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A Review of Social Skills Intervention For Students With Autism Spectrum Disorder

Angela M. Walters
Bethel University

A REVIEW OF SOCIAL SKILLS INTERVENTIONS FOR STUDENTS WITH AUTISM SPECTRUM DISORDER

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ANGELA M. WALTERS

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Angela M. Walters

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Advisor's Name: Susan A. Larson, MAC, MS CCC-SLP

Program Director's Name: Katie Bonawitz, Ed.

Abstract

According the Center for Disease Control and Prevention, autism spectrum disorder (ASD) is a disability that impacts on in 54 children in the United States (CDC, 2020b). Children with ASD exhibit delays in communication, behaviors, and social skills. This paper examines a variety of published interventions that are available to support the social skills of students with ASD. Intervention types include music, technology, parents, and support for paraprofessionals. Many of the studies focused on preschool and elementary-aged children that, included a few older students. Significant costs were associated with them and all studies reported at least a small improvement in the participants' social skills and several studies noted significant social skills increases.

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CHAPTER I: INTRODUCTION

What is Autism?

According to Diagnostic and Statistical Manual (DSM-5), autism spectrum disorder (ASD) is a disability that ~~causes~~ delays in communication, behavior, and social skills (American Psychiatric Association, 2013). Symptoms of ASD typically present in a range from mild to severe and vary significantly among individuals. Signs of autism can be observed in children as young as six months even if the diagnosis is made later in life. Providing early intervention has been shown to provide significant gains in development. No cure has been found for ASD. A definitive cause for ASD has not been confirmed but it could be linked to genetics or the environment. Boys are four times more likely than girls to have ASD. The Minnesota Autism and Development Disabilities Network (MN-ADDM) collects ASD data for the CDC (2020a). Data from 2016 found that 25% of the children with ASD had a cognitive disability. No notable differences were seen when race and ethnicity were considered. By age eight, one in every 44 children in MN were identified with ASD in 2016. The number of children diagnosed with ASD continues to climb each year. An evaluation had been completed on 39% of the children prior to age three of all children diagnosed with ASD (CDC, 2020a).

An autism diagnosis is made using criteria from the Diagnostic and Statistical Manual (DSM-5) (American Psychiatric Association, 2013). The criteria include: social, communication, and behavioral information. Social communication and interaction examine the ability to participate in back and forth conversations, sharing of interactions, nonverbal communication, and relationships. Restrictive and repetitive behaviors examine repeated movements, patterns or routines, excessive interests, and sensory needs. The impairments must have been present

during the early developmental period. Impairments must impact the ability to function. A diagnosis is not always made until the social demands become more challenging as children get older (American Psychiatric Association, 2013).

Personal Experience

I sit in a classroom with seven preschool children. I am working with one student at the table while the other six are playing. I hear car tires going back and forth repeatedly on a shelf and a child repeatedly digging through a bin of blocks. All children are playing independently and not paying attention to the others in the room. The only interactions are children taking preferred toys away from each other. A paraprofessional uses bubbles to engage a child in taking turns. Suddenly, I hear a child yelling. All the children want the bubbles. As the children discover they will get a turn to blow bubbles, the room quiets again. One child is heard saying, "my turn." Another paraprofessional decides to instruct the child driving the car to maneuver it differently. I hear the staff model what to say followed by the child uttering, "Ready set go" followed by throwing the car across the room out of frustration. The child eventually returns to the car and continues driving it repeatedly back and forth on the shelf. Staff approach again and the child again throws the car out of frustration. These children participate in a center-based special education classroom setting where all the students have an educational label of ASD. Two children also have a medical diagnosis. One day a week the students practice newly learned skills in a small group in the general education setting.

The next day the children participate in general education. One student with ASD tried to engage with two neurotypical students during gym class. The neurotypical students tried to share a ball with the ASD student and then decided to pretend to share before running away

with the ball. Each time the students ran away with the ball, they looked back at the special education student and laughed. This frustrated the student with ASD, but she continued to follow and attempted to play. I intervened to help educate the other students and support my student with her social skills. After several attempts to engage in play, my student followed the student crying while the neurotypical students ran away laughing. Our class left the gym early to allow time to calm down before snack. The general education class returned to class to talk about playing with friends. In our room, snack time was silent except for the occasional prompted request for a snack item. I quickly learned that teasing begins as young as three-years-old and that we had a lot of work to do to help prepare special education students to be independent in the general education environment.

Why this Topic is Important

My class frequently plays alone at recess and during choice time in silence. Attempts to get the students to try new things is frustrating for them and for the staff. It takes a long time to teach new skills and it is hard to watch students struggle in general education. They easily become stuck wanting to continue their familiar activities and routines. Our class lessons focus on basic skills for interacting with others but the neurotypical students still notice how far behind they are. I have worked hard with my team of service providers to find ways to increase the students' communication and social skills. Core boards are provided for a communication when students struggle to use their words. Pivotal response training (PRT) is used to teach social skills which also includes play skills. The teaching team began to implement formal instruction followed by teaching the paraprofessionals. The paraprofessionals spend several weeks watching the interactions of the teaching team and then try to follow our model to make

it work for them. Once multiple team members work with the class, the students' social skills increased a little quicker. A continual struggle is to get the paraprofessionals to implement the skills consistently. They become frustrated when they do not see immediate progress. It can take several days practice before the students attempt the new skills. I also wondered whether we used the best interventions for our students. It was challenging to watch the students attempt the new skills and continue to get laughed at by their peers.

On March 13th, 2020, due to the Covid-19 pandemic, our district began teaching via a distance learning format which created a new problem. The staff communicated with the students and families using the internet. The focus of instruction became teaching the parents how to instruct the students. Several students refused to participate in the same activities that they loved at school, including play. I reflected on how I taught the paraprofessionals to work with the students. The paraprofessionals had the opportunity to observe the license staff while implementing the interventions. We made a few short videos, but we did not have any students to use for models to make them more realistic. It felt like we were beginning social skills instruction again. We had to break down the steps of each task and explain it all to the students' families. The parents needed the basics, like playing with toys in a bucket full of water or blowing bubbles to get the child to engage in the interaction. We quickly saw the benefits of teaching parents' ways to interact with their children and the connection between home and school was growing fast. Once parents understood how we had been teaching, they engaged with their children with greater purpose. I knew that teaching parents was something I wanted to continue when we returned to school. I also found myself questioning whether there were effective methods to teach the parents ways to support their children's social skills.

It was the first day of school for one of my students and everyone was washing their hands. The child refused to walk near the sink and began to scream as the other children waited in line. He would not walk near the sink and support from staff only made it worse. I talked to the parents at pick up time and learned that the child had never washed his hands before. The family used wipes or hand sanitizer at home. Following two days of handwashing with screaming, our occupational therapist remembered that the family reported that their child learned best through video modeling. This child was three years old and nonverbal. We were unsure how much language he understood. I had never tried video modeling and was not sure where to begin. We made a couple of videos for basic skills like hand washing and getting dressed which seemed to be successful. The handwashing video worked quickly, and we were making progress. I also wanted to try video modeling for social skills. The success of handwashing encouraged me to seek other interventions to teach social skills.

Guiding Questions

Watching my students struggle to communicate with others and become frustrated when they try to play with others, brought me to my first guiding question. What research-based interventions increase the social skills in children with ASD? The next question was created from challenges that I faced when trying to teach paraprofessionals the skills needed to work with my students. What social skills interventions can I teach paraprofessionals to implement? Distance learning brought a new challenge to educate parents in ways to work with their children. This challenge lead to my next question. What interventions are used to train parents to facilitate their children's social skills? My class frequently struggled with peers in the inclusion environment. These observations led to: Does participation with neurotypical

peers increase social skills success? My struggles to reach some children and my previous small successes with video modeling led me to my final question. How can technology be used to support social skills interventions?

CHAPTER II: LITERATURE REVIEW

Overview of Literature Reviewed

The articles used for this thesis were located using ProQuest Education Journals, Academic Search Premier, EBSCO MegaFILE, ERIC. The search included journal articles with only empirical studies that were peer reviewed. Key words used in this search included "ASD social skills," "young children ASD social skills," "preschool ASD social skills," and "music teaching ASD social skills."

Social Skills Curriculum

Realizing the lack of classroom-based social skills research, Laugeson, Ellingsen, Sanderson, Tucci, and Bates (2014) researched the effectiveness of an intervention curriculum for students with Autism Spectrum Disorders (ASD) called the Program for the Education and Enrichment of Relational Skills Curriculum for School-Based Professionals (PEERS). This intervention used in school settings targets adolescents. This study was the first study completed to look at PEERS. Previous social skills studies occurred in clinical settings. The study sought to determine the effectiveness of social skills instruction in the least restrictive setting which is often the classroom. Researchers wanted the students to have the opportunity to return to the classroom and use the newly learned skills.

A group of 73 students between the ages 12-14 were selected to participate in the study. Only students with a medical diagnosis of Autism Spectrum Disorder, Asperger's disorder or Pervasive Disorder Not Other Wise Specified (PDD-NOS) could participate. Criteria from the Diagnostic and Statistical Manual IV (DSM-IV) was required for the diagnosis. The study population included 64 males and nine females. All students went to Village Glen Middle

School, a middle school that served ASD students with no intellectual disability. Teachers and parents also participated in this study. A total of eight teachers from two different campuses were included (Laugeson et al., 2014).

Data was collected before the interventions began, and at the conclusion of the study using questionnaires completed by the students, parents, and teachers. Previously trained teachers provided instruction on how to implement the program over a period of 14 weeks. The students received social skills instruction for 30-minutes a day, five days a week. The students were located at two different campuses and in four different classrooms at each campus. The experimental group at one school received the PEERS instruction and the control group received the social skills curriculum currently used at the second school. The instruction was divided between the two schools to prevent interventions from being shared among groups. All staff who participated in the study were given three hours of initial training and followed by weekly additional hours of supervision and support. The teachers who worked with the control group did not receive PEERS training but were previously trained on their current curriculum. The social skills instruction included social rules and role plays. The students practiced the skills in the classroom and were given homework to practice outside the classroom (Laugeson et al., 2014).

The results indicated that PEERS successfully increased the number of social interactions initiated by the teens and the number of invitations to social events. ASD anxiety in social settings was reduced for students who participated in the PEERS curriculum when compared to the control group. Both teachers and students confirmed this improvement. Parent survey

completion was low. However, the completed parent surveys showed improvement in students' overall functioning (Laugeson et al., 2014).

The study limitations included limited parental participation and lack of ability to use a random group of students. Researchers needed to keep the students divided between the two schools to prevent the control group from learning PEERS strategies. Researchers also encountered financial constraints and were unable to verify the students' ASD diagnosis. It was also determined that other school social skills instruction programs should be compared to PEERS in the future (Laugeson et al., 2014).

Schiltz, Mcvey, Dolan, Willar, Pleiss, Karst, Carson, Caiozzo, Vogt, Yund, Vaughan, and Hecke (2018) analyzed a different outcome using the PEERS curriculum. These researchers considered whether increased social skills using PEERS decreased the number of depression symptoms in adolescents. The researchers recognized that adolescents with ASD had a challenging time with social interactions which directly impacts their self-esteem. This study looked at improving self-esteem using PEERS to decrease depression symptoms.

The participants included 49 adolescents with ASD between the ages of 11-16. These participants were part of a larger PEERS study. There were 24 participants in the experimental group and 25 in the control group. All participants had an IQ score of at least 68, which fell well-below average. Questionnaires were completed at the beginning and at the end of the study period. The students participated in the curriculum for 14 weeks. The participants received instruction focused on ways to improve socials skills along with techniques for ways to respond to bullying. PEERS was administered according to the curriculum protocol (Schiltz et al., 2018).

The data collection showed that as social skills and the quality of social interactions increased, and students reported fewer depression symptoms. The PEERS curriculum improved the students' self-esteem and decreased symptoms of depression. The amount of time the students in the control group thought about suicide increased. The control group did not participate in any specific social skills instruction (Schiltz et al., 2018).

Some research limitations were noted. Further information should be collected on specific ways that PEERS decreased depression symptoms by improving adolescent social skills. The participants could have received therapeutic services in other settings which might have impacted the results of this study. The researchers were unable to limit the participant's exposure to other intervention or therapeutic services. The data was based on participants' self-reporting. The researchers would like to repeat the study and incorporate data collection strategies to eliminate self-reporting. This may be accomplished by including input from other people who work with the participants. Researchers noted that adolescents do not accurately report depression symptoms. This study did not compare PEERS to other social skills curricula. Other social skills curricula could have shown the same impact on depression. The sample group was small and the participants in the study were from remarkably similar backgrounds. The researchers noted that the findings could not be generalized to all ASD students based on the sample groups in this study (Schiltz et al., 2018).

The results from this study indicated that when the social skills of students with ASD increased, other areas including depression, also showed improvement. Researchers discovered that the students saw improvements in many areas of their life after participating in

social skills training. It was confirmed that more studies are needed to determine the impact of social skills instruction on depression symptoms (Schiltz et al., 2018).

Ingersoll (2012) recognized that a child's ability to imitate during early development impacted cognitive and social development. This study looked at Reciprocal Imitation Training (RIT). RIT was created to teach early social imitation skills. This study looked at both joint attention and how parents reported their child's social emotional skills at the conclusion of the study.

The 29 children in the study ranged in age from 27- 49 months. Only 27 children participated for the entire study. All children had a previous diagnosis of ASD. Prior to the interventions, all children's cognitive, language and social functioning skills were assessed. All children were re-assessed following the study. The participants were divided into control and the treatment groups. The treatment group participated in RIT instruction one hour a day, three days a week for a total of 10 weeks. The previous educational instruction continued for all students throughout the study. All students received the same type and amount of services during regular instruction time. Three or more different therapists worked with each participant to facilitate generalization skills (Ingersoll, 2012).

Ingersoll (2012) found that RIT participants increased joint attention skills to a greater level than the control group. There was also a greater increase in social emotional functioning compared to the control group. The parent ratings of social emotional growth supported the research findings. Additional joint attention increases were seen on behavior measures administered at two and three months following the intervention. RIT increased the social

functioning of students with ASD by teaching imitation skills. The intervention increased the students' ability to recognize when to imitate (Ingersoll, 2012).

One study limitation was that the participants in the control group did not receive any additional instruction. The parents, therapists and people giving the assessments knew which students participated in each group. All students continued to participate in their previous instruction. It was not documented if any of the students participated in instruction that could have impacted the results of this study. Additional research would help to determine the long-term impact of this intervention. Further studies could look at how RIT impacts other areas of social behavior (Ingersoll, 2012).

Music

Music therapy is another intervention used to increase social skills for students with ASD. Researcher LaGasse (2014), completed a study to determine the impact of music therapy on social skills for students with ASD. This study compared the impact of music therapy and social skills instruction with and without music. LaGasse (2014) wanted to explore whether there would be a difference between the two groups.

LaGasse (2014) collected parent surveys during, three days after, and three weeks after the study was completed. Video recordings of the sessions were reviewed on weeks three and ten to gather additional data on the students' progress. The videos were reviewed by two people trained in music therapy (LaGasse, 2014).

A selection of 22 participants were placed randomly into groups. There were 12 students in the control group and ten in the music therapy group. The participants all met ASD criteria with no other documented disability diagnoses. The subjects' primary language was

English, and none had previous experience with music therapy. At the end of the study the number of participants dropped to 17. Four females and 13 males completed the study. Video modeling was used to help collect data twice during the study. The groups participated in instruction for 50 minutes twice a week for ten sessions over a five-week period. Two staff supported each group. Additional staff could not provide any prompts or instruction unless they had been given specific instruction. The group sessions used similar instructional protocols, except for the music added to the instruction for the experiment group. Both groups allowed a similar number of breaks and activities to meet the sensory needs of the students throughout the activities (LaGasse, 2014).

LaGasse (2014) found that the students who participated in music therapy demonstrated greater increases in eye gaze and joint attention. The control group increased at less significant levels. Eye gaze decreased when props were used during music therapy sessions with the experimental group compared to the control group. In the control group, the students' focus remained on the props and not the other participants. Both groups noted a slight increase in the level of communication imitation. The data showed that both groups maintained interest in the interventions and participated throughout the study (LaGasse, 2014).

Limitations impacted the study results. The number of participates was low and the timing of the interventions limited the availability of participants. The number of participants dropped by the end of the study. Participants felt like the expense was not worth the drive to the facility for the interventions. The researchers would like to conduct a trial with a larger group of participants to explore additional ways music therapy impacts social skills (LaGasse, 2014).

Thompson, McFerran and Gold (2013), looked at how music therapy that incorporated family members impacted social skills in students with ASD. The researchers recognized that students with ASD frequently struggled with social interactions and posited that the use of music in a family-centered environment could improve family interactions. Previous studies found an increase in children's social skills after they participated in family music therapy. This study examined family music therapy that occurred in the participants' homes.

All participants in the study met the DSM-IV criteria for ASD and were between the ages of three and six years. The participants with limited language skills previously participated in a family-centered early intervention program. There were 23 total participants with 11 who only participated in the early intervention program and 12 who participated in the early intervention program along with the music therapy. The data collected included observations, parent interviews and standardized parent rating scales. The study took place over 16 weeks where sessions occurred once a week (Thompson et al., 2013).

Parents reported that their children who participated in the music therapy demonstrated higher levels of parent-child interaction following the sessions. Both groups saw increased speech and language skills with no significant difference noted between groups. The parents who participated in the music therapy reported having a more positive outlook for their child that included the parent-child relationship. The music therapy participants demonstrated increased social communication skills. The level of parent-child interaction also increased for the families who participated in music therapy. Parents found that they expanded upon the strategies they learned from the therapist and increased their child's participation in activities offered outside of therapy time (Thompson et al., 2013).

Several limitations were noticed throughout the Thompson et al., 2013, study including a small sample size and bias resulting from parental reporting. Further studies could incorporate data collection in a more controlled manner. Only one therapist reviewed and interpreted the information.

Thompson et al., 2013 concluded that it would be beneficial to conduct additional research with family-centered music therapy. Social engagement was positively impacted when music therapy was added to family center interventions. The addition of music might increase student engagement in social activities by creating enjoyable activities. The researchers believed that as the parents participated in activities along with their children, the parents' positive perceptions of their child also increased. Researchers found the number of parent-child interactions increased as the perception of the interactions became more positive. There is also a need for research that focuses on how parent participation impacts a child's ability to learn and use new skills (Thompson et al., 2013).

Carpente (2017), reviewed the impact a curriculum called DIR, or Developmental, Individual Difference, Relationship-based Improvisational Music Therapy Program had on children diagnosed with ASD. DIR teaches parents how to work with their children to increase social skills. The activities are based on the child's interests and needs. Improvisational Music Therapy also called, IMT is a therapy that incorporates music based on the skills and needs of the participants. The therapy relies on the relationship between the therapist and the participant and it follows the interests and abilities of participants to create the therapeutic relationship. The goal of incorporating both DIR and IMT interventions was to build a reciprocal

relationship between the participant and the therapist. The therapy goal was to generalize reciprocal interaction to other areas and to activities without music.

Carpente's study (2017) included four students who attended a therapeutic day school. They were between four and eight years old diagnosed with ASD and newly enrolled in the school. Subjects could not have participated in a previous music therapy program to participate in this study. An assessment, based on play, was given twice, administered at the beginning and end of the study. The subjects participated in 15-30-minute sessions adjusted based on their attention level twice a week for 13 weeks. Each session was driven by the participant's interests and ability to focus and attend to activities. All sessions were video recorded for later review. The participants had access to instruments that did not require previous instruction. Each student guided the direction of the instruction provided by the therapist. The goal was to increase the number of interactions exchanged between the therapist and the participant.

DMI-based IMT increased the social communication skills for students with ASD. During the study, the participants picked up musical cues from the therapist and participated in the reciprocal musical activity. During the study, all participants made progress in at least one of the six assessment levels. A *normal* level was achieved by three out of four students based on their ability to regulate themselves, demonstrate joint attention and organize their behaviors. Carpente's results were consistent with previously reviewed studies. This study was the first one that used a standardized tool to evaluate the effectiveness of the intervention. The study showed that skills learned during music therapy sessions were generalized by the participant into play-based settings without music (Carpente, 2017).

The study was limited by lack of a control group to allow intervention results comparisons. Carpente (2017) was unable to confirm whether a different intervention would have shown comparable results. More research is needed to confirm the effectiveness of DMI-based IMT using a larger group of participants. Future studies should include participants randomly assigned to a trial or a control group with data collected following the sessions to determine how well the students retained and generalized the newly learned skills.

Eren, B. (2018), explored an intervention using music to teach understanding of reading facial expressions. The researcher recognized that the ability to accurately read facial expressions was an especially important part of understanding and using nonverbal communication. (Eren, B. 2018).

A five-year-old autistic boy participated in this study. He struggled with reading and using emotions. Eren (2018) believed that it would be best to teach the emotions one at a time. The intervention focused on the sadness chosen by his mother. The 12 45-minute instructional sessions were taught at the child's school once a week for three months. Distinct types of music were collected and used during the sessions. Data was obtained through notes and observations of recorded sessions. The activities included listening to songs, singing, dancing, listening to stories, coloring, and drawing. The sessions followed a consistent pattern that helped the subject participate in the routine (Eren, B. 2018).

During the first phase the subject participated in some of the movements and actions with prompting. By the end of the phase the child hummed the songs and eventually started to sing them. During phase two the child listened to a story and identified the characters who were sad. He located the sad picture in a field of three while listening to a song during the third

phase. He sang the song intelligibly. During the fourth phase he identified three different emotions with only verbal prompting. During the fifth phase the subject drew a sad face. He learned and practiced gestures for sad in the sixth phase (Eren, B. 2018).

The results indicated that the subject recognized events that made people sad in life situations. He also recognized what made characters in stories sad. His mother reported that he was able to use the sad gestures outside of the music sessions. He chose the sad photo when he was provided photos that represented a variety of facial expressions. He drew a face that was sad and used gestures that represented sad. He demonstrated increased independence as evidenced by fewer prompts and reinforcements (Eren, B. 2018).

Limitations were identified by Eren (2018). This study used only one child. More research is needed to look at the results of a more diverse group and to determine how the skills generalize to other settings. (Eren, B. 2018).

Parents and Paraprofessionals

Mrachko and Kaczmarek (2017), wanted to explore whether paraprofessionals who provided interventions to children with ASD 18 months to eight years could increase the participants' social communication skills. Previous studies were focused on parents and teachers who implemented interventions. Mrachko and Kacazmarek (2017) recognized that paraprofessionals spend a large amount of time with ASD students and could help teach social skills interventions.

Previous research was reviewed by Rispoli et al. (2011) who looked at the effectiveness of using paraprofessionals to support social communication in students with ASD. There were seven studies reviewed which included a total of 22 paraprofessionals, 21 were female and one

male. The paraprofessionals ranged in age from 18- 60 years. The paraprofessionals' education levels varied. Completed questionnaires were used to monitor the success of the interventions and the comfort level of the paraprofessionals. Five out of seven studies also looked at how the interventions impacted the children. Data collection from the interventions was used to determine the success of the paraprofessional-supported interventions (Mrachko et al., 2017).

Mrachko et al., (2017) demonstrated that students increased skills when taught by the paraprofessionals. The students also increased the amount of expressive communication used without adult prompting or support. Paraprofessionals had the most success implementing the strategies when they received continued feedback and modeling once they learned the strategies.

Future studies should look at the best ways to provide feedback and modeling for paraprofessionals while they learn the interventions. Pivotal Response Training (PRT) was the most successful intervention implemented by paraprofessionals. Additional research should be completed to determine how PRT can be used to support the students' spontaneous communication. More information is needed to determine how well students generalize social communication skills and maintain them over time. The researchers believed the impact of interventions taught by paraprofessionals should continue to be studied (Mrachko et al., 2017).

Researcher, Hernandez-Ruiz, E. (2018), explored another intervention which involved teaching parents ways to support instructing their children in social skills. This study incorporated the Early Start Denver Model (ESDM) and the Parent-Early Start Denver Model (P-EDSM) to increase social communication in children. This study included three parent and child combinations. All children were between two and a half to three years old and were diagnosed

ASD by the completion of the study. Twelve sessions were offered and only one family participated in all twelve sessions. No families had previous knowledge of ESDM, or hand participated in any other therapies.

The sessions took place in a room often used for music therapy. The music selected was familiar to adults and easy to replicate at home or other settings. The team wanted the family to be as successful as possible. The songs were interactive and encouraged interaction between the parents and children. The students used manipulatives to represent objects in the songs, body movements and instruments to encourage active participation. The participants completed two evaluation sessions which included the pre and post testing. Learning sessions commonly occurred ten 30-minute sessions, twice a week over a six-week period. A baseline was collected through a variety of questionnaires and interviews completed by the parents during the pretest session. The assessments were administered again after the parent therapy sessions (Hernandez-Ruiz, E. 2018).

The data indicated that all parents reported that they enjoyed participating in the program. Only one of the parents felt that the activities challenged their child. All parents felt their child engaged in the activities and did not feel overwhelmed by the demands of the activities. All the parents expressed an interest in additional music therapy classes. Two of the parents felt like their parenting skills improved after participating in the activities. One parent reported that they wished there were more participants because they felt that it would have increased the child's engagement. The parents learned how to make small adjustments to interactions with their children to better meet their needs. Parents also learned how to

facilitate imitation skills. Increased communication and increased interactions between the parents and children were observed (Hernandez-Ruiz, E. 2018).

Limitations noted during this study included the small sample size. The results of the study were based on parent's reports of how they felt before and after the sessions. It would be helpful to find objective ways to measure the success of the intervention without relying on parents' subjective input. Additional parent coaching in a smaller group setting would increase the success of the parents' ability to generalize the skills outside of the class. Opportunities to work with individual families might lead to greater results and provide in-the-moment feedback for the families (Hernandez-Ruiz, E. 2018).

Researchers Hardan, A. Y., Gengoux, G. W., Berquist, K. L., Libove, R. A., Ardel, C. M., Phillips, J., Minjarez, M. B. (2015), explored the impact of Pivotal Response Training when it was used to train parents on how to teach social communication skills to their children with ASD. PRT had shown promising results with students in the past and Hardan et al. (2015) wanted to explore whether parents could be trained to implement PRT. Other studies have shown that training parents as interventionists helped increase student progress. More practice in natural settings could help students increase their ability to generalize the skills.

This study took place over 12 weeks with a total of 53 children between the ages two and six diagnosed with ASD. Participants were randomly placed into control and treatment groups. Psychologists participated in trainings one day a week. Eight of the PRT sessions were 90-minute training sessions that included only parents and the psychologist. The four remaining sessions were 60- minutes long and included the parents and children. The psychoeducation group (PEG) also participated in 12 sessions. Ten sessions were parent-only

meetings for 90-minutes and two of the sessions included the parent, child, and psychologist. Videos were reviewed to determine how well parents implemented the PRT intervention and a research assistance analyzed the data (Hardan et al., 2015).

The results indicated that students increased their ability to imitate others when they received PRT interventions at home. The treatment group showed an increase in social communication skills greater than the students who participated in the PEG. This study confirmed that parent involvement increased the number of skills the students learned and decreased the amount of time it took to acquire the skills (Hardan et al., 2015).

This was the first PRT study using parents therefore, additional studies are needed to confirm the results. A larger size study would be beneficial in the future. It was not possible to monitor parent consistency in using the interventions at home which could have impacted the end results. Additional assessments and home implementation monitoring would help determine intervention fidelity. Adding more student sessions along with the parent training might increase the results in future studies. More studies are needed to explore how PRT impacts social behavioral skills for children with ASD (Hardan et al., 2015).

Social Narratives

Sani Bozkurt, S., & Vuran, S. (2014) explored how children with ASD were impacted by social narratives. They recognized the challenges that children with ASD had with peer relationships and interactions. Sani Bozkurt, S., & Vuran, S. (2014) explored previous studies focused on social narratives to find the most effective social narrative interventions.

A total of 49 articles were reviewed for this study with 32 selected. The review parameters included the intervention environment, the effectiveness of the stories, how well

the participants generalized skills following the intervention, the specific social skill selected, and the reason a child needed a story. The articles were reviewed by two researchers who then compared the results. A total of 70 children between the ages of 0-15 participated in the studies with many of the children under age 12. Most of the studies took place at school or a health center. Social interactions and communication initiating were the most common social skills targeted because the teachers identified these deficit skills (Sani Bozkurt et al., 2014).

Social narratives were justified as a cost-effective strategy to teach social skills. Several studies have shown that using social narratives increased social skills in children with ASD. In these studies, researchers, or teachers most common administrated the intervention. The studies recommended that parents, siblings, and paras utilize the social narratives. Social narratives were more effective when they were paired with other interventions (Sani Bozkurt et al., 2014).

Children with ASD over age 15 were not included in the San Bozkurt et al., (2014) study but continue to have social skills needs. Additional studies should be completed to include how older children may benefit from social narratives. A review of group studies would be beneficial because his study reviewed single subject and case studies. This study did not document the time spent creating and teaching social narratives or how often they were presented.

Wainer, A., Pickard, K., & Ingersoll, B. (2017), looked at how to bridge research interventions and community-based settings. They discovered that the providers did not use available resources because they did not feel like they had adequate training. Written information provided for the team intervention strategies did not equate with positive results.

This study looked at training community-based providers on Project ImPACT in two distinct phases.

The first phase of the study included 30 early intervention providers at three schools who provided services to students with ASD. No participants had prior training on Project ImPACT. Each provider chose at least one family on their caseload to teach Project ImPACT strategies. The family had at least one child between 18 months and six years diagnosed with ASD. The Project ImPACT intervention design taught parents how to increase their child's social skills. The first phase took place over about three months. The providers completed a five-hour online training followed by a one-day workshop and given three feedback sessions highlighting their use of the Project ImPACT interventions. The providers' progress was tracked by videotaping and questionnaires that completed three times during the first phase (Wainer et al., 2017).

The second phase of the study began about six months after the first phase and included only 14 participants. This phase occurred over three months and began with a one-day training. The training focused on how to teach parents to use the intervention. The providers recorded videos of teaching the material and provided feedback to participants three times over the course of the study. The progress was again tracked by videotapes and questionnaires which were completed three times during the second phase (Wainer et al., 2017).

Phase one results showed that by the completion of the final feedback session, the providers implemented the interventions as designed and gave high satisfaction ratings. In phase two the providers implemented the interventions as designed and reported high

satisfaction. Twelve months post training, the participants reported that they continued to use the interventions with positive results. This study demonstrated the importance of using technology to teach new strategies in a flexible and cost-effective way (Wainer et al., 2017).

The study was limited by the substantial number of staff turnover throughout organizations that provide early intervention services to students. The staff turnover prevented data collection regarding how well parents implemented the strategies prior to phase two. Limited money and time prevented additional data collection that would have considered the impact of the intervention on child outcomes (Wainer et al., 2017).

Technology

Researchers Jung and Sainato (2015) recognized that students with ASD struggled to participate in play activities. This study examined the impact of using the participants' interests to teach social skills through using video modeling and considered ways the skills generalized into other social situations. The participants included three children with ASD and six peers in the same kindergarten classroom. Each ASD student worked with two peers. The ASD students worked with separate groups of peers throughout the study. The interventions were chosen carefully and based on all participants' interests. The participants watched video modeling of adults participating in their chosen game. The videos demonstrated how to play the game and modeled conversations that typically occurred during games. The participants were asked to follow the same steps they viewed in the video. The students watched the videos and practiced until they were able to complete the steps with 90% accuracy. Students needed between four and five sessions to achieve mastery.

The video modeling sessions resulted in increased levels of student participation. In addition, students continued to use the new skills. When students were observed one month later, data showed they maintained and even improved some of the newly learned skills. The participants generalized the skills to other games. The number of prompts needed to help the students participate in the skills also decreased. The ASD students were observed assisting the other students in how to complete the steps of the game and reminding them that it was their turn. The students shared more comments about the games they played. This study included the activities the children's selected which contributed to the participants willingness to engage. It was also easy for subjects to view the video multiple times on the iPad as needed (Jung et al., 2015).

There were some limitations to this study. This was the first time that researchers explored how using the student interests to design the videos and games impacted student learning. Further studies should break down each part of the intervention to see which element was the most effective. Generalization and maintenance data should be collected more than one time following the intervention. Additional studies should also look at how well students with ASD generalize skills when not participating in preferred activities. The number of children playing games could also be adjusted to see if the skills can be generalized to larger groups. The specific games being taught could also be studied to determine which games mostly impacted the participants engagements. Future studies could also look at the effectiveness of the classroom interventions instead of using a resource room (Jung et al., 2015).

Researchers Apple, Billingsley & Schwartz (2005), noticed that children with ASD often struggled socially due to limited interests and the ability to participate in conversations. They recognized that video modeling had been effectively used to teach social skills to children with ASD but discovered that video modeling alone was not enough to teach these skills.

The participants in this study included two five-year-old boys. The boys attended an inclusion preschool program for half of the day and a program for children with ASD the other half. The interventions were implemented during play time in the inclusion preschool setting. The students participated in 30-minutes of play time each day. Teachers and parents completed rating scales twice, once prior to the interventions and when the study was completed. They also participated in pre and post interviews for comparison purposes. The team created four one-minute videos for each participant where two peers demonstrated new skills and adults taught the rules (Apple et al., 2005).

Initially, the videos were presented randomly three times a week in a separate classroom. The children returned to the classroom to practice the skills they had learned. The subjects' participation was recorded for the first 15 minutes of play time. The participants were not making progress, so a prize was added. The participants were promised a prize if they gave four compliments. The videos were eventually stopped but the prize was continued. The tangible prize was eventually phased out and replaced with a verbal praise (Apple et al., 2005).

Video modeling increased the students' social skills. Both students maintained the newly learned skills even after the video modeling ended. The results showed that video modeling did not increase the participants' ability to give compliments. The adult tracking the

number of compliments may have impacted the success of this intervention (Apple et al., 2005).

Apple et al., (2005) initiated a system where the students tracked their own participation. The revised study included three participants. Information was collected in an equivalent manner as in the previous study with videos created for each student. Students tracked their own behaviors. The students recorded their interactions on a stopwatch or a checklist. The students were shown the prizes and then were asked to give compliments. The participants were prompted when they did not produce a compliment or when they forgot to track a compliment. Following instruction and practice, students moved into the classroom to participate in the giving and tracking of compliments (Apple et al., 2005).

All three participants increased the number of compliments expressed. The students quickly generalized the newly learned skills. The self-tracking system for the interactions increased student success in giving compliments. This system allowed the students to gain independence with this social skill (Apple et al., 2005).

A caveat was that one participant learned to give compliments only about things he liked. It was noticed that participants sometimes only complimented staff and not peers. The video creation time was extensive. Further studies could consider how well the students learned when adults were used in video modeling instead of peers. Additional studies should consider the impact of removing the self-management system (Apple et al., 2005).

Almutlaq, H., & Martella, R. C. (2018) explored the effectiveness of teaching social narratives through an iPad application. They noticed that children with ASD frequently struggled with social and communication skills. They found that social narratives were used to

teach the social skills that neuro-typical children learned naturally through the environment. Students with ASD needed more intentional instruction than could be taught through social narratives. They also learned that personalized stories increased the social skills success. This study looked at using technology as a tool to teach social narratives.

Three students previously diagnosed ASD ranged in age from 8-10 participated in the study. The sessions took place during a 20-minute recess with each session scheduled for 15 minutes. The sessions occurred two or three times a week for a total of 32 sessions. An individualized social narrative was created for each student using an application called Kid in Story (Version 3.1.0). Photos of typical peers were used in the social narratives. Each one to two-minute story was seven pages long with one step per page. An audio recording was available if needed. The participants reviewed the social narrative once before for recess. The app was not used when the participants worked on generalization of skills. Teachers compiled interviews and rating scales prior to the intervention. Checklists tracked data throughout the study (Almutlaq et al., 2018).

All students completed the social skills steps. All completed more steps than previously noted, but continued to struggle with the first two skills which included directing their body and looking at their partner. When the iPad was used for the intervention, the number of steps the participants completed increased. The teachers found the app allowed for adjustments based on the student needs and it was easy to use. This study did not show an increased ability to give compliments. More research is needed to look at the effectiveness of using social narratives during unstructured school times, such as recess (Almutlaq et al., 2018).

Due to the substantial number of children with ASD who struggle with social interactions researchers Rice, L. M., Wall, C. A., Fogel, A., & Shic, F. (2015), took a closer look at FaceSay, a computer social skills intervention. Rice et al., questioned to what degree children with ASD read and understand facial expressions, and believed additional research was needed. Previous studies using FaceSay improved emotional recognition and increased social interactions. They believed additional research was needed. This study looked at the impact of FaceSay when it was administered by teachers and aids.

A total of 31 students between the ages of five and eleven participated in the study. All ASD participants qualified for special education based on the state of California educational criteria. Participants were randomly placed in two groups, with 16 students in the FaceSay intervention and 15 students in the control group. A total of 28 males completed this study. The control group used a computer-based reading program called SuccessMaker. Following the FaceSay training, participants completed the activities that required problem solving skills to complete the tasks. The computer program provided feedback and adjusted the skills level based on the participants' previous sessions. Participants completed one 25-minute session each week for a total of 10 weeks using their assigned computer program. Assessments were completed prior to the intervention and at the conclusion of the study (Rice et al., 2015).

The results revealed that FaceSay increased the participants ability to recognize basic emotions. Participants scores decreased based on the results of the Social Responsiveness Scales- Second Edition indicating fewer autism characteristics. Observations were used to confirm these results. FaceSay increased the participants overall socials skills. The social skill improvements were not generalized to the playground (Rice et al., 2015).

Limitations were noted during this study. Additional research is needed to explore the impact of FaceSay on more complex emotions such as jealousy and spite. The study was completed in a computer lab and not a natural setting. No self-monitoring skills were taught to the participants. Only one teacher reported assessment looked at the participants' ability to use the skills in other settings. Further research should use more participants with a wider age range. This study used an academic curriculum for comparison instead of a social skills curriculum (Rice et al., 2015).

Almutlaq et al., (2018) questioned whether recess was an appropriate time for students to practice giving compliments. They discussed the possibility of using the classroom or lunchroom instead. It might also be helpful to train peers to assist the participants in giving compliments. There was no information about whether peers participated in compliment-giving activities. Additional studies could consider what other steps should be included.

Another group of researchers, Yoshimura, Y., Minabe, Y., Kikuchi, M., Kumazaki, H., Warren, Z., Swanson, A., Mimura, M. (2019), looked at how technology and the use of robots increased the social skills of students with ASD. The researchers noted that early intervention increased social communication in young children and impacted later communication and social skills development. They wondered if children might show more interest in robots and engage in skills that they struggled to use with other people.

This study included 14 children with ASD and 23 children who were considered typically developing. All children were preschool-aged with an average age of three. All children with ASD received a diagnosis prior to the study. Two robots and an avatar displayed on a screen were used for the stimulus prompt. The first robot was created to look like a real person. The

second robot looked less like a human, but it could express a variety of emotions. The avatar displayed on the screen resembled a female (Yoshimura et al., 2019).

The child and parents entered the room and were encouraged to play. The robots were stationed about eight feet in front of the child. Thirty-two trials of "Hey" were provided. The participant heard, "hey" every five seconds from either one of the two robots or the avatar. The parents could play with their children but were asked to ignore the robot's attempts to get the child's attention. A research assistant also attempted to gain the child's attention (Yoshimura et al., 2019).

All students with ASD responded less to the attempts to gain attention than the typically developing children. The children with ASD were more likely to look at the simple robot and the avatar displayed on a screen. The children with ASD were less likely to show any response to the human-like robot and the human. It was believed that the children did not respond to the human-looking robot because it looked too much like a human. The typically developing children showed the most responses to the human (Yoshimura et al., 2019).

Yoshimura et al., (2019) the study had several limitations. First, the study was completed in one session so additional sessions might have provided different results. Additional social cues could have also been provided to see if the results differed. The researchers were not sure if the simple robot would hold the student's attention over a longer period. It would be helpful to include more children with ASD and increase the overall number of participants in the study. Additional studies may help determine ways robots could impact social skills development.

Young, R., & Posselt, M. (2012), recognized that children with ASD struggled to identify and interpret the emotions of others which impacts their ability to understand the perspectives of others. These researchers believed that previous research interventions struggled to connect with the participants' interests impacting the success of the intervention. Young, R., & Posselt, M. (2012), looked at the video results of children to see if the children demonstrated improvements in emotional recognition. Subjects watched *The Transporters*, made up of characters represented by vehicles that displayed human-like emotions.

The study included two groups of children ranging in age from four to eight years. One group had 13 children and watched *The Transporters* on DVD. The characters in this DVD had human faces and researchers hoped that the children would generalize their understanding of emotions to other situations more easily. The second group of 12 children watched a *Thomas the Tank Engine DVD.* The *Thomas the Tank Engine* videos consisted of a variety of episodes focused on emotions. Each DVD series included 15 different episodes. Children were asked to view a minimum of three episodes a day over a total of three weeks. The videos were five-ten minutes, and included parent interaction via a user guide. User guides for both groups encouraged parents to point to the faces of the characters in the DVDs. Parents provided feedback when their children incorrectly responded. They also tracked the number of episodes watched daily. Parents completed assessments prior to the study and when the study was complete

Young et al., (2012) found that viewing *The Transporters* increased the participants' ability to recognize emotions and participate in social interactions. The control group did not demonstrate increased in emotion recognition. Increased social interactions and improved

behaviors noted in both groups. The parents reported increased eye contact for both groups after watching the DVDs. Exposure to facial movements and expressions increased the participants' interest in social interactions. Each set of DVDs included social narratives and each group noticed an increase in the participants' interest in social interactions with peers. The participants' IQ had no impact on the ability to recognize others' emotions.

Further research to consider the impact of this intervention over a longer period is needed. It would be helpful to explore the impact of *The Transporters* on social behavior. An additional study would be beneficial to determine how the participants generalized the skills over time (Young et al., 2012).

Warren et al., (2015) explored whether robots impacted social skills acquisition of children with ASD. Previous studies documented improvements in social interactions over a small period (Warren et al., 2013). The studies have not made a strong impact on skill generalization of skills over longer periods. Previous robotic systems and tools struggled to adapt to the changing responses of the ASD child. Warren et al., (2015) focused on whether a robot intervention that targeted the typical deficit areas of children with ASD would improve imitation skills.

A total of 16 children completed the study. Eight children had an ASD diagnosis and eight children were identified as neurotypical. The average age of the children was three years. The children participated in one research session broken into four parts. Two sessions were led by a human administrator and two by the robot. The participants were seated across from either the robot or the human. Each session began with the administrator imitating the child to model for the children how they should respond. Each child was then asked to imitate

the administrator. The children were asked to complete a series of four different simple movements throughout the sessions. A sensor detected the movements and provided the children with feedback or praise based on their performance. The program evaluated the participant's level of attention directed to the administrator and how the activities were completed (Warren et el., (2015).

All children participated in the activities presented during this study. The neurotypical children were more successful imitating the human movement than the children with ASD. The children with ASD maintained their attention better when they looked at the robot. This confirmed previous studies that illustrated that children with ASD preferred to focus their attention on robotic interactions. This study shows future promise for creating systems that help children with ASD develop the critical social skills often missing (Warren et el., (2015).

The small sample size was one of the limitations of this study. This trial was not used to teach intervention skills but only used to determine whether children with ASD preferred instruction from a robot system. The system monitored head movement but was unable to determine if eye gaze was used. Additional improvements in technology are needed to detect these differences. This system used more color technology, found in the home, but the system design may be cost prohibitive. Additional research and technological improvements are needed to create effective interventions (Warren et al., 2015).

Peers

Researchers Thiemann-Bourque, K., Feldmiller, S., Hoffman, L., & Johner, S. (2018), explored whether using a speech-generating device (SGD) paired with a peer-mediated approach improved the social communication skills of preschoolers with ASD. Previous

research has shown that children learning to use devices struggled to participate in their school environments which impacted ability to interact with their peers (Light & McNaughton, 2012). Other studies have noted positive results using peers as communication partners (Thiemann-Bourquet et al., 2016: 2017). Thiemann-Bourquet et al., (2016: 2017) study used a larger number of children than in previously documented studies.

There were 45 participants with ASD including 36 boys and 9 girls. The age range of the participants was between 2 years 11 months and 5 years. Twenty-three children in the treatment group and 22 in the control group were selected from 14 different preschools. All participants were given an iPad along with an app that allowed voice output. The study included 95 peer controls without disabilities ranging from 3.4 to 5.1 years. Up to four peers were paired with each ASD child taking turns working one: one over the course of the year (Thiemann-Bourque et al., 2018).

A total of 42 special education team members were provided with a two-hour training prior to the intervention. Staff were divided evenly between the treatment and control group and assigned to groups. All staff assigned to the treatment group attended an additional one-hour training that included learning ways to set up social activities using the devices. The staff were informed not to allow the control staff to observe any of the interventions. Peers were selected and trained how to use the SGD; and taught how to be communication and play partners. The training took place over three days in classrooms, hallways, or empty rooms. The classroom was used as much as possible with students organized based on their ability to attend and focus. Data collection was completed after the first training and before the students were assigned to staff. During data collection, one iPad was placed between two

children and they were asked to play together. The children in the treatment group met with their peers two to three times a week for a total of 17-31 sessions. The control group did not receive any coaching; only support to program their iPads if needed. The children participated in one 15-minute activity weekly for nine to 19 weeks. Generalization data researchers collected during play sessions one to two weeks following the intervention and maintenance data at four to eight weeks following the intervention (Thiemann-Bourque et al., 2018).

The study results confirmed that peer mediation combined with using an SGD positively impacted communication skills for preschoolers with ASD. Interactions increased for both children with ASD and their peers. The students generalized and maintained the skills. Positive effects were noted in the control group only during the trained peer interactions. The children in the treatment group participated primarily in equal communication exchanges, and the children in the control group participated in one-sided communication (Thiemann-Bourque et al., 2018).

Several limitations to the Thiemann et al., (2018) study should be noted. The children in the treatment group had varied experiences using SGD devices. They also had more exposure to typical peers, and their data was collected more often. It would be helpful to use larger sample sizes for future research. The spoken language coding did not capture all utterances produced by the children (Thiemann-Bourque et al., 2018).

Researchers Watkins, L., O'Reilly, M., Kuhn, M., Gevarter, C., Lancioni, G., Sigafoos, J., & Lang, R (2015), looked at the effectiveness of peer-mediated interventions (PMI) for students with ASD. They recognized that children with ASD struggled with social interactions and a PMI model could increase the opportunity to interact with peers and practice critical skills. PMI

offers a variety of peer social skills partners. PMI worked well in natural environments and allowed for inclusion opportunities.

Watkins et al., (2019) reviewed previous studies on PMI that included data from only students with ASD. All studies occurred in the general education setting in one environment. Most of the studies were conducted in the classroom, but some studies used the playground, cafeteria, or lunchroom. No data was included for interventions used in the special education setting. A total of 14 articles from nine journals were reviewed comparing 84 items to determine the strength of each study. The quality of each study was ranked and sorted into groups based on the strength of the research and an agreement made among the authors (Watkins et al., 2015).

Subjects in the studies included 38 males and six females for a total of 44 participants. Their ages ranged from four to 21 years. A total of 130 similarly aged peers were included in the study. The studies focused on initiating peer interactions. A combination of reinforcement, prompting and proximity were used during the interventions along with variety of strategies which included role-play, feedback, peer trainings and the use of visual aids (Watkins et al., 2015).

All studies yielded positive results using PMI with increased social interactions for ASD students. Most of the studies were considered strong or adequate, based on the data collection and analysis. Students maintained and generalized the skills learned during the intervention in nine of the 14 studies reviewed. Proximity was indicated as not successful as a stand-alone intervention. Both the participants and their peers benefitted from the studies based on observations (Watkins et al., 2015).

Additional research is needed to determine specific PMI parameters based on the participant's need. Additionally, it would be beneficial to determine the impact of PMI to low functioning students with ASD including the impact of an inclusion setting. The number of studies was limited for preschool age students therefore additional studies would be beneficial. It is important to complete studies that involve a control group with random participants to further explore the impact of age and PMI (Watkins et al., 2015).

Wolfberg, P., DeWitt, M., Young, G., & Nguyen, T. (2015), recognized the challenges that children with ASD face during social play, and explored Integrated Play Groups (IPG). They noticed that children struggled to interact with peers and recognized how important it was to encourage positive peer relationships. The children struggled to participate during spontaneous, creative play that changed throughout the interaction such as pretending to be a superhero. The most commonly observed play observed in children with ASD included sensory play or the repetitive movement of objects. The ASD children made fewer attempts to communicate or seek out different play opportunities.

A total 48 children with ASD, ranging in age from five to ten participated in this study along with 144 neurotypical peers. All children continued to participate in their other therapy sessions but were asked to not participate in any programs designed to increase play with peers. The study took place over a period of two years. Observations were completed every three months following the completion of specific interventions. Interventions took place twice per week for 12 weeks during an after-school program. The participants were divided into 24 groups comprised of two children with ASD and three peers. All sessions followed a similar format but focused on different strategies. The instructors received training and were

observed three times during the sessions to determine instructor consistency. Assessment data was collected three times during each session. The children with ASD participated in unsupported play activities along with two new peers in sessions led by trained graduate assistants (Wolfberg et al., 2015).

Participants' levels of social play increased, and sensory play decreased because of the IPG. Previous interventions had not yielded an increased level of play for these children. The children with ASD were not only able to maintain following the interventions but they also generalized the skills to other settings. Wolfberg et al., (2015) also found that the children chose to participate in an increased number of social skills activities. Parents provided positive feedback regarding the children's growth in social abilities and in the opportunities for them to participate in social situations (Wolfberg et al., 2015).

The typical IPG program takes place over a six to nine-month period. This study included three months of instruction; therefore, it would have been beneficial to continue this study for the nine-month duration to allow students to experience all components. Further research should identify how long the children participated in the play activities rather than how often they occurred. There was no way to track which other therapies students participated in outside of this program which could have influenced the results. An additional study focused on the long-term impact of this intervention would be helpful. Research should be completed using younger children using IPG to increase social communication (Wolfberg et al., 2015).

Researchers Lane, J. D., Gast, D. L., Ledford, J. R., & Shepley, C. (2017) studied early social skill development and found that the early development of social skills has shown to improve the later social development in children. Lane et al., (2017) recognized the limited

access that students in non-inclusion settings had to neurotypical peers. They examined this using progressive time delay (PTD). PTD teach children how to take turns, share, and recognize peer preferences. During these trials, prompts are used initially and slowly faded.

The study included a total of six children between four and five years. All children had delays in their social skills development. The children were divided into three groups based on their experience receiving instruction in a small group setting. Three students had previous experience working in a small group setting and the other three children had extremely limited group experiences. Two of the groups received instruction on how to participate in small group instruction prior to the intervention. The instruction took place in the student's self-contained classroom during center time. Students worked in pairs at a table during eight, thirteen-minute sessions four days a week. The participants were provided small snacks as reinforcers (Lane et al., 2017).

All children learned to share tokens during the sharing activity and could identify their peer's preferences. Several students generalized the skills learned during the interventions. One student continued to play with a peer following a sharing activity. Follow-up instruction during unstructured play time helped the students who struggled to maintain and generalize the skills they learned during the PTD intervention. PTD provided a successful intervention that required minimal instructional time (Lane et al., 2017).

Additional training is needed on how to effectively use PTD with fidelity. It might be helpful to provide peers with an opportunity to learn more about each other before starting the interventions. The classrooms could provide additional opportunities for peers to share materials within the classroom, separate from the instruction time. Peers should be paired

based on their interests to increase the intervention success. This study did not keep track of the students' ability to wait for a prompt. Generalization tasks used only ten preferred items so additional studies should increase the number of preferred items. Generalization should be observed in more than one setting to determine which students need additional instruction. A comparison study that included the use of neurotypical peers would be helpful (Lane et al., 2017).

Sharing is an important part of early social skill development in children. Researchers Lori McCann Sawyer, Luiselli, J. K., Ricciardi, J. N., & Gower, J. L. (2005) explored this with research focused on increasing the sharing that happens between peers. They considered both the verbal and physical responses to sharing. The interventionists continued to teach their usual instruction and implemented these interventions.

The target participant was a four-year-old boy who spoke using simple phrases or one-word answers. Prior to the study he did not interact with peers or share toys. The subject participated in 30-minute play sessions with three to five of his neurotypical peers. Either the classroom teacher or the teaching assistant participated in the sessions. The number of prompts needed to elicit sharing was recorded each session. The teacher and peer modeled ways to share. The subject practiced sharing at the table before he transitioned to the play area where his sharing attempts were recorded. The instructor prompted when the subject did not participate in a sharing activity within one minute. During the second phase, the subject immediately played. The instructor continued to provide prompts if the subject did not participate in play activities. Follow-up observations were completed at 40 and 60 days to determine whether the subject maintained the sharing skills (Lori et al., 2005).

During the first phase of intervention sharing increased. During the second phase, the physical sharing decreased but verbal sharing increased. Phase one was reintroduced which increased the physical sharing; verbal sharing remained the same but required fewer prompts. The subject maintained the verbal sharing skills and increased physical sharing. Neurotypical peers demonstrated increased sharing as well. The classroom staff were successfully implemented the intervention while continuing to support all students (Lori et al., 2005).

One limitation in this study was that adult prompting and reinforcement was provided through all phases including maintenance. Not all play sessions collected data. Additional research would be beneficial to determine how the students generalize the skills outside of the classroom. This study focused on preschoolers, so the impact of this intervention is unknown for other children. The reliability between observers was not assessed (Lori et al., 2005).

Social Skills Groups

Participation in social skills group is another intervention method used to teach social skills. Researchers Rose, R., & Anketell, C. (2009) explored social skills groups. They recognized the increased need for social skills intervention in children with ASD. They also recognized that individualized therapy sessions were expensive and wanted to find an alternative social skills instruction method.

Two psychologists led the social skills sessions. Four groups were created by dividing 31 children between the ages of seven and 18 who were previously diagnosed with ASD. The children were divided by age into two groups, seven to 11 years and two groups of 12-18 years. One group in each age range was from a mainstream class and one from a special education class. Children completed questionnaires three times including a prequestionnaire, post

questionnaire, and a questionnaire completed six months after the final intervention. Each participant completed a questionnaire following each session. Data was collected from observations during the sessions. Rose & Anketell (2009) also documented the cost of the group sessions and compared the total with the cost of teaching the same skills individually. The children participated in the groups for a total of five weeks following a similar routine to learn new skills (Rose & Anketell, 2009).

Rose and Anketell (2009) noted that group sessions were cost effective. The group format included 40 hours of support from the psychologists versus 155 hours for individual sessions. The group members' participation increased following each session. The students were observed exchanging phone numbers to continue to communicate with the each other. More strategies are needed to better support more severe ASD students in inclusion activities. Positive feedback was reported by parents, participants, and the psychologists regarding the development of social communication skills. The participants reported that they liked the opportunity to make new friends. The parents appreciated a chance to connect with other families with ASD children.

In the future, a more accurate way of assessing social skill growth would be beneficial. The facilitators should not also be the evaluators in future studies. This study revealed an increased need for parent and child support. Additional studies should explore whether students with more severe autism should be included in classrooms and how to best support them. More information about students' learning targets should be shared with parents to allow for increased home practice and to generalize skills at in a variety of settings (Rose, R., & Anketell, C. 2009).

Researchers Ingersoll, B. R., Wainer, A. L., Berger, N. I., & Walton, K. M. (2017), found that developing early social communication skills in children with ASD significantly impacted later development. They studied how Project ImPACT increased social communication skills in children. This intervention is designed to support children's play skills, increase language and overall engagement during social activities.

A total of nine children previously diagnosed with ASD between 32 and 93 months participated in this study. Each participant attended a one-hour session per week. The sessions were completed by a clinician who also had a degree in social work, four psychology graduate students, and five undergraduate research assistants. All administrators received training before sessions started and during the sessions to ensure fidelity. Each participant completed sessions with three different administrators throughout the study. Sessions were completed in small group settings and materials were chosen based on the participants' interests. Five of the participants received 30-minutes of play skills work followed by 30-minutes language skills work. The other four participants received one hour of language while play interactions were rotated throughout the session. Each session was recorded and reviewed considering social engagement, play and language. Data was collected during the first ten minutes of each session. The raters were not informed about how long the children had participated in the interventions. Rating scales caregivers completed prior to and following the intervention (Ingersoll et al., 2017).

Social engagement increased for eight of the nine children. Generalization occurred for seven children. All children generalized the language skills to a new setting. Seven children used the new language skills during new play activities. Play skill improvements were seen

compared to the baseline assessment. Researchers were unable to determine whether the continued increase was due to the time of implementation or the specific intervention. Each child improved in at least one area targeted during the sessions. Most of the children improved in at least two areas and some improved in all areas. The caregivers reported positive changes on the questionnaires (Ingersoll et al., 2017).

The results were not consistent for all children so further research should consider implementing this intervention more than once a week. The study struggled with consistency in scoring among administrators when play skills and language were co-taught. Additional research should consider the significance of the attendance days per-week and the level of training required for the administrators. This study did not measure how often prompts were given. The number of participants was small, and they were not randomly placed into groups (Ingersoll et al., 2017).

Lopata, C., McDonald, C. A., Thomeer, M. L., Donnelly, J. P., Jordan, A. K., & Rodgers, J. D. (2018) explored an intervention called summerMAX. They noticed a lack of social skills research focused on young children between the ages of four and six with High Functioning Autism Spectrum Disorder (HFASD). They also noted that the language and cognitive levels of the children impacted the success of the social skills intervention.

The participants included 23 children between the age of four and six diagnosed with a HFASD. Children were randomly assigned to four groups of five or six children. Three graduate or undergraduate students led the groups. Staff and parents completed multiple rating scales before and after the intervention. The summerMAX intervention was structured into shorter sessions and adjusted for young children. All staff received training prior to the study and

supported the program adjustments. The 30-minute sessions occurred six hours per day five days a week. Ten minutes of instruction was followed by 20 minutes of skills practice. Parents participated in five 90-minute sessions once a week to improve skills and facilitate generalization (Lopata et al., 2018).

All rating skills indicated that parents, children, and staff were happy with the children's' progress. Students' adaptive communication skills improved, and their participation increased throughout the program. No changes were made to the study or protocols for this adapted summerMAX intervention for younger children (Lopata et al., 2018).

Limitations were noted in the Lopata et al., (2018) study. No control group was used for comparison. There was potential for bias among the raters because all raters were aware of the intervention goals and all observers had knowledge of the study. No data was collected to determine whether the students maintained or generalized the skills. The completion of a larger scale study could be beneficial.

Radley, Roderick, Battaglia, Lum, and Dadakhodjaeva (2017) looked at the effects of a social skills curriculum called the Superheroes Social Skills Program. These researchers noticed that children with ASD frequently struggled with communication and interactions with others. They also found that the children were frequently paired with peers who struggled with the same deficits. They also struggled to generalize the skills that they were taught. Radley et al., (2017) considered how incorporating typically developing peers during interventions impacted the participant's ability to generalize newly learned social skills. The Superheroes Social Skills Program incorporated peers naturally into the curriculum to foster generalization.

Three participants diagnosed with ASD and two participants with no medical diagnoses were chosen for the study. The non-ASD participants struggled with social skills but demonstrated age-appropriate language skills. All participants were between the ages of four and five. The study took place over the course of about five weeks with two sessions provided each week. Two or three psychology graduate students administered the sessions. All participants received the same instruction in a group setting. The Superheroes Social Skills curriculum included teaching the skills, watching a video of superheroes using the skill and watching similar aged peers using the skill. Following the lesson participants were given the opportunity to play and use their newly learned skills. The participants were provided feedback throughout the sessions to help them learn the new skills. Parent surveys were completed pre and post intervention to determine progress (Radley et al., 2017).

All participants increased targeted social skills during the study. One student, with more significant language delays, did not demonstrate as much progress as the others for skills that required more of language. Radley et al., (2017) found that additional skill instruction might be necessary for participants who struggled to learn the skill levels commensurate with others. The stress levels reported by the parents decreased after their children completed the study (Radley et al., (2017).

Some limitations were discussed in this study. No data was collected to determine how this program impacted the participants following the program or whether the skills were maintained. It would be beneficial to have additional studies consider how to best support skill maintenance following the program. This study did not consider individual program components to determine whether specific instruction produced the most success for the

participants. Further research should be completed to determine if the instruction order impacted the acquisition of new skills. Parent reporting was the only data used to determine how the skills were used in the community and home. Additional data collection could be useful to determine how well participants generalized skills to other settings (Radley et al., 2017).

Behavior

Repetitive and restrictive behaviors (RRBs) diagnostic features of with ASD. Researchers Radley, K. C., Dart, E. H., Moore, J. W., Lum, J. D. K., & Pasqua, J. (2017) explored how RRBs impacted social skills. They examined the framework created by Wolfe and colleagues focused on social behaviors. The framework was based on a strategy for instruction that caused challenges when taught in isolation. To eliminate the challenges, researchers paired a Superheroes Social Skills program with the framework created by Wolfe and colleagues.

This study included three children between the age of five and seven diagnosed with ASD. Caregivers completed rating scales to determine current social skills levels and intervention goals. The subjects and five peers participated in two-hour sessions twice per week for eight weeks in a university clinic. The participants practiced social skills and answered questions following a video model. Responses were correct if the participant produced relevant answers different from the stimulus materials. The Superheroes Social Skills program used DVD instruction with animated superhero characters. The participants received feedback and review before watching a new video. The session ended with ten minutes of free play where data was collected on skill implementation. Five day data collection determined

maintenance of skills. During this time, no prompts or reinforcements were given to the participants (Radley et al., 2017).

The results showed that teaching specific strategies to vary participant's responses was insufficient. Varied responses increased when reinforcement was given each time a response was different from previous responses. The use of visual cues or prompts were also necessary to increase varied responses. Varied responses were not maintained as well as the researchers hoped. It may have been helpful to fade the number of prompts and reinforcement during the study. Participants demonstrated increased social skills after participating in the Superhero Social Skill program (Radley et al., 2017).

Several limitations were noted. The participants did not always attend consistently which caused participants to miss specific skills training. Participants were not given the opportunity to practice the new skills with different people or settings. Prompts were automatically provided at the beginning of each trial and that prevented participants from attempting new skills. This could have also caused prompted dependency. Additional research should consider the impact of prompt fading before completing the study. Researchers should look at each component to determine the specific impact on the success of learning the skills (Radley et al., 2017).

Researches Mancil, G. R., Conroy, M. A., & Haydon, T. F. (2009) explored whether combining Milieu Therapy and Functional Communication Training (FCT) increased children's appropriate social responses. FCT or maintenance has not been studied with participants in natural settings. Previous studies using milieu therapy were not created specifically for students with ASD or for students who struggled with behaviors. Milieu therapy did not target

behaviors that impact a students' ability to communicate. This study will combine FCT and milieu therapy to replace undesired behaviors with social communication skills.

Three boys between four and seven years diagnosed with ASD participated in the study. The participants needed prompting to communicate with others using two- and three-word phrases. To utilize a natural environment assessment data was collected at the student's home. Classroom data evaluated how the students generalized skills. A visual schedule provided the participants with each step during the five-minute sessions held two to three times a week. Students completed all four phases in three to four weeks. Stimulus items were created based on students' preferred items (Mancil et al., 2009).

Parents were taught ways to increase their child's communication skills using milieu therapy by watching videos. The teachers were taught to give participants one of their highly preferred items when students handed them a card with a picture. When the child provided the picture card, they were given access to the desired item for 30-seconds before the parent made the next request for a turn. The child had five seconds to make a request before a prompt was provided. To help the child gain independence, the parent was instructed to vary the level of prompting following the child's request. Two weeks after the sessions, the children were videotaped in their homes to determine if skills were maintained. Throughout the sessions, classroom data was collected to see if the participants generalized the skills learned at home (Mancil et al., 2009).

All children demonstrated increased communication responses. The increase was maintained two weeks later. There was a decreased need for prompts as the sessions

progressed. The number of behaviors seen decreased as the sessions continued. During generalization, no behaviors were present (Mancil et al., 2009).

Limitations were present during this study. This study included a small sample size limited to young children; therefore, additional research is needed to determine the impact for older children. The behavior change results may have been similar with only milieu therapy provided. Parents did not use the intervention with the preferred items when participating in the sessions. No comparison videos were used to determine if children who did not participate in the study would have comparable results (Mancil et al., 2009).

CHAPTER lll: DISCUSSION AND CONCLUSION

Summary of Literature

The first question focused on which interventions increased social skills for children with ASD. All studies reported an increase in social skills for the participants in at least one area. Success was noted using a variety of interventions types which included music, social narratives, social skills groups, interventions using peers, and technology. Parents and paraprofessionals were trained to provide social skills instruction with positive results. Researchers Laugeson et al., (2014) and Ingersoll (2012) both looked at the PEERS curriculum. Positive improvements in the children's social skills were noted in both studies.

The second question explored which interventions paraprofessionals could be trained to implement. Mrachko and Kacazmarek (2017) recognized that paraprofessionals spend a large amount of time with students with ASD and could help teach social skills interventions. They found that the students' communication and social skills improved with paraprofessional intervention. Paraprofessionals were the most successful with implementation if they received modeling and feedback on the interventions. Pivotal Response Training (PRT) was the most successful intervention implemented by paraprofessionals. This was the only study found that utilized paraprofessionals to support interventions with students.

Another question examined which interventions could be implemented by training parents. Researcher, Hernandez-Ruiz, E. (2018), explored an intervention which involved teaching parents ways to support their children in learning social skills. This study incorporated the Early Start Denver Model (ESDM) and the Parent-Early Start Denver Model (P-EDSM) to increase social communication in children. The parents learned to make small adjustments to

interactions with their children to better meet their needs. Parents also learned how to facilitate imitation skills; they expressed enjoyment in the activities. Researchers Hardan et al., (2015), explored the impact of Pivotal Response Training when it was used to train parents to teach social communication skills to their children with ASD. This study confirmed that parent involvement increased the number of skills that the students learned and decreased the amount of time it took to acquire the skills (Hardan et al., 2015). The article by Wainer et al., (2017), looked at how to bridge research interventions into the community-based settings. This intervention used Project ImPACT to teach the families how to implement the interventions with their children. The parents reported that after twelve months they continued to use the interventions with positive results. All studies that utilized parents for interventions demonstrated positive results.

To determine how peers impact the success of social skills instruction, researchers Thiemann-Bourque et al., (2018) explored whether using a speech-generating device (SGD) paired with a peer-mediated approach improved the social communication skills of preschoolers with ASD. The study results confirmed that peer mediation combined with using an SGD positively impacted communication skills for preschoolers with ASD. Researchers Watkins et al., (2015), looked at the effectiveness of peer-mediated interventions (PMI) for students with ASD. They recognized that children with ASD struggled with social interactions and a PMI model could increase the opportunity to interact with peers and practice critical skills. All studies reported positive results using PMI with increased social interactions for ASD students. Researchers Lane et al., (2017) recognized the limited access that students in non-inclusion settings had to neurotypical peers. They explained this using progressive time delay

(PTD). PTD provided a successful intervention that required minimal instruction time. The last study reviewed by Lori McCann Sawyer, et al., (2005) explored PTD with research focused on increasing the sharing that takes place between peers. The classroom staff successfully implemented the intervention while continuing to support all students; the social skills of the students increased.

The last question examined how technology could be used to support social skills intervention. Researchers Jung and Sainato (2015) examined the impact of using the participants' interests to teach social skills through video modeling. The video modeling sessions resulted in increased levels of student participation. Almutlaq, H., & Martella, R. C. (2018) explored the effectiveness of teaching social stories through an iPad application. The number of steps the participants completed increased when the iPad was used for the intervention. The teachers found that the app allowed for adjustments based on the student needs and was easy to use. Young, R., & Posselt, M. (2012) looked at the results of children who watched the video *The Transporters*, made up of characters represented by vehicles that displayed human-like emotions. Viewing *the Transporters* increased the participants' ability to recognize emotions and participate in social interactions. Rice et al., (2015) took a closer look at FaceSay, a computer social skills intervention. Participants increased their ability to recognize emotions. Another group of researchers, Yoshimura et al., (2019) looked at how technology and the use of robots increased the social skills of students with ASD. The children with ASD were more likely to look at the simple robot and the avatar displayed on a screen. The children with ASD were less likely to show any response to the human-like robot and the human. It was believed that the children did not respond to the human-looking robot because

it looked too much like a human. The use of the robot increased the number of responses given by the children with ASD. Increased skills were noted in all the studies which used a variety of technology.

Professional Application

Social skills are critical for the success of students. As social skills deficits are one of the defining features of ASD, students with ASD have significant needs in this area. There are several social skills interventions available that are worth exploring further. I need to determine what type of interventions will work the best with the student population while considering financial availability. Some of the interventions had significant costs associated with them. I also think it is important to consider the age of the students you are working with and whether the specific intervention is applicable promoting generalization of skills long term. It is important to consider whether the parents or paraprofessionals can support the interventions and if the chosen intervention allows that to happen.

Limitations of the Research

I tried to limit the search of articles to include children in preschool or elementary school. These ages were the most relevant to the students in my classroom and the skills I typically address. All articles had to include social skill interventions focused on children with ASD. I searched for a variety of available research-based interventions.

Several of the articles did not include control groups. The number of participants in the studies was small. Most of the articles included children with higher functioning autism and higher cognitive ability. I work with students in multiple settings and hoped to find interventions for both high and low functioning students. I specifically wanted interventions to

address the limited verbal and low functioning students. Multiple studies did not document whether the students were able to maintain and generalize the skills. It is hard to the long-term impact of an intervention without generalization data.

I expected to find more studies using PRT and I was only able to find one. PRT is the intervention currently used at my school and we have found it to be successful.

Implications for Future Research

Additional research would be helpful that addresses ways paraprofessionals can support social skills instruction. It would be beneficial to know what interventions work best along with best practice for instruction. More research is needed on ways to best include parents in their child's social skills instructions. It should be focused the most successful interventions for parents, interventions that work well in both home and school environments, and demonstrating the most effective way to teach parents. Research using social skills interventions with students presenting with low cognitive and limited verbal skills would be beneficial. Long term studies should be completed to determine if the students were able to maintain or generalize the skills learned. Comparisons between the several types of social skill interventions and a cost comparison would also be useful.

I wonder if the technology interventions would be ideal for students a specific age. Are there better interventions that use technology for preschool aged children? Which interventions work better with elementary children? How does age or cognitive level impact the parent's ability to support their child with social skills instructions? Does the participants cognitive ability impact which interventions are the most successful? It would be interesting to group children based on their cognitive levels and determine if the results are the same for all

groups. Children with different cognitive and language ability need varied instruction based on their needs.

Conclusion

There is a plethora of research-based social skill interventions available. The interventions are taught in a variety of ways that include paraprofessionals, parents, technology, group instruction, and working with peers. This paper answered several questions about social skill interventions for children with ASD. Social skills instruction for children with ASD continues to evolve, special education teachers and parents will adapt to provide the best interventions possible.

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