed with autism.

Many of these skills have also been generalized across settings and peers; however it is still unclear of the long term effects of these approaches. Another concern is the appropriate age for peer mediated interventions. Most of the studies presented in this literature were representative of pre-school age or older, but what about the toddler age? Although peer mediated approaches seem to be the method of choice for children with
autism of various levels of functioning, the preschool age or older were the most
frequently targeted group that supports this type of method (Bass & Mulick, 2007). There
have been no studies conducted for younger children. It would appear that providing
appropriate models for toddlers with autism would be beneficial, should be a priority for
early intervention, and possibly result in stronger longer term outcomes for peer mediated
approaches.
Chapter 3

METHOD

The purpose of this study was to examine the effectiveness of a peer mediated play intervention on the play and social behaviors of toddlers with autism, and to see if these skills would generalize. Specifically, the investigation was designed to determine whether exposure to typical peers, who have been coached to engage with their new friends with autism, would increase the following three skills: joint attention, social initiation, and vocalizations. Secondly, the investigation measured whether the skills would generalize to a new typical peer.

Participants

The participants included three toddlers with autism who were currently clients of an intensive behavioral center-based treatment program. In addition, four typical peers participated in the study. Three typical peer models were used during treatment phase and an additional peer model was used during the generalization phase of the study. All children in the study had parent consent.

The children with autism were selected on the basis of availability, irrespective of their levels of functioning in the domains of socialization, communication and play skills. The peer models were selected on the basis of their age at the initial time of testing (between the ages of two and four), their demonstrated age appropriate intellectual and social development according to parent reports, their availability, and their parents’ report of general high levels of willingness to participate in adult directed activities. The
researcher reviewed the method with all of the parents and provided them with a consent form (see Appendix A for consent form) allowing their child to participate in the study.

Michael was a two year-nine month old boy diagnosed with autism. Michael began an early intensive behavioral treatment program at the age of two years one month old, and he was enrolled in the treatment program for eight months prior to the study. During the initial time of assessment, he was described as being at the 13-16 month range in social skills, and the 10-14 month range in functional communication, according to the scoring criteria of the Carolina Curriculum for Infants and Toddlers with Special Needs. He was able to entertain himself with toys for short periods of time and tolerated being taken to a variety of environments. However, he responded differently to family members and strangers when participating in simple games. Michael typically looked for an adult’s assistance when exploring the environment by vocalizing, pointing or using other communicative signals. He did not demonstrate the ability to consistently wait for his turn or play reciprocal games. Michael displayed skills such as maintaining eye contact with an adult for at least three seconds. He was able to vocalize at least five consonant sounds, and he used approximately five words and signs to express his wants and needs.

Jeff was a two year-two month old boy diagnosed with autism. Jeff began the center-based program at the age of one year eleven months old and was enrolled in the program three months prior to the start of the study. According to his scores from the Carolina Curriculum, Jeff was at the 3-6 month range in social skills and the 4-7 month range in functional communication. Jeff smiled when completing a task and gathered toys to play with from a box or shelf. However, he did not respond to his name or engage in
interactive games with a peer or instructor. Jeff did not provide eye contact to an adult
and would often avoid eye contact by looking in any other direction, such as the wall or
ceiling, other than to the adult. Jeff emitted sounds, however they were not under
instructional control.

Shaun was a two year-three month old boy diagnosed with Pervasive
Developmental Disorder Not Otherwise Specified (PDD-NOS). Shaun began the center-
based program at the age of two years one month old and was in the treatment program
for two months prior to this study. According to the scores from the Carolina Curriculum,
Shaun scored at the 12-16 month range in social skills and the 4-7 month range in
functional communication. During the initial time of assessment, Shaun entertained
himself for short periods of time with a variety of toys, explored his environment and
laughed (although not reciprocally). However, he did not participate in simple games
with others and would often cry when prompted to engage in play activities. He also cried
when prompted to share with a peer or adult. Shaun smiled at a person who was talking to
him, but he did not greet familiar people, sustain eye contact for more than three seconds,
or display any speech sounds (vocalizations) in a meaningful manner.

The peer models included one girl, Bailey who was four years old; and two boys
(Chase and Andy). Both Chase and Andy were three years old at the time of the study.
The peer in the generalization phase was one boy, Tyson, who was four years of age.

**Setting and Training Materials**

The study took place during regularly scheduled program hours (8:00 a.m. to 5:00
p.m.) in the center-based program. All of the children were brought into a room at the
program. Play materials were selected based on the interests of the children with autism, and the peer models. The researcher also brought out novel toys during each session to increase motivation levels for all participants.

**Procedures**

The researcher implemented a single subject, multiple baseline design across peers to evaluate the effectiveness of a peer mediated intervention. The study consisted of three phases: baseline, intervention, and generalization. After five days of baseline (which include one target child and one peer model) to establish stability, the researcher began training the first group of peers, while the second and third group remained within the baseline phase. Once the target child in the first group demonstrated an increase in rates of social interactions (based on the testing criteria), training then began for the second peer group, with the third group remaining in baseline. Once the target child in the second group demonstrated an increase in rates of socialization, the third group was moved into the training phase. All training sessions occurred at least one time per week.

**Dependent Measures**

There were three dependent variables. The first was joint attention which was defined as: a) the child with ASD and the typical peer (at least one) actively sharing attention to the same toy or activity; or b) the child with ASD attending to the peer model (i.e. watching the activity of a peer); or c) the child with ASD providing eye contact to a peer. The second dependent variable was social behavior of the children with ASD. The researcher defined this as: a) social initiations (i.e. any non-verbal behaviors directed toward a peer to evoke a response, or helping, or sharing); and/or b) social responding
(i.e. looking when name was called, following directions, and responding to questions). The third dependent variable was intentional social vocalizations. The researcher defined these as vocal or verbal behaviors which were directed to a peer to evoke a response, comment, greet, help, or share.

**Observation and Recording Procedures**

The researcher was present in the room and videotaped all training sessions. All training sessions were ten minutes long. The videotapes were then reviewed by the researcher and data was transferred to a data sheet, created by the researcher. The researcher and an assistant recorded the data, both following a partial interval recording method with intervals of 30 seconds. The researcher and assistant reached a criterion level of agreement for each assigned category before the study began. The researcher and assistant independently and simultaneously collected data on each of the target participants’ behaviors being measured. The reliability measures were taken on 100% of the observations.

**Baseline**

During the baseline condition, the social interactions between the target children with ASD and their typically developing peers were observed for ten minutes. Minimal vocal guidance, including redirections and prompts were provided by the researcher. The researcher began by providing a simple instruction to the typical peer to play with their new friend. If the target child walked away from the designated play area and the peers were unable get him to return within thirty seconds, the researcher would: a) physically
bring the target child back to the play area with the peers; or b) ask the peer to move within closer proximity to where the target child was now playing.

**Intervention Phase**

During the intervention phase, prior to the play session, the peer models participated in a five minute social skills lesson directly with the researcher. These lessons focused on teaching the peers ways to interact with their new friend with autism. Lessons included: the importance of increasing eye contact; making sure their friend looks at them; calling the target child’s name; including them in play by suggesting play activities and initiating conversations (Tsao & Odom, 2006). The researcher also modified several effective peer mediated intervention lessons similar to the Stay-Play-Talk approach (Goldstein & English, 1997; Tsao & Odom, 2006).

The function of the training opportunities with the typical peers was to facilitate successful play interactions with the children with autism. There were a total of five lesson outlines and some were repeated. Each lesson was created to focus on strategies to increase the peer’s motivation to engage in play with the target child and for the peer to model play. For example, skills were taught on how to capture and contrive opportunities for turn taking, manding (requesting) and/or imitation through pretend play. The researcher also explained to the typical peers that the children with autism may not always want to play with them, but not to get discouraged and continue to contrive initiation strategies (Strain, Hoyson, & Jamieson, 1985).

During the trainings, the researcher performed a tell, show, guide model for the peer models. The researcher also reviewed the videotapes after each session to determine
what additional training may need to be conducted to assist in more successful play interactions. The researcher reinforced the typical peers when they used new strategies when playing with the target child. If the peer model was off task, the researcher prompted the typical peer to perform the social strategies they learned during their teaching session. Occasional vocal, gestural and positional prompts were used to keep the peer models on task, if the peer did not attempt to engage in an interaction with the child with autism for thirty seconds.

**Generalization**

To test whether the participants with autism would generalize their skills, this phase resembled the baseline phase in which the children played for ten minutes. However, there was a different typical peer in the dyad. During this phase, the researcher did not perform any structured teaching session for social skills. The researcher only provided the initial instruction to the peer model to play with his friends.
Chapter 4

RESULTS

Joint Attention

Joint attention was defined as the ability to share attention between objects and other people throughout the environment. In this study, the specific data on joint attention included: turning to the direction of their peer by the sound of a peer's voice, turning to the direction of their peer solely by the sound of a toy/activity, making eye contact with a peer and/or responding to his/her own name.

Figure 1 shows the percentage of 30 second intervals in which each child with autism engaged in joint attention during a ten minute session. All three children diagnosed with autism increased their frequency of joint attention skills with their peers in play sessions from the baseline condition to intervention. However, only one child generalized those skills above intervention level to the newly introduced peer in the generalization phase.

Michael was in the baseline phase for five (once per week) sessions. During baseline, he demonstrated joint attention on an average percentage of 34% of the observed time. During intervention (across 11 sessions), this increased to an average of 41.4%; while this change isn’t huge, he was able to generalize these skills to a new peer over a six week period, maintaining approximately the same level of joint attention. During the baseline phase, Michael demonstrated joint attention skills most frequently by turning to the direction of a peer by the sound of a peer. This was also variable due to
how frequently the peer would make a sound. Toward the end of the intervention phase and in the generalization phase, Michael’s eye contact with his peer increased.

Jeff was in the baseline phase for seven sessions. During baseline, Jeff demonstrated joint attention skills at an average percentage of 10.7% of the observed time. Following introduction of the intervention, Jeff’s joint attention doubled (25%) in the 2nd session. It dipped again during the next four sessions, but then rose to 45% of the interval by the eighth session. Unfortunately, there was a five week absence before the generalization phase of the study, and Jeff’s generalization data dropped to baseline levels.

Shaun was in the baseline phase for nine weekly sessions. During baseline, Shaun displayed joint attention skills on 15 to 30% of the intervals with an average of 22.2% of the sessions. When the intervention was introduced, his skills significantly increased overtime, reaching 70% of the intervals by the 11th session. When the new peer was introduced in the generalization phase, Shaun was able to generalize his skills, reaching over 50% by the 8th session.

Social Behavior

In this study, social behaviors were defined as: 1) social initiations (any nonverbal behaviors directed toward a peer to evoke a response); or 2) social responding (looking when name was called, following directions, and responding to questions). Figure 2 depicts the percentage of 30 second intervals that the children spent in demonstrating appropriate social behavior. In all three cases, the children with autism increased their social behaviors after the intervention was introduced. All three of the
children significantly increased their frequency of social behaviors from the baseline phase to intervention and two generalized the skills to the new peer.

The percentage of intervals in which Michael demonstrated non-verbal social behaviors as defined earlier ranged from 5% to 20% in baseline. After the intervention began, his social behaviors steadily rose, reaching 50% of the intervals in the 11th session before moving into the generalization phase. During the generalization phase, Michael quickly generalized and even increased his social behaviors to 65% by the 3rd session.

Jeff’s non-verbal social behaviors ranged from 0% to 15% (average of 7.9%) during the seven sessions of baseline. Jeff definitely improved during the intervention. His data reached 30% of the intervals by the 8th day of intervention. While his data were not as high as the other two participants, it is important to note the significant change. He doubled his social behaviors. Jeff did not generalize his social behaviors with the new peer, however, as stated above, Jeff had a significant amount of time lapse between intervention phase and the generalization phase, which could also have affected the outcome.

Shaun’s data were similar to his joint attention data. During the nine weeks of baseline, he demonstrated use of non-verbal social behaviors ranging from 0-35% of the intervals. After the intervention was introduced, Shaun showed an immediate increase, peaking at 85% on the 4th session, and settling to an average of 54% at the end of this phase. Shaun demonstrated good generalization of the skills with the new peer in the generalization phase. He initially dropped, but then his data recovered by the 4th session. Most notably, Shaun increased his social behavior from parallel play to more frequent
observations of interactive play. As the sessions went on and Shaun became more familiar with the typical peer, he became more interested in her. The typical peer also enjoyed playing the teacher role and took advantage of every opportunity to be the teacher with Shaun.

**Vocal Behavior**

Vocalizations were defined as making a sound or word approximation. The vocalizations could be within the context of play with their typical peers or in isolation. Figure 3 depicts the percentage of vocalizations made during the 30 second intervals in observed sessions. All of the participants with autism demonstrated some increases in vocalizations from the baseline phase to intervention. All three generalized an increase in vocalizations above baseline levels.

During baseline, Michael engaged in very few vocalization. His data ranged from 0 to 10%. During the intervention phase, Michael’s data initially jumped to 40%. His data dipped during the next four sessions, but rose again reaching 50%. Data in the generalization phase was mixed, but still higher than baseline. Anecdotally, it is interesting to note that his vocalizations in baseline were unintelligible, but by the end of the generalization phase, all of his vocalizations consisted of words or close approximations to words. He would attempt to vocalize to his peer and/or the adult in the room videotaping the session.

During baseline Jeff’s vocalizations ranged from 0 to 20% of the 30 second intervals. After the intervention, his data only improved slightly. He had similar data in the generalization phase. It should be noted that Jeff was using the Picture Exchange
Communication System (Frost & Bondy, 2002). All of the vocalizations observed were sounds, rather than actual words or approximations.

In baseline, Shaun’s vocalizations data ranged from 0 to 30% of the intervals. After the intervention was introduced, Shaun’s vocalizations improved dramatically in the first three sessions. However, over the next eight sessions, the data dropped to baseline levels. During the generalization phase, Shaun’s vocalization data rose again in the middle of the sessions. Shaun’s vocalizations consisted of sounds and word approximations. Although it was often difficult to distinguish what he was trying to say, he most frequently vocalized during interactive play with his typical peers.

**Reliability and Treatment Fidelity**

All sessions were recorded and an observer and the researcher watched the video tapes independently scoring each child (see Appendix B for data sheet). Reliability data were collected using an explicit criteria and a rubric. Inter-observer reliability was taken on 100% of the data and computed using stand reliability measures. The two observers were in agreement on 94% of the data recorded.
Chapter 5

CONCLUSION

Discussion

The results from this study suggest that a peer mediated approach can be an effective method in increasing the social and joint attention skills for toddlers with autism. The first research question addressed in this study regarded the engagement of joint attention skills for toddlers with ASD and their typical peer models. In all three peer interactions, the focus child with autism displayed stable levels with considerably low interval percentages. They ranged from 10.7% to 34% of the observed intervals during the baseline phase. All three children increased their joint attention skills within the intervention. However, only one child continued to increase his skills in the generalization phase, one child decreased his joint attention skills to below baseline and the other decreased his percentage slightly below the intervention phase.

The second research question addressed the initiation and social responses of children with ASD. Two out of the three pairings increased their percent intervals from baseline to intervention and through the generalization phase, while one group increased the percent intervals from baseline to intervention but percentages dropped during the generalization phase. The peer interactions that continued to have difficulty maintaining the skills may have been a result of the pairing of the two children. The typical child, Andy, was a sibling of another child (not in this study) diagnosed with ASD. He was three years of age and much of his play at home was parallel since his brother also struggled with the same deficits as Jeff. The researcher had a difficult time with the
training sessions with Andy because he would frequently ask irrelevant questions. He also required the most prompts, both vocal and gestural, to stay on task and follow through with the training guidelines. It was because of these factors that it may have caused a lower acquisition rate for Jeff. Then again in the maintenance phase, although Tyson was a slightly older peer and was successful in maintaining and increasing the appropriate social behavior of the other two participants, it did not carry over to Jeff.

The last area analyzed was the vocal behavior of children with autism. In two out of the three pairings, the percent of sessions where the child engaged in vocalizations significantly increased (i.e. 8% to 33% and 12% to 41%). This could also be based on the familiarity of the two children within the group and maturity. While children participated in this study, they also continued to receive an ABA package which also worked on their vocalizations. Based on the length of this study, vocalizations could have increased solely on the amount of time between the start of the study to the completion of the maintenance phase.

An important finding might be to look at the amount of time between the phases. In the case with Shaun and Bailey, there was minimal time lapsing from the intervention phase to the maintenance phase, whereas, for Jeff and Andy, more time had passed. The extended duration was due to the availability of Tyson, our peer during the maintenance phase.

Another area to note was the satisfaction of the peer models. During the baseline phase, both Bailey and Chase required tangible and edible reinforcers prior to participating in the study. The researcher set the deal with the peers and once they
participated in the play session, they were able to select their reinforcer. Chase continued to require the setting the deal model prior to the session during the intervention phase. However, towards the middle of the intervention phase, he started to ask to see and play with the peer with autism. When Chase and the researcher would walk Michael back to his classroom, Chase would give him a hug. At the end of the intervention phase, the researcher asked Chase if he enjoyed participating and playing with Michael and he selected the “happy face” card, which represented that he did have fun (see appendix C). Chase’s mother also reported months after the study was completed that Chase would frequently ask to come to ABC school to play with Michael. Chase would also visit the researcher and would ask if he could go say “hi” to Michael in his classroom.

There was also a difference in Bailey’s behavior across sessions. She initially would attempt to avoid Shaun by moving away from him in the classroom during the baseline phase. She was also more interested in the adult (researcher in the room) and would only communicate with her instead of transferring her attention to Shaun. This required the researcher to repeatedly provide vocal and gesture prompts for Bailey to stay on task. Once the intervention phase began and she received training sessions, there was an increase in her ability to represent herself independently as a peer model. She enjoyed being the teacher and it was demonstrated by her willingness to have Shaun follow her around the room, imitating her actions, and making frequent vocalizations to get her attention. They played hide and seek around the classroom, drew on the white board and played in the bean bin together. At the end of the intervention phase, the researcher asked
Bailey if she enjoyed playing with Shaun and she also selected the “happy face” icon, but stated that, “she liked being the teacher.”

Andy required tangible, edible and activities as reinforcers to participate in the study. He would most frequently select to play on the playground after he was done. His participation was not as strong compared to the other play groups and as mentioned above he preferred to engage in parallel play. When the researcher prompted Andy to play with his friend, he would get within close proximity, but did not engage with Jeff. At the end of the intervention, the researcher asked Andy if he enjoyed playing with Jeff and he also selected the “happy face,” however he commented that he liked playing with the new toys and on the playground the most. Although Andy did not demonstrate all that was learned during the training sessions, his babysitter told the researcher that there was an increase in appropriate social play between Andy and his younger brother with ASD in their home environment.

After turning three years of age, all of the participants with ASD transitioned to a least restrictive environment, no longer requiring an intensive ABA program. Michael transitioned to an autism classroom in a non-public school with the student-teacher ratio, 4:1. He did not receive any additional services or support. Although Jeff’s results did not demonstrate generalization of skills, after the study concluded, Jeff began to demonstrate an increase in all three targeted areas, joint attention, social behavior and vocalizations. Upon turning three years of age, Jeff transitioned to a Montessori preschool placement with no additional support. He also did not continue to receive any additional ABA services. At age of three, Shaun transitioned to a full inclusion classroom within his home
school district. His parents declined any additional ABA services after his transition. Parents have reported that he continues to demonstrate an increase in all targeted behaviors and continues to generalize his school across new environments and peers.

**Future Research**

For children with autism, there is evidence that the exposure to typically developing peers can help improve their social behavior and increase joint attention skills and possibly verbal behavior skills. Children with autism have been seen to engage in social initiations and reciprocations from their peers. Most of the research has been done on preschool age children and older. Yet, like this study, extending it to the younger population of toddlers can give us more information on the effectiveness of this approach. Not only applying this method to younger children diagnosed with ASD, but analyzing the ages of the peer models. For toddlers it might be useful to study the differences between using same age peers compared to using older peer models with regards to the children with autism’s responding rate. Older peers may have a better understanding of what is being expected of them through the trainings by the researcher, which may lead to more successful interactions. Slightly older (four-five years of age) peers may also require less prompts to stay on task. Further studies should also include multiple peers and take place across a variety of natural play based settings to increase generalization.
Figure 1. Percentage of 30 second intervals in which the child engaged in joint attention during a 10 minute session.
Figure 2. Percentage of 30 second intervals in which the child engaged in non vocal social behavior during a 10 minute session.
Figure 3. Percentage of 30 second intervals in which the child engaged in vocalizations during a 10 minute session.
Appendices
Appendix A

Consent to Participate

I hereby agree to allow my child to participate in research which will be conducted by Robyn Matsumoto, a graduate student at California State University Sacramento in the Department of Special Education, Rehabilitation, School Psychology and Deaf Studies and which will involve the following procedures:

- Sessions will be video taped to accurately record data.
- Direct observation and data collection (from the video tapes) on interactions between child with autism and peer will be collected by the lead author and a secondary observer.
- Initial baseline data will be taken to observe how the children interact with one another.
- The treatment will include training sessions for the peer models, provided by the researcher to increase the opportunities for successful interactions between typical peers and the infants and toddlers with autism.
- The study will also follow up with maintenance to see if the child with autism and typical peer generalize the skills when training is no longer provided.

The research will take place in the California State University Sacramento Research Laboratory on the campus of Applied Behavior Consultants, Inc.

I understand that this research may have the following benefits:

- Determine if infants and toddlers diagnosed with autism display an increase in joint attention such as a) activity coordinating/ sharing attention to the same toy b) attending to a peer by watching and observing their play behavior and c) provide eye contact to a peer during play during play dates with typical peer models
- Determine if social behaviors will also increase in infants and toddlers diagnosed with autism when observing there a) social initiation and b) social responses when typical children around the same age are trained to be peer mediators.
- Determine if typical peers motivation to interact with children with autism increases with the training provided by the researcher and opportunities to engage in play.
- Lead to a more information about how children with autism learn to play and how they react to peers within their natural learning environment.
- Further the understanding of implementation of the best practice procedures during early intervention.
- Encourage the use of inclusive practices before the age of three.

I understand that the research will have the following risks:
• It may be difficult to train the peer mediators, due to age and lack of compliance, which could result in no change within the treatment.
• By having a play group with multiple typical peers, they may not interact with the other typical peers alone.

This information was explained to me by Robyn Matsumoto. I understand that she will answer any questions I may have now or later about this research. Robyn Matsumoto can be reached at Rmatsumoto@appliedbehavior.com.

I understand that participation in the study is not required for my child to receive services from Applied Behavior Consultants, Inc., nor will lack of participation in the study reflect negatively on my child’s ability to receive services in the future.

I understand that I may discontinue my and my child’s participation at any time without any penalty, and that the investigator may discontinue my child’s participation at any time.

Signature: _______________________________ Date: ______________
Appendix B

Data Collection Form

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Appendix C
REFERENCES


