

Moving Beyond the Speech Room: Using Peer Mediated Instruction and Intervention
(PMII) to Foster Social Skills Development

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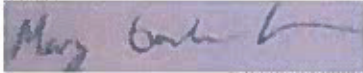
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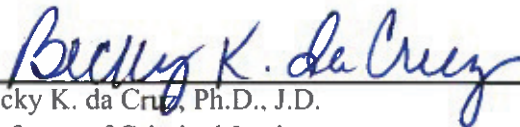
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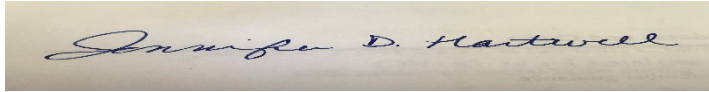
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ABSTRACT

As diagnostic numbers within autism continue to climb, educators, parents, and other professionals have an ever-increasing demand to provide effective, empirically based programs that foster improvements across a variety of developmental, academic, and social needs. This study incorporated use of a Peer Mediated Instruction and Intervention (PMII) program within a general education classroom setting aimed to increase the number of initiations and conversational turn-takes in students with an autism spectrum disorder (ASD) diagnosis. The study also aimed to determine if such a program changed and enhanced the perspective of general education students towards their peers with disabilities. In addition, documenting if carryover of skills by participants towards those students not part of the PMII program occurred following treatment withdrawal. This study took place over a 7-week period within the third grade science/social studies classroom, and included one week for baseline data collection, 5-weeks of treatment, and a final week of maintenance data collections following withdrawal of treatment. Visual analysis across all phases for data sets of initiations and conversational turns revealed differences in level between the baseline and the treatment phases. The highest variability across the treatment phase indicated widely varying data points, combining to exhibit a “noneffect.”

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DEDICATION

This dissertation is dedicated to my husband, Heath, and our two children, Judson and Vivian. Without your support and love, this journey would not have been completed. We started and finished together, and this will be a wonderful gift to our family.

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Chapter I

INTRODUCTION

Problem Statement

The National Institute of Mental Health (NIMH) defines autism spectrum disorder (ASD) as a group of developmental disorders that are associated with a wide range of symptoms, skills, and levels of disability. Those with ASD often have several common characteristics, such as repetitive behaviors, limited interests or activities, and ongoing social deficits specific to communicating and interacting effectively with others. The NIMH states that those symptoms hurt one's ability to function socially in all areas of life. Understanding nonverbal communication also requires recognizing the body language of others and infer meaning by integrating all the available nonverbal and contextual cues in the environment (Boutot, 2017). As diagnostic numbers continue to climb, educators, parents, and other professionals have an ever-increasing demand to provide effective, empirically based programs that foster improvements across a variety of developmental, academic, and social needs.

Federal legislation, such as the No Child Left Behind (NCLB) Act of 2001, continues to push for inclusive services and access to the mainstream classroom setting and curriculum for all those needing special education services. Educators and other school-based personnel must focus on implementing evidenced-based practices to allow each child, those with and without disabilities, to achieve success within their educational environments. These practices have met rigorous peer review and other standards with

consistent and reliable fidelity yielding a history of positive results (Simpson, LaCava, & Garner, 2004). The American Speech-Language Hearing Association (ASHA) also promotes incorporating evidence-based interventions into clinical and educational practices, which focus on use of high-quality research evidence integrated with practitioner experience and the preferences of clients, students, and families (Byiers, Reichle, & Symons, 2012).

In addition to the academic focus, fostering of social skills development is another crucial component. Access to the mainstream curriculum occurs within the inclusive general education setting. Within this setting, those with autism have expectations of being educated and demonstrating adequate performance while also being surrounded by their non-disabled or “typical” peers. In turn, professionals must be able to provide effective intervention programs that target social skills development for these students to enhance their success in the mainstream environment. Over the years, a number of methods have been developed, implemented, and evaluated empirically with various degrees of success. Unfortunately, school personnel often report not feeling adequately prepared to help this population, with research noting a lack of implementation of evidence-based practices in school settings due to limited time, resources, and a failure to produce improvements in other environments (Battaglia & Radley, 2014). Specific to speech-language pathologists (SLPs), who are often the facilitators of social skills interventions, they too cite a lack of time for accessing research resulting from large caseloads, understaffing, and insufficient planning time (Wilson, 2013). Although inclusion has shown to be of benefit academically, there remains continued stereotyping

of students and a lack of social integration for those with ASD (Kalyva & Avramidis, 2005).

One such intervention program implemented and evaluated over years of research is peer-mediated intervention and instruction (PMII), which aims to teach typically developing peers ways to interact with and help those with ASD acquire new skills by increasing social opportunities. These social opportunities occur ideally in natural environments such as school settings. Per Battaglia and Radley (2014), within peer mediated instruction and intervention, peers are trained to serve as intervention agents, learning how best to initiate and respond to social interactions with ASD peers. It is erroneous to assume that simple immersion in the typical setting is enough support for students on the spectrum. The ultimate goal is to help those with ASD to generalize newly acquired skills to a variety of settings. PMII implementation includes pairs or small groups beginning in preschool and extending through the high school years. For younger children the focus can center on peer-initiation training or the use of a buddy approach to facilitate skill acquisition. Older students benefit from social networking strategies, such as with the use of social clubs.

Statement of Purpose

The purpose of this study was to incorporate the use of a PMII program within a general education classroom to increase the number of initiations and conversational turn-takes in students with an autism diagnosis. In addition, the current study sought to determine if such a program would change the perspective of general education students towards their peers with disabilities. Finally, the study aimed to determine if those with

autism demonstrated learned social skills with typical students not trained as part of the PMII program.

Research Questions

RQ1: Will the use of PMII within a general education classroom affect the number of initiations in students with an autism diagnosis?

RQ2: Will the use of PMII within a general education classroom affect the number of conversational turn-takes in students with an autism diagnosis?

RQ3: Will the use of PMII within a general education classroom change the perspective of general education students towards their peers with disabilities?

RQ4: Will targeted and learned skills be demonstrated towards peers who were not trained as part of the PMII program?

The researcher hypothesized that there would be a positive increase in social skills for those with autism, as well as a demonstrated enhancement in the attitudes and beliefs of general education students towards their peers with disabilities. The researcher further hypothesized that the students within autism would demonstrate learned skills towards their peers not trained as part of the PMII program.

Overview of Methodology

This study incorporated the use of single-subject or single-case experimental design. Single-subject research is a popular choice in the field of special education. The design is useful when the researcher is attempting to change the behavior of an individual or a small group of individuals and wishes to document that change. Each of the three target participants met the criterion for an educational diagnosis of autism spectrum disorder and presented with a need to foster pragmatic (i.e. social) language development.

Those chosen were all from the same elementary school, within the same third grade special education ASD classroom setting, and each participated daily in academic segments in a general education classroom. Three general education peer models were chosen to be a partner for each target student. Determination of student selection incorporated teacher recommendation and baseline questionnaire responses.

The study took place over a 7-week period within the third-grade science/social studies mainstream classroom, and included one week for baseline data collection, 5-weeks of treatment, and a final week of maintenance data collections following withdrawal of treatment. Within PMII peers are trained to serve as intervention agents, learning how best to initiate and respond to social interactions with ASD peers. A combination approach addresses the need for direct skills instruction and the social-pragmatic use of language to have successful communication interactions with others. Peer modeling, written text cues, and direct adult instruction are all components of a combined PMII program. For purposes of this study, these combined components allowed for support of pro-social behaviors during academic small group instruction.

The daily group began with a developed social skills lesson with the six participating students. Topics included initiating greetings, starting conversations, friendship skills, giving compliments, asking for help, working with partners, and disability awareness education. The lead researcher combined the use of verbal modeling followed by visual written text cues for students specific to examples of initiating and asking questions to start conversation. She also provided verbal praising throughout the treatment phase. Following completion of the small group lesson, the lead researcher transitioned to the class academic task, which varied each day. Academic lessons

included partner and project work, completion of notes and study guides, game play for test prep, and research in a school computer lab. During the first four weeks of the study, the target students participated in a project-based group-learning activity with their peer partner focused on the American colonies.

For purposes of data collection, an *initiation* occurred if the student sought out another person to either verbally greet, make a request and/or comment, or ask a question. *Conversational turn-taking* occurred when the student demonstrated the ability to comment or question with another person, on topic, for at least two exchanges. Data collection included using a frequency count and tally mark system by both the lead researcher and the special education paraprofessional who served as an observer for all sessions. Visual analysis of the data examined the causal relationship between the independent variable and dependent variables by focusing on measures of level, trend, and variability.

Rationale and Significance

Students within special education programs have reported increased rates of bullying perpetration and victimization as compared to their general education peers (Rose, Swearer, & Espelage, 2012). At-risk factors were specific to physical attributes, personal characteristics, and school-related factors, such as having to receive specialized services. It has been argued that children and adolescents with learning disabilities have deficits with interpreting verbal and nonverbal communication, combined with poor social skills, which may contribute to them being bullied and being aggressive themselves (Rose et al., 2012). One could hypothesize that those with autism are at an even greater risk to become victims of bullying, due to the pervasive social skills deficits

that are a common core feature. Furthermore, as children advance in school, the focus shifts to academics, which in turn can limit further social opportunities. The increasing social challenges for adolescents and young adults with ASD can be linked to the greater complexity of peer relationships, a growing drive toward identity exploring, a lack of availability and knowledge of what services are available, as well as an uncertainty about the balance of responsibility between themselves and those who support them (Gantman, Kapp, Orenski, & Lagueson, 2012) Social deficits in young adults with ASD may continue to exacerbate and lead to problems with friendships, romantic relationships, daily living, and vocational success. Many have self-reported that these difficulties in establishing and maintaining social relationships, have led to increased feelings of loneliness and mental health problems. There is a common self-perception of a lack of social support from peers, friends, and parents that positively correlates to loneliness, poor friendship quality, depression, anxiety, and withdrawal (Gantman et al., 2012).

Role of the Lead Researcher

For purposes of this study, the lead researcher provided direct implementation of a PMII program for target students within the mainstream classroom. Program design focused on the social skills needs of the target students. The special education paraprofessional who worked with the target students daily served as an active observer and data collector for reliability. She was taught how to support and encourage the social skill needs of the target students, as she would continue to work with them in the mainstream classroom following completion of the study.

Organization of the Dissertation

The organization of this dissertation consists of an opening introduction, followed by a comprehensive literature review covering wide-ranging topics specific to autism spectrum disorder. The third chapter reviews study methodology and implementation, followed by chapter four presenting study results. The concluding fifth chapter presents a review of evidenced-based practices, and discussions specific to study results, study limitations, recommendations for future research, and concluding thoughts. References to developed tables and appendices are noted throughout chapter text.

Chapter II

REVIEW OF RELATED LITERATURE

Introduction

The American Psychiatric Association's (APA) Diagnostic and Statistical Manual, Fifth Edition (DSM-5) describes ASD to include persistent deficits in social communication and social interaction across multiple contexts, manifested by impairments in social-emotional reciprocity, nonverbal communication, and with developing, maintaining, and understanding relationships. From an educational standpoint, the Individuals with Disabilities Education Act (IDEA) defines autism as “a developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three, that adversely affects a child's educational performance” (Special Education Guide, n.d.). To date, approximately one in 59 children have been identified with ASD per estimates from the Center for Disease Control's (CDC) Autism and Developmental Disabilities Monitoring (ADDM) Network (Centers for Disease Control and Prevention, 2018). With the rise in diagnoses, educators, parents, and other professionals have an ever-increasing demand to provide effective, empirically-based programs that foster improvements across a variety of developmental needs.

In order to effectively provide such programming, it is imperative to also understand the history of autism leading up to the current research. A comprehensive review begins with early diagnostic procedures, the neuroscience behind autism, current

assessment measures, typical language development as compared to those with autism, as well as a review of evidenced-based practices with a focus on the use of peer mediated interventions to foster social skills development amongst this population.

History of Autism

Eugen Bleuler first devised the term autism in 1911, referring to withdrawal behavior as a symptom associated with schizophrenia (Cohmer, 2014). In 1943, Leo Kanner provided the earliest known research into defining autism as a unique category, through his paper titled “Autistic Disturbances of Affective Contact.” A total of 11 cases were described, citing an emergence of a number of essential commonalities that when combined allowed for a unique syndrome. Kanner (1943) reported that the most prevalent characteristic that was fundamental to this disorder was a child’s inability to relate themselves in the typical way to people and situations from the beginning of their lives. The children would disregard or ignore anything that came from the external environment. Instead of adjusting their body posturing to those who held them within the first few months of life, it could take two to three years for these children to demonstrate such behavior. The children would ignore any direct physical contact, presentation of food, or any such motion or noise that would aim to disrupt this drive to be alone. Conversely, the children themselves would gladly produce sounds that they feared from others and move objects to their content. These noises were monotonously repetitive, as were verbal utterances, with behaviors governed by an obsessive desire for maintenance of sameness that only the child himself may interrupt rare occasions. Objects that did not change appearance and position were accepted and viewed as not interfering with the child’s need to be alone. People, so long as they left the child alone and regardless of

their relation, were treated in the same manner as were common office items, such as a desk or bookshelf (Kanner, 1943).

Most of the children within Kanner's research acquired the ability to speak at the typical age with language patterns consisting mainly of naming nouns, identifying objects, labeling colors, and expressing numbers that were not necessarily specific to an amount. The inability to use language in any other way coupled with excellent rote memory and good cognitive potentials, often led parents to inundate their children with more and more, in turn allowing language in large part to become a self-sufficient, semantically, and conversationally valueless or grossly distorted memory exercise (Kanner, 1943). Parents and other family members were strongly preoccupied with ideas of a scientific, literary, or artistic nature, and lacked a genuine interest in people. They were highly intelligent and not always warmhearted towards their children, leading Kanner to question what extent these patterns contributed to the behaviors of their children.

Beginning with Kanner in 1943 through the 1970's, accounts of early autism encouraged psychiatrists to focus on deemed emotionally cold or refrigerator mothers (Cohmer, 2014). For years of his work, Kanner described autism's cause as rooted in an emotional refrigeration from parents, with many mothers who reported deep feelings of anguish and resentment towards professionals who made them feel at fault for their children's disability (Cohmer, 2014). Beginning in the late 1950's, Kanner began to correspond with Benard Rimland, a psychologist, with a son diagnosed as autistic. Through his work, Rimland concluded that autism was the result of biological factors and not a psychological disturbance (Cohmer, 2014). He further argued that the assertions

made by Kanner and fellow author Leon Eisenberg claiming that the home environment played a role in the genesis of autism was based on inferring cause from a correlation of events, without providing any evidence of a causal relationship (Cohmer, 2014). By 1969, Kanner officially stated that he no longer thought autism was due to parenting, but was in fact innate. Rimland is credited for rejecting the refrigerator mother theory as fiction and encouraging biological research into autism, specific to neurological development (Cohmer, 2014).

Neuroscience and Autism

Heredity within Autism

Currently, autism is defined as a biological disorder and not rooted in deficient parenting or other social factors (Ozonoff, Rogers, & Hendren, 2003). Even within his work, Kanner described identifying features considered important to diagnosis, including comorbid anxiety and mood issues, and physical features such as macrocephaly. Ozonoff et al. (2003) reported that genetic factors appear to have a strong role in the development of autism, citing the recurrence risk after the birth of one child with autism as well as the concordance rate among twins. Autism occurs in tandem with other genetic abnormalities. Transmission of some type of genetic anomaly occurs in the families of autistic members that is not present in families of children with other disabilities. According to Moldin and Rubenstein (2006), studies have shown that the heritability estimates for autism are greater than or equal to 90%, concluding that it is one of the most heritable neuropsychiatric disorders. Studies have indicated several genetic variants interacting in some way to produce a clinical phenotype that includes three to four predisposing genes, with up to as many as 15 loci per some reports. Documented

abnormalities for chromosomes 15 and 7, along with differences of the sex chromosomes, have been most frequently reported. Gadia, Tuchman, and Rotta (2004) reported that whole genome analysis revealed strongly positive signs of correlation on chromosomes 2, 7, 1, and 17. Moldin and Rubenstein (2006) further noted the presence of several characteristics specific to social reticence, communication difficulties, and rigidity, evidenced in the relatives of children diagnosed with autism. Although abnormalities have been documented, the relation between genetics and the expression of autism needs further investigation, with suggestions that five to as many as 100 loci may be involved, with no definitive answers yet to be found (Gadia et al., 2004).

Social Brain in Autism

An additional component not being addressed within neuroscience is study of the *social brain* (Moldin & Rubenstein, 2006). This more recent area of focus centers on the evolution of the brain and cognitive functions that separate humans from other species, allowing for implications as to the behavioral pathology that autism and other mental health and degenerative disorders (Moldin & Rubenstein, 2006). Kim et al. (2015) noted that for the past 30 years various brain imaging studies, including the use of functional magnetic resonance imaging (fMRI), have investigated the neural correlates of social deficits in autism. Research begins by first asking what processes are involved in social behavior. For a behavior to result from a presented social stimulus, such as interpreting facial expression, specific processes need to occur. Initially one must perceive that stimulus and be able to evaluate the social significance. A response is generated dependent upon motivation, what emotions may be generated that could impact the response, and whether or not the context allows for a social response (Moldin &

Rubenstein, 2006). Kim et al. (2015) described this as a three-step process. Step one is the recognition of the facial expression of another person. During step two, one must be able to experience and share the emotional state of another person by imitating and reproducing the recognized emotion within their own mind, termed the “empathic process.” For step three, one must be able to take on the perspective of another, to understand the basic situations and intention of someone else, and predict and perform appropriate responses, what has been termed as the “mentalizing process.”

Theory of Mind

This deemed mentalizing process began with the work of Simon Baron-Cohen (1989) as one’s “theory of mind” (ToM). Level one ToM focused on perspective taking and being able to think about another person’s thoughts regarding an objective event. Level two encompasses the ability to consider what another person may be thinking specific to a third person’s thoughts about an objective event. Within his own work, Baron-Cohen (1989) reported that only 29% of the autistic subjects screened were able to attribute beliefs at the simplest level. For those who did pass, none attributed beliefs at a more advanced level. It has been suggested that these deficits can be deemed as a type of “mindblindness.” Baron-Cohen has further argued that these individuals lack the ability to understand people, while possessing an overdeveloped ability to understand systems, movements, and mechanical thinking (Link, 2008).

Executive Function

Among the cognitive development correlates of ToM is that of executive function (EF). Executive functioning refers to the higher-order self-regulatory cognitive processes, including being able to control attention and motor responses, resistance to

interferences, and delays in gratification (Carlson, Mandell, & Williams, 2004). EF is typically associated with structures in the prefrontal cortex and assessed using a variety of imitative and non-imitative tasks. Research has pointed to both direct and indirect influences that EF may have on the development of a mature ToM. It is thought that those with better EF skills will be more inclined to have good social and communication skills, allowing more opportunities to observe social interactions and learn about other people's minds. The ability to communicate about internal states may be ever important in the organization of self-control and the ability to reflect on the mental states of others (Carlson et al., 2004).

Brain Responses

Provided with adequate perception, evaluation, motivation, and context, the brain must then perform an appropriate behavioral and physiological response. The anatomical regions of the brain that appear to be consistently active in aspects of social functions are the amygdala, the orbitofrontal cortex, the cingulate cortex, several areas of temporal lobe, the medial prefrontal cortex, and the somatosensory cortex. The amygdala may serve a variety of functions specific to social stimuli including: 1) attaching a learned emotional state or reward/punishment to social stimuli, 2) facilitating appropriate behavioral responses through their interactions, and 3) evaluating environmental stimuli for potential dangers and coordinating a response which is involved in the generation of emotion that depending on the context, may either inhibit or facilitate social exchanges (Moldin & Rubenstein, 2006). Functional MRIs have shown that those on the autism spectrum activated the frontotemporal regions, but not the amygdala when making social inferences from the eyes as compared to control subjects. Children and adolescents with

autism have also shown abnormal amygdala activation when matching faces to emotion and assigning labels to facial expressions. When shown faces of expressions from happy to fearful, the various areas of the social brain relevant to social cognition showed reduced activation (Kim et al., 2015). For a happy face, those with autism showed hypoactivation of the left insular cortex. When presented with a fearful face, there was lower activation of the right amygdala among other areas (Ha, Sohn, Namwook, Sim, & Cheon, 2015). This deficit may be a deterioration in the ability for visual analysis of emotional faces and subsequent deficits in transmitting and processing information for emotion recognition and imitation. Those with autism may also lack social motivation allowing for a lack of interest in attending to the face. An alternative view presented by Moldin and Rubenstein (2006) is that individuals with autism perceive social interactions as threatening and therefore avoid the interaction as a means of easing anxiety. Research has found that the amount of time persons with autism spent looking at the eye region of the face showed strong positive correlation with amygdala activation, but not in typically developing control subjects. It is then plausible that those with autism are experiencing a heightened emotional or even fearful response when looking at another person's eyes, regardless of whether they are familiar. Based on current knowledge of amygdala function and pathology, Moldin and Rubenstein (2006) concluded that abnormal amygdala development could then contribute to abnormal fear and anxiety processing in children with autism, which may in turn exacerbate social avoidance and further social withdrawal.

Restricted and Repetitive Behaviors

Investigations of restricted and repetitive behaviors (RRBs) occur to a lesser extent than social communication. Symptoms expression does not occur in the same manner and can change over time. Ha et al. (2015) reported on some studies demonstrating children aged 18-24 months of age with an ASD diagnosis had more frequency and longer duration of RRBs than typically developing controls. Younger children exhibited more motor and sensory repetitive behaviors, with more complex behaviors observed in older children. A few studies have noted associations between RRBs with functional and structural alterations in the cortical-basal ganglia circuitry, a cluster of nerve cells involved in motor and learning functions (Ha et al., 2015).

Biological Processes within Autism

Beyond studies involving specific regions of the brain, there is mounting evidence that the underlying biological processes specific to autism are ongoing and may result in changes in brain weight, volume, and neurochemical characteristics (Moldin & Rubenstein, 2006). Imaging studies have noted a marked increase in brain volume from two to 4.5 years of age, followed by a deceleration of growth. Brain development during early childhood appears dominated by an enlarged brain volume of the frontal and temporal lobes followed by arrested growth and a possible decline in volume around 10-15 years of age (Ha et al., 2015). Within the frontal lobe, Broca's area is responsible for the ability to put together words syntactically and grammatically in order to create expressive language. For those with damage present, they are typically able to understand language but not able to effectively express language (Boutot, 2017). Wernicke's area is the portion of the brain where receptive language is processed. Those

with damage to this area may have comprehension and word-finding deficits. These two distinct areas of the brain work in tandem for language processing in a typically developing brain. For those with autism, these areas often do not work together, although for reasons not fully understood (Boutot, 2017). Ha et al. (2015) reported that several neuroimaging studies have suggested that atypical activations in both Broca's and Wernicke's areas may play a crucial role in impaired language processing in ASD. The left inferior and middle frontal gyrus along with the left angular gyrus have shown hypo-activation in an adolescent with ASD as compared to a typically developed control (Ha et al., 2015). Neuroimaging studies reported by Gadia et al. (2004) indicated 90% of boys between 2-4 years of age had a larger volume of cerebral and cerebellar white and gray matter as compared to controls, which was not observed among older children with autism. Early white matter differences may explain why the brain appears with an atypical manner of connections and associated accelerated expansion of gray matter (Ha et al., 2015).

Stress studies have indicated differences in the serotonergic and cholinergic systems of those with autism, allowing for hyper-responses when in distress. This could be the result of a "difference in the level of perceived stress, an overelicitation of the psychologic response, or even deficits in the stress response or arousal systems" (Moldin & Rubenstein, 2006, p. 309). A proposed hypothesis is that damage has occurred to the limbic system in the early stages of fetal life, leading to abnormal development of the brain areas connected directly to the limbic system (Inui, Kumagaya, & Myowa-Yamakoshi, 2017). Specifically, there could be a delay in the onset of synapse elimination and axon pruning. This delay can result in hyperconnectivity in the ASD

brain as compared to the typically developed brain. The autistic brain exhibits an excessive excitation/inhibition (E/I) neuron ratio, caused by local hyperconnectivity and a deterioration of inhibition (Inui et al., 2017). An increased ratio can influence the sensory, memory, and emotional systems. Building on deficits in pruning, Thomas, Davis, Karmiloff-Smith, Knowland, and Charman (2016) proposed that since pruning has differential onset across areas of the brain, ASD should first emerge with sensory and motor atypicalities, followed by higher-level cognitive differences. Often, the initial symptoms of autism include social orientation and attentional deficits affecting social skills development. The atypical, or over-pruning hypothesis, may have a greater impact on long-range connectivity, thus impairing integrative functions, which can lead to a unique behavioral profile in ASD (Thomas et al., 2016). Although initial findings from longitudinal studies of at-risk infants appear to support the hypothesis, researchers note that it is intrinsically developmental and involves a time-varying multi-system process. Thomas et al. expect secondary abnormalities from each impacted system, along with compensatory processes, and interactions with environmental influences. They concluded that this idea of widespread deficits contrasted with approaches proposing narrow deficits. Future research should focus on examinations of early sensory and motor skills, along with brain measures that attend to processes of generating and eliminating brain connectivity.

Typical Skills Development and Autism Differences

Early communication development presents as an organized process that reflects how young children think about the world and what is key to them within it (Cohen & Volkmar, 1997). Language is one component of communication and defined as a rule-

governed system of abstract symbols, with components specific to syntax and morphology, semantics, and pragmatics (Boutot, 2017). Beginning from gestures to single words and increasing to sentences, children will look at what their caregivers are doing, what is being exhibited in certain situations, and how to interpret what is being asked. In turn, parents provide gaze shift, intonation, gestures, and object functions (Cohen & Volkmar, 1997). Those with typical language development will exhibit a variety of nonverbal communicative behaviors by the end of their first year, specific to requesting, rejecting, reaching towards objects, and reacting to objects, people, or events. By 12 months of age, nonverbal behaviors pair with vocalizations, then speech, allowing for a rapid increase in both understanding and verbal expression (Cohen & Volkmar, 1997). In addition to the names of common objects and people, children begin to learn the social words used for greetings, as well as how to express ideas about object permanence. As children move beyond one-word utterances, they begin to develop a structure to their language, referred to as syntax, combined with their vocabulary or semantic knowledge to form increasingly complex utterances.

Social Pragmatic Acquisition

Wetherby and Prizant (2000) presented the social pragmatic approach to language acquisition considered within a transactional perspective to development. This model focused on the structured social world of the child and their ability for tuning into and participating in the social world around them. This perspective focused on the reciprocal, bidirectional influence of the child's own social environment, the level of response from communication partners, and the child's developing communicative competency. A child's emotional and physiological regulation, which allows them the capacity to be

ready to learn and participate in a social context, is a crucial foundation to this model of development (Wetherby & Prizant, 2000). The ability to maintain some level of emotional and physiological regulation influences development, coupled with caregivers effectively responding to produced signals, which allows for mutually satisfying transactions in everyday interactions. Children are engaged in social interactions during which they attempt to understand and interpret the communicative intentions of the adults around them to make sense of situations (Wetherby & Prizant, 2000). As children continue to process language, they learn new words best during joint attention interactions with adults and other constants. These interactions often take place during routine situations, such as bathing, feeding, and changing, consisting of referential looking and gaze shift between the object and the adult.

Joint Attention

Wetherby and Prizant (2000) further noted that children's emerging ability to engage in nonlinguistic mediated joint attention tasks with adults is inherently related to emerging linguistic development. Two types support the development of verbal and nonverbal communication skills. Response joint attention (RJA) involves an individual's ability to respond to initiations from others. Initiating joint attention (IJA) interactions involves eliciting interactions with a communication partner (Boutot, 2017). Children use protodeclarative initiations to share or engage in social interactions. Protoimperative initiations allow children to direct the behavior of others. Through joint attention, the child begins to understand communication as a back and forth process between two individuals. As a child engages in joint attention interactions, he learns his role in

directing the attention of others. Over time, he comes to understand that not only can he direct the attention of others, but others can also direct his attention (Boutot, 2017).

By 18-24 months of age, children possess a deep and flexible understanding of other individuals as intentional beings and are skilled in being able to determine the communicative intent of others in new situations. Through this imitative learning, children imagine themselves in the adult's role and enact that action, in turn allowing for comprehension of novel language and further linguistic development (Wetherby & Prizant, 2000). By two years of age, skills shift to allow for development of conversation, as children begin to understand an obligation to answer others' speech and start to take part in their own conversational exchanges (Cohen & Volkmar, 1997). As children transition from toddlers to early school age, language grows to include fully grammatical sentences, an expansion of vocabulary, and more elaboration of ideas and conversation. The social language skills that we use in our daily interactions with others have been termed *pragmatic language*. This includes what we say, how we say it, our non-verbal communication (eye contact, facial expressions, body language etc.) and how appropriate our interactions are in each situation. Effective pragmatic language skills allow children to elicit positive reactions from others as they engage in socially approved behaviors (Boutot, 2017). First, children learn these social behaviors and then demonstrate performance, paired with the ability of social competence in others that allows for reactions to the behaviors of their peers.

Social Attachments

Cohen and Volkmar (1997) described social skills development specific to the fact that typical infants are born with the motivation and ability to begin developing an

immediate social relationship with their caregivers. It was noted how newborns demonstrated preferences to the voice of their mother's as compared to other sounds, showed penchant for the human face over other patterns, and oriented themselves toward their parents. Initial socialization occurred through facial dialogue with the use of expressions and eye contact. Typically developing 3-to-7-month-old infants may learn that their own smile is associated with a caregiver's smiling behavior, allowing for a developing sense of relatedness to the caregiver that involves sharing affective experiences (Mundy & Sigman, 1989). This association may become an embodied cognitive schema and create an understanding that their smiles have value to others. By the end of the first year, infants have developed a consistent pattern of social behaviors in the form of attachments that serve to maintain closeness to caregivers and allow for exploration (Cohen & Volkmar, 1997). With time, social skills become increasingly differentiated based on development of peer relations and the ability to self-regulate. As children transition from preschool through school age, ToM becomes more complex with a deeper understanding that they may know something that someone else does not, and that a person can feel one thing but keep those feelings hidden. Children can self-monitor their speech for errors, negotiate play roles, make and respond appropriately to comments, and use language to maintain social status. Through adolescence, social stories include complex embedded episodes. Persuasion and argumentative skills are nearing adult levels, and they are able to comprehend ambiguous humor.

Development of Play Skills

In combination with language and social skills development, play skills demonstrate a typical progression over the first two years of life. Beginning first with the

simple mouthing and the manipulating of objects, and then transitioning toward combining objects in play. As play becomes more advanced, children begin to demonstrate functional use of objects as they transition to true symbolic play that becomes independent of action and is no longer limited by an object's physical properties (Cohen & Volkmar, 1997). The emergence of symbolic play reflects the cognitive capacity for metarepresentation (Mundy & Sigman, 1989). The mind can characterize a higher-order representation with a lower-order representation embedded within it.

Autistic Differences in Development

For those with autism, communication, play, and motoric skills, both gross and fine motor, can all present as deficient areas. Reports indicated that up to one-third of those with autism are nonverbal, with as many as 31% having an accompanying intellectual disability (Autism Speaks, 2017). As children grow older, any comorbid cognitive deficits can significantly affect continued development.

Communication Development

Cohen and Volkmar (1997) highlighted the communication development of those with autism. Most begin to speak late with a much slower rate of expressive speech development as compared to typically developing peers. Various retrospective studies using parent reports and video recordings collected throughout infancy and toddlerhood suggested that communication skills in autism were different from that of other children by the second year of life (Cohen & Volkmar, 1997). The children stopped engaging in communicative routines and demonstrated a language regression. They no longer learned new words and gradually stopped speaking altogether. Expressive skills showed greater development within the latter years, perhaps because speech is more accessible than

comprehension, and is increasingly the direct target of intervention efforts (Cohen & Volkmar, 1997). Those with autism often do not attempt to use their language to communicate, present with a low rate of verbal initiations, and have less frequent and varied speech acts, with the majority used to get attention and comment. Estimates of up to half of all children with autism fail to develop functional speech, and even among those with good expressive skills there are continuous and pervasive impairments in the use of language to communicate and comprehend more complex concepts (Howlin, 1998).

Echolalia is one of the most salient aspects of autistic speech, and defined as the repetition, with similar intonation, of words and/or phrases that someone else has verbalized (Cohen & Volkmar, 1997). Although often considered as inappropriate, echoing often serves identifiable and important communicative functions (Howlin, 1998). Echoing may be due to a child's lack of understanding and is likely to increase when in distress or anxious. Howlin stated that a greater understanding is needed as to why such behavior occurs to enable more appropriate interventions that target altering those factors leading to the echolalia. As with the use of echolalia, restricted and repetitive behaviors and interests are hallmark characteristics of autism. These behaviors may be the result of either sensory or communicative needs and could increase within stressful situations (Boutot, 2017). The need for sameness may also be a strength that can enhance independence in those with autism.

Further Deficit Areas

Additional impacted speech and language development includes articulation, word usage, syntax and morphology, vocal quality and intonation, as well as non-verbal

language. Cohen and Volkmar (1997) reported speech sound errors as having a great impact upon communication skills. The failure to use word meanings in correct contexts, slower development of grammatical forms, and peculiarities in vocal intonation and stress patterns, can all affect emotional tone of verbal exchanges and comprehensibility. For grammar, confusion and interchanging of personal pronouns is one of the most frequently reported language behaviors in autism and viewed as part of a more general difficulty with deixis, the aspect of language that codes shifting reference between the speaker and listener (Cohen & Volkmar, 1997). This could ultimately be the result of poor joint attention, perspective, and comprehension of not only the self but also others (Cohen & Volkmar, 1997). Research into how the core symptoms of autism manifest during adolescence and adulthood are limited. Most studies focused on age-related differences and/or changes in the severity of symptoms (Seltzer, Shattuck, Abbeduto, & Greenberg, 2004). Evidence suggests that impairments abate to some extent or become more “splintered” with age, showing improvements in only some behaviors and at different times. Not all individuals demonstrate improvements and those observed are rarely significant enough to move into the typical range of functioning. There can also be periods of plateauing or symptom worsening along the course of development (Seltzer et al., 2004).

Social Deviance

When discussing social deviance within autism, research has reported deficits within the first months of life. During this time, infants can fail to develop reciprocal eye contact and do not acquire a social smile (Cohen & Volkmar, 1997). They can be highly sensitive to subtle changes within the environment. The human face and social

interactions are of much less interest. Social behaviors do eventually develop, although children may not be as likely to seek physical comfort from caregivers, share interesting or pleasurable events, or even take preference in interaction with their parents (Cohen & Volkmar, 1997). Boutot (2017) categorized social skills deficits within several areas including nonverbal communication, social initiation, social reciprocity, and social cognition. Successful social skills require the ability to read and understand the nonverbal cues of others and clearly express thoughts, feelings, and intentions through facial expressions, gestures, and body language. Understanding nonverbal communication requires that we recognize the body language of others and infer meaning by integrating all the available nonverbal and contextual cues in the environment. Social initiation encompasses two categories including those who rarely initiate interactions with others and those who initiate frequently but inappropriately. Social reciprocity is specific to the give-and-take of social interactions. Those with ASD often engage in one-sided interactions in which they do all the talking or fail to respond to the social initiations of others to build on those conversations. They may continually derail conversations by changing the subject to fit their own self-interests. Finally, social cognition is as how one processes social information, which directly influences the success of social functioning. Social cognition involves the understanding of the thoughts, intentions, motives, and behaviors of others and ourselves. Knowing and understanding social norms, customs, and values is essential to healthy social interactions and influenced by our social cognition.

Joint Attention within Autism

By definition, joint attention skills are specific to those preverbal social communication skills that allow one to share with another person the experience of an object or event. Those with autism demonstrate preverbal communication that is almost entirely for requests, greatly affecting their ability to engage others and develop social relationships (Cohen & Volkmar, 1997). The degree to which young children with autism demonstrate nonverbal joint-attention behaviors has been associated with subsequent language development, and may be regarded as an important manifestation of the early aspects of autistic development (Mundy & Sigman, 1989). Autistic joint-attention deficits may involve a disturbance in the processes of affective expression and sharing affect with others. Children with autism infrequently display these behaviors. If shown, there is often a deviance in that the type of affect paired with attention behaviors are different from those displayed within typical development (Mundy & Sigman, 1989). Those with ASD demonstrate a difference in the function of their interactions with others and are more likely to engage in protoimperative communication (Boutot, 2017). Disordered joint attention impedes the understanding of the social nature of communication, and if the child does not understand this social function, his communicative interactions continue to focus on personal desires (Boutot, 2017).

Imitation and Play

Toward the end of the first year, play becomes more object focused and children begin to imitate caregiver's actions with toys. Imitation games involve affective gestures among mother-child dyads, and remains one of the most common, stable patterns of interaction throughout early childhood (Ingersoll, 2008). Reciprocal imitation initiates

interactions between toddlers and often leads to maintained or increased social interactions (Ingersoll, 2008). Imitation of peers serves to increase and refine interactions and communicates a common understanding of ongoing activities. Younger children with autism have consistent difficulties in imitating simple body movements and those that include objects, as they will seldom imitate their parent's actions and are less versed at elicited attempts (Cohen & Volkmar, 1997). Through a review of several research studies, Ingersoll (2008) reported a correlation between imitation and joint attention in autism, with one positively affecting the other. It is unclear whether deficits with imitation are directly impacting upon impairments with other social communication skills, or if they are the result of some other developmental variable that is also reflected in the measurement of imitation skills. As indicated, pretend play skills emerge at 12-24 months of age within typical development. For many with autism, play skills include repetitive stereotyped object manipulation, are often nonfunctional, and may be the result of social deficits or problems with the cognitive capacity of metarepresentation (Cohen & Volkmar, 1997).

Theoretical Explanations

Theory of Mind

Simon Baron-Cohen (1988) presented two theories to explain what might underlie the social and pragmatic deficits within autism. The *Affective Theory* based on the work of Hobson (1988) proposed that the social and communication deficits in autism are primarily affective. Those with autism lack the innate ability to interact emotionally with others, resulting in a failure to recognize the mental states of others, and an impaired ability to abstract and symbolize. This leads to deficits with recognition of emotions,

pragmatics, and pretend play. Baron-Cohen (1988) offered an additional alternative theory based on a primarily cognitive explanation for the social deficits of autism. Through this *Meta-Representation Theory*, difficulty in understanding the mental states of others is also a central theme. The difference being that this view starts from the idea that mental states are not directly observable but instead inferred. This diminished meta-representational capacity leads to impaired ToM and symbolic skills, further affecting upon specific social skills, pragmatic deficits, and pretend play. Baron-Cohen (1988) proposed a separate question specific to the extent to which these two theories are independent. He began by citing the work of Hermelin and O’Conner (1985) who proposed that cognitive and affective systems interact in an inseparable manner to produce a system termed the “logico-affective” state. Correlates to the development of ToM include language skills, relationships with friends and siblings, parental style, and pretend play (Carlson et al., 2004). Ha et al. (2015) noted an association between ToM and the mirror neuron system (MNS). The MNS is thought to be a group of specialized neurons that “mirrors” the actions and behaviors of others (Rajmohan & Mohandas, 2007). Some research proposed that an impaired MNS plays a critical role in autism. Abnormal activity in adolescents with ASD while observing and imitating the behaviors of others has been observed in the right temporo-parietal junction linked with ToM. The consensus has come that mentalizing deficits are widespread within autism but not universal. There is evidence that although some may fail to spontaneously use ToM, a large proportion of those with autism do demonstrate an ability to represent others’ mental states, however, deficits with social motivation are present (Chevallier, Kohls, Troiani, Brodtkin, & Schultz, 2012).

Social Motivation Theory

There has been a shift in autism research from ToM and executive dysfunction to the idea that social motivation deficits play a central role in autism. At the functional level, social motivation is a set of psychological dispositions and biological mechanisms biasing one to preferentially orient to the social world, seek out and take pleasure in social interactions, and to work at fostering and maintaining social relationships. At the evolutionary level, social motivation includes an adaption focused on enhancing one's ability within collaborative environments (Chevallier et al., 2012). The main difference between social motivation and social cognition theories is specific to causality. Within social motivation, a reduction in social interest may result in poor development of social inputs and learning opportunities, which in turn lead to a diminished capacity in social cognition. When focused on "mindblindness," social impairments occur because those who struggle to understand what encompasses the social world are going to end up losing interest in social interactions. This loss of interest then results in subsequent deficits of social cognition. Autism includes the presence of diminished social orienting, social reward, and social maintenance. These deficits appear to be rooted in biological disruptions of the noted amygdala circuitry, as well as in dysregulation of certain neuropeptides and neurotransmitters (Chevallier et al., 2012).

Again, theories focused on narrowing deficit areas contrast with those proposed by Thomas et al. (2016) when discussing the neuroscience of autism. Within their multi-system concept, there is no single core deficit with secondary deficits. In total, ASD is a heterogenous disorder, with no single cause or trajectory presenting across a wide spectrum of individuals.

Assessment and Diagnosis of Autism Spectrum Disorder

In May 2013, the APA published the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Two overarching conceptual shifts within the DSM-5 were specific to the elimination of “subthreshold” categories, such as pervasive developmental disorder not otherwise specified (PDD-NOS), and a focus on the implementation of relevant assessment instruments for use in real-world settings (Hazen, McDougle, & Volkmar, 2013). This new edition included significant revisions to the diagnostic criteria for ASD, including: 1) merging the diagnostic groups under the category of PDDs into a single diagnosis of ASD; 2) combining the social and communication impairment symptom domains required for the diagnosis of autism into a single domain; 3) expanding the restricted and repetitive behaviors symptom domain to include deficits in sensory processing; and 4) relaxing the age at onset criterion. The joining of diagnoses under a single category of ASD came in response to concerns about the diagnostic reliability of the DSM-IV subgroups. The refining of ASD from two to three symptom domains shifted because of the APA’s view that deficits in communication and social skills were inseparable, and more accurately considered within a single set of symptoms (Hazen et al., 2013). The category of restricted and repetitive behaviors has been expanded to include sensory symptoms, which although have been observed, were not part of the previous diagnostic criterion. Under the newer definition, two or more behavioral symptoms must be present, versus the previous single symptom requirement. The age at onset criterion broadened to state the symptoms must be present in early childhood, as compared to the previous criterion of symptomology before three years of age.

Diagnostic Criterion Concerns

The new definition raised concerns that many with a PDD diagnosis under the previous DSM-IV criteria would not meet the new ASD diagnostic criterion, potentially resulting in the loss of services (Hazen et al., 2013). Those with higher IQs or Asperger's syndrome may no longer be eligible, although they still present with deficits in social behavior, and across their functional and adaptive skills (Beighley & Matson, 2014). Research focused on examining who would still meet diagnostic eligibility has yielded mixed results. Some estimates reported that up to 54% of children diagnosed with a PDD under the DSM-IV criterion would not meet criterion for ASD under the DSM-5 criteria. A fear is that children no longer identified or diagnosed with an unrelated non-autism spectrum disorder, would then no longer be able to access needed services throughout school and clinical environments (Beighley & Matson, 2014). However, other findings noted that application of the DSM-5 criteria in a clinical population improved specificity of diagnosis without a significant reduction in sensitivity, with 91% of those who met the previous criterion for PDD would also meet criteria for ASD under the revision (Hazen et al., 2013). In April 2018, the CDC presented information from the Autism and Developmental Disabilities Monitoring (ADDM) Network that provided estimates of the prevalence of ASD among children eight years of age across 11 states. Information from 2014, after release of the new DSM-5 criterion, provided evidence that the prevalence of ASD is higher than previous reports, and continued to vary among certain racial/ethnic groups. Implementation of the DSM-5 criterion had little effect on the total number of children diagnosed with ASD during the 2014 surveillance year. The ADDM Network indicated that over time, the estimate may track downward as fewer people will meet

criteria of ASD based solely on the previous DSM-IV diagnosis, and may also track upward as more professionals align their clinical descriptions to match the DSM-5 criterion.

Family Reporting

Parents of children with autism typically identify developmental concerns by 12 to 18 months of age, with the average age of diagnosis still not until four years old (Zwaigenbaum, et al., 2009). Parental concerns most often involve delays in speech and language development, extreme behaviors, poor eating and sleeping patterns, as well as deficits with social-communication, play, and motor development. Analysis of early home videos suggested some children later diagnosed with autism showed signs of atypical development by their first birthday (Palomo, Belinchon, & Ozonoff, 2006). Atypical patterns emerged with social orienting, joint attention, imitation, affect, and reduced use of gestures. Those later diagnosed with autism also showed decreased flexibility, variety, and appropriateness of object-oriented play (Zwaigenbaum et al., 2009).

Healthcare Provider Role

To help close this gap between concerns and identification, the American Academy of Pediatrics (AAP) and other groups recommend screening for all 18- and 24-month-olds, specific to ASD. For the youngest population, community-based screening provides a way to systematize autism surveillance and maximize opportunities to detect the earliest signs (Zwaigenbaum et al., 2009). Healthcare providers can begin with the assessment of a child's social, communication, and play development within the office, through use of parent questionnaires and direct observations. If concerns remain and

other factors, such as possible hearing loss, are addressed, a referral should be made for early intervention services and further evaluation. Information is to come from multiple sources and contexts, with measures of parent reports, teacher reports, and child observations across settings (Ozonoff, Goodlin-Jones, & Solomon, 2005). In addition to the use of multiple sources and a team approach, it is also important to consider the unevenness and patterns of delay in development that differs across the lifespan for those with autism. Symptoms are usually the worst in preschool and may significantly improve overtime. Those who exhibited poor eye contact and engaged in few social initiations may have very different social symptoms as teenagers. Some may have meaningful expressive language and a large vocabulary yet are unable to participate in conversational exchanges or answer questions (Ozonoff et al., 2005).

Across ages, diagnosis should be based on the combination of clinical judgment using a multidisciplinary team approach, and consider all information from developmental and medical histories, parent interviews, and completion of cognitive, language, motor, and adaptive standardized measures. Through this combination, planning appropriate intervention models is a key outcome. Currently there are no universally agreed-on skills to change or the degree to which that change can be considered clinically significant. However, there is a consensus that intervention outcomes should have social validity that make a genuine difference in the everyday life for the person treated and those within their family (Ozonoff et al., 2005).

Racial Discrepancies in Diagnosis

When determining best practice for evaluation and diagnosis, another area of consideration is that of the racial disparity in autism identification. Schools throughout

the United States are witnessing increasing numbers of students from diverse family backgrounds and communities (Dyches, Wilder, Sudweeks, Obiakor, & Algozzine, 2004). Evidence supports that multicultural students have increasingly more difficulty with the academic and behavioral customs of school culture as compared to the dominate culture (Dyches et al., 2004). Most research on the disproportionate representation of racially diverse populations within special education focused on those categories influenced by some degree of subjectivity, such as learning disability, emotional behavioral disorder, and intellectual disability (Travers, Tincani, & Krezmien, 2011). This overrepresentation may be due to variations in disability definitions, regional population differences, socioeconomic factors, biases, and cultural differences between educators and students. Travers et al. (2011) noted arguments that “nonjudgmental” or “hard” disability categories, including that of autism, experienced less influence by social variables resulting in a less disproportionate representation. Dyches et al. (2004) reported how a meta-analysis of 19 epidemiological surveys conducted across 10 countries from 1966 until 1997 revealed that for most surveys there were no data regarding the exact proportion of children with autism from immigrant families. Through their own work, Travers et al. (2011) indicated that the representation of racially diverse students with autism revealed a noticeably and significantly different profile in comparison to Caucasian students for the years of 1998 to 2006. One possibility is that racially diverse students are being identified with autism at later ages or are misidentified, allowing them to not receive early intervention services during a critical period of development.

Familial Perspectives and Culture

In addition to the prevalence rates of autism within diverse populations, there are also cultural and parental perspectives to consider when faced with diagnosis. The literature does not distinguish autism from other disabilities when it comes to literature on how families adapt to raising a child with developmental disabilities. Dyches et al. (2004) stated that it is crucial for autism to be isolated into a single group when researching how families adapt, as autism can have a more debilitating effect on the overall family dynamic. They further noted how little information there is specific to how multicultural families appraise their family situation when raising a child with autism and how much outside support they can gain. Ponde and Rousseau (2012) focused on the perceptions of immigrant parents regarding their child's disability after a medical diagnosis of ASD. Results suggested influences on parents' perception by both their cultural backgrounds and by the views prevalent in the host culture. Across families, some acknowledged the autistic traits within their children, while others preferred to state them as development or communication delays, or even having no problems at all. These varying coping methods may be a need to preserve hope for the children's futures or to a different developed perception based on cultural diversity (Ponde & Rousseau, 2012). Although true for all families within the ASD community, immigrant families increasingly deal with loss and cultural shock and may not be ready to accept that their child is facing significant deficits (Ponde & Rousseau, 2012).

Defining Evidence-Based Practices and the Education of those with Autism

The term evidence-based practice (EBP) began in the field of medicine, with the intent to minimize the gap between research and practice (Mayton, Wheeler, Menendez,

& Zhang, 2010). The most common definition of EBP is specific to the integration of best research evidence with clinical expertise and inclusion of patient values (Sackett, Strauss, Richardson, Rosenberg, & Haynes, 2000). In 2004, the American Speech-Language-Hearing Association (ASHA) convened a committee charged with determining the issue of EBP in relation to the field of speech-language pathology. The goal of EBP is the integration of: (a) clinical expertise/expert opinion, (b) external scientific evidence, and (c) client/patient/caregiver values to provide high-quality services reflecting the interests, values, and choices of the individuals served within the field. ASHA further reiterated that EBP is a dynamic integration of ever-changing clinical expertise and evidence within everyday practice, with the ultimate goal to provide optimal services.

Evidenced-Based Practices in General and Special Education

The NCLB Act of 2001 first introduced the movement for EBP within the field of education. It emphasized inclusion of scientific-based practices by teachers within their classrooms (Mayton et al., 2010). These practices met rigorous peer review and other standards, yielding a consistent and reliable history of positive results (Simpson, LaCava, & Garner, 2004). In addition to the field of education in general, the gap between research and practice has been particularly evident within special education, despite the use of more elaborate research designs and increased validity. In 2002, the Department of Education awarded a grant to the What Works Clearinghouse (WWC) to assess and report on effective scientifically based programs (Simpson, 2005). The WWC strategy for identifying such practices is the *Design and Implementation Assessment Device*. Through this validation process, judgment of evidence and scientifically based practices

included a focus empirical rigor, with randomized experimental group design considered the gold standard.

Scientifically Based Interventions and Autism

When determining scientifically based interventions, Mayton et al. (2010) incorporated the work of Simpson (2005), who conducted comprehensive reviews of treatment literature and rated them into various categories. These categories divided the interventions as follows: (a) *scientifically-based*, with evidence of benefit following substantial, credible research, (b) *promising practice*, which have been used for a length of time with no or minimal adverse results, but warrant further research, (c) *limited support*, those with limited research and have not been widely used, and (d) *not recommended* interventions that have been proven as ineffective or have unfavorable outcomes. Mayton et al. (2010) noted that the disparity between research and practice is particularly apparent to the use of EBP and intervention for those with autism. Simpson (2005) reported how such methodology has not typically been used to assess those with ASD, because of limited samples of students with similar characteristics, programs, needs, and how different research methods need to answer different questions. The combination of the highly unique and idiosyncratic characteristics associated with ASD, along with the manifestation of irregular and even advanced skills, are some of the factors that have led to the significant debate about which interventions choices are appropriate and result in favorable outcomes (Simpson, 2005).

Hess, Morrier, Heflin, and Ivey (2008) conducted a survey with 185 educators across the state of Georgia asking them to identify strategies used in the education of children with autism spectrum disorders. Using these categorical criteria, survey results

suggested that fewer than 10% incorporated use of scientific practices (Hess et al., 2008). Of the top five treatments reported, four fell within the category of promising practices. One-third of reported strategies have limited support, with upwards of 40% not even part of the interventions reviewed by Simpson et al. (2004). Treatment selection also varied by grade level and type of classroom placement. Without clear best practice guidelines for those with ASD, teachers have little support when choosing which strategies to implement, and appear to make decisions based on variables unrelated to scientific research. When considering the life-long disability of autism, for which there are no universally accepted interventions, it is understandable that parents and educators are willing to consider and use approaches that purport to lead to significant improvements (Simpson, 2005). Hess et al. (2008) further suggested that school systems may be trying to avoid litigation and are allowing treatments to be available to all students, instead of creating a curriculum based on validated and empirically sound methodology.

EBP and Speech-Language Pathology

Within the field of speech-language pathology, ASHA published a series of documents outlining the roles and responsibilities of speech-language pathologists (SLPs) in the diagnosis, assessment, and treatment of those with autism. These guidelines specify that SLPs play a vital role in screening, diagnosing, and enhancing social communication skills (Schwartz & Drager, 2008). As autism prevalence rates have risen, up to 82% of school-based SLPs have students with ASD on their caseloads, making it ever necessary to develop specialized competencies to serve this population. A survey completed by Schwartz and Drager (2008), which included 67 school-based SLPs across 33 states, resulted in the majority of respondents reporting that they did not possess

accurate knowledge of autism, nor were confident in their abilities to provide services to students on the spectrum. Although the return rate was small, most also reported that they would have benefited from additional training in the area of autism.

EBP and Autism

A number of researchers have focused on determining which intervention models fall under the umbrella of EBPs for those with autism. Simpson (2005) noted how it has become increasingly evident that there is no single best suited and universally effective practice for all youth with autism. The most effective programs are those that incorporate a variety of objectively verified practices and support the needs of students, professionals, and family members.

Effective Programming

Through the work of Simpson (2005) and use of the above-mentioned categories, those deemed as scientifically based include applied behavioral analysis (ABA), discrete trial, and pivotal response trainings. Odom, Boyd, Hall, and Hume (2009) further identified 30 comprehensive treatment models (CTMs), with the majority based on an applied behavioral analysis framework that have procedures developed well enough for implementation by a variety of stakeholders. CTMs consist of a set of interventions designed to achieve a broader learning or developmental impact on the core deficits of ASD. As a group, these models demonstrated clearly stated procedures and materials, use of frequent replications, and well-established evidence. Practices thought to be promising included social stories, sensory integration, augmentative communication, and incidental teaching. Those considered as having limited support or not recommended

vary from use of floor time, and animal therapy, to holding therapy, and facilitated communication (Simpson, 2005).

Through their review, Iovannone, Dunlap, Huber, and Kincaid (2003) provided a description of six core elements with empirical support that should be included when designing comprehensive instructional programs for students with ASD. Program development should incorporate individualized supports and services, such as increasing social engagement with peers through functional use of the child's unique obsessive behaviors as play themes. Systematic instruction and comprehensible/structured learning environments were additional elements. Discrete trial training, differential reinforcement, and shaping are all systematic approaches focused on adult facilitation and one-on-one instruction resulting in predetermined responses to increase communication skills (Prelock & McCauley 2012). Visual schedules and video priming can provide structured environments for transitions and decreasing disruptive behaviors. A fourth element from Iovannone et al. (2003) was specific to curriculum content. Specialized curriculum should include systematic instruction in social engagement skills, appropriate leisure skills, as well as language comprehension and communication. Peer mediated interventions, use of social stories, and written social phrases, specialize to increase social interaction skills for those with autism. Functional approaches to problem behaviors and family involvement were the final two noted core areas. Use of functional behavioral assessments and functional communication training can serve to decrease challenging behaviors. Parent involvement through the use of pivotal response training and social stories, as an antecedent intervention in the home environment, can serve to increase appropriate behaviors, parent-child interactions, and prevention of challenging

behaviors. When discussing intervention options, the autism community advocates for identification of coping strategies for symptoms, which are found to be problematic by those with autism and locating particular niches for unique perceptions and skills (Ponde & Rousseau, 2012).

Bridging the Gap: Use of Peer Mediated Interventions within Autism

Students within special education programs have reported increased rates of bullying perpetration and victimization as compared to their general education peers (Rose et al., 2012). At-risk factors were specific to physical attributes, personal characteristics, and school-related factors, such as having to receive specialized services. It has been argued that children and adolescents with learning disabilities have deficits with interpreting verbal and nonverbal communication, combined with poor social skills, which may contribute to them being bullied and being aggressive themselves (Rose et al., 2012). It could be hypothesized that those with autism are at an even greater risk to become victims of bullying, due to the pervasive social skills deficits that are a common core feature. Owen-DeSchryver, Carr, Cale, and Blakely-Smith (2008) noted the social skills impairments inherent to those with ASD to include, a lack of appropriate eye contact, poor joint attention, limited verbal initiations, as well as a failure to develop age-appropriate friendships. During social interactions, youth can experience difficulties with initiating, responding, interpreting nonverbal cues, using and maintaining eye contact, and demonstrating appropriate emotional responses, which can lead to peer rejections and impact the overall quality of life for those with autism (Cappadocia & Weiss, 2011). With more students receiving special education services within the inclusive general education classroom, teachers and therapists must be able to provide effective

intervention programs that target academic and social skills development for these students. Over the years, a number of methods have been developed, implemented, and evaluated empirically with various degrees of success.

Peer Mediated Instruction and Interventions (PMII)

As noted in Chapter 1, within peer mediated instruction and intervention (PMII), peers are trained to serve as intervention agents, learning how to best initiate and respond to social interactions with ASD peers (Battaglia & Radley, 2014). The advantages noted were: the availability of peers, the decrease in the demands on the teachers (after initial training), and the provision to children with ASD of opportunities to learn and practice social skills in a natural social context across multiple settings, with peers serving as natural contingencies for social skill use. Sperry, Neitzel, and Englehardt-Wells (2010) defined PMII strategies as a set of focused intervention practices designed to systematically teach typically developing peers avenues to successfully engage students with ASD. One cannot assume that simple immersion in the typical setting is enough support for students on the spectrum. The ultimate goal is to help those with ASD to generalize newly acquired skills to a variety of settings. Chan et al. (2009) further reiterated that PMII is a treatment approach in which peers serve as the intervention mediators by implementing instructional programs, behavioral treatments, and facilitating social interactions. Facilitation of PMII occurs in pairs or small groups beginning in preschool and extending through the high school years. For younger children, the focus can center on peer-initiation training or use of a buddy approach to foster skill acquisition. For older students, social networking strategies, such as with the use of social clubs, has been shown to be effective. Ideally, students with ASD are able to

create relationships with non-disabled peers, in turn increasing the number of social partners and social environments available.

Implementation Steps

Regarding procedures, Battaglia and Radley (2014) described four implementation steps beginning with the first step of peer model selections. Models should have a positive or at the very least a neutral history with the target student. The second step focuses on deciding which skills to target through use of teacher interviews, rating scales, and direct observations. During this step, the aim is to determine whether a performance or acquisition deficit is present. A performance deficit creates struggles in that the child cannot perform a target skill, as compared to an acquisition deficit in which the child does not know how to perform the skill. The third step includes baseline data collections that results in choosing which skills to focus on for means of intervention. The transition to intervention targets three specific peer-mediated interventions: peer modeling, peer initiation training, and direct training for both the chosen and ASD peers. The final step is to monitor student progress, ideally at a rate of once per week. This is again done through direct observations and rating scales, focusing on trouble shooting for any lack of progress and needed corrections.

Sperry et al. (2010) outlined a five-step PMII approach. The implementation steps included: 1) peer selection, 2) training and supporting peers across two phases, consisting of teaching peers to recognize and appreciate individual differences and commonalities between “typical” and ASD peers, then introducing specific strategies one at a time and practice with an adult trainer, 3) implementing a daily structured session between peers and ASD students, 4) implementing strategies in a variety of classroom

and school settings, and 5) extending initiations across the day to allow for generalizations to begin through an embedded intervention and class-wide peer buddy system. Embedded intervention provides training in a child-centered, naturalistic, context-based environment. The use of visuals was also a focal point, specific to incorporating peer script models during structured play activities (Sperry et al., 2010).

Peer and Direct Training Approaches

Peer modeling includes the process of training peers to demonstrate appropriate utilization of target skills, which can take place in naturalistic settings or within a social skills training group (Battaglia & Radley, 2014). Prior to the modeling, an adult will review the steps with the peer and allow for role-play. A noted important aspect of peer modeling is performances in close proximity to the child with ASD, prompting the child to observe and imitate the behavior, with reinforcements provided for all peers (Battaglia & Radley, 2014). Peers learn various initiation strategies to promote the interactions of those with ASD, such as inviting them to play or offering help. The peers then practice the strategies with an adult who provides constructive feedback, moving onto implementing the strategies with the target child. Krebs, McDaniel and Neeley (2010) designed a peer assisted social intervention program for two older elementary students aimed to improve upon use of eye contact, maintaining proximity to others, directing or initiating conversation, and maintaining topic. Researchers trained typical peers on how to elicit these behaviors, and once there was noted mastery of skill through role playing, interactions with the focal children were initiated through play. Adult facilitators cued typical peers if they were not applying learned strategies. Study results suggested that both target participants significantly increased their use of learned social behaviors across

each treatment session. However, training and treatment took place in a private clinic setting, not a natural context. This isolated context could negatively impact upon skill carryover to other communication environments.

A direct training model is best suited for social skills training groups, during which all members receive instruction in the target skill. Peer models and those with ASD learn discrete social skills, such as maintaining conversation, turn taking, and participating. They then practice the skill with one another through role-play scenarios. An adult facilitator provides reinforcement and positive feedback (Battaglia & Radley 2014). As a collective, research results often reflected positive behavioral changes for the students with ASD and their peer models, but variety existed specific to sample size, design method, defining of deficits, what skills to target, and in which environments. Most research has focused on younger elementary age-students and lacked empirical support for the adolescent and young adult populations.

Combining Approaches

In addition to the singular use of peer-mediated program models, researchers have also utilized a combination of approaches, such as peer modeling, written text cues, video modeling, and direct adult instruction. According to Kamps et al. (2015), through a combination approach, one addresses the need for direct skills instruction and the social-pragmatic use of language, to bring about successful communication interactions with others. The authors described this peer-mediated approach with the use of a peer network, consisting of a small group of typical peers selected to provide support for greater integration in social environments for those with pragmatic deficits, as with ASD. Within this network approach, there is a combination of adult facilitation, repeated social

learning opportunities, and active peer mediation with their ASD classmates (Kamps et al., 2015). Per Thiemann and Goldstein (2004), the combining of approaches is key in order to provide more comprehensive treatment. Those with autism often have restricted language skills that can hinder the ability to initiate, warranting the use of print, photographic, or pictorial cues, in order to help them better process transient information, and aid in recalling sequences of verbal information. Researchers assessed the effectiveness in the use of peer training and systematic instruction using written text cues on social skills to improve responsiveness and interactions of focal students. Stated results concluded again that the use of this intervention model was effective in increasing the overall rates of interactions; however, it did not demonstrate an effect to increase social initiations (Thiemann & Goldstein, 2004).

Specific to the described PMII singular and combined approaches, Battaglia and Radley (2014) presented two case examples, with improvements noted for both students across time, concluding that peer-mediated interventions represent an effective and undemanding approach to addressing social skills needs for students with ASD. Through careful selection of peers, appropriate behavioral targets, and frequent progress monitoring, these strategies allow students with ASD naturally occurring social reinforcers, thereby developing social competence. Owen-DeSchryver et al. (2008) reported positive results to peer initiations for two of three students, within a multiple baseline study design that incorporated use of three peer-training phases. The first phase began with providing peer models the rationale for developing friendships with students with disabilities through use of literature and group friendship activities. Each group of students then participated in a general discussion about the strengths/preferences of their

classmates with ASD, aiming to help peers recognize that all children have abilities and gifts. The final phase concluded with peers again guided in discussion of several central themes, including helping others learn to play, locations to play, and responding to students. This information was then used to guide peers during social interactions, provide visuals, and in the creation of friendship books. The authors noted the most unexpected finding was that initiations toward students with ASD increased for trained and untrained peers following intervention. This could have been the result of modeling from trained peers, and exposure to naturally occurring reinforcers from either the trained peers or those with ASD (Owen-DeSchryver et al., 2008).

Kamps et al. (2015) conducted a larger scale study over the course of two years, aimed to determine the effects of a comprehensive peer network intervention implemented by trained school personnel for kindergarten and first grade children with ASD. Groups met two-three times per week, for 20-30-minute sessions, over a period of six months. Peers learned five skills, each targeted for four to five weeks before the addition of a new skill. Visual cues were included to aid with recall of the target skill. Reported results indicated that children enrolled in the peer networks intervention showed more growth in initiations to peers during the non-treatment social probes and during generalization probes in a natural setting, as compared to the comparison group participants (Kamps et al. 2015). The peer network group did not show differences in growth for responses of total number of overall communications. During treatment sessions, children showed increases in total communication to peers the longer they were in the peer networks. Kasari et al. (2016) compared two different social skills interventions that varied group composition and social skills teaching approach. Specific

child characteristics and the teacher-child relationship prior to intervention provided insight as to who might benefit from which approach. However, the teaching of typical peers occurred independent of those with ASD, with groups being comprised of a small number of typical peers and those with ASD from the same classroom, versus a small group of children with ASD from different classrooms, aiming to determine if a specific group type fostered more peer acceptance and engagement. The activity based “engage” method included children with ASD along with their typical peers. The social group targeted peer engagement and acceptance and used shared interests of the group to provide the context for interactions. Each group began by creating a schedule, with activities focused on conversational exercises, structured games, free play, improvised storytelling and music. Peers were encouraged to take leadership of their own groups, with adult supervision as needed. The didactic “skills” approach targeted specific social skills, with content delivered in lesson format from a variety of programs and homework activities to reinforce the topics discussed. Sessions began with the children checking in for the day and review of the previous week’s lesson and homework. They then participated in an interactive lesson, with presentation of the next topic, and completion of an activity to practice the skill. Children were allowed time for free play, with group leaders facilitating rapport, offering verbal praising, and using punch cards to earn trips to a treasure box. Study results indicated no improvements for the primary measure of increased social network connections, but with noted gains for secondary/moderator measures (Kasari et al., 2016). Children within the “skills” groups increased peer engagement and decreased isolation during recess. Participants reported to have low child-teacher closeness or high conflict improved with social connections through use of

the “skills” method. Children with reported higher teacher-child closeness improved more through use of the “engage” intervention. The authors concluded that the study demonstrated social skills groups conducted at school can affect both peer engagement during recess and peer acceptability (Kasari et al., 2016).

Pivotal Response Training and Peer Models

Additional studies focused on peer models using pivotal response training (PRT). Like the above description, PRT incorporates peers as primary agents to allow for opportunities to engage in increased social interactions in naturalistic environments, without allowing children to isolate themselves or rely on teacher prompting. Harper, Symon, and Frea (2008) evaluated the use of PRT during recess segments, through the use of a multiple baseline design for two focus students. Each student demonstrated improvements for peer interactions and turn taking skills. In contrast, one student demonstrated minimal improvements for initiations as compared to the other. Participant one was specifically reported to have been actively and independently seeking out play opportunities on a daily basis. These results pointed towards the beginning of a viable option, as the children demonstrated maintenance of increased levels of skills across generalization probes (Harper et al., 2008). Pierce and Schreibman (1997) reported earlier use of PRT, with a larger number of peer trainers being taught a number of PRT strategies that included use of didactic instruction, modeling, role-playing, and feedback. Results suggested that PRT is an effective intervention for producing positive social changes. Improvements for all observed behaviors were noted across all settings, with the authors speculating that this was due to the use of multiple peer models.

Play Skills and Peer Models

Wolfberg, De Witt, Young, and Nguyen (2015) reported results on the use of integrated playgroups (IPG) to focus on play skill deficits in those with ASD. IPG intervention addresses these challenges through promoting social communication, reciprocity, and relationships with peers, while also expanding their play repertoire to include symbolic play. The IPG protocol consisted of three to five players and one adult facilitator, with interventions lasting for a period of 12 weeks, across 24 groups that met twice weekly for 60-minute sessions in after school play groups. IPG sessions provided a structured framework that offered a high level of predictability, encouraged flexibility through guided participation in activities that considered the unique interests, abilities, and needs of each player and the group as a whole. Reported results demonstrated that after participating in a three-month IPG intervention, the children with ASD showed significant gains in both symbolic play and social play as compared to the three-month baseline phase. Data analysis revealed increases in functional and symbolic-pretend play behaviors, accompanied by decreases in unengaged and manipulation-sensory play behavior. Socially, data analysis revealed increases in participants having closer proximity with peers and sharing of common goals during play, along with decreases in isolation and use of on-looker behaviors (Wolfberg et al., 2015).

Effects of Group Size

Whole Group

Another area of focus within research has been specific to the use of small groups versus a whole-class group model in fostering development of social skills during play activities and instructional segments. Laushey and Heflin (2000) aimed to determine if a

peer-mediated procedure taught to all peers in a kindergarten class would produce more or less effective results than a simple proximity approach to peer interactions. For this study, an ABAB reversal design assessed treatment effects on the percentage of demonstrated appropriate social skills for two students within two classrooms.

Researchers collected baseline data for the first four weeks during the passive proximity peer-tutoring phase, during which the target students were in their integrated classrooms with nondisabled peers as models, but with no intervention implemented. An active peer tutor-training program occurred for the first treatment phase during the free play center for all students in both classes in the form of a “buddy system.” This system allowed for a daily rotation in which each focus participant paired with a different classroom peer. Removal of the buddy system then occurred during return to baseline, with the children returned to the passive proximity condition.

The second treatment phase reinstated the buddy system. For the peer training condition, all students were trained to stay with, play with, and talk to a buddy according to a presented “Buddy Skills Training Script.” Within this five-step procedure, the first author served as the trainer and explained to the students that she would be spending time talking to them about ways that people can be alike and ways that people are different. Reported results indicated that the buddy program elicited more appropriate social skills in the students with autism than the passive proximity method (Laushey & Heflin, 2000). The authors noted how the training of all students, rather than focusing on peers without disabilities or only the student with a disability, resulted in better long-term effects. The students with autism generalized their skills across diverse individuals, without the use of small groups, or having to overburden the use of a single peer model. Additional

research needs to assess if a program such as this can help students with autism improve in social areas other than the four skills measured and be able to generalize these improvements across settings and activities (Laushey & Heflin, 2000).

Small Group

Similar to the use of a “buddy system,” Kalyva and Avramidis (2005) incorporated the use of a “circle of friends” model, that recognized the power of the peer-group to be a positive, as well as an exacerbating influence on individual behavior. At an environmental level, this support network is created for the individual child in need who experiences success and the receiving of positive feedback from peers. Again, the focus centered on specific social deficits, with typical peers taught how to cope with any inappropriate behaviors. Intervention consisted of observing each of three groups, with one focus child plus five typical peers and an adult, each for one hour, over three recorded live data collection points across five months of weekly intervention. Toys chosen based on preferences of the focus child, each being provided the same set as the teacher used to facilitate imitation of the activity, while being encouraged verbally to interact. The typically developing children within the group received verbal praising for their contributions during intervention. Researchers reported significant increases in the number of successful responses and initiations for those who received the intervention, as well as significant decreases in the number of unsuccessful responses and initiations for those in the treatment group, with reported improvements maintained, although not increased, over time (Kalyva & Avramidis, 2005).

Academics and Peer Models

Research conducted during academic instruction aimed to also increase social engagement opportunities. General education teachers have reported a lack of knowledge and support on how to manage the needs of those with autism, while also providing effective instruction to their class as a whole. Students with autism may become more socially isolated, as they are restricted to one-on-one support with a paraprofessional. Banda, Hart, and Liu-Gitz (2010) reported a study that investigated the effects of training both students with autism and typical peers to improve social interactions during academic-related center time activities in general education classrooms. Interventions took place during activities involving cooperative play or shared materials during academic centered small group tasks. Child training included a simultaneous focus on how to ask questions of their peers and how to answer. The lead investigator would prompt the children to ask a question and then model if the student was unable to provide it themselves, with verbal praising of all attempts. Next, the modeling of appropriate responses was provided, with the children again prompted to ask a question in order to practice responding, and praise given for all attempts. Reported results indicated increased initiations and responses with no percentage of non-overlapping data points for both students. Social skills interventions provided immediate and robust improvements for initiations as well as the involvement of peers during center-time activities. The interventions proved effective for improving skills and further supported the need to focus intervention during academic tasks (Banda et al., 2010).

Ledford and Wehby (2015) continued research showing the benefits of small group classroom instruction for those with autism, during which teachers can

purposefully create opportunities for social interactions during academic activities. Through the small group model, academic instruction included one student with autism and up to two socially competent peers. Peer training focused on engagement in pro-social behaviors, with the goal of providing repeated and salient opportunities for social engagement to increase the likelihood that those with autism will attend to and imitate peer models. The purpose of their research was to determine whether children with and without autism could be simultaneously taught pro-social and academic behaviors during small group instructions, with peers who were also determined to be at-risk academically (Ledford & Wehby, 2015). Instructional, play, and reinforcement materials, along with printed social statements, allowed for further guidance. Specific academic behaviors varied by group, consisting of sight word recognition or knowledge of geometric shapes. Targeted social behaviors also varied by group and focused on group sharing, giving of compliments/encouragement, and talking to friends. Major findings from the study included: a) students with ASD and at-risk peers successfully learned academic behaviors at similar rates, b) at-risk peers learned to engage in social behaviors and consistently engaged in the behaviors during instructional settings, c) students with ASD learned to engage in social behaviors during academic sessions, and d) variable generalization occurred in an unstructured context, with three of five participants with ASD demonstrating small increases in social behaviors, and two of three demonstrating additional increases when intervention was implemented in the generalization setting (Ledford & Wehby 2015). This study showed that small group instruction for heterogeneous groups of students is possible and may be preferable to individual instruction due to student-to-teacher ratio benefits. In addition, it may be possible to

embed social opportunities during small group instruction, with no apparent effects on learning (Ledford & Wehby 2015). Beyond the use of PMII to increase social skills, there is also evidence to support their use on improvements in academics.

Research Outcomes Specific to the Use of PMII

Chan et al. (2009) evaluated 42 studies meeting inclusion criteria for PMII and summarized them into various categories: a) participants receiving intervention, b) peers implementing, c) method of training peers, d) intervention procedures, and e) desired outcomes. Results from the systematic review revealed a wide variety of intervention components used by peers, to address a number of common deficits experienced by those with ASD, within social, communication, and academic areas. As a collective, the research indicated PMII as a useful and versatile intervention approach. From the 42 studies, 91% reported positive outcomes with the use of PMII (Chan et al., 2009).

DiSalvo and Oswald (2002) also reviewed research on peer-mediated social skills training strategies used with ASD students. The methods included a comprehensive review of previous research articles, organized by the approach used to change peers' expectancies. The first of three targeted approaches gauged how researchers manipulated the situation or contingencies to promote interaction. Examples included integrated playgroups, peer buddy/tutor, and a group-oriented approach. The second category centered on specific peer instruction in social interaction strategies to promote interactions, such as the use of peer networks, pivotal response training, and peer interaction training. The third grouping targeted child specific instruction in initiation strategies to promote interactions, such as target child training and initiation training for both the target child and peers (DiSalvo & Oswald 2002).

Following a review of comparative studies, the authors raised social validity issues in the use of these social interventions regarding the level at which typical peers interacted with ASD targets. Study researchers placed an increased emphasis on the use of quantitative results versus qualitative measures, with questions as to the generalizability of strategies across settings, peers, and the necessity to promote interactions with ASD peers (DiSalvo & Oswald, 2002). The issue of maintaining interventions over time raised an additional concern. Authors highlighted the difficulty in producing stable and substantial improvements with socialization. They noted that interventions generally address only a small facet of the problem resulting in negligible changes. They also indicated the lack of research on the importance of peer expectancies in their role as intervention agents (DiSalvo & Oswald, 2002). In combination, these concerns bring to light the continued need for replication and advancement in the use of PMII for students with autism. Skills taught within a therapeutic setting allow a limited ability to assess if carryover is occurring throughout other communication settings. Beyond feedback from the special and general education teachers, or perhaps paraprofessional, it is difficult to determine if social skills presented in such isolation can be maintained and transferred to other environments. By taking skills and teaching them with the use of same-aged peer models, students with autism may be more inclined to interact with others and make connections to more peers with whom they have daily contact.

Wang, Cui, and Parrila (2011) completed a comprehensive meta-analysis to provide a synthesis of intervention studies focused on the use of either peer mediated or video modeling methods. They incorporated the inclusion of an analysis of the factors

that possibly moderate intervention outcomes, such as age, language ability, and duration of treatment, in order to help identify the interventions most likely to benefit a specific child. The authors used a meta-analytic approach, combined with the use of hierarchical linear modeling (HLM), to examine the outcomes across multiple single-case studies. In terms of study results, the effect sizes of the reviewed studies ranged from 0.65 to 2.31, with a mean of 1.27. The mean of the effect size was significantly different from zero suggesting that the interventions were effective in improving social behaviors (Wang et al., 2011). The effect of treatment type was minimal, suggesting that both approaches were equally effective. In addition, age predicted effect size greatly across treatments. Interventions tended to be slightly more effective for younger children, with the impact of age possibly depending on the intervention type (Wang et al., 2011). The authors concluded that peer-mediated and video-modeling interventions are both effective in improving the social behaviors of children with ASD, and there is no significant difference between the effectiveness of these two approaches (Wang et al., 2011). Perhaps an area of concern could be how those with autism are able to connect a video model versus a live person facilitating interactions with them in real time. As noted with the example of teaching skills within a small therapy group, one questions how the students would transfer skills presented via video to actual attempts from peers to engage socially.

Authors Cappadocia and Weiss (2011) stated how social skills teaching techniques can take the form of direct instruction, modeling, role-playing, shaping, feedback, and reinforcement of positive interactions. Programs may also include components of cognitive behavioral therapy or parent training. By the date of their

review, there was no common, agreed upon approach for teaching social skills to children with autism. As a result, the need for literature reviews represents an important tool for summarizing and organizing evidence-based programs (Cappadocia & Weiss, 2011). Their review took on a novel approach to organizing and understanding outcome studies of social skills training group (SSTG) programs by comparing traditional SSTGs for children and youth to SSTGs with explicit cognitive behavioral components (SSTG-CB), and SSTGs with parent intervention components (SSTG-PC). Cappadocia and Weiss (2011) believed that the addition of a cognitive behavioral or parental component could change the nature of intervention. They indicated the inclusion of cognitive behavioral therapy promoted positive changes for mental health concerns, specifically anger and anxiety. In addition, the use of a parental component demonstrated positive changes. Parental support can take on a variety of levels within intervention. There is often disconnection in parental involvement and knowledge of interventions provided within a public-school setting. If parents are given a role to help facilitate carryover of learned social skills, this can be a crucial step to engraining social skills and improving maintenance. All programs included similar teaching techniques, such as modeling and role-play, as well as common learning goals and targeted social skills.

In regards to needs for future research, the authors noted investigations of SSTGs should target skills and teaching techniques that have the largest impact on social skills development across youth. A focus on generalizing skills assesses transfer to other environments, such as home and the community, as well as examining maintenance of skills improvements over time (Cappadocia & Weiss, 2011). Again, having parents help with carryover of taught skills and creating a consistent conversation for how they can

help their child within other communication environments could be a crucial missing link in how the successful maintenance of skills taught through PMII.

Research Across the Sexes

Authors Jamison and Schuttler (2016) went a step further to examine the known social skills literature specific to the sexes. Much of the literature focused on school-age male children. In addition to being male-centered, these interventions, if applied to females, would not address biological changes and resulting challenges in self-care specific to adolescent females. Jamison and Schuttler noted how this developmental stage is a time of social vulnerability and biological change for typical adolescent girls. Social vulnerabilities and biological changes are compounded further for those with ASD and can significantly affect social functioning and adaptive skills. Again, while there is ample literature describing how social skills variability and self-perceptions impacts males, there is little information about how ASD is expressed in females. Girls tended to develop play skills earlier than boys, and demonstrated greater use of nonverbal communication skills. These early sex differences may play a critical role in the initial presentation and diagnosis of ASD in females. To date, girls with ASD make up only 25% of the diagnosed population, and comprise only about 15% of the subjects in current research literature (Jamison & Schuttler, 2016).

For high school populations, implementation of PMII aimed to foster social skills through group networks, classroom support arrangements focused on social and academic gains, and an additional curriculum presented specifically to the life skill needs of adolescent females. As stated, the work of Jamison and Schuttler (2016) examined PMII specific to adolescent females with autism. The authors contended that since the

literature for interventions thus far included school age males, it is difficult to discern whether those interventions are appropriate for adolescent females and their unique challenges. As a result, they created specific programming for adolescent females, and evaluated its effectiveness with this specific population. The developed social skills training program, deemed as Girls Night Out (GNO), targeted the physical and social-emotional health of adolescent females. Researchers assumed improvements in self-perception and self-confidence would result in an increased likelihood for engaging in social skills and activities with peers (Jamison & Schuttler, 2016). The resulting data gathered from self and parent responses across three measures of social competence, self-perception, and quality of life, as well as satisfaction data from parents, participants, and peers, demonstrated statistically significant improvements within the small sample and medium to large effect sizes (Jamison & Schuttler, 2016). In total, results suggested meaningful changes in perceived quality of life and provided some evidence of social validity.

PMII with Adolescent Populations

There is extensive literature as to the use and success of PMII in younger children with autism. However, as children age, transitioning to middle and high school, research into the use of PMII becomes much more limited. It is unfortunate that as children advance in school, the focus shifts more to academics and does not continue to allow for social opportunities. The increasing social challenges for adolescents and young adults with ASD can be linked to the greater complexity of peer relationships, a growing drive toward identity exploring, a lack of availability and knowledge of what services are available, as well as an uncertainty about the balance of responsibility between

themselves and those who support them (Gantman et al., 2012). Social deficits in young adults with ASD may continue to exacerbate and lead to problems with friendships, romantic relationships, daily living, and vocational success. Many have self-reported that difficulties in establishing and maintaining social relationships have led to increased feelings of loneliness and mental health problems. There is a common self-perception of a lack of social support from peers, friends, and parents that positively correlates to loneliness, poor friendship quality, depression, anxiety, and withdrawal. Koegel et al. (2012) noted how adolescents with ASD demonstrate deficits when interacting with peers including, limited responsiveness, few if any initiations, reduced reciprocal exchanges, and in sustaining social engagement. These adolescents have fewer lasting peer relationships and spend less time in peer interactions, as compared to typically developing peers. In turn, this lack of socialization correlated with higher risks for developing depression amongst this population. Due to their often-odd behaviors and naiveté, those with ASD are more likely to experience victimization by peers through bullying and sexual manipulation (Gantman et al., 2012).

Peer and Direct Training Approaches

For younger adolescents, research into the use of PMII has continued to focus on peer mediators, a fading of direct adult involvement, use of self-monitoring, as well as incorporating visual scripts, and social clubs focused on the perseverative interests of those with autism. Morrison, Kamps, Garcia, and Parker (2001) focused on increasing initiations through teaching focal students how to make requests, comments, and share. They assessed peer mediation of skills during game play, along with allowing for self- and peer-monitoring conditions for further improving skills use. The authors stated that

the key finding from the study was that teaching social skills using peer mediation, self-monitoring, peer monitoring, and reinforcement was effective in increasing initiations by target students with their peers during game play. The use of teacher instruction served as a priming condition that allowed the typical peers to successfully model, prompt, and reinforce social interactions, responses, and social skills, throughout training and game play sessions.

Combining Approaches

Visual Scripts

Within adolescent populations, researchers combined PMII and visual scripts. Ganz et al. (2012) noted several research articles from the literature that described the use of visual scripts as a means to promote social interactions and teach a variety of communication skills. These skills included requesting, asking questions, and making statements. Through this intervention, training sessions are begun in which the student with ASD is taught what the script says until he or she is able to recite the script when seeing it. Following training sessions, role-playing opportunities are provided to create opportunities for implementation of the scripts during appropriate activities, allowing for prompting as needed to ensure the correct use of the target script. The use of script fading procedures allowed the individual to become independent from the use of scripts. To further report on the effectiveness of using visual scripts, Ganz et al. (2012) highlighted a study that investigated the use of PMII and visual scripts on communicative behaviors during leisure activities. Results indicated that the target students use of taught skills increased significantly while being prompted with the script by the trained peer.

Following withdrawal of the script, use of the skill did drop, but usually remained above baseline level (Ganz et al., 2012).

Perseverative Interests

In addition to incorporating the use of visual scripts, research has also focused on using the perseverative interests of adolescents with autism to create social opportunities through PMII. Koegel et al. (2012) presented research aimed to assess the effectiveness of structured lunchtime clubs based on the perseverative interests of adolescents with ASD. The authors hypothesized that the use of these clubs would increase the positive social interactions between those with ASD and their typically developing peers. Study results indicated all three focal participants increased their number of initiations and level of engagement following intervention. Koegel et al. (2012) further reiterated how this intervention model is simple, peer driven, and corroborates previous research related to the use of perseverative interests and peer-mediated interventions to improve social behaviors. By creating clubs centered on a particular interest, researchers provided common ground for those with autism and their typical peers resulting in improved social interactions. These perseverative interests may be powerful self-reinforcers to those with ASD, and provide them with the context and confidence needed to engage appropriately with peers (Koegel et al., 2012).

Academics and PMII

Research has also focused on the use of PMII with older students to increase access during small group academics. Carter, Cushing, Clark, and Kennedy (2005) noted that peer support interventions are emerging as an effective alternative as compared to the traditional model of using the paraprofessional in assisting students in gaining access to

the general curriculum. They reported that often times, supports result in a heavy reliance on the use of paraprofessionals. This over-reliance can in turn limit a student's social interactions with peers, stigmatize the student, prolong an overdependence on adults, and even reduce interactions with the general education teacher (Carter et al., 2005). The paraprofessional provides academic support and may not be able to facilitate or share knowledge on how to foster social engagement opportunities. Through the use of peer support interventions, peers are taught to: (a) adapt class activities to facilitate student participation, (b) provide instruction related to IEP goals, (c) implement relevant behavior plans, (d) provide frequent feedback, and (e) promote communication between the student with disabilities and classroom peers. The authors also focused on evaluating the impact of altering the number of participating students in peer support arrangements on the social and academic outcomes of students with severe disabilities. Reported results indicated that changes in the configuration of peer support arrangements differentially affected student outcomes. Specifically, there were higher levels of social interaction and contact with the general curriculum with the use of two peers as opposed to one (Carter et al., 2005).

PMII with Older Adolescent and Young Adult Populations

Moving into later adolescent and early adult years, there continues to be substantial changes occurring throughout the social lives of this population. Those with ASD have experiences with many more youth through the transition to high school, and the ever-growing need for students to develop greater autonomy and independence within their daily lives (Gardner et al., 2014). Through these new interactions, adolescents share in a broad range of emotional and practical supports, find commonalities, enjoy shared

activities, develop new skills and values, and learn how to get along with others in a diverse world. Interactions with peers have an impact upon satisfaction with school, sense of belonging, and overall well-being. On the contrast, being able to navigate through this complex social landscape is an ever-challenging task for adolescents with autism. Deficits with social interactions, communication, and behavior are the main characteristics of autism, leading to difficulties with being able to develop these essential relationships with peers (Gardner et al., 2014)

Use of PMII within High School

Authors Bambara, Cole, Kunsch, and Tsai (2015) noted how the increased demand for social conversation within this population often serves to widen the social gap between those with autism and their typical peers. As a result, many teenagers begin to feel they are socially isolated and marginalized. With evidence based mainly on interventions aimed at promoting social connections within preschool and elementary populations, far fewer studies have focused specifically on the social interactions of high school students, yet these challenges do not diminish with age (Gardner et al., 2014). Interventions need to address conversational deficits to prevent them from negatively affecting future adult relationships, employment, mental health, and overall quality of life (Bambara et al., 2015).

Peer Networks

Due to the continued presence of social skills deficits in adolescents, researchers deemed it necessary to examine the use of peer networks as a promising strategy for increasing the opportunities students with ASD have to interact with and strengthen social skills with peers. Researchers continued assessing if such interventions are

feasible and acceptable to implement in high schools (Gardner et al., 2014). For high school students, PMII research began in 1992 and has only slowly emerged. The most recent studies did not begin again until 2009. The use of peer networks to promote social interactions and social skills in structured classroom and lunch activities demonstrated increases in social engagement and peer interactions, but a lack of consistency with initiations and novel communication exchanges (Bambara et al., 2015). Reported observational studies for older adolescent populations suggested social interactions among students with autism and their typical peers are often limited, even when present in the same classrooms, cafeterias, or clubs (Gardner et al., 2014). Researchers and educators realized the need to equip these young adults with the skills and opportunities to enjoy increased interactions with peers. The work of Bambara et al. (2015) extended the PMII research in high school students by assessing the effects of a PMII model on improving the specific conversational skills of passive or reluctant conversationalists with ASD. The conclusion that were drawn from the results indicated that the effects of the PMII model resulted in the focal students' improved conversational abilities with their peers. Focal students showed improved abilities to initiate conversations, ask follow-up questions, as well as collateral increases in their use of comments. In turn, students developed into active conversationalists. Typical peers and educators validated the impact of interventions, and reasserted the use of PMII with improving social-communication skills of high school students with ASD.

Gardner et al. (2014) further examined the use of peer networks for high school students through evaluating the efficacy and social validity of these networks as a means of fostering social interactions and skill development. The findings of this study extended

the limited literature for this population on promoting social interactions through several presented ways. Described data demonstrated that implanting peer networks within a high school general education advisory class setting lead to substantial and sustained increases in both social engagement and peer interactions. In addition, through completion of stakeholder surveys, adult facilitators considered peer networks as an acceptable social support model, with participating adolescents also reporting enjoyment and affirming social validity (Gardner et al., 2014).

Community-Based PMII

To assess the use of a community-based research approach, authors Gantman et al. (2012) aimed to adapt, further develop, and test the effectiveness of a manualized evidenced-based adolescent social skills training program known as *PEERS for Young Adults*, for use with high-functioning young adults with ASD, a critically underserved population. The small group format consisted of 9-10 participants, with the use of the *PEERS* program being focused on the training of social etiquette through use of concrete rules and steps. The presentation of social rules was conducted in the form of Socratic questioning, and intended to promote and enhance participation in the lesson among a population that often exhibits low self-directed behaviors. At the end of each session, group leaders provided socialization homework assignments. Caregivers received specific instructions on how to provide assistance with social coaching, while also helping to promote or maintain social independence for their young adults (Gantman et al., 2012). Researchers noted increases across skills, including social responsiveness, greater participation in social activities, more frequent and appropriate attempts towards romantic interests, and decreases in self-reported loneliness.

Conclusion and Direction for Future Research

Pervasive social skills deficits are a common core feature for those students diagnosed as exhibiting behaviors that are associated with autism spectrum disorder. With more students being provided special education services within the inclusive general education classroom, stakeholders must provide effective intervention programs that target social skills development for these students. Peer-mediated interventions and instructions teach typically developing peers ways to interact with and help those with ASD acquire new skills by increasing social opportunities, ideally in natural environments such as the school setting. Implementation of PMII includes pairs or small groups beginning in preschool and extending through the high school years. For younger children the focus can center on peer-initiation training or the use of a buddy approach to facilitate skill acquisition. Older students benefit from social networking strategies, such as with the use of social clubs.

Limitations

All reviewed research studies and literature analyses indicated consistent limitations. Rao, Beidel, and Murray (2008) completed a comprehensive article review specific to social skills interventions for those with high functioning autism (HFA) and Asperger's disorder. Several reported limitations included: 1) the lack of a common definition of social skills and no agreement as to what behaviors should be addressed, 2) a lack of group designs to control for the effects of maturation and time over the course of treatment, 3) reduced sample sizes that do not allow for sufficient power to provide meaningful data analysis, 4) the use of unblinded observer ratings to determine treatment response, and 5) a lack of generalization and follow-up assessments.

Validity

As stated, DiSalvo and Oswald (2002) raised issues in the use of these social interventions specific to social validity. They questioned the level at which typical peers interacted with ASD targets and the overemphasis given to quantitative results versus qualitative measures. Further questions were raised to the generalizability of strategies across settings and peers, as well as the need to facilitate interactions with ASD peers.

Maintenance

An additional concern included issues of maintaining interventions over time. Authors highlighted the difficulty in producing stable and substantial improvements with socialization results from interventions generally addressing only a small facet of the problem, resulting in negligible changes. Rao et al. (2008) further discussed the need to establish efficacy through single-case and open trial research designs, and effectiveness through controlled randomized clinical trials. There is a need to establish a specific set of universal behaviors to address. This in turn will allow for the design of social skills training programs that facilitate generalization to natural settings, and provide a comprehensive manual to allow for implementation across settings (Rao et al., 2008). A set of universally accepted target behaviors to address may be of importance within school settings. There can be a lack of consistency from school to school within the same local county, across differing counties, and even state lines. It is key to remember the heterogeneity of autism and what may be a target for one student is not necessarily appropriate for another. One must keep in mind the need to take an EBP approach and use interventions best individualized for targeted students.

Effective Peer Models

Locke, Rotherman-Fuller, & Kasari (2012) noted how there is a lack of research specific to the social characteristics needed to make an effective peer model, and whether or not peer models themselves presented with positive social outcomes. Researchers aimed to expand the existing literature on typically developing peer models. They examined specific social characteristics, such as the centrality toward their social network and friendship quality, and the stability of social behaviors, as compared to a matched cohort of non-peer models. In Locke et al.'s (2012) study, chosen peers were included in peer-mediated interventions designed such that three typically developing children from the target ASD child's classroom trained to work with these students twice a week for six weeks during recess or lunch periods. The peer models learned specific strategies that would help to engage the students with ASD, such as initiating and sustaining engagement. Taught strategies included modeling, role-playing, direct instruction, and rehearsal. When provided with "missions" between sessions, peers practiced learned skills at recess with their ASD peers and other classmates.

Overall, the results demonstrated typically developing peer modelers were more socially adept and connected to those with ASD, as compared to non-peer models at the start and conclusion of treatment (Locke et al., 2012). The authors suggested these findings point to the need for a specific type of child most often selected as a model, which challenged any idea that being a model would create negative social outcomes for these students (Locke et al., 2012). When creating a PMII, it may only be natural to target peer models who are leaders, or perhaps present as more empathetic to and even interested in friendships with their disabled classmates. However, it would be the hope

that by providing PMII within a typical classroom setting, non-trained peers would also benefit from seeing others facilitating and participating in these social interactions, and perhaps give them the confidence to develop more friendships. Gauging the perceptions of all classroom peers both before and following the use of PMII to determine any changes, as well as observing any carryover of taught skills from those with autism to their non-trained classmates, would provide useful feedback.

Concluding Thoughts and Study Purpose

In conclusion, for those students diagnosed as exhibiting behaviors along the autism spectrum disorder, pervasive social skills deficits are a common core feature. There is a substantial need to design and implement effective intervention programs that target social skills development for this population. Through a review of the literature, one can aim to assess current research trends for use in the guiding of future research questions, specific to the development and use of effective social skills interventions for our students and youth with ASD. Skills taught within the isolated therapeutic setting do not allow for real-time engagement with typical peers, and is difficult to determine carryover. Often our students with autism receive academic support within the typical classroom setting from a paraprofessional. Although many will, their role is not to specifically facilitate social engagement with typical peers. In addition, general education teachers have students with various disabilities in their classrooms, but are often not equipped on how to best facilitate academic success, nor provide social engagement opportunities. Research incorporating a PMII program within an inclusive setting, targeting both typical and ASD students, paired with assessing and educating attitudes and beliefs across peers, could further help change societal views, increase

acceptance, and foster improved social skills development for an ever-growing population of students.

The purpose of the current study incorporated the use of a PMII program within a general education classroom setting aimed to increase the number of initiations and conversational turn-takes in students with an autism diagnosis. In addition to determining if such a program would change the perspective of general education students towards their peers with disabilities. Further measures gauged if carryover of social engagement between those with autism and untrained peers occurred following the withdrawal of treatment.

Research Questions and Hypothesis

RQ1: Will the use of PMII within a general education classroom affect the number of initiations in students with an autism diagnosis?

RQ2: Will the use of PMII within a general education classroom affect the number of conversational turn-takes in students with an autism diagnosis?

RQ3: Will the use of PMII within a general education classroom will change the perspective of general education students towards their peers with disabilities?

RQ4: Will targeted and learned skills be demonstrated towards peers who were not trained as part of the PMII program?

Previous research demonstrated positive increases in skills development with use of a PMII program within the general education setting. The researcher hypothesized that there will be positive increases in social skills for those with autism, as well as an enhancement in the attitudes and beliefs of general education students towards their peers with disabilities, across this study. As targeted participants gain more insight on how to

approach social situations, they may feel more confident with initiating and responding to their peers. With better understanding through direct instruction and afforded social opportunities, peers can gain skills that will improve their school experiences and attitudes. In addition, as those without disabilities become more knowledgeable to the differences and abilities in others, they too can be more confident in how to engage and make connections with a variety of classmates. Previous studies have indicated limited reports of gains made with being able to demonstrate learned skills with peers not specifically trained as part of the PMII program. The researcher hypothesized that there will be opportunities provided through natural transitions within the general education setting that allows for the targeted skills of initiations and turn-taking to be demonstrated by target participants towards peers not trained as part of the PMII program.

Chapter III
METHODOLOGY

Study Design

This study received approval from the Valdosta State University Institutional Review Board before recruitment of participants (see Appendix A for approval form). This study also received approval from Gwinnett County Public Schools before recruitment of participants, as their students and facilities were utilized in the study (see Appendix B for approval form). A quantitative study is appropriate when attempting to describe the causal relationships of interest (Creswell, 2003). Within quantitative studies, researchers aim to advance the relationship among variables, and pose this through questions or hypotheses. This study incorporated use of single-subject or single case experimental design. Single-subject research is a popular choice in the field of special education. The design is useful when the researcher is attempting to change the behavior of an individual or a small group of individuals, and wishes to document that change. Unlike true experiments where the researcher randomly assigns participants to control and treatment groups, in single-subject research the participant serves as both the control and treatment group (Fraenkel & Wallen, 2006). Single-subject designs allow professionals across settings to ask questions that may not be feasible or possible to answer with more traditional group designs (Byiers, Reichile, & Symons, 2012). Furthermore, they are a tool that can be used to establish the viability of treatments in real-life environments, such as a school setting, before attempts are made to implement

them at a large-scale level, when aiming to determine if a practice can be considered as evidence-based (Byiers, et al., 2012).

Participants

Purposive sampling is also known as judgmental, selective, or subjective sampling. This non-probability sampling procedure allows target selection based on characteristics of a population, and the objective of the study. The choosing of three student participants focused on the use of a purposive sample. Each participant met the criterion for an educational diagnosis of autism spectrum disorder, and presented with a need to foster pragmatic language development. The educational criterion was established through score results on the *Autism Spectrum Rating Scale (ASRS)* (Goldstein & Naglieri, 2009). The *ASRS* instrument includes a 71-item checklist for students aged 6-18 that assesses the full range of spectrum characteristics to help assist in diagnostic decisions, treatment planning, and ongoing progress monitoring (see Table 1 for score results). The selected participants were all from the same elementary school, within the same third grade special education ASD classroom setting, and each participated daily in academic segments in a general education classroom.

Table 1

Participant demographics and Autism Spectrum Rating Scale (ASRS) results

Name, ethnicity	Age, sex	Disability	ASRS- Teacher	ASRS- Parent
Anna Bell, Anglo	8, F	Autism	72	64
Ivan, Latino	8, M	Autism	84	44
Micah, Anglo	8, M	Autism	74	74

Participant One

Anna Bell was an 8 years and 2 months old, third grade student. She has a significant medical history, including a liver transplant, hearing loss, and a clinical diagnosis of ASD. Noted deficits specified inconsistent developmental rates, difficulties with social interactions and social communication, articulation, receptive and expressive language delays, mild sensory issues, and difficulties adapting to changes in routine. Anna Bell received school-based services through both ASD and speech-language impairment (SLI) eligibilities. She was diagnosed along the autism spectrum from a clinical psychologist evaluation in 2016 at 4 years of age. Anna Bell received an educational diagnosis for autism in 2017, based on score results from the *ASRS* completed by her parents and classroom teacher. At that time, she exhibited many behavioral characteristics similar to a child diagnosed with autism. Elevated scores were reported for both the social communication and unusual behavior domains across the

teacher and parent ratings. Anna Bell's cognitive scores were within average. At school, Anna Bell demonstrated elevated levels of difficulty with peer socialization, social-emotional reciprocity, and behavioral rigidity. Anna Bell began receiving mainstream services at the start of the 2018-2019 school year. She received academic instruction for language arts and math in the special education setting. Instruction in social studies and science was within the general education classroom with adult assistance. Anna Bell was a pleasant, compliant student who aimed to please. She typically followed directions, shared materials, and asked for assistance when in need. Anna Bell exhibited weaknesses with reading comprehension, math problem solving, written expression, social skills, articulation, and independent work completion. Her parents expressed that they would like Anna Bell to have more opportunities for social interactions with neurotypical peers.

Participant Two

Ivan was an 8 years and 6 months old, third grade student. He has demonstrated impairments in both verbal and nonverbal communication, social interaction and participation, pragmatic language, articulation, and stereotypical behaviors. Ivan has a history of sensory impairment and is very rigid to routines. He meets educational criterion for support through the ASD and SLI eligibilities. Per the *ASRS* results in 2017, when Ivan was 5 years old, he was exhibiting many of the behavioral characteristics similar to children diagnosed with autism. He had difficulty with using appropriate verbal and nonverbal communication for social interactions, engages in unusual behaviors, had trouble relating to others, and difficulty with providing appropriate emotional responses. Review of parental ratings suggested no elevated areas in any domain. His parents indicated concerns with frustration, social relationships, and with

Ivan's ability to tolerate changes in his routines. Ivan's reported cognitive scores are above average. He received mainstream service time for a significant portion of the school day, with math, social studies, and science segments within the general education classroom. Ivan received academic instruction for language arts within the special education classroom. He was an eager student who wanted to please. Ivan's noted areas of weakness are with independent work completion, social/emotional skills, articulation, and written expression. Ivan's parents are pleased with his progression in the school environment.

Participant Three

Micah was an 8 years and 3 months old, third grade student. He demonstrated splintered developmental abilities, impairments in social relationships, as well as deficits in verbal and nonverbal communication, and stereotypical and rigid behaviors. Micah presented with deficits in receptive and expressive vocabulary, articulation, and pragmatic language weaknesses. Along with a clinical diagnosis of autism spectrum disorder in 2014, at the age of 2, educational eligibilities for ASD and SLI are also in place. Per *ASRS* results in 2017, Micah also demonstrated many behavioral characteristics similar to children diagnosed with autism. He had difficulty with using verbal and nonverbal communication appropriately to initiate, engage in, and maintain social contact. Both his teacher and parent ratings reflected difficulties for social communication, unusual behaviors, peer socializations, and use of atypical language. Micah struggled with tolerating changes in his routine and could overreact to certain sensory experiences. His reported cognitive scores are below average. The current 2019-2020 school year was the first that Micah began receiving mainstream services for

academics. Instruction for social studies and science were within the general education classroom with adult assistance. His previous experiences with general education peers were solely during the once daily specials segments of art, music, physical education, and math enrichment. Micah received academic instruction for language arts and math within the special education classroom. He was compliant and eager to please across classroom settings. Micah's weaknesses are math computation, writing, attending to tasks, listening comprehension, and social skills development. His parents are pleased with progress, but continue to express concerns for high levels of anxiety.

Parental and General Education Teacher Rating Scales

For purposes of gathering information from all those who interact with student participants, the general education classroom teacher along with students' parents were asked to complete the *Social Responsiveness Scale-2 (SRS-2)* (Constantino, 2012) at the start of the study, to further identify social impairments (see Table 2 for score results). The *SRS-2* is a 65-item Likert-scale objective measure of the symptoms associated with autism. Its use focused in schools, clinics, hospitals, and other environments, to evaluate strengths and weaknesses in reciprocal social behavior. Scale results for each participant are presented below in table form with included subtest measures (see Table 2 for score results). T-scores of 59 and below are considered to be within normal limits. Scores between 66-75 are considered as within the range of mild impairments. Scores between 66-75 are considered within the range of moderate range, whereas scores of 76 and higher are considered as severe impairments.

Table 2

SRS-2 Student Participant Results

Subtest Measure	Participant	Parent T-Score	Teacher T-Score
Social Awareness	Participant 1	59	70
	Participant 2	48	64
	Participant 3	73	62
Social Cognition	Participant 1	68	73
	Participant 2	55	78
	Participant 3	84	83
Social Communication	Participant 1	79	67
	Participant 2	43	75
	Participant 3	81	72
Social Motivation	Participant 1	56	63
	Participant 2	44	76
	Participant 3	88	75
Restricted and Repetitive Behaviors	Participant 1	66	66
	Participant 2	45	77
	Participant 3	85	85
Total Score Results	Participant 1	70	70
	Participant 2	45	77
	Participant 3	86	78

Subscale clusters included social awareness, cognition, communication, motivation, as well as restricted interests and repetitive behaviors. Social awareness focuses on the ability to pick up on social cues, with cognition focused on the ability to interpret those cues. Social communication includes expressive social communication, with motivation focused on the extent to which the individual is generally motivated to engage in social-interpersonal behaviors. Restricted and repetitive behaviors includes stereotypical behaviors or highly restricted interests. For participants one and three,

similar total score results were noted from both the parent and general education teacher, across several to all clusters. Both scores were within the moderate range of impairment. For participant two, a greater discrepancy was evidenced in total score results when comparing parent and teacher responses. The teacher score was within the moderate range of severity. Noted deficits for social cognition, communication, and motivation. Conversely, parent score was within normal limits for all clusters and total score results.

Measures

Four research questions were developed and evaluated for the purposes of this study. The first two questions were specific to the use of a PMII program within a general education classroom to increase the number of initiations and conversational turn-takes in student participants with an autism diagnosis. An *initiation* was defined as the participant seeking out another person to either verbally greet, make a request and/or comment, or ask a question. *Conversational turn-taking* was defined as the participant demonstrating the ability to comment or question with another person, on topic, for at least two exchanges.

The third question focused on whether PMII would change the perspective of general education peers towards their peers with disabilities. To start, each general education peer within the chosen third-grade classroom completed a questionnaire to determine their level of knowledge specific to what is meant by having a disability, the variety of differences between students, and how they would describe their level of interactions with their peers within special education (see Appendix C for questionnaire). From those answers and based on teacher recommendation, a total of three general education peers were chosen to pair with the three student participants. The lead

researcher also interviewed each student participants to determine their level of knowledge of how they view differences among themselves and others, and their overall quality of friendships with peers (see Appendix D for interview questions). Following completion of the treatment phase, each of the selected peers completed the original questionnaire again for comparison from baseline through treatment.

The fourth question centered on the student participants exhibiting targeted and learned skills towards peers not trained as part of the PMII program. If participants demonstrated skills with other classroom peers who were not part of the PMII training, then this demonstrates a carryover of skills across a variety of peers following withdrawal of intervention. Again, use of initiations and conversational turn taking, as defined previously, were the measured behaviors.

Within PMII, peers are trained to serve as intervention agents, learning how best to initiate and respond to social interactions with ASD peers. A combination approach addresses the need for direct skills instruction, and the social-pragmatic use of language to have successful communication interactions with others. Peer modeling, written text cues, and direct adult instruction are all components of a combined PMII program. For the purposes of this study, a combination approach supported pro-social behaviors during academic small group instruction. The chosen third grade general education classroom participated in project-based learning (PBL) for much of the curriculum. This instructional methodology encourages students to learn and apply knowledge and skills through engaging experiences. A key characteristic of PBL is the focus being student-centered. They are able to work more independently through the process, with the

teacher providing support when needed. Students are encouraged to make their own decisions about how best to do the work, and demonstrate understanding.

Procedures

Baseline

This study incorporated a baseline, treatment, and maintenance, an A-B-A design. For data collections, a frequency count was used by tallying the number of initiations and conversational turn-takes from each participant (see Appendix E for data collection form). Data collection procedures allowed both measures to be documented simultaneously. The baseline A-phase took place over a period of four days, during which the lead researcher completed daily classroom observations of each target participant, documenting the number of initiations and conversational turns, and then graphed those using an Excel spreadsheet. To ensure reliable data collection, the special education paraprofessional, who works with the participants, also collected data on initiations and conversational turns. The lead researcher provided the previously described questionnaire to determine general education peers, and completed interviews with each target participant.

Treatment

The intervention B-phase took place within the general education social studies/science group four times per week, throughout a 45-minute segment over the course of five weeks. The daily group focused first on the developed social skills lesson with the six participating students. Topics included initiating greetings, starting conversations, friendship skills, giving compliments, asking for help, working with partners, and disability awareness education. The lead researcher trained each peer

simultaneously on how to initiate greetings and ask questions for the participants to answer. The questions varied and focused on the task at hand, giving compliments, encouraging peer participation, and the sharing of opinions. The lead researcher combined the use of verbal modeling for students specific to examples of initiating and asking questions to start conversation. She also provided verbal praising throughout the treatment phase. The lead researcher prompted the peer to ask a question and then model if the participant was not able to provide it independently. The lead researcher modeled appropriate responses, with the peer again prompted to ask a question to allow practice with responding. The lead researcher provided verbal praising for all attempts. Following completion of the small group lesson, the lead researcher transitioned to the class academic task, which varied each day. Academic lessons included partner and project work, completion of notes and study guides, game playing for test prep, and research in a school computer lab. During the first four weeks of the study, the participants completed a project-based group-learning activity with their partner focused on the American colonies. The special education paraprofessional served as an active observer during all sessions for the purposes of data collection, and learning how to implement a PMII program.

After the first week of treatment, the lead researcher continued the same small group and academic task model, while also reducing her use of verbal modeling, and transitioning instead to the use of written text cues as a visual support for peers. The lead researcher would simply point to the written text as a reminder to use initiations, and to ask questions of participants during the academic lesson. The lead researcher again provided verbal praising for all attempts. This model continued over the course of the

four remaining treatment weeks. For the treatment B-phase, data collection occurred again through a frequency count specific to the use of initiations and conversational turn-takes as previously defined, and entered into an Excel spreadsheet. To ensure reliable data collection, the noted special education paraprofessional again collected data on initiations and conversational turns.

Maintenance

Observations continued for a final four days following withdrawal of treatment, during the same social studies/science 45-minute class segment, the third-A phase. The lead researcher aimed to determine if learned skills would be maintained and carried over to untrained peers who were not part of the PMII program. The number of initiations and conversational turns were recorded and graphed using an Excel spreadsheet. The lead researcher and special education paraprofessional documented on data sheets if the general education peer was or was not part of the PMII training. The researcher again used a frequency count tally mark system for data collection. To ensure reliable data collection, the paraprofessional again collected data on initiations and conversational turns.

Data Analysis

Visual Analysis of Data

Visual inspection of the data allows researchers to make judgements as to the reliability or consistency of intervention effects by visually examining the graphed data (Kazdin, 2011). The underlying rationale is to allow investigators to focus on interventions that produce potent effects that are obvious from merely inspecting the data. Kazdin (2011) further indicated that the intention of visual inspection is to serve as a

filter, interpreting only clear and strong interventions as producing reliable effects. In single-subject design, performance is met by examining the effects of intervention at different points over specific conditions or phases. Conditions most often include a baseline, during which no intervention occurs, then followed by one or more treatment phases.

A treatment effect, and the magnitude of the relationship, can be determined by visual inspection of data across all phases of a study for at least three standards (Kratochwill et al., 2010). Researchers describe these standards, or effect measures as: (1) level, (2) trend, (3) variability, (4) immediacy of the effect, (5) overlap, and (6) consistency of the data patterns across similar phases. This study focused on examination of level, trend, and variability as recommended by Byiers et al. (2012). Level, which represents the mean score of the data, focused on adding the values of all the data points in each phase (i.e. baseline, intervention, maintenance) and dividing the sum by the total number of data points. Trend was determined by obtaining slope values for each phase to inspect for significant upward or downward trends. That is, a notable difference occurred between the slope of the line that connects the average of the first and the second half of data points in each phase. Finally, variability focused on using the range of data in each phase. The lead researcher then compared the variability between conditions (i.e. baseline and intervention). Byiers et al. (2012) noted how visual inspection does not produce a quantitative index of intervention strength, or the effect magnitude. They described how the determination of which practices are considered as evidence-based increasingly involve quantitative synthesis of data, and the need for an established effect size metric to reflect the magnitude in single-subject design. Determining the percentage

of nonoverlapping data (PND) allows one to present an effect size metric (Tarlow & Penland, 2016). The lead researcher calculated the PND using the formula from the information of Tarlow and Penland.

For research questions, one and two, data collection occurred across phases using a frequency count which was plotted using an Excel spreadsheet. Visual inspection of the data determined if a change had occurred. For research question three, use of a pre and post questionnaire with general education students aided in determining if a perception change had occurred. Data collection for question four incorporated use of a frequency count, noting if the peer was trained or untrained, with information added to an Excel spreadsheet. Data were inspected visually to determine if carryover to untrained peers had occurred.

Inter-rater Reliability

Inter-rater reliability was calculated using 10% of randomly selected data collection sessions. The second rater consisted of another speech-language pathologist who worked at the same elementary school as the lead researcher. The lead researcher provided her with training on how to identify and quantify the dependent variables. A paired samples *t*-test was used to examine agreement between the two raters.

Treatment Fidelity

To assess for treatment fidelity, a procedural checklist was completed for two intervention sessions (see Appendix H for procedural checklist). The previously described second rater completed the checklist while watching a video of the two treatment sessions across the five-week treatment period.

Chapter IV

RESULTS

Introduction

The study incorporated the use of a PMII program within a general education classroom setting aimed to increase the number of initiations and conversational turn-takes in students with an autism diagnosis, and to determine if such a program will change the perspective of general education students towards their peers with disabilities. The study also aimed to determine if those with autism demonstrated learned social skills with typical peers who were not trained as part of the PMII program. A total of four research questions were developed to support the lead researcher's hypothesis. For research questions, one and two, data collection occurred across phases using a frequency count which was plotted using an Excel spreadsheet. Visual inspection of the data determined if a change had occurred. For research question three, use of a pre and post questionnaire with general education students aided in determining if a perception change had occurred. Data collection for question four incorporated use of a frequency count, noting if the peer was trained or untrained, with information added to an Excel spreadsheet. Data was inspected visually to determine if carryover to untrained peers had occurred.

Inter-rater Reliability

Special Education Paraprofessional

In order to investigate if significant differences existed between the rating profiles of the lead researcher and the special education paraprofessional, a series of interrater reliability analyses were conducted on the initiations and conversational turns data. A Pearson product-moment correlation analysis revealed significant correlations between the two raters in regards to initiations, $r(73) = .88, p < 0.01$ and conversational turns, $r(73) = .94, p < 0.01$. In addition, a paired samples t -test was conducted on the initiations and conversational turns data. No significant differences were found for the initiations data, $t(74) = 1.77, p < .08$ or for the conversational turns data, $t(74) = 0.18, p < .86$.

Second Rater

Another speech-language pathologist, a colleague of the lead researcher, completed a second manner of reliability analyses, via observations of video-recordings for one-third of the treatment sessions. Following completion of all phases, the SLP watched a total of six randomly selected treatment videos. She had been educated as to the definitions of initiations and conversational turns. The SLP took data using the same data collection form and frequency count measure. In order to investigate if significant differences existed between the rating profiles of the lead researcher and this additional rater, a series of fidelity checks were conducted on the initiations and conversational turns data. A paired samples t -test was conducted on the initiations and conversational turns data. No significant differences were found for the initiations data, $t(10) = 0.12, p = .91$ or for the conversational turns data, $t(10) = 0.00, p = 1.00$.

Participant Baseline Interviews

Completion of student participant interviews occurred during the baseline phase. The lead researcher asked each participant a total of six questions focused on disability and differences, as well as having and being a friend. Each student indicated that they did not know what the word “disability” meant, while also noting that everyone has differences specific to things they know or can do. They each labeled those they deemed as “friends,” with two demonstrating difficulty with how to describe being a friend. Participant one expressed that friendship is specific to doing things together, being nice, and caring for each other. Each shared a desire to have more friends, but could only name one or none of those who they are friends with outside of school. During the second week of treatment, participant one presented to the lead researcher a two-page story with illustrations of two people exchanging greetings, with the caption of “make comments at all times” listed on each page.

Dependent Variable Analysis Across Phases

Initiations

Specific to dependent variable analysis across study phases, research question one focused on determining if the use of PMII within a general education classroom (independent variable) affected the number of initiations (dependent variable) in students with an autism diagnosis. It was hypothesized that there would be a positive increase in the number of initiations demonstrated by participants. It should be noted that across the third maintenance phase, all opportunities for participants to demonstrate carryover of learned skills occurred with peers not trained as part of the PMII program. Data

collection took place across phases using a frequency count and added to an Excel spreadsheet. The graphed data are presented below in Figure 1.

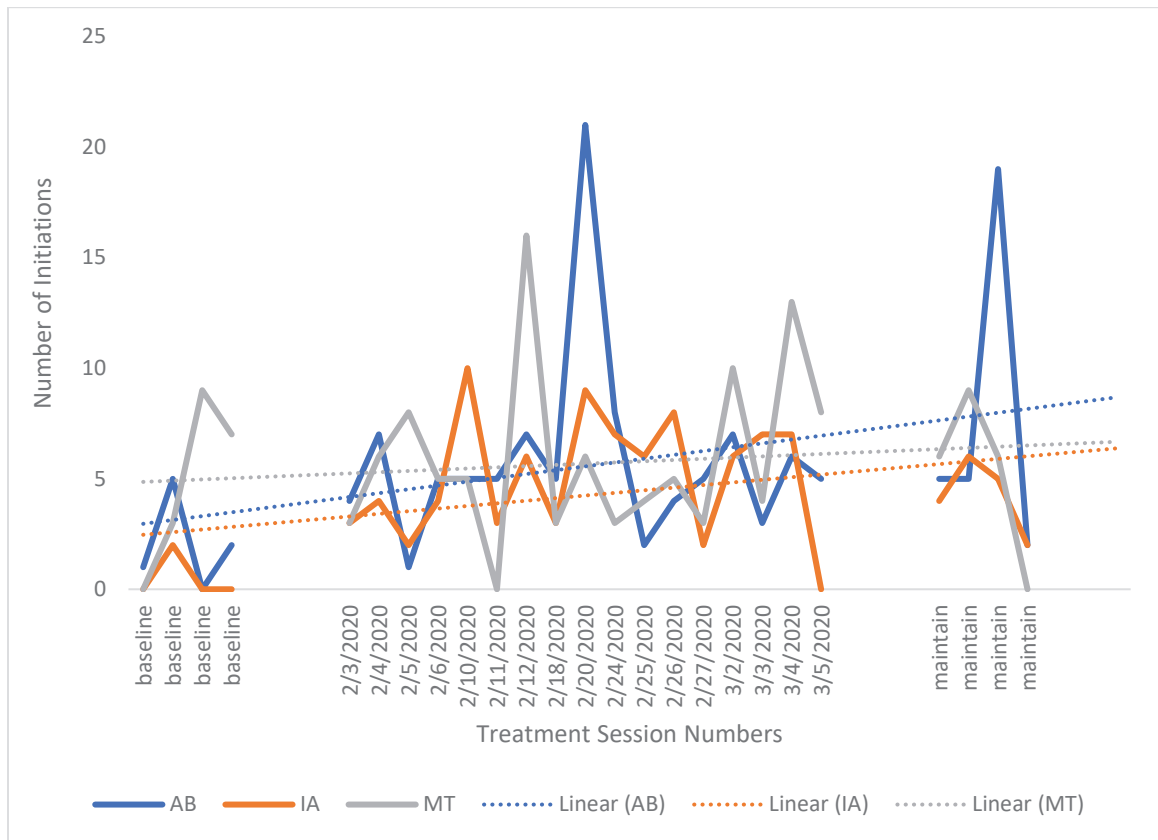


Figure 1. Participant initiations data

Visually inspected data determined if a change had occurred, focused on level, trend, and variability as recommended by Byiers et al. (2012). For participant one, examination of the data revealed noted increases in level across all three phases. The baseline average was 2.0 initiations, with an increase to an average of 5.88 initiations during treatment, and then a 7.75 average number of initiations following treatment withdrawal across the maintenance phase. For participant two, examination of the data revealed an increase from a mean of .05 to 5.11 average initiations over the course of treatment. There was a noted decrease to a mean of 4.25 initiations following withdrawal of treatment across the maintenance phase. For participant three, examination of the data

revealed a limited increase from a mean of 4.75 to 6.0 average initiations over the course of treatment. There was again a noted decrease to a mean of 5.25 initiations following withdrawal of treatment across the maintenance phase. The researcher calculated the percentages of nonoverlapping data (PND) for each participant. Participant one had a PND of 35.29% for initiations, allowing again for demonstrate of little effect. Participant two had a PND of 82.35%, allowing for evidence of some type of positive treatment effect. Participant three also demonstrated a high PND at 94.12%.

Trend was determined by obtaining slope values for each phase to inspect for a significant upward or downwards trend. Regardless of whether slope was being investigated across the whole data collection series, or across just the treatment phase, there were no significant findings. By adding a linear trend line to each range resulted in a line whose slope was equal to or nearly to 0, indicating the average of the values does not move to any real degree.

Finally, visual inspection revealed changes in variability across each phase. Participant one demonstrated a baseline range of 9, a treatment range of 4, and a maintenance range of 17. Participant two demonstrated a baseline range of 2, a treatment range of 10, and a maintenance range of 20. For participant three, the baseline range was at 9, with the treatment range of 16, and maintenance range of 9. The highest variability occurred across the treatment phase, which indicated widely varying data points. Refer to Appendix F for table of all score results.

Conversational Turns

Research question two focused on determining if the use of PMII within a general education classroom (independent variable) affected the number of conversational turns

(dependent variable) in students with an autism diagnosis. It was hypothesized that there would be a positive increase in the number of conversational turns demonstrated by participants. Data collection took place across phases using a frequency count and added to an Excel spreadsheet. Again, it should be noted that across the third maintenance phase, all opportunities for participants to demonstrate carryover of learned skills occurred with peers not trained as part of the PMII program. The graphed data are presented below in Figure 2.

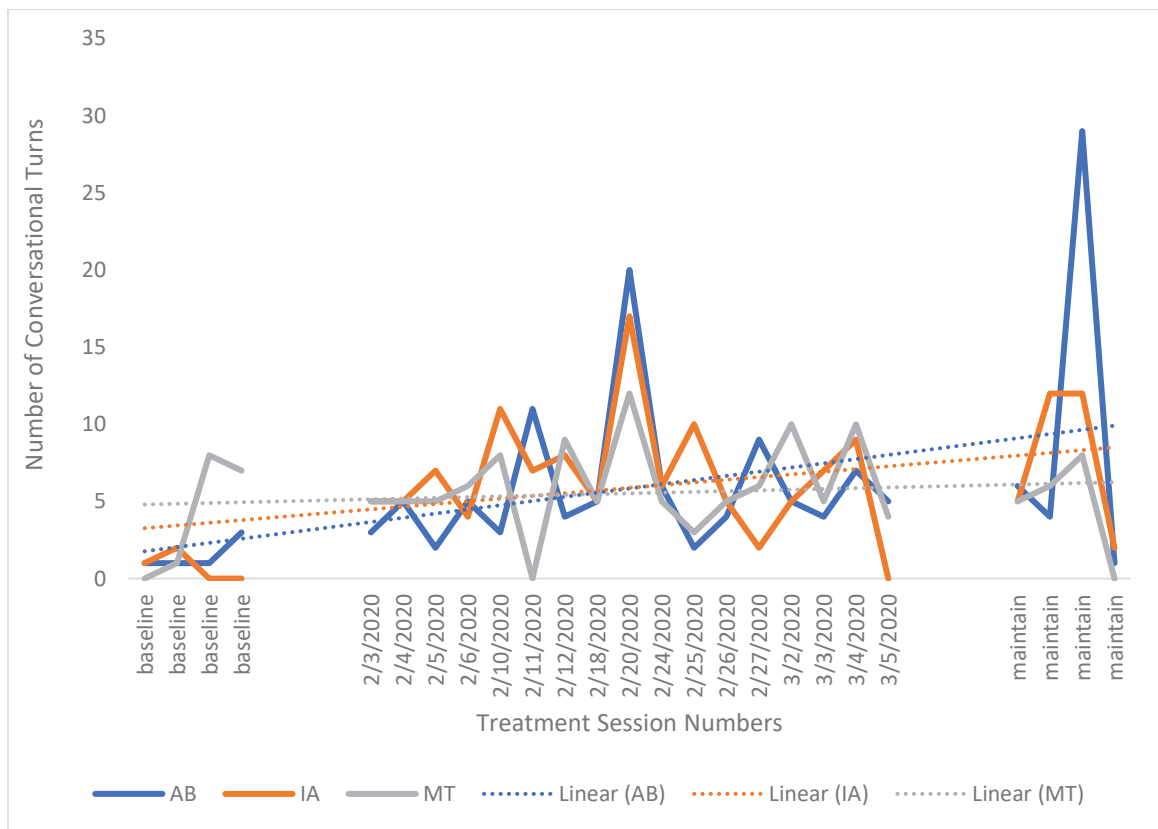


Figure 2. Participant conversational turns data

For participant one, examination of the data revealed noted increases across all three phases. The baseline average of 1.5 conversational turns increased to 5.8 conversational turns during treatment, and then 10 conversational turns following withdrawal of treatment across the maintenance phase. Examination of the data for

participant two again demonstrated an increase from a mean of .075 to 6.65 average conversational turns over the course of treatment. There was a noted increase to a mean of 7.75 conversational turns following withdrawal of treatment across the maintenance phase. For participant three, examination of the data again revealed a limited increase from a mean of 4.0 to 6.06 average conversational turns over the course of treatment. A noted decrease was revealed to a mean of 4.75 conversational turns following withdrawal of treatment across the maintenance phase. The researcher again calculated effect size through use of PND. Participant one demonstrated a PND at 76.47%. Participant two demonstrated a PND at 88.24%, with participant three at 17.65%.

Trend was determined by obtaining slope values for each phase to inspect for a significant upward or downward trend. Again, regardless of whether slope was being investigated across the whole data collection series or within each treatment phase, there were no significant findings. By adding a linear trend line to each range resulted in a line whose slope is or is nearly equal to 0, indicating the average of the values does not move to any real degree. During treatment slope values were near zero (.10, -.10, .11), which indicated that progress was not trending upward to be able to demonstrate a positive effect.

Visual inspection again revealed changes in variability across each phase. Participant one demonstrated a baseline range of 2, a treatment range of 18, and a maintenance range of 28. Participant two demonstrated a baseline range of 2, a treatment range of 17, and a maintenance range of 10. For participant three, the baseline range was at 8, with the treatment range of 12, and maintenance range of 8. The highest variability

occurred across the treatment phase, which indicated widely varying data points. Refer to Appendix G for a table of all score results.

General Education Peer Responses

The third research question focused on whether or not the use of PMII within a general education classroom would change the perspective of general education students towards their peers with disabilities. As noted, during baseline and following treatment, the chosen general education peers completed the same questionnaire specific to disability and friendship. Each of the peers reported knowing someone with a disability, with two peers accurately defining the word “disability.” Each were able to label how to be a “friend” to others through being kind, socializing, being close with, and having trust in that person. Two students felt sad towards their peers with a disability, as they cannot do the same things as other typical peers. Each describe being a role model to others through demonstrating appropriate behaviors at school. Following treatment, one student noted how his feelings towards those with a disability focused more on caring about them and how to help them. Two of the students requested to be in the same class as the target students for the next school year to be able to continue to help them as needed. They also asked if the lead researcher would be willing to continue the PMII program within the 4th grade classroom.

Carryover to Untrained Peers

The fourth research question focused on if carryover of learned skills by target participants would be demonstrated towards peers who were not trained as part of the PMII program. It was documented by both the lead researcher and the special education paraprofessional during the third-A maintenance phase, if the behaviors of initiations and

conversational turn-takes were exhibited with a peer not part of the PMII training. For all data collected, each noted initiation and conversational turn-take were indeed demonstrated towards a peer not trained as part of the program by each of the target participants.

Chapter V

CONCLUSION

Overview

This study incorporated a PMII program within a general education classroom setting to improve targeted social skills in participants with an autism diagnosis. Four research questions were developed specific to if the program would affect the number of initiations and conversational turn-takes in participants, and determining if such a program changes the perspectives of general education students towards their peers with disabilities. The study also aimed to determine if participants demonstrated learned social skills with typical peers who were not trained as part of the PMII program.

The researcher hypothesized there would be a positive increase in social skills for those with autism, as well as an enhancement in the attitudes and beliefs of general education students towards their peers with disabilities. The researcher further hypothesized that target students demonstrated learned skills towards their peers who were not trained as part of the PMII program.

The study took place over a 7-week period within a third-grade science/social studies mainstream classroom, and included one week for baseline data collection, 5-weeks of treatment, and a final week of maintenance data collections following withdrawal of treatment. Data collection occurred across phases by the lead researcher and special education paraprofessional through the use of a frequency count, which was then graphed onto an Excel spreadsheet. Visual analysis of the data examined the causal

relationship between the independent variable and dependent variables, and focused on the examination of level, trend, and variability. Visual analysis across all phases for data sets of initiations and conversational turns revealed differences in level between the baseline and the treatment phases. The highest variability across the treatment phase indicated widely varying data points, combining to exhibit a “noneffect.”

Review of EBP and Autism Treatments

As defined, evidence-based practice (EBP) is specific to the integration of best research evidence combined clinical expertise and inclusion of patient values (Sackett et al., 2000). Within the field of speech-language pathology, EBP integrates clinical expertise, scientific evidence, and client and family preferences, to provide optimal services (ASHA, 2004). When deciding how to best serve clients and students with autism, one must keep in mind the highly and unique idiosyncratic characteristics associated with ASD, differences in skills development, and how these factors continue to create significant debate about which are the most appropriate intervention choices (Simpson, 2005). Programs should incorporate several elements including, individualized supports, systematic instructions, specialized curriculum, and parent involvement (Iovannone et al., 2003). Curriculums should include targeted instruction specific to social skills engagement, such as those offered through use of PMII, social stories, and written scripts. Specific to PMII, research as a collective, indicates that this is a useful and versatile intervention approach (Chan et al., 2009).

This study focused on use of a combined PMII approach, with direct peer training, modeling, and use of written text cues. The peer models were within close proximity to their ASD target partner, allowing for direct observation of taught social

behaviors and response examples. Through a combined approach, one can address the need for direct skills instruction, and the social-pragmatic use of language (Kamps et al., 2015). There is a focused use of adult facilitation, repeated social learning opportunities, and active peer mediation between students. Use of direct peer training has often reflected positive behavioral changes in those with ASD and their peer models (Battaglia & Radley, 2014). In addition to social skills training, this study incorporated an academic component. Again, general education teachers have reported a lack of knowledge and support on how to manage the needs of those with autism, while also providing effective whole-group instruction. Use of a special education paraprofessional is routinely included in both special and general education classrooms. Within the mainstream setting, students can become over reliant on the paraprofessional, creating increased social isolation from peers. Through inclusion of the academic content, the lead researcher provided target students the opportunities to practice social skills in real contexts within the general education setting. The general education teacher often observed the academic instruction and reported a positive opinion of the treatment model and student responses. The special education paraprofessional served as an observer and data collector for all sessions. She reported gaining a better understanding on how to model and provide social skills supports for the target students. She also repeated the opinion of the general education teacher specific to the treatment model and student responses. The following sections provide discussions of visual analysis, each research question, and interpretation of subsequent results.

Visual Inspection of the Data

Visual analysis of the data examined the causal relationship between the independent variable and dependent variables. The insensitivity of visual inspection to detect weak effects, as compared to effects demonstrated using statistical analysis, is seen as an advantage because it centers on looking for powerful treatments (Kazdin, 2011). Visual inspection allows for more Type II error patterns that conclude an intervention did not produce an effect, when in fact it did. Relying on visual inspection only discounts reliable but weak effects. After completion of data collection across phases, numbers are examined for changes across level, trend, and variability. Level focuses on the magnitude of change across phases, with trend specific to the rate of change observed (Kazdin, 2011).

Discussion of Research Question One

Research question one focused on determining if the use of PMII within a general education classroom affected the number of initiations in students with autism toward their peers. The researcher hypothesized that participants would demonstrate an increase in performance. For each of the three participants their number of initiations did increase in average between the baseline and treatment phases, with a wide variety of change, from an average increase of only two initiations to as high as an average change of over five initiations. The researcher calculated the percentages of nonoverlapping data (PND) for each participant. Participant one had a PND of 35.29% for initiations, allowing again for demonstrate of little effect. Participant two had a PND of 82.35%, allowing for evidence of some type of positive treatment effect. Participant three also demonstrated a high PND at 94.12%. However, each participant did not present with a consistent

baseline trend. Baseline variability may mean that the PND scores results are inconsistent with visual examination (Carr, Anderson, Moore, & Evans, 2015). Byiers et al. (2012) described how the baseline phase creates a benchmark that allows for comparison of participant behaviors across subsequent conditions. Baseline data must contain certain qualities to allow for an appropriate comparison. Two key qualities are first that baseline data are stable with limited variability, and that there is a lack of clear trend of improvement (Byiers et al., 2012). Since the scores in the baseline phase for each series had larger differences between each point, and scores went both up and down, measuring the number of initiations became highly variable. In turn, one cannot predict future data points from those observed. There were overlaps between many sessions in the baseline and intervention phases, even though the average level of performance was higher during intervention. These overlaps obscured any potential effects and created a threat to internal validity, the extent to which a study establishes a reliable cause-effect relationship. As a result, instead of demonstrating any potent treatment effects, intervention demonstrated a “noneffect” (Byiers et al., 2012).

Analysis of trend demonstrated this continued noneffect, as the linear trend line across each phase resulted in a line with a slope at or nearly zero. The average of the values did not change much due to the widely varying data points. Analysis of variability itself examined the range or difference between the highest and lowest data points in each phase. For example, participant three demonstrated a treatment range of 16, which indicated highly variably performance and an inability to state with confidence that the treatment was effective. It is possible that the high level of variability could have resulted from the variety of opportunities presented across academic tasks. For example,

when prepping for a next day test, the academic task involved partners playing a class-wide Kahoot trivia game. The number of opportunities provided to each student was significantly higher than during completion of a worksheet activity. It may have been advantageous for the lead researcher to focus on documenting the number of initiations and the total number of opportunities provide across tasks, to address issues with variability.

Following withdrawal of treatment, during the third A-maintenance phase, conditions returned to pre-intervention. Two of the three target participants demonstrated a decrease in mean performance during maintenance as compared with the treatment phase. Only participant one demonstrated an increase across maintenance versus treatment. A functional relationship cannot be established if the same level of performance continues even though intervention is withdrawn. However, Byiers et al. (2012) indicated that studies aimed to improve proficiency in a skill through practice may not experience return to baseline levels following withdrawal of interventions. None of the participants returned to baseline averages during the maintenance phase.

Trend as noted above continued at a near zero value due to variability in data points. Variability of scores remained highly changing across maintenance. Ranges at 17, 20, and 9 for target participants again allowed for demonstration of a noneffect. A-B-A withdrawal designs create an ethical issue specific to removing an effective intervention (Byiers et al., 2012). However, due to the high variability within this study, the intervention did not demonstrate a positive effect leading to an ethical dilemma.

Discussion of Research Question Two

Research question two focused on determining if the use of PMII within a general education classroom affected the number of conversational turns in students with autism toward their peers. The researcher hypothesized that target participants would demonstrate an increase in the use of conversational turns with peers. For each of the three target participants, their number of conversational turns did increase in average between the baseline and treatment phases, with another wide variety of change, from an average increase of only two conversational turns to as high as an average change of over six conversational turns. The researcher again calculated effect size through use of PND. Participant one demonstrated a PND at 76.47% indicating a positive effect of intervention. Participant two demonstrated a PND at 88.24%, with participant three at only 17.65%, indicating a lack of true treatment effect. Again, each participant did not present with a consistent baseline trend. Since the scores in the baseline phase for each series had larger differences between each point, and scores went both up and down, measuring the number of conversational turns became highly variable. Baseline variability may mean that the PND scores results are inconsistent with visual examination (Carr et al., 2015). As stated, one cannot predict future data points from those observed. There were overlaps between many sessions in the baseline and intervention phases, even though the average level of performance was higher during intervention. These overlaps obscured any potential effects and created a threat to internal validity, the extent to which a study establishes a reliable cause-effect relationship. As a result, instead of demonstrating any potent treatment effects, intervention again demonstrated a “noneffect” (Byiers et al., 2012).

Analysis of trend demonstrated this continued noneffect, as the linear trend line across each phase resulted in a line with a slope at or nearly zero. The average of the values did not change much due to the widely varying data points. Analysis of variability itself examined the range or difference between the highest and lowest data points in each phase. For example, participant two demonstrated a treatment range of 17, which again indicated highly variable performance and an inability to state with confidence that the treatment was effective. Again, it is possible that the high level of variability could have resulted from the variety of opportunities presented across academic tasks. It may have been advantageous for the lead researcher to focus on documenting the number of conversational turns and the total number of opportunities provided across tasks, to address issues with variability.

Following withdrawal of treatment, during the third A-maintenance phase, conditions returned to a pre-intervention model. Data collection again focused on the number of conversational turns to determine if target participants demonstrated learned skills following withdrawal of treatment. Two of the three target participants demonstrated an increase in the mean of performance during maintenance as compared with treatment. Participant three demonstrated a decrease in performance across the maintenance phase. Again, a functional relationship cannot be established if the same level of performance continues even though intervention is withdrawn. None of the three participants returned to baseline averages during the maintenance phase.

Trend, as noted above, continued at a near zero value due to variability in data points. Variability of scores remained highly changing across maintenance. Ranges at

28, 10, and 8 for target participants again allowed for demonstration of noneffect and no concerns with the creation of an ethical dilemma.

Discussion of Research Question Three

The third research question focused on whether or not the use of PMII within a general education classroom would change the perspective of general education students towards their peers with disabilities. The researcher hypothesized that those without disabilities would become more knowledgeable as to the differences and abilities in others, and gain confidence in how to engage and establish connections with a variety of their classmates. By providing peers with the tools and knowledge on how to initiate, engage, and model to the student participants, they were able to change their understanding of those who are different, and in turn demonstrated a desire to continuing building friendships with the participants. This changed understanding was reflected through responses to the questionnaire, as well as observations from the lead researcher. Peer models appeared more confident engaging, establishing, and maintaining friendships with the target participants. Each expressed enjoyment with the activities, with two of the three peers desiring for intervention to continue.

Discussion of Research Question Four

The fourth research question focused on target participants demonstrating targeted and learned skills towards peers who were not trained as part of the PMII program. The lead researcher hypothesized that skills would be demonstrated towards other peers, as increased social opportunities would be provided through natural transitions within the general education setting to allow for increased opportunities. Due to the change in student-seating arrangements, each participant was provided with a new group of peers to

demonstrate learned skills. As a result, all initiations and conversational turn-takes demonstrated by the participants included a peer not trained as part of the PMII program. Specific to the question and hypothesis, target participants did demonstrate the use of targeted and learned skills with students who were not trained.

Limitations of the Study

Study limitations included the small sample size and the heterogeneity among participants. Although each had been diagnosed along the autism spectrum, the severity of impairments differed, and each participant presented with comorbid deficits beyond autism, including hearing loss, attention deficits, varying cognitive levels, and anxiety concerns. It has been reported that up to 85% of those with autism also have some form of a co-morbid psychiatric diagnosis, with as many as 35% on at least one treatment medication. (Children's Hospital of Philadelphia, 2017). Differing severity levels and co-morbid impairments could have affected participant performance. Additionally, target participants already had a history of receiving intervention specific to teaching of social skills in isolation; that foundation could have influenced any increases in measured behaviors. There could have also been an influence with peer selections not being random but based on questionnaire responses and teacher recommendations. These peers could have already presented with more of a willingness to be effective peer models.

Limitations may have also been specific to the type of data collection used. The daily academic task changes led to differing numbers of opportunities to demonstrate learned behaviors. The lead researcher needed to not only collect data on the variables of initiations and conversational turns, but also on the total number of opportunities afforded to each participant for all sessions, which could have explained the widely-varying score

results. Perhaps extending the number of baseline sessions would have allowed for a stabilizing effect, and better ability to predict future data points.

Recommendations for Future Research

The number of children diagnosed with autism continues to rise. The presence of social skills deficits is an all-encompassing part of this diagnosis. Parents, teachers, and other professionals continue to seek out treatment interventions that aim at teaching and improving the social skills development in children with autism. With that, it is crucial to become educated as to the most effective, evidence-based practices to apply across a heterogeneous group of students in a variety of setting. Using PMII within schools has revealed positive treatment effects for students with autism. For future research within the school setting, refinement of data collection methods, including all behavior opportunities, and experimental design model to include another treatment phase, could be of benefit when trying to demonstrate a true treatment effect. In addition, researchers may want to include direct parental involvement, through providing daily communication of what occurred during treatment sessions, and having participants communicate to parents the daily lesson and target behaviors.

Conclusions

As stated, this study did not demonstrate a positive treatment effect; however, participants demonstrated increases in the production of target behaviors, as well as carryover toward untrained peers. Perhaps, the lacking of more comprehensive data collection and study design limited visual demonstration of effective treatment. There was no evidence of a negative treatment effective, so a need is still present to study the use of a PMII program to improve the social skills of students with autism throughout

their school environments. Skills cannot stay limited to the small group speech therapy classroom; however, this study was not able to demonstrate effective treatment within the general education setting as developed.

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APPENDIX A:

IRB Research Approval Valdosta State University



**Institutional Review Board (IRB)
for the Protection of Human Research Participants**

EXPEDITED PROTOCOL APPROVAL

Protocol Number: IRB-03963-2019

Responsible Researcher: Jennifer D. Hartwell

Supervising Faculty: Dr. Matthew Carter

Project Title: *Moving Beyond the Speech Room: Using Peer Mediated Instruction and Intervention (PMII) to Foster Social Skills Development.*

Level of Risk: Minimal More than Minimal
Type of Review: Expedited Convened (Full Board)
Approval Category: 6 & 7
Approval Date: 01.06.2020
Expiration Date: 01.06.2023

- Consent Requirements:**
- Adult Participants – Written informed consent with documentation (signature)
 - Adult Participants – Written informed consent with waiver of documentation (signature)
 - Adult Participants – Verbal informed consent (Research Statement)
 - Adult Participants – Waiver of informed consent
 - Minor Participants – Written parent/guardian permission with documentation (signature)
 - Minor Participants – Written parent/guardian permission with waiver of documentation (signature)
 - Minor Participants – Verbal parent/guardian permission
 - Minor Participants – Waiver of parent/guardian permission
 - Minor Participants – Written assent with documentation (signature)
 - Minor Participants – Written assent with waiver of documentation (signature)
 - Minor Participants – Verbal assent
 - Minor Participants – Waiver of assent
 - Waiver of some elements of consent/permission/assent

Approval: This research protocol is approved. Your approved consent form(s), with IRB approval stamp are attached. If you prefer the original stamped consent, please email tmwright@valdosta.edu and the form will be sent via inter-office mail, or you may come by the OSPRA office to obtain the original. Please see page 2 for additional important information for researchers.

Comments:

Elizabeth Ann Olphie

Elizabeth Ann Olphie, IRB Administrator

01.06.2020

Date

Thank you for submitting an IRB application.

Please direct questions to irb@valdosta.edu or 229-253-2947.

Form Revised: 06.02.16

APPENDIX B:

Gwinnett County Public Schools Research Approval



LOCAL SCHOOL RESEARCH REQUEST FORM

Name of School: Duncan Creek Elementary School

Name of Researcher: Jennifer Hartwell

Position or Grade: Speech-Language Pathologist

A. Research Project

a. Title: Moving Beyond the Speech Room: Using Peer Mediated Instruction and Intervention (PMII) to Foster Social Skills Development Between Peers

b. Statement of Problem and research question: The purpose of this study is to incorporate use of A PMII program within a general education classroom setting aimed to increase the number of initiations and conversational turn takes in students with an autism diagnosis, and determine if such a program will change and enhance the perspective of general education students towards their peers with disabilities.

Please refer to the included attachment specific to research questions and hypothesis.

c. Subjects or population for the study: There will be a total of 6 third grade students chosen for the sample population, to include 3 students from the Level 3 ASD special education classroom, and 3 general education students.

Reason for doing this research:

<input checked="" type="checkbox"/>	Graduate Study at <u>Valdosta State University</u> University/College
<input type="checkbox"/>	Publication/Presentation
<input type="checkbox"/>	Other (please specify) _____

d. Dates research will be conducted: February 3, 2020 to March 27, 2020

B. All research and researchers must a) Protect the rights and welfare of all human subjects, b) Inform students and/or parents that they have the right not to participate in the study, c) Adhere to board policies and applicable laws which govern the privacy and confidentiality of students records.

C. This request applies to research conducted within and by local school personnel. All other research requests must be submitted by completing a GCPS Research Application and submitting it electronically according to instructions. For complete details and instructions, please visit our Web Page at the following link: <http://tinyurl.com/ce7pmpm> or you can simply go to gwinnett.k12.ga.us. When you open our webpage, click on "I want to" section.....Apply for Research Approval." This will take you to our webpage.

D. Principals ONLY need to approve Local School Research Requests. The copy sent to the Research & Evaluation Office is for filing purposes only. No further approval is necessary.

E. After approval by the principal, please forward a copy of this completed form to:

Via GCPS Courier: Jim Appleton GCPS - Research & Evaluation ISC	Via US Mail: Dr. Jim Appleton, Executive Director Research & Evaluation Department Gwinnett County Public Schools 437 Old Peachtree Road, NW Suwanee, GA 30024	Via Fax: Jim Appleton 678-301-7088
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Carrie Young
Principal's Signature

10/24/19
Date of Approval

APPENDIX C:

Questionnaire for General Education Peers

1. Describe what the word “disability” means to you.
2. Do you know anyone who has a disability?
3. Describe your feelings about students in your school with a disability?
4. Describe what the word “friend” means to you?
5. What does it mean to be a role model for others?

APPENDIX D:

Interview Questions for Students with Autism Spectrum Disorder

1. What have your parents taught you about disability or differences?
2. How do you think you may be different from other students in your class?
3. What does it mean to be a “friend” to someone?
4. Do you have friends in your classes with you?
5. Do you want to make more friends at school?
6. Do you have friends outside of school who you spend time with?

APPENDIX E:
Data Collection Form

Data Collection Sheet Example- Frequency Count:

Observer: _____ Location: _____

Date: _____ Start: _____ End: _____ Participant _____

Initiation Behavior	
Conversational Exchanges	

Reliability Observer: _____

Comments: _____

Data Collection Sheet Example- Frequency Count:

Observer: _____ Location: _____

Date: _____ Start: _____ End: _____ Participant _____

Initiation Behavior	
Conversational Exchanges	

Reliability Observer: _____

Comments: _____

Data Collection Sheet Example- Frequency Count:

Observer: _____ Location: _____

Date: _____ Start: _____ End: _____ Participant _____

Initiation Behavior	
Conversational Exchanges	

Reliability Observer: _____

Comments: _____

APPENDIX F:

Participant Visual Analysis Data Numbers for Initiations

Measure	Baseline	Treatment	Maintenance
Trend			
Participant one	2.0	5.88	7.75
Participant two	0.5	5.11	4.25
Participant three	4.75	6	5.25
Level			
Participant one	No slope was different than 0 across phases		
Participant two	No slope was different than 0 across phases		
Participant three	No slope was different than 0 across phases		
Variability			
Participant one	9	4	17
Participant two	2	10	20
Participant three	9	16	9

APPENDIX G:

Participant Visual Analysis Data Numbers for Conversational Turns

Measure	Baseline	Treatment	Maintenance
Trend			
Participant one	1.5	5.8	10
Participant two	.75	6.65	7.75
Participant three	4	6.06	4.75
Level			
Participant one		.11	
Participant two		-.10	
Participant three		.10	
Variability			
Participant one	2	18	28
Participant two	2	17	10
Participant three	8	12	8

APPENDIX H:
Procedural Checklist

Procedural Checklist:

- Lesson to begin each group session _____
- Written text card for each group provided _____
- Modeling of appropriate responses from lead researcher _____
- Verbal praising for attempts from lead researcher _____
- Academic task completed during group _____
- Evidence of peers demonstrating target behaviors _____
- Data collection by lead researcher and paraprofessional _____