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**EFFECTIVENESS OF PIVOTAL RESPONSE TRAINING AS A PEER-MEDIATED STRATEGY TO INCREASE SOCIAL INTERACTIONS FOR STUDENTS WITH AUTISM SPECTRUM DISORDER AND COMMUNICATION DISORDERS**

by

Alyssa Erin Friedrich

A Thesis

Submitted to the  
Department of Interdisciplinary and Inclusive Education  
College of Education

In partial fulfillment of the requirement

For the degree of

Master of Arts in Special Education

at

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Thesis Chair: Amy Accardo, Ed.D.

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## Dedications

I would like to dedicate this thesis to my parents Michael and Mary, my brother Joshua, and my fiancé Kevin Mebs. Without your love and support my dreams would never have become a reality.

## **Acknowledgment**

I would like to express my appreciation to Professor Amy Accardo, Ed.D. for her endless patience, support, and guidance throughout this study.

## Abstract

Alyssa Erin Friedrich

### EFFECTIVENESS OF PIVOTAL RESPONSE TRAINING AS A PEER-MEDIATED STRATEGY TO INCREASE SOCIAL INTERACTIONS FOR STUDENTS WITH AUTISM SPECTRUM DISORDER AND COMMUNICATION DISORDERS

2015-2016

Amy Accardo, Ed.D

Master of Arts in Special Education

The purpose of this study was to: (a) examine the effectiveness of using PRT as a peer-mediated strategy, (b) examine the effectiveness of using PRT to increase social interactions (play initiation and turn taking) for students with Autism Spectrum Disorder (ASD) and (c) evaluate typical peer satisfaction and perception of this intervention. Eight kindergarten students participated in this study, four students classified as having ASD or Communication Disorders, and four typical peers. A single subject multiple baseline across participants design was used, and maintenance data was collected. During the baseline, the frequency of taking turns and initiating play were observed and recorded for students with ASD and communication Disorders. During the intervention, typical peers acted as peer mediators in order to help the students increase skills. Results reveal that all students increased initiation and turn taking skills during intervention. Maintenance data shows that several participants maintained the skills post intervention. Moreover, typical peers showed satisfaction with study participation. Further research is suggested for investigating PRT with preschool children of varying functional levels.

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## Chapter 1

### Introduction

Social interactions are a critical aspect of life that human beings are involved in every day (Bellini, Peters, Benner, & Hopf, 2007). These skills are reinforced from the very beginning when a newborn baby hears their mom's voice for the first time. Once babies have grown and become young children entering school, social interactions expand beyond immediate family. In school, children interact with their peers, teachers, and other school staff. They continue learning how to engage in conversations and discussions while playing with others (Rogers, 2000). Communication is an important tool that all individuals use to express their wants and needs, and communication comes in many forms, such as speaking, writing, singing, sign language, augmentative communication, and braille (Rogers, 2000).

Elementary school children are lucky enough to have a part of their daily schedule carved out for recess (Harper, Symon, & Frea, 2008), an opportune time to interact and communicate with others. Some may take full advantage of this opportunity, whereas others may engage in independent or parallel play (Wolfberg, Bottema-Beutel, & DeWitt, 2012). Some children are naturally willing to ask another friend to play, or to join in an activity others are doing (Rogers, 2000). Children with social deficits, however, can find social interactions difficult and are often withdrawn from social activities (Bellini et al., 2007).

### Statement of the Problem

Students with Autism Spectrum Disorder (ASD) in particular have a very difficult time engaging in social situations and reciprocal play (Terpstra, Higgins, & Pierce, 2002).

Students who have ASD often lack the social skills necessary to hold a conversation, initiate play, or take turns during play (Terpstra et al., 2002). A lack of ability to engage in social situations may lead to students with ASD appearing socially awkward (Terpstra et al., 2002). Depending on the child's level of functioning, they may not have the verbal ability to speak or to form sentences of their own. They may benefit from instruction in sign language, or they may use an alternative form of communication such as an augmentative communication device (Rogers, 2000).

Children with ASD often have other traits that come with their communication, such as flapping, stimming, scripting, or other repetitious behaviors (Greenspan & Wieder, 1997; Corsello, 2005). Children who have very low verbal abilities may grunt, moan, or use a repetitious sound to communicate (Greenspan & Wieder, 1997). The approach to teaching appropriate social interactions for students with ASD should consider communication needs and may depend on their abilities and their response to different strategies (Terpstra et al., 2002).

Research has shown that many students with ASD, particularly those of elementary age, benefit from social skills groups, social stories, and peer-mediated strategies as a method of increasing social skills (Rogers, 2000). One evidence-based practice (EBP) in particular is Pivotal Response Training (PRT) (Vismara & Bogin, 2009). PRT can be defined as “a method of systematically applying the scientific principles of applied behavior analysis (ABA) to teach learners with autism spectrum disorders (ASD) functional social-communicative and adaptive behaviors within a naturalistic teaching format” (Vismara & Bogin, 2009, p.9).

For purposes of this study, typical peers will be taught to use PRT to communicate with peers with ASD in a natural context. It is suggested that PRT allows a teacher to utilize and fade typical students as reinforcers, and as motivators to support students with ASD (Rogers, 2000). Rogers also suggests that when teachers fade the typical peers, it leads to increased generalization and maintenance of acquired social skills (2000). When using PRT it is important to use natural contexts, as children with ASD typically have difficulty generalizing learned skills (Dunlap & Powell, 1999). Children with ASD are often literal when it comes to social communication, and they may not understand humor or sarcasm (Harper et al., 2008) leading to difficulty in peer interactions.

When using PRT to support students with ASD, educators use a mixture of modeling, visual cues, and scripts to train typical peers (Harper et al., 2008). Training typical peers typically entails multiple sessions of practicing strategies and role-playing social situations with an educator in preparation for implementing these same strategies with a child with ASD (Pierce & Schreibman, 1995). There are different strategies embedded within this approach, such as encouraging student conversation, giving choices, and modeling (Pierce & Schreibman, 1995). The present study will consider a training manual developed by R.L. Koegel and L.K. Koegel designed to guide trainers through the process of PRT. The manual can be obtained online and provides explicit instructions for carrying out the appropriate steps (Koegel & Koegel, 2012).

### **Significance of the Study**

Further research is needed to investigate PRT, an EBP, as an effective approach for increasing social skills among early elementary aged children with ASD, especially in

the area of unstructured play or recess. This study was unique in that it focused on using typical peers in a kindergarten inclusion classroom to work with students with ASD. Specifically, the typical peers were trained to use PRT to appropriately engage in play situations, with a goal of increasing turn taking and initiation of play by students with ASD and Communication Disorders.

PRT may be a means to incorporate peers in encouraging social interactions for students with ASD. Students are always looking for a way to help out or act as a role model, and PRT is a potential way to include them in a child with ASD's social learning. An inclusive setting provides opportunities for children with communication or social skill deficits to learn appropriate behaviors and skills from typical peers. Although, this approach requires preliminary training of typical peers, and a solid chunk of time to make sure they are appropriately equipped to implement these strategies, it could potentially change the dynamic of the inclusion classroom. The more peers are involved in every day learning for one another, the more independent they may become.

### **Purpose of the Study**

The purpose of this study was to: (a) examine the effectiveness of using PRT as a peer-mediated strategy, (b) examine the effectiveness of using PRT to increase social interactions (play initiation and turn taking) for students with ASD and (c) evaluate typical peer satisfaction and perception of this intervention.

### **Research questions**

Research questions investigated follow:

1. Does the use of peer-mediated pivotal response training increase play initiation skills for students with ASD and Communication Disorders?

2. Does the use of peer-mediated pivotal response training increase turn taking for students with ASD and Communication Disorders?
3. Does the use of peer-mediated pivotal response training provide satisfaction for the typical peers implementing the intervention?

## Chapter 2

### Literature Review

Social interaction deficits are found to be a defining factor amongst children diagnosed with ASD (Owen-DeSchryver, Carr, Cale, & Blakeley-Smith, 2008). Some examples of social deficits, although they vary among individuals, are impaired eye gaze, poor joint attention, few verbal initiations, and failure to develop age-appropriate friendships (Owen-DeSchryver, et al., 2008). Bellini, Peters, Benner, and Hopf (2007) suggest that initiating interactions and establishing and maintaining social relationships are among the main social skill deficits of children with ASD.

Owen-DeSchryver et al. (2008) conducted a study promoting social interactions among students with ASD, and concluded that social interactions should be taught in natural contexts to support generalization. Students with ASD often cannot generalize new skills taught in new contexts, supporting the reasoning behind natural contexts as the environment of social interaction instruction (Owen-DeSchryver et al., 2008). Rogers (2000) similarly reports that naturalistic approaches have shifted from teacher directed to more peer-mediated strategies. Moreover, Rogers reports that using typical peers is more successful than using adult trainers in generalizing behaviors with peer interactions (2000).

There is a consensus in the research indicating that PRT is an effective naturalistic intervention for increasing social interactions among children with ASD (Rogers, 2000; Owen-DeShryver et al., 2008; Pindiprolu, 2012). PRT can be defined as a naturalistic method for increasing a child's motivation to engage in learning new skills (Stahmer, Ingersoll, & Carter, 2003).



Prior studies have been designed to implement PRT as a peer-mediated intervention in which typical students carried out the intervention with peers with ASD. For example, in a study conducted by Kuhn, Bodkin, Devlin, and Doggett, typical peers engaged in a one to two week period of direct instruction by the teacher, and then successfully carried out a PRT intervention to increase social interactions with their peers with ASD (2008). Play interactions such as initiation, joining in, and turn taking may be taught using this naturalistic method (Bellini et al., 2007).

### **Social Skills**

Typically developing children acquire social skills through the use of play (Harper, Symon, & Frea, 2008). However, the acquisition of these skills does not naturally occur for children with ASD (Harper et al., 2008). Bellini and colleagues further report that children with ASD require interventional support to address difficulties communicating with others, maintaining relationships with peers, and participating in new environments (2007). Social skill deficits for these children include initiating interactions, taking another peer's perspective, and sharing enjoyment (Bellini et al., 2007). Social deficits may hinder a child's ability to establish positive and meaningful relationships, which may explain why these children with ASD are often seen in isolation (Bellini et al., 2007). Bellini and colleagues extend the importance of including social skills in a child with ASD's programming (2007).

Similar to Harper et al. (2008) Wolfberg and Schuler (1993) report that children with ASD require more motivation to play and interact with others than typically developing children and that they encounter obstacles when engaging in play situations with their peers (Wolfberg & Shuler, 1993). Due to these obstacles, children with ASD

are at risk of being isolated during play (Wolfberg & Schuler, 1993). Social skills instruction facilitated in a school setting provides an opportune time for children to interact with one another in a natural social environment (Bellini et al., 2007). It is essential, however, that teachers receive the proper training, resources, and time to properly implement social skills interventions (Bellini et al., 2007). Kuhn et al. recommend that teachers are trained in PRT strategies so that in turn, typical peers are more effective in implementing the use of PRT with peers with ASD (2008). Suhrheinrich reports that PRT has been successful when teachers implementing the method are properly trained; however, teachers in a study conducted by Suhrheinrich were unable to meet mastery of PRT implementation criteria, indicating more training would be necessary for effective implementation (2011). This study also suggests that teachers require and benefit from ongoing professional development in PRT in order to effectively and appropriately implement the strategy (Suhrheinrich, 2011).

In addition, Rogers (2000) notes social dysfunction as a significant feature of ASD. The researcher studied the different ways in which socialization can be taught to children with ASD. Rogers reports a variety of methods to teach socialization, and found that the use of peer-mediators is among those methods that have successfully supported the transfer of knowledge from adult partners to peer partners working with individuals with ASD.

Similarly, Skokut, Robinson, Openden, and Jimerson (2008) researched school-based interventions that promote social competence in children with ASD. Because significant delay in communication and social interaction is a defining feature of ASD,

Skokut and colleagues analyzed a variety of methods to determine their effectiveness, and PRT emerged among the methods identified as effective (2008).

According to a systematic review by Verschuur, Didden, Lang, Sigafos, and Huskens (2014), PRT serves as an effective method to improve language and communication skills such as functional verbal utterances and maintaining interactions. The researchers further suggest that play skills were improved by the majority of students with ASD in the studies, due to the effectiveness of PRT (2014). Specifically, the social maladaptive behaviors that were displayed by students with ASD prior to the intervention were reduced after PRT (Verschuur et al., 2014).

### **Play**

Terpstra et al. (2002) studied the importance of play on a child's development as it provides opportunities for children to learn from one another both socially and behaviorally. The researchers report that children can lack social skills from not engaging in experiences with peers more often (2002). Play is an area that children with ASD have difficulties engaging in, both individually and with peers (Terpstra et al., 2002). The researchers identify three specific types of play (1) symbolic play, (2) functional play, and (3) sociodramatic play. Symbolic play, which is more commonly difficult for children with ASD, can be defined as using an object as another object, giving it functions that it normally does not possess or referring to an object that is not currently present (Terpstra et al., 2002). Children with ASD, for example, are not often seen using a block for a cookie (Stahmer, 1999). Since symbolic play requires abstract thinking, children with ASD may be unable to acquire these skills naturally (Stahmer, 1999). Functional play refers to using an object with the correct function, a task which children

with ASD may find easier as they are more literal (Terpstra et al., 2002). Furthermore, the researchers define sociodramatic play as activities such as playing house or store, and report that sociodramatic play is more difficult for children with ASD, due to the requirement of social interaction (Terpstra et al., 2002). By nature, Sociodramatic activities require the child to understand body language, social cues and the ability to think abstractly or use their imagination (Terpstra et al., 2002).

Furthermore, Terpstra and colleagues (2002) identify different levels of play that children engage in. These levels are (1) isolated play, (2) dyadic play, (3) group play, and (4) team play. Isolated play is when a child is playing alone or engaging in an activity that does not require another peer (Terpstra et al., 2002). Children with ASD are often seen engaging in isolated play, which does not require playing with another individual (Terpstra et al., 2002). Rather than playing with another child, Terpstra et al. discuss how children with ASD instead engage in repetitive behaviors (2002). Dyadic playing usually involves children playing a game together, similar to group play which involves a group of three or more children playing a board game or other group activity (Terpstra et al., 2002). Team play, which is a form of group play, usually involves a competition, which can be difficult for children with ASD due to the high level of activity and interaction that is involved with a game (Terpstra et al., 2002).

Children with ASD often engage in fixated play, where the child's focus is on one object or situation at a time (Wolfberg & Schuler, 1993). When it comes to representational forms of play, children with ASD display unique profiles in which they may engage in spontaneous actions with toys that serve no purpose and avoid variation (Wolfberg & Schuler, 1993).

Similar to representational play, children with ASD display similar behaviors when involved in social play (Wolfberg & Schuler, 1993). When given free-play opportunities, these children can either be observed as “aloof” because they appear withdrawn from their peers, or passive, due to the child with ASD imitating a peer from afar (Wolfberg & Schuler, 1993). Wolfberg and Schuler report that others may see this as a lack of motivation to play or interact, but they suggest that these children may express their desires in different ways that should not be taken as a lack of interest (1993).

Peers provide support in ways that adults cannot for children with ASD (Wolfberg & Schuler, 1993). In a study of social skills for children with ASD, Harper and colleagues (2008) found that peer-mediated techniques increased the levels of initiation and responding for children with ASD. The researchers found that participation in creative play opportunities with typical peers supported students with ASD in increasing their social interactions (2008).

Owen-DeShryver et al. (2008) suggest that children with ASD’s social deficits vary, and similarly, Terpstra et al. (2002) suggest that interventions be dependent on the individual child. Interventions have different outcomes depending on the ability and developmental level of the child (Terpstra et al., 2002). Stahmer (1999) also suggests that the development of the child with ASD plays a role in how the child will acquire play skills. Due to the fact that PRT is very flexible, it can be used to support students of varying levels (Stahmer, 1999).

Terpstra and colleagues recommend that developmentally appropriate activities are chosen for children with ASD and geared toward their current functional levels rather than toward developmentally appropriate activities for typical children of the same age

(2002). This functional level should be individualized, as ASD is unique to each child (Terpstra et al., 2002). When selecting appropriate activities, the teacher must determine whether the child with ASD has the prior knowledge that is required in order to fulfill the activity and acquire the skills (Terpstra et al., 2002).

The development of social play and cognitive play happen simultaneously, and proceed to develop through a multi-step process (Jordan, 2003). A child begins to explore self-play then moves towards understanding cause and effect and eventually notices the interactive play of others (Jordan, 2003). A child first develops self-awareness and then begins to become aware of others and their surroundings through typical emotional development (Jordan, 2003). Furthermore, Harper, Symon, and Frea (2008) found that recess is the best time to intervene with social skills instruction. Recess provides unstructured, natural contexts for play to occur (Harper et al., 2008). Social play may not be pleasurable for children with ASD, however, due to the flexibility needed and unpredictability surrounding peer play (Brown & Murray, 2001).

Many studies of students with ASD focus on the two areas of initiating and turn taking to determine the effectiveness of interventions for increasing play skills (Owen-DeShryver et al., 2008; Rogers, 2000; Terpstra et al., 2012; Pindiprolu, 2012). Harper et al. (2008) conducted a study of social play that resulted in increased social behaviors of participants with ASD, and determined that learning to initiate and take turns is key to acquiring social skills for children with ASD.

## **Initiating Play**

Kuhn, Bodkin, Devlin and Doggett define initiation as starting a conversation or approaching a peer to play without a prompt (2008). An example these researchers provide is that of offering another child help with an activity (2008).

Pierce and Schreibman (2007) conducted a study on initiation of play and increasing social behaviors of students with ASD using peer-mediated strategies. Throughout the study, students were measured on any verbal or nonverbal initiation of original play, for example, handing the peer trainer a ball (2007). Pierce and Schreibman (1995) found PRT to be an effective method for increasing initiation of children with ASD.

Harper et al. (2008) also conducted a study in which typical peers were trained to use a peer-mediated strategy to help a peer with ASD increase social interactions such as initiating. The study utilized recess as the prime time to address this social skill, as it is often free play, unstructured, and in a natural context (2008). PRT was one method deemed effective in increasing initiations during play by Harper and colleagues (2008). In addition, Terpstra et al. suggest that social initiations are a common pivotal behavior (2002), and Renshaw and Kuriakose (2011) suggest that self-initiation is a pivotal behavior leading to social gains for children with ASD.

Furthermore, Weiss and Harris (2001) investigated teaching the skill of initiation to children with ASD. Contrary to other research supporting peer-mediated methods, Weiss and Harris report that children with ASD should be taught to initiate without the help of peers since they may be unavailable at times (2001). Despite this discrepancy, a

research consensus exists considering initiation to be a critical skill for children with ASD to possess leading to independence (Harper et al., 2007).

### **Using PRT to Teach Play**

PRT was initially developed as a method to support communication skills, both nonverbal and verbal (Suhrehrich, 2011). Vismara and Bogin (2009) suggest that PRT was developed to effectively and efficiently enhance four pivotal learning variables: motivation, responding to multiple cues, self-management, and self-initiation. These researchers state that “PRT builds on learner initiative and interests, and it is particularly effective for developing communication, language, play, and social behaviors” (Vismara & Bogin, 2009, p.9). More commonly, PRT involves typical peers as peer-mediators to increase pivotal behaviors for children with ASD (DiSalvo & Oswald, 2002). Typical peers are trained to increase these behaviors by engaging in role-playing scenarios and modeling by teachers (Terpstra et al., 2002). Terpstra et al. also report that once the typical peers are trained, they can then implement these strategies to their peers with ASD (2002). During the training session, typical peers are in a room free of distractions and are taught specific behaviors that are used to facilitate social interactions (Neitzel, 2008). The specific behaviors that Neitzel suggests are initiating interactions, responding to initiations, keeping an interaction going, starting and engaging in conversations, giving and accepting compliments, taking turns, and sharing (2008).

Stahmer proposed PRT as an effective method for increasing play skills for children with ASD of varying developmental levels (1999). Moreover, Stahmer (1999) suggests that PRT provides an opportunity for children to naturally learn complex play skills, while still having the flexibility to maintain creativeness. The researcher suggests



the following procedures for effectively carrying out PRT: (1) provide clear instructions and questions, (2) intersperse maintenance skills, (3) incorporate child choice, (4) use direct reinforcement, (5) provide reinforcement of goal-direct attempts, and (6) promote turn taking (1999). Overall, there has been a gradual move to less-structured and more naturalistic interventions to increase social skills, as opposed to the high-structured behavioral approaches of the 1960s (Stahmer, 2003). Subsequently, Stahmer and colleagues (2003) conducted an analysis of behavioral techniques for promoting play, and found that PRT is a naturalistic method that allows for creativity and flexibility. Harper et al. also found PRT to be a naturalistic approach to improving play skills for children with ASD (2007).

Through a study conducted by Pindiprolu (2012), PRT was determined to be effective in facilitating the acquisition and generalization of a variety of skills, such as language behavior, social interactions, different play types, and behavior changes. More research is required, however, on the maintenance and generalization of social skills after such interventions have been implemented. Studies, such as those conducted by Pindiprolu (2012) and Pierce and Schreibman (1995), provide evidence of participants with ASD generalizing social skills to everyday activities. Terpstra et al. (2002) suggests that acquisition and generalization of social skills, such as initiation and turn taking are more likely when the developmental appropriateness of the activity is taken into consideration.

Although there is a wealth of information on PRT, the results of the effectiveness of this interventional strategy continue to be inconsistent for children with ASD. There is

still more research needed on this strategy as a peer-mediated approach for increasing social skills for students with ASD.

## **Conclusions**

This review of the literature summarized the importance of play and social skills instruction for children with ASD. Childhood play is an activity that not only provides an opportunity for social skills growth, but also an opportunity to gain skills that define social positions in school and society (Terpstra et al., 2002). Stahmer (1999) has recommended that PRT be used to help children not only initiate more in school activities, but to initiate conversations in the community as well. PRT is a peer-mediated strategy that many researchers have used to increase social skills among children with ASD (Pierce & Schreibman, 1995; Harper et al., 2007; Stahmer, 1995). Many of these studies found PRT to be an effective method for increasing initiations in play and social situations for children with ASD (Pierce & Schreibman, 1995; Harper et al., 2007). Rogers (2000) suggests that current approaches to social skills instruction be peer-mediated and take a naturalistic approach by intervening during play.

Despite numerous studies on PRT and initiation, research appears limited on whether PRT is an effective method for increasing the skill of turn taking in children with ASD. Furthermore, there is little to no research on using PRT for children with other Communication Disorders besides ASD. In general, limited research still remains for PRT (Boudreau, Corkum, Meko, & Smith, 2015).

This study examined the effectiveness of PRT for not only children with ASD, but also children with Communication Disorders. The study aimed to provide additional research on PRT used with children with communication and social disorders. This study

also aimed to investigate whether PRT is an effective method for increasing social initiations and turn taking among children with these disorders, and to investigate the satisfaction of typical peers engaging in PRT implementation.

## Chapter 3

### Methodology

#### Setting and Participants

This study included eight kindergarten students, four general education students and four special education students. Two of the four special education students are classified as having ASD, while the other two are classified as having communication disorders. The students attend an elementary school in a rural southern New Jersey school district. The school district contains only two schools, an elementary school and a middle school. There are a total of approximately 750 students in the district. The elementary school includes students in preschool through fourth grade and the middle school includes students in grades fifth through eighth. The typical school day at the elementary school runs for six hours and thirty minutes. The amount of actual instructional time is four hours and forty-five minutes.

According to the New Jersey School Performance Report (New Jersey Department of Education, 2014), 84.8% of the students in the elementary school are white, 1.9% of the students are black, 11.3% of the students are Hispanic, .5% of the students are Asian and 1.4% of the students are two of more races. English is the primary language spoken in the community and a small percentage speaks Spanish. When examining the elementary school population, 19% of the students are students with disabilities, 11.8% of the population is considered economically disadvantaged, and 1.2% of the population is considered English Language Learners.

The special education students participating in this study have a documented diagnosis of either ASD or communication disorder. According to their Individualized

Education Plans (IEP), these students have social goals that require intensive instruction in the area of play. The school psychologist along with the classroom teachers recommended these children for the study.

*Participant 1.* AU is a Caucasian male kindergarten student who is currently receiving special education split between an inclusion classroom for the majority of the day, and a self-contained classroom for intensive teaching for an hour in the afternoon. This student has an IEP and is eligible for special education services under the category of “Autistic.” AU shares an educational specialist with another student in the classroom. This student was chosen for this study due to his inability to socialize with others. He is often seen engaging in parallel play or scripting movies and television shows. When AU attempts to join in, he is unable to appropriately gain other’s attention, and therefore unable to build or maintain positive relationships with his peers.

*Participant 2.* EL is a Caucasian female kindergarten student who is currently receiving special education in an inclusion classroom by both a general and special educator. This student has an IEP and is eligible for special education services under the category of “Autistic.” EL shares an educational specialist with two other students in the classroom. This student was chosen for this study due to an inability to appropriately gain another person’s attention, initiate and maintain a conversation, as well as to engage in more complex and imaginary play. This student came into preschool two years ago unable to pretend play other than as a cat. Now that the student has matured and is away from wanting to play “cats” all day, she is beginning to want to build friendships with peers. EL is unsure of how to start a conversation as well as accept that others may not have the

same interests or plan for play as she does. EL has made unexpected strong academic gains in the area of phonology and reading this year.

*Participant 3.* CR is a Caucasian male kindergarten student who is currently receiving special education in an inclusion classroom from both a general and special educator. This student has an IEP and is eligible for special education services under the category of “Communication Impaired.” CR came into school as a three-year old without any recognizable speech, often seen grunting or pointing. CR receives many services, from speech to physical therapy to occupational therapy. He has come a long way since entering our Pre-K with Disabilities program two years ago; however, CR is still very difficult to understand. CR has difficulty holding conversations with his peers, as they often do not understand him due to his speech. He often is seen roaming the playground, observing others playing, unsure of how to initiate and join in.

*Participant 4.* KD is a Caucasian female kindergarten student who is currently receiving special education in an inclusion classroom and has an IEP. KD is eligible for special education services under the category “Communication Impaired.” This student also has an Individualized Health Plan that requires a full-time nurse in the classroom to manage her medical needs. KD receives all of her instruction in the in-class resource room by a general and special educator. She shares an educational specialist with two other students in the classroom. KD has difficulties initiating play appropriately, taking turns, waiting her turn, and appropriately gaining someone’s attention. Along with social difficulties, she has behaviors that adversely affect her daily functioning. KD has a behavior plan and related data collected daily. A strength for KD is her diagnosis of hyperlexia, which sets her above grade level in the area of Reading and Language Arts.

*Participant 5.* BS is a Caucasian male kindergarten student who is in the general education population of the inclusion classroom. BS was chosen for this study due to his ability to build positive relationships with his peers. BS is a people person, always making others laugh and always lending a helping hand. He tends to float toward our special education population, willing to help or guide them whenever possible.

*Participant 6.* NF is a Caucasian male kindergarten student who is in the general education population of the inclusion classroom. NF was chosen for this study due to his calm nature. NF started off the year very shy. Since buddying up with BS, NF has come out of his shell, yet has a calm and soothing nature that others feed off of. He is always willing to include others and offer to play with those who do not have someone to play with. These positive features contribute to why he was chosen as a peer-mediator.

*Participant 7.* CD is a Caucasian female kindergarten student who is in the general education population of the inclusion classroom. CD was chosen for this study due to her friendly nature and will for wanting to help others. Whenever a child needs some extra support, CD steps in and offers to help the child out. She is a very curious child and wants to know why things happen and how things work, so by including her in this study, she is able to understand an entire process, expanding her knowledge base.

*Participant 8.* AM is a Caucasian female kindergarten student who is in the general education population of the inclusion classroom. AM's vibrant and outgoing personality was the reason behind choosing her for this study. AM had difficulties herself in the beginning of the year, but since learning she needs to bring her enthusiasm down a notch to gain attention appropriately, she has soared socially this year. AM is very bright and has the making of a leader, which led to her serving as a peer-mediator in this study.

## Procedure

The intervention was implemented over a five-week period from March 2016 to May 2016. The teacher met with the typical students for one week in order to prepare them for the intervention phase. Each morning for twenty minutes, the typical students were supported in reviewing the skills they would be working on with their peers. Through a series of role-play scenarios and visuals, the students were trained to use the intervention. The meetings were held in the back of the room during Morning Meeting. During the week of training, baseline data collection began. Baseline data was then taken until all participants entered the intervention phase. To increase reliability of data, a multiple baseline across participants design was implemented. Students entered the intervention one at a time until all participants were taking part in the intervention. As a result, time in the intervention phase varied among participants.

The intervention was implemented for thirty minutes during recess. The typical peers were instructed to implement for a day, then back off and observe, then implement again, and then observe. On Fridays, the typical peers and teacher met in the morning and discussed whether they felt their peer would benefit from more instruction or an observation day. This pattern continued for all participants during each phase of the intervention. The typical peers would switch between the two skills every other day. The teacher observed both skills each day during recess, collecting data.

Participant 1 began the study on day 6. Originally, each typical peer was going to be paired with a child with special needs; however, the typical students wanted to help each other, so they were given the opportunity to implement in pairs or groups.

Participants 5 and 6 immediately jumped right in and engaged Participant 1. The typical



peers chose to work on turn-taking first, so they began by playing a game of pass with a soccer ball.

Each participant started at a different point in the intervention, following the exact procedures of participant 1. Some days the typical students worked alone, other days they combined into a large group. They were given some freedom with this aspect so they could take ownership of their mentoring. The implementation of the intervention took place over the course of four weeks, with length of intervention dependent on participant's starting point.

After the study was complete, the typical peers took a survey presented in a Likert Scale format. Results are reported in Chapter 4. Two weeks after the intervention was complete, maintenance data was collected over a one-week period to determine the continued effectiveness of the peer implemented pivotal response intervention.

### **Intervention and Outcome Measures**

The experimental intervention for this study was PRT. This intervention was taught to typical peers for one week and then they implemented this intervention with their peers with ASD or Communication Disorders. This intervention is different from other every day social interaction interventions as it was peer-mediated instead of teacher directed.

The outcome measures of this study were social interaction skills of students with ASD and communication disorders, specifically turn-taking and initiations.

### **Experimental Design**

This study used a single subject AB multiple baseline across participants design, and maintenance data collection. Data collection procedures included collecting baseline

and intervention data. Baseline and intervention data were collected through tally marks to determine how many times the children initiated play, and took turns. Furthermore, the general education peers playing with the students with ASD or communication disorders completed a Likert scale based survey to report their satisfaction participating in the social interactions. See Appendix A for a copy of the survey.

## Chapter 4

### Results

This single subject study utilized a multiple baseline across participants design to investigate the effects of peer-mediated PRT on the social interactions (initiations and turn taking) of student with ASD and communication Disorders. The research questions follow:

1. Does the use of peer-mediated pivotal response training increase play initiation skills for students with ASD and Communication Disorders?
2. Does the use of peer-mediated pivotal response training increase turn taking for students with ASD and Communication Disorders?
3. Does the use of peer-mediated pivotal response training provide satisfaction for the typical peers implementing the intervention?

The typical peers were trained for a week prior to intervention. The baseline data was obtained through teacher observation on the playground during recess, weather permitting. If the weather was inclement, the teacher observed play during indoor recess in the classroom.

Data was taken throughout the intervention on initiations and turn taking. Maintenance data was taken two weeks after the conclusion of the study. The results are reported in Table 1. At the conclusion of the study, the typical peers completed a Likert scale on their satisfaction of participation. The results are reported in Table 3.

#### Group Results

Table 1 shows the total amount of times each participant took turns during play, and initiated play during the baseline, intervention, and maintenance phases.

Table 1

*Total Number of Incidences and Total Days of Intervention Across Phases*

| Participant | Turn-Taking |              |                      |             | Initiations |              |                      |             |  |
|-------------|-------------|--------------|----------------------|-------------|-------------|--------------|----------------------|-------------|--|
|             | Baseline    | Intervention | Days of Intervention | Maintenance | Baseline    | Intervention | Days of Intervention | Maintenance |  |
|             | Total       | Total        | Total                | Total       | Total       | Total        | Total                | Total       |  |
| 1           | 9           | 157          | 25                   | 33          | 8           | 70           | 25                   | 20          |  |
| 2           | 36          | 163          | 20                   | 45          | 26          | 61           | 20                   | 3           |  |
| 3           | 14          | 85           | 17                   | 30          | 6           | 23           | 17                   | 9           |  |
| 4           | 20          | 55           | 15                   | 20          | 8           | 42           | 15                   | 13          |  |

Table 2 shows the daily mean scores and standard deviations for each skill during each phase for each participant. Examining participants' frequency of turn taking during play reveals that the mean of all participants more than doubled. For example, Participant 2 took turns a mean of 3.60 daily times during baseline and a mean of 8.15 times daily during intervention. Examining participants' frequency of initiating play also reveals that the mean of all participants increased from baseline to intervention. For example, during baseline for initiating play, participant 2 initiated a means of 2.80 times daily, which increased to 3.05 times during intervention. Overall, there was an increase in skills for all participants.

Table 2

*Daily Mean and Standard Deviation across Phases*

| Participant | Turn Taking |      |              |      |             |      | Initiations |      |              |      |             |      |
|-------------|-------------|------|--------------|------|-------------|------|-------------|------|--------------|------|-------------|------|
|             | Baseline    |      | Intervention |      | Maintenance |      | Baseline    |      | Intervention |      | Maintenance |      |
|             | Mean        | SD   | Mean         | SD   | Mean        | SD   | Mean        | SD   | Mean         | SD   | Mean        | SD   |
| 1           | 1.80        | 0.84 | 6.28         | 2.48 | 6.60        | 1.14 | 1.60        | 0.55 | 2.80         | 1.53 | 4.00        | 1.41 |
| 2           | 3.60        | 0.97 | 8.15         | 2.06 | 9.00        | 1.22 | 2.80        | 1.03 | 3.05         | 1.74 | 0.60        | 0.89 |
| 3           | 1.08        | 0.76 | 5.00         | 1.94 | 6.00        | 1.59 | 0.46        | 0.52 | 1.35         | 0.70 | 1.80        | 1.48 |
| 4           | 1.33        | 0.62 | 3.67         | 2.59 | 4.00        | 1.41 | 0.53        | 0.64 | 2.80         | 1.43 | 2.60        | 0.89 |

Table 3 displays results from the Likert scale-type survey given to the typical peers at the end of the study. The typical peers, as shown below, reported enjoying participating in this study. One hundred percent of the students enjoyed working with the teacher, learning new play skills, teaching their friends, learning something new, and helping their friends. Seventy-five percent of the typical peers, 3 out of 4, strongly agreed with the fact that they would engage in this type of activity again, whereas 25%, or one student, agreed.

Table 3

*Student Satisfaction Survey*

| Statement                                | Strongly Disagree (%) | Disagree (%) | Neutral (%) | Agree (%) | Strongly Agree (%) |
|--|-----------------------|--------------|-------------|-----------|--------------------|
| 1. I enjoyed working with Ms. Friedrich. | 0                     | 0            | 0           | 0         | 100                |
| 2. I enjoyed learning new play skills.   | 0                     | 0            | 0           | 0         | 100                |
| 3. I enjoyed teaching my friends.        | 0                     | 0            | 0           | 0         | 100                |
| 4. I learned something new.              | 0                     | 0            | 0           | 0         | 100                |
| 5. I helped my friends.                  | 0                     | 0            | 0           | 0         | 100                |
| 6. I would do this again.                | 0                     | 0            | 0           | 25        | 75                 |

**Individual Results**

Figure 1 illustrates the outcomes for each participant detailing turn taking during baseline (Phase A), intervention (Phase B), and maintenance data collection. During baseline, Participant 1 took turns a mean of 1.80 times per day, which increased to 6.28 times during intervention. During maintenance data collection taken two weeks after the intervention, Participant 1 increased turn taking to a mean of 6.60 times. Participant 2 took turns a mean of 3.60 times per day during the baseline data collection. This increased to 8.15 times during the intervention phase. When maintenance data collection took place, Participant 2's mean increased to 9.00. Participant 3 took turns a mean of 1.08 times per day during baseline, which increased to 5.00 times during intervention. During maintenance data collection, the mean continued to increase to 6.00 incidences of turn

taking. Finally, during baseline, Participant 4 took turns a mean of 1.33 times, which increased to 3.67 during intervention. During maintenance data collection, the mean continued to increase to 4.00.

Data reflects continuous progress for all participants baseline to intervention. Maintenance data shows Participant 4 maintaining skills post intervention, and Participants 1-3 continuing to increase skills post intervention. All four students increased their mean frequency of turn taking from baseline to intervention, and maintained or increased turn taking skills post intervention.

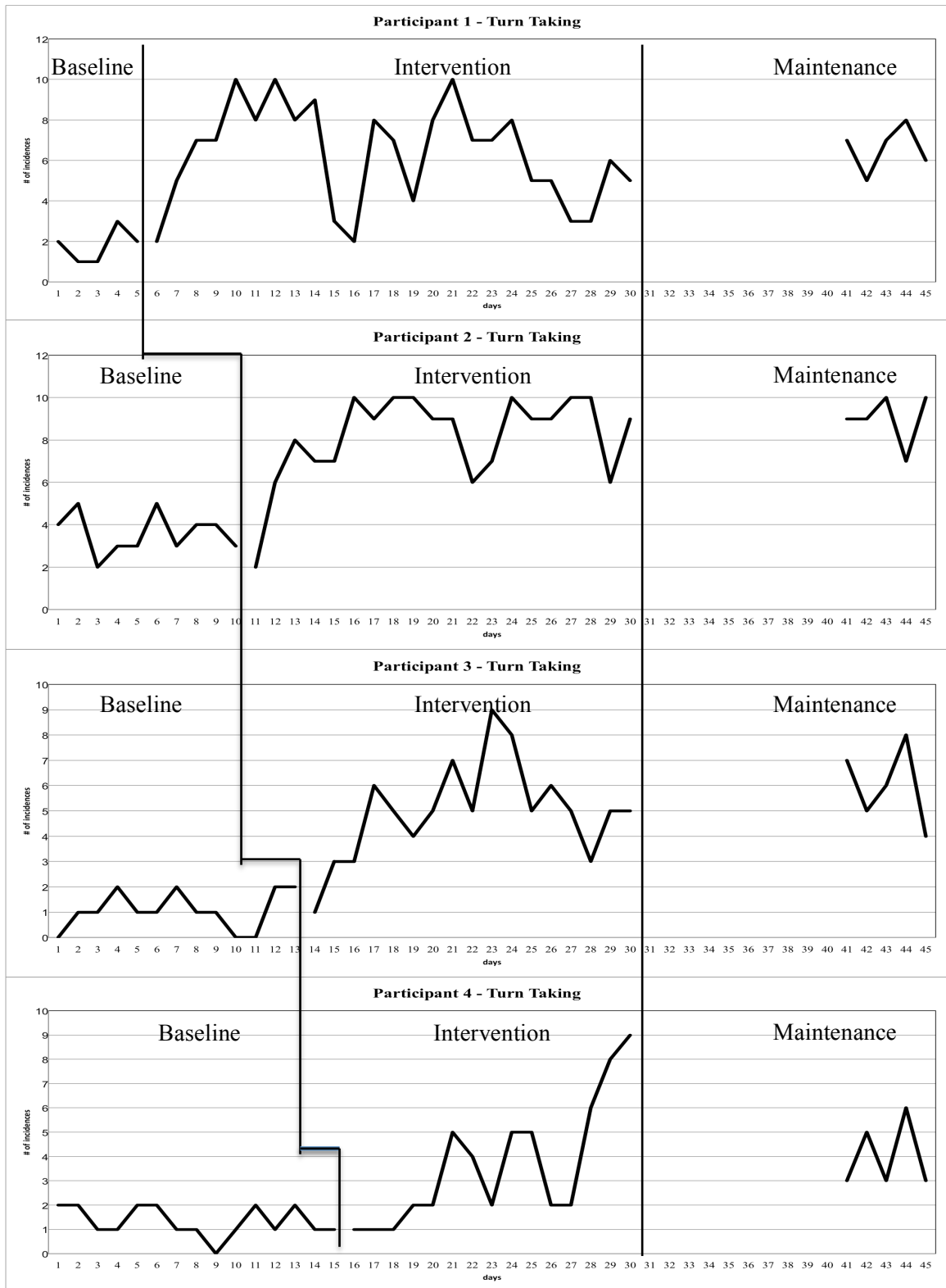


Figure 1. Turn Taking



Figure 2 illustrates the results for each participant detailing initiation of play during baseline, intervention, and maintenance data collection. During baseline, Participant 1 initiated play a mean of 1.60 times, which increased to 2.80 times during intervention. During maintenance data collection taken two weeks post intervention, the mean again increased to 4.00. During baseline, Participant 2 initiated play a mean of 2.80 times, which increased to 3.05 times during intervention. After maintenance data was collected two weeks after intervention, the mean decreased to 0.60 times, below the baseline level. Participant 3 initiated play a mean of 0.46 times during baseline, which increased to 1.35 times during intervention. During maintenance data collection the mean increased to 1.80. Participant 4 initiated play a mean of .53 times during baseline, which increased to 2.80 during intervention. When maintenance data was collected, Participant 4's mean decreased to 2.6. After analyzing the data, it appears that two out of the four students were able to maintain the skills they were taught during the intervention phase.

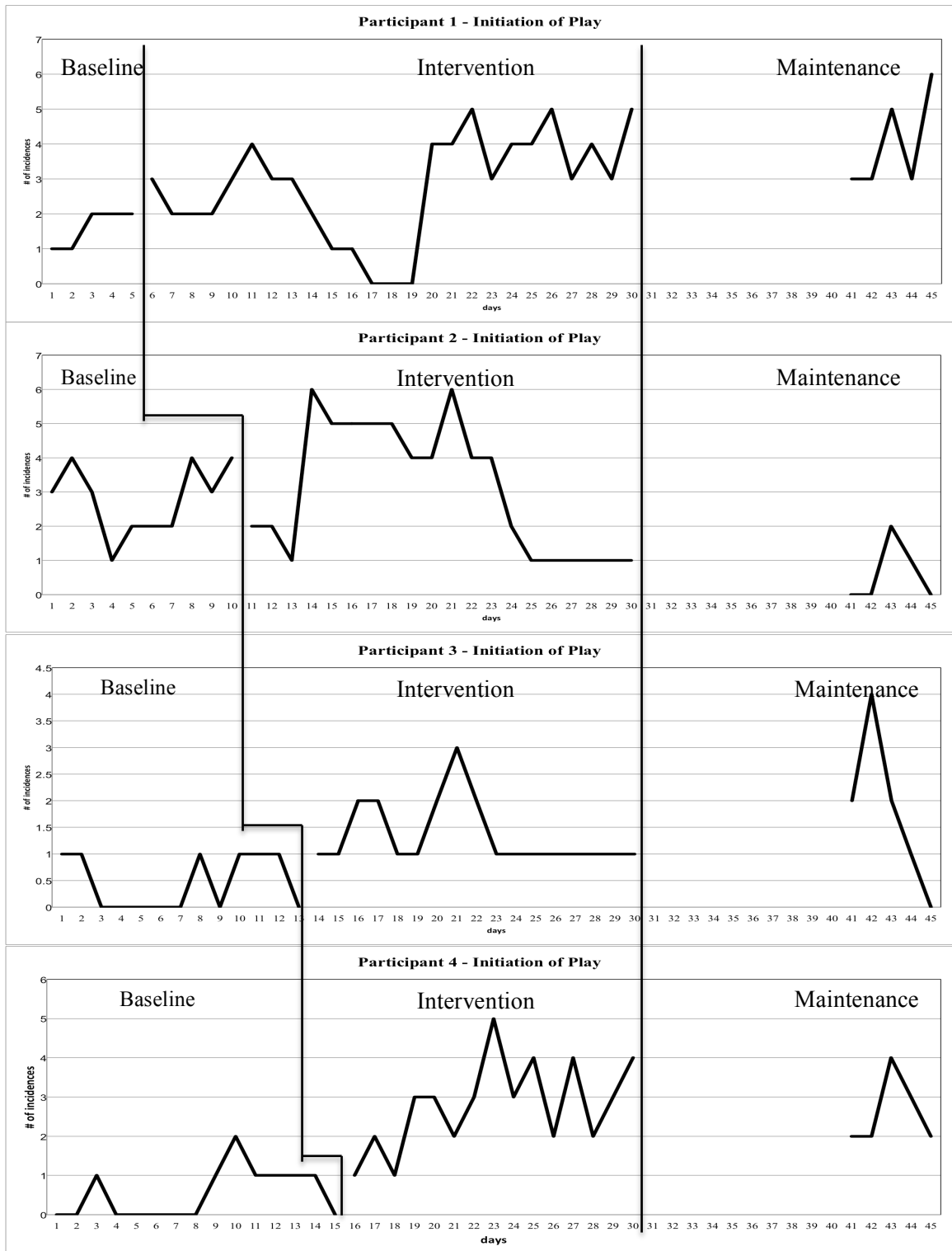


Figure 2. Initiation of Play

## Chapter 5

### Discussion

The purpose of this study was to determine the effectiveness of PRT as a peer-mediated intervention for increasing social interactions among children with ASD and Communication Disorders. More specifically, this study focused on the students' abilities to initiate play, as well as take turns during unstructured play. At the end of the study, the typical peers were given a satisfaction survey to capture their satisfaction participating as peer-mediators.

### Findings

The results showed that all students increased their social interactions from baseline to intervention in both the area of turn taking, and initiation of play, suggesting that peer mediated PRT is an effective intervention for kindergarten students with ASD and Communication Disorders. For example, Participant 1 increased the frequency of turn taking by almost five times from baseline to intervention. All participants displayed continuous growth in turn taking from baseline through the maintenance data collection period.

In regards to initiation of play, the participant outcomes were more varied. Participant 1 and Participant 3 showed an increase over all three data collection periods. Participant 2 and 4 displayed an increase in skill acquisition from baseline to intervention, however their mean frequency of initiation decreased after the intervention was removed, as evidenced by maintenance data collection. This data suggests that the intervention did not generalize to the classroom environment for Participants 2 and 4. This may also be explained by the timing of the study occurring during the final months

of the school year. Participant 2 in particular appeared to be highly effected by the end of school activities and the upcoming summer vacation.

All students showed an increase in turn taking baseline to intervention suggesting PRT provided by peers was effective. Typical peers appeared to continue serving as mentors to the participants in the area of turn taking post intervention, which may have provided for the maintenance of skills. In regards to initiation of play, however, the typical peers did not continue serving as mentors to the participants as they did with turn taking. It seems the area of initiation requires more adult support. For future studies, it is recommended that teachers check in weekly with the typical peers post intervention to support the continuation of skill maintenance.

The inability to maintain the skill of initiation could be due to the use of typical peers as the source of skill retrieval instead of an adult. . The typical peers often had the students engage in group activities such as passing a soccer ball, playing duck, duck, goose, and taking turns going down the slide. These experiences provided ample opportunities to mentor the students in the area of turn taking, but the skill of initiation emerged as more difficult to teach. When feedback was gathered, Participant 3 shared that it was “easier” to encourage their friends to take turns then to have them initiate play. This participant also shared that in order to practice having them ask a friend to play, they had to encourage and boost them up before doing so. This suggests PRT may be more appropriate for mentoring students in the area of turn taking than initiation.

In terms of student satisfaction, the survey results reveal that all four typical peers enjoyed being part of this study. They enjoyed helping others and learned acceptance and

respect for students of all abilities. All four participants stated that they would be interested in participating in a similar study or project again.

### **Limitations**

This study had several possible limitations. One limitation may have been the age of the typical peer mentors. This study incorporated kindergarten students aged five to six. The results may have differed if the age of typical peer was slightly older. The participants' young age and lack of experience serving as a leader may have affected the results.

Another limitation to this study was the time frame in which it was conducted. This study was a master's thesis conducted during a spring semester. A limited time frame between university IRB approval and the end of the school year led to the study being conducted up to the last week of school. In the beginning of the study, April, the students were well engaged with learning. However, as the study drew towards the end of May, student interest levels appeared to decrease as summer excitement began to set in.

Another limitation may have been the pairing of students. Some of the students with special needs were more interested in working with typical peers than others. It depended on the day if they were interested in working together or not. Some of the participants with special needs, when having a more difficult day, lacked the focus or interest in working with their typical peer. There were days that meltdowns occurred, however, with the help of behavior plans, we were able to redirect and continue to take applicable data.

Finally, a limitation inherent to single subject design is small sample size. This study was conducted with 4 students. Data from this study may not be generalizable

beyond the 4 student participants, and additional research with a larger sample size is warranted.

### **Implications and Recommendations**

Although the study has its limitations, the data suggested that the use of PRT was an effective intervention for increasing social interactions; more specifically turn taking and initiation of play, for students with ASD and Communication Disorders. Previous studies suggested even stronger outcomes for initiation of play, however, which could be a result of using older typical peers as peer-mediators (Owen-DeShryver et al., 2008; Rogers, 2000; Terpstra et al., 2012; Pindiprolu, 2012). Along with the use of older children, the prior research also included children with ASD of varying functional levels. This study was unique in that PRT was provided for students with ASD, and students with Communication Disorders. It is recommended that more research be conducted on the effectiveness of PRT for students of varying ages and grade levels, for students of varying functional levels, and for students with various disabilities. Furthermore, as suggested by prior researchers (Harper, Symon, & Frea, 2008), it is recommended that future PRT research take place during unstructured time, such as recess or center time, to allow for flexibility of activities, the use of typical peers, and ample time for data collection.

### **Conclusion**

This study was successful in that it increased social interactions among students with ASD and Communication Disorders using typical peers as peer-mediators. Further research is needed to validate the findings and determine the appropriate age in which typical peers can implement the strategy of PRT most effectively. Perhaps more peer-

mediated activities can be incorporated into classrooms, as the research continues to document positive gains in using typical peers to support students with disabilities.

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## Appendix A

### Data Sheet

| During free play,<br>centers, inside recess:  | Initiate a play<br>situation ( <i>e.g., eye<br/>contact, holding<br/>out a toy,<br/>verbalization,<br/>etc.</i> )   | Take turns<br>during play | Join in idea for<br>play from peer |  |  |  |  |  |   |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |
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|   |   |                           |                                    |  |  |  |  |  |   |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |
|   |   |                           |                                    |  |  |  |  |  |   |   |  |  |  |  |  |  |  |   |   |  |  |  |  |  |  |  |  |

+ = Independent

P = Prompted

X = Refused or problem behavior

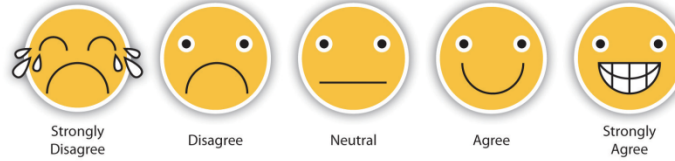
## Appendix B

### Likert Scale

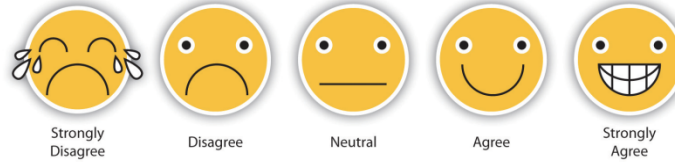
1. I enjoyed learning new play skills.



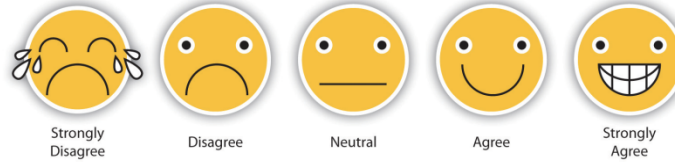
2. I enjoyed teaching my friends.



3. I learned something new.



4. I helped my friends.



5. I would do this again.

