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Expressive Language Ability In Preschool Children With Autism**

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The University of Southern Mississippi

THE EFFECT OF JOINT ATTENTION INTERVENTION TECHNIQUES ON
EXPRESSIVE LANGUAGE ABILITY IN PRESCHOOL CHILDREN WITH AUTISM

by

Beverly Locker

A Thesis

Submitted to the Honors College of
The University of Southern Mississippi
in Partial Fulfillment
of the Requirements for the Degree of
Bachelor of Science
in the Department of Speech and Hearing Sciences

April 2013

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Abstract

This study sought to investigate the effect of an intervention program for joint attention on joint attention and expressive language skill. The participants were five males with autism spectrum disorders who were attending a reverse inclusion preschool in the southeastern United States. The investigator observed the participants in their classrooms over a five-week period. The most significant finding was variation in the participants' joint attention and language behaviors. Only one participant showed improvement across the period of the study. One important clinical implication from this study is the idea that therapy for joint attention might be more effective in a natural setting instead of a therapy setting where the clients might only be giving responses in order to gain rewards.

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Introduction

With the increasing number of preschool-aged children diagnosed with autism spectrum disorders (ASD), the demand for effective therapy techniques has increased significantly, especially for those children who have difficulties with speech and communication (Yeargin-Allsopp et al. 2003). Clinicians, including speech-language pathologists seek new ways to treat language impairments in an effort to have the most effective method. Therapy can be very beneficial for children, especially if a clinician targets the main communication problem within each specific child. Identifying the problem can often be difficult, because individuals with ASD sometimes cannot tell anyone what difficulties they are experiencing. Children diagnosed with ASDs are those who are recorded as having “deficits in 1) social interaction, 2) verbal and nonverbal communication, and 3) repetitive behaviors or interests” (National Institute of Mental Health, 2004). In many cases, children with ASD have significant deficits in communication skills, making it difficult for them to understand or communicate with others, through speech or any alternative methods. One branch of research that is significant for understanding and treating the language impairments is research done to evaluate the receptive and expressive language skills of children with ASD.

In this study, the joint attention and expressive languages skills of the children will be assessed in conjunction with each other. Expressive language refers to the ability of the individual to produce language in any of a number of different modalities such as speech, sign or writing. If these skills are impaired, it can affect the child in many different ways, including their ability to communicate or express themselves. For this study, a Natural Language Sampling (NLS) will be utilized to directly observe and record each child’s language skill level.

Joint attention involves the shared visual attention between two people on an object or

event (Bono, Daley and Sigman, 2004). For a child with autism, this means looking at the person they are interacting with, as well as looking at an object with another person and sharing in play and interaction. Most children with ASD have impairments with joint attention, which hinder social interactions and growth. These deficits will hinder the child from connecting with a peer group in normal daily interactions, and may also influence the progression of language development. In this study, teachers and classroom assistants at a preschool will provide intervention aimed at facilitating joint attention. The utilized techniques will be detailed in the Methods section.

There are certain criteria that must be met for participation in this study. The age of the children involved in the testing will be limited to children between 2 and 5 years of age and the specific autism spectrum disorders of the children will be identified. Children of this age will be involved in the present study, because their language skills are still in the developmental stage. With the use of the child test, the child's early expressive language abilities will be explored. These delimitations help to identify some limitations of the study. Because the study limits the number and type of participants, it will not account for any differences among ages, different autism disorders, regional differences, ethnicities or genders. The study also will not account for any prior therapy or education that the children may have received. Since the tests only attempt to identify the children's expressive language abilities, any other language impairments that the child may have will not be evaluated in this particular study.

Another important element to understand before the start of the study is the assumptions that will be made. With the study, there are some assumptions that can be made about the children, including the assumption that the children will not know exactly what is being communicated to them during testing. This assumption will be reflected in the data collected

from the tests. The second assumption of the study is that the testing methods are effective measurements of the children's expressive language skills and joint attention skills.

With the increasing number of children diagnosed with autism spectrum disorders and subsequently suffering from communication problems, identification and treatment of the problem is paramount. By studying the efficacy of treatment, researchers can gain more insight into the nature of ASD and the best practices for treating individuals with ASD. Understanding is a part of working towards a cure, which is the ultimate goal for those doing research about autism.

Much research has been done concerning expressive language and joint attention in children with ASD separately (e.g. Schertz & Odom, 2007; Tager-Flusberg et al. 2009). Very little has been done to investigate a connection between the two, especially for preschool-aged children. This study will investigate the effect of joint intervention techniques on expressive language abilities in preschool children with ASD. The research questions explored in this study are: Will increasing joint attention in toddlers diagnosed with ASD affect expressive language skills? How will the expressive language skills be affected?

Literature Review

Existing literature pertaining to joint attention and children with ASD is extensive; however, the literature relating joint attention with expressive language development in children with autism is limited. Many studies have been done to test the effectiveness of using joint attention intervention to improve social skills (e.g. Schertz & Odom, 2007). These studies have yielded mixed results. Joint attention is a typical step in the acquisition of language (Bono et al. 2004). A child must first learn to notice and recognize an object or event before he or she can speak about it. Often, children are prompted to begin this recognition because of parent or caregiver action, including steps like initiating and joining in joint attention with a young child. According to Bono, Daley, and Sigman (2004), children learn to respond to joint attention before they learn to initiate it. An infant will learn to follow the gaze of the mother, but it will take longer for the child to prompt their mother to follow his/her gaze. For the purposes of the Bono, Daley and Sigman study and the present study, only eye gaze indicates attention in a child. In some cases, professionals believe that head turning must accompany the eye gaze for it to be perceived as attention; however, it has been shown that children can be focused on something without orienting themselves completely toward it (Bono et al. 2004).

Disruption in the development of joint attention is unique to autism, which makes it one of the earliest markers of autism in toddlers (Tomasello & Farrar, 1986). Children with ASD are, as recalled from the definition, known for avoiding social situations that involve making eye contact and interacting with peers or adults. These children, as compared to typically developing children, are less likely to initiate any joint attention behaviors such as looking, pointing or showing. They require prompting to join in joint attention behaviors. This problem not only affects the child socially, but also developmentally in regards to language acquisition.

Bono et al. (2004) indicated that children who respond more to joint attention have better receptive and expressive language skills. This knowledge can be useful when professionals are planning intervention techniques. If increasing joint attention promotes language skills, clinicians can begin working with young children to prompt them to respond and initiate attention skills, thereby hopefully working to expand vocabulary and other language skills. If intervention begins early enough for a child, it could have a significant impact on the language of the child for the rest of his or her life.

According to Tager-Flusberg et al. (2009), the Framework for Describing Spoken Language Acquisition contains five phases that move in a progressive manner from infancy to early childhood. Phase one refers to the preverbal phase of an infant, which is defined by babbling and gestures. In a typical child, the phase will last from 6 to 12 months. From there, the child will move to a phase of first words, from 12 to 18 months. This step is when a child first learns to refer to objects and events using words. Phase three involves progression from single words to word combinations and phrases. This more complex method of language typically occurs when the child is between 18 and 30 months of age. A child then combines the words and phrases to create simple sentences. This continues until 48 months, when a child enters the final phase and is able to hold complex discussions about events.

It is widely known, and supported through extensive literature, that most children with ASD have delayed language (e.g. National Institute of Mental Health, 2004; Watson & Flippin, 2008). A child with ASD will not progress from phase to phase as a typical child will. Watson and Flippin (2008) explained that there is a large spectrum when it comes to early language skills in children with autism. It is difficult to know exactly how a child with ASD will progress with language skills. That must be observed on an individual basis. Each child's language progression

can be affected by the disorder they are diagnosed with, and the amount and type of therapy that the child has received. Watson and Flippin did find that a child with ASD's early language does not progress in a linear fashion as is typical. However, Watson and Flippin recognized that early language skills and progression predict later language development and skills.

The most relevant study to this study is one completed by Schertz and Odom (2007). The purpose of their study was to simply increase joint attention skills on an individual basis for three toddlers with autism. Schertz and Odom used a parent-mediated therapy style to prompt and increase the children's skills in four ways. The joint attention strategies they promoted and measured were focusing on face, turn taking, responding to joint attention, and initiating joint attention. These skills were presented in order, and observations were made based on how well and how often the child used these strategies when working with his or her mother. For two of the children, the joint attention skills increased substantially by the conclusion of the study. For the third, because of the unwillingness of the mother to comply, the child did not progress with either responding to joint attention or initiating joint attention. Schertz and Odom ended their study there; however, the current study will investigate further by facilitating the same joint attention skills and then testing early language skills to see how they are affected.

This study seeks to continue the research that Schertz and Odom began. Not only will the clinician observe and use the joint attention techniques that they taught in their study, but the child's expressive language will be assessed throughout the intervention. The study will richly describe the changes in language abilities of the participants following intervention with the joint attention techniques.

Method

Introduction

The goal of this study was to determine how facilitating joint attention skills in preschool children with ASD affected early language skills. This goal was accomplished via a qualitative research design, specifically ethnographic methodology through the use of observation. The investigator collected data throughout the study via observation of the joint attention intervention and the joint attention skills of the children, and use of Natural Language Sampling (NLS) for the children. Throughout the study, probe testing was also used to track the participants' improvements session by session. The information collected was then cyclically reviewed and analyzed for patterns.

Participants

The participants were five preschool children previously diagnosed with an autism spectrum disorder. The children were students attending a reverse-inclusion preschool for children with autism. The participating children widely ranged in severity. The children being observed were all male and between the ages of three and five at the time of the study.

Procedure

Following approval by the Institutional Review Board (IRB), the participants were identified and permission from their parents or guardians was obtained prior to any participation in the study. Permission was also obtained from each classroom's teacher and teacher's assistant.

The preschool program that participated in the study was a reverse inclusion preschool for children with autism. The curriculum and activities were created in order to focus on treatment of specific aspects of an autism diagnosis. Half of the students were identified as being on the autism spectrum. The other half were identified as typically developing children. The

typically developing children attended the preschool in order to provide peer modeling for behaviors to supplement the curriculum and teacher guidance.

Intervention Procedure. The participating preschool program had existing joint attention techniques that the teachers employed to encourage the children with ASD to respond to and initiate joint attention with others. The teachers and aides used phrases and words to prompt joint attention from the children. To encourage the children to focus on their faces, they would say, “look at me” or a similar phrase. The teachers would also maneuver themselves into the children’s line of gaze when the children would try to look away. If the children did look at the teachers, the teachers would reward by providing verbal and tangible reinforcement. The teachers said, “good looking at me” and gave the children either a toy or a treat, like candy or a potato chip.

The teachers had similar techniques for each of the joint attention skills. They would give a child a direction, then move into the child’s space, and, last, provide a reward if the children engaged in joint attention (e.g., verbal praise, tangible rewards.) The teachers also used the typically-developing children as models for the children with autism. The teachers rewarded the typically-developing children for doing something like singing along with a song or following along with a book. These rewards for the typical children were intended to motivate the children with autism to participate in order to gain the reward. In these scenarios, the teachers would say, “Everyone who is looking at me gets an M&M.” or “Good singing along, _____. You’ve earned a cookie.”

To encourage interaction with peers, the teachers would give each of the children a small task or activity to do independently, and then would ask students to help each other or praise each other for doing the task correctly or quickly. During these activities, typical children would

be paired with children with autism. This was intended to prompt communication and interaction among peers.

Data Collection

The researcher observed the youngest classroom at the preschool for children ages three to four. In this class, there were five typically-developing children and five children diagnosed with autism spectrum disorders. The classroom also had a teacher and two to three teacher's aides at any time. Given the purpose of this study, the researcher's focus was solely on making observations of the joint attention and expressive language behaviors of the five children with autism. The researcher took notes on these behaviors via data collection sheets (see Appendix). The researcher also recorded comments on each participant's data collection sheet to note any out-of-the-ordinary circumstances and behaviors, such as an illness or a change in activities.

There were seven joint attention behaviors that the researcher focused on during observations. The first joint attention behavior was "focusing on face." This behavior refers to when a child made eye contact and looked a teacher or peer directly in the face when communicating. The second and third behaviors were "turn-taking with peers" and "turn-taking with adults". These refer to when the participants had back and forth interaction with peers or adults, such as doing a craft or playing with a peer. The fourth and fifth joint attention behaviors were "responding to joint attention with peers" and "responding to joint attention with adults." These behaviors were observed in order to know whether each child was capable of responding when others attempted to communicate with them. The final two behaviors were "initiating joint attention with peers" and "initiating joint attention with adults". These behaviors took the joint attention of each child a step further to observe if the children would initiate attention with others when attempting to communicate. The researcher observed in the above manner every Monday

and Wednesday for eight total sessions over five weeks (there was a one week school break). Each observation session lasted for an hour and a half.

Data Analysis

The qualitative data gained from the observations was analyzed for each child, for both the joint attention behaviors and the NLS collection. This data gave an indication of the overall change in the subject's expressive language abilities and joint attention abilities. The data collected from the probe testing was compiled and compared on a session-by-session basis to observe any improvements in both the joint attention skills and the specific language skills observed. The changes will be described in depth, with examples given, in the Results section.

Results

In order to answer the research question, the research was conducted as detailed in the Method section. The results from the observation sessions were recorded in tables. There were seven joint attention behaviors observed in the five participants. Each of the participants observed had different behaviors and language abilities. The number and type of joint attention behaviors recorded varied highly. In addition, the language sample that was obtained throughout the research showed not only variation between the individual participants, but also variation from one session to the next.

Participant A

Participant A was considered to have a moderate autism spectrum disorder. The following is a table that shows Participant A's joint attention behavior by type and by day.

Table 1. Participant A's Joint Attention Behaviors.

Participant A	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Total for Behavior
Focus on Face	3	1	1	2	2	0	2	2	13
Turn Taking with Peers	0	0	0	0	0	0	0	0	0
Turn Taking with Adults	0	0	0	0	0	0	0	0	0
Responding to Peers	3	1	0	0	0	0	0	2	6
Responding to Adults	4	5	5	10	12	2	7	7	52
Initiating with Peers	0	0	0	1	1	0	0	1	3
Initiating with Adults	0	0	0	2	0	0	3	2	7
Total for each day	10	7	6	25	15	2	12	14	81

As shown in the table above, Participant A displayed an average number of joint attention behaviors each day. These observations were made during circle time, which was a time when all ten children in the classroom were asked to join in with songs, activities and hands-on learning. The teacher asked for the students' attention considerably more often than Participant A gave it.

One observation that can be made from Participant A's behaviors is that he did not engage in communication with peers very often at all. While Participant A had 59 interactions or behaviors toward adults, he only had nine toward his peers. Another observation that can be made is that Participant A did not engage in any prolonged interaction with peers or adults. Participant A did not exhibit any turn taking. Instead, he only engaged in short bursts of attention and interaction.

Participant A was able to speak well, but in most cases he remained completely silent. Participant A only vocalized a few times, but when he did, it showed that he had a much wider vocabulary and language than he typically exhibited. During the first observation session, Participant A only vocalized one word (i.e., "rain"). However, during that first session, Participant A also produced nonverbal vocalizations. Participant A hummed for about one minute with his hands over his ears. Participant A also made prolonged /a/ and /i/ sounds. When a teacher instructed Participant A to remove his hands from his ears, he did not acknowledge the instruction. The teacher had to remove Participant A's hands from his ears. One characteristic of Participant A's joint attention behaviors throughout was that he did not focus if someone attempted to communicate with him. Participant A would look away, cover his ears, and hold his eyes closed if someone attempted to get his attention.

Despite Participant A's lack of vocalization during the first session, he spoke more in several of the other sessions. In session two, Participant A became interested in the group

activity when the teacher presented him with a picture of a cat, prompting him to say “meow” and “cat.” The third, fourth and fifth sessions showed the most vocalizations from Participant A. In session three, Participant A was having one-on-one time with one of the teachers, when the teacher asked him, “What’s your name?” Instead of answering the question, Participant A produced echolalia, repeating, “What’s your name?” back to the teacher several times. Participant A produced the most language during the fourth observation session. During circle time, Participant A was engaged with the songs and activities that the teacher was leading. Participant A initiated conversation with one of the teachers by verbalizing, “Hey,” “Hi, teacher,” and “I want an Oreo”. These productions were rewarded by the teacher with candy. When a teacher offered Participant A a different snack, he responded, “No thank you.” Participant A produced several other utterances during the course of session four, such as “I want green,” “Twinkle, twinkle, little star,” and “Ready, set, go.” He did not sit with his hands over his ears at all during the fourth observation session. Session five brought much of the same results, with Participant A saying “I want that chip,” and responding to questions asked by the teachers.

Sessions six and seven had very few vocalizations from Participant A. During the sixth session, he sat the entirety of circle time with his hands over his ears. Participant A did not produce any verbalizations or nonverbal vocalizations. Participant A produced four utterances during session seven, mostly when singing along with “Twinkle, Twinkle Little Star”. During the final observation, Participant A used nine vocalizations. Participant A responded to questions asked of him during circle time, including producing, “No!” when one of the other children took something from him. At one point during the session, Participant A said to one of the teachers, “You want to stand there,” and pointed to a location in the room. When Participant A earned a

reward for using his words, he said, “I want starburst.” Participant A seemed quite adept at initiating attention with his teachers in order to earn food or something else that he wanted.

Participant B

Participant B was considered to have “very mild autism”. Table 2 shows Participant B’s joint attention behaviors observed throughout the study.

Table 2. Participant B’s Joint Attention Behaviors.

Participant B	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Total for Behavior
Focus on Face	16	20	22		19	26	21	16	140
Turn Taking with Peers	3	2	0		5	9	5	5	29
Turn Taking with Adults	2	0	8		3	3	0	0	16
Responding to Peers	7	3	1		3	8	12	4	38
Responding to Adults	9	18	28		6	16	9	10	96
Initiating with Peers	7	6	0		10	9	12	2	46
Initiating with Adults	6	3	14		8	6	3	3	43
Total for each day	50	52	73		54	77	62	40	408

As shown in the chart, Participant B engaged in a variety of joint attention behaviors during the observation sessions. Participant B looked at teachers and peers directly in the face, and responded to and even initiated communication. Participant B also engaged in turn taking with peers and adults during playtime and other activities, demonstrating his ability to maintain joint attention. Many of the turn-taking behaviors exhibited by Participant B were during crafts with teachers and open play with peers.

Participant B exhibited willingness to respond to and engage in communication with adults and peers alike. Participant B had more interactions with adults during the observations sessions. Participant B responded to adults 96 times, whereas he only responded to peers 38 times. On the other hand, Participant B initiated joint attention with peers 46 times and with adults 43 times. While this is not a significant difference, it showed that Participant B was capable of initiating interaction with both his peers and classroom teachers. Participant B looked people directly in the face when engaging in communication with them. Participant B did not hesitate or turn his head away when someone called his name or attempted to get his attention. If Participant B needed to use the restroom or wanted to play with a certain toy, he looked straight at the person who he was talking to when making a request. Participant B also looked directly at peers when they were engaged in play activities together.

Very different from Participant A, Participant B produced many vocalizations and joint behaviors during each observation session. Participant B looked very similar to a typically developing child in a classroom setting. He was able to talk very well for a child his age, and he engaged almost as often as typical children would.

For the first observation session, Participant B was in the same classroom as the other children being observed. Participant B participated in all the circle time activities, including choosing songs that he wanted to listen to such as “Gummy Bear,” “Black Sheep,” and “Iguana.” Participant B responded to questions appropriately (e.g., “No thank you”, “Yikes, I’m scared”). Participant B also commented to his peers and the teachers in the room. Participant B told one child, “I can’t see,” because the child was blocking his view of the screen. He also said to one of the teachers, “I got a fox” when he pulled out an animal at craft time.

After the first session, Participant B got moved up to a classroom for older children, because the teachers and administrators felt that he was ready for a room with more stimulation and with children who were on the same communication level as him. From the second observation session on, Participant B’s language only expanded and increased. Participant B began using longer sentences, talking to his peers more often, and asking questions of his teachers. He used sentences, such as “I’ve got a spaceship and an airplane,” and “Watch out! There’s a dragon.” Participant B also demonstrated symbolic play (for example, saying, “It’s a talking marshmallow.”). Participant B used language for a variety of purposes such as to defend himself (e.g., “I don’t did it. You did it.”).

During all the observation sessions, Participant B engaged anyone and everyone in the room. Several times, Participant B walked up to the observer and interacted, saying, “I want to go potty,” and “I earned my train, see?” Participant B did not have to be prompted to engage in joint attention with anyone.

Participant C

Participant C was considered to have a moderate autism spectrum disorder. Table 3 shows C’s joint attention behaviors throughout the study.

Table 3. Participant C’s Joint Attention Behaviors.

Participant C	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Total for Behavior
Focus on Face	4	10	9	3		6	5	6	43
Turn Taking with Peers	1	1	0	0		0	0	0	2
Turn Taking with Adults	0	2	0	0		0	0	2	4
Responding with Peers	4	1	0	1		1	0	0	7
Responding with Adults	4	12	6	10		4	9	9	54

Initiating with Peers	0	0	1	0		2	0	0	3
Initiating with Adults	3	0	2	2		0	0	6	13
Total for each day	16	26	18	16		13	14	23	126

As shown in the chart, Participant C showed a total of 126 joint attention behaviors, which is a relatively low number, especially compared to Participant B. Participant C had two behaviors, focusing on face and responding to joint attention with adults, that he exhibited significantly more often than the other behaviors. The other joint attention behaviors were used very little by Participant C.

Participant C focused on face 43 times during the observation sessions. Compared to the rest of the joint attention behaviors, this was frequent. However, if a teacher or student called his name or tried to engage in communication with him, Participant C turned his head and sometimes even closed his eyes to avoid eye contact. The only times that Participant C looked at someone were when he wanted something, like a reward, or when he was laughing with one of the teachers. Participant C sat with the same teacher's aide every day during circle time. Sometimes Participant C turned around to face the aide and he would tickle her or touch her face. Participant C engaged in communication with the aide voluntarily.

The joint attention behavior that Participant C exhibited most often was responding to joint attention with adults. The teachers and aides in the classroom prompted Participant C to speak to them and engage in the various activities during circle time. He paid attention during circle time when the class was watching a video, reading a book or singing a song (as demonstrated by his visual gaze). If the teachers were attempting to teach colors, numbers or shapes, Participant C looked away or played with his own toy. However, the teachers drew

Participant C back into the class activity by offering rewards. He was required to say what he wanted and look at the teacher to gain a reward.

Participant C did very little turn taking and initiation of joint attention. Participant C participated in turn taking a few times during crafts and hands-on activities during circle time when either teachers or peers were initiating and leading the turn taking activity. He also showed almost no initiation of joint attention with adults or peers. Participant C initiated a couple of times to take a toy or reward away from one of the other children. Participant C also initiated joint attention with adults whenever he seemed to really want something, like a cookie or a ball.

Participant C did not produce many verbalizations during the observation sessions. Most of the verbalizations were prompted by the teachers and aides during circle time. Most of the time, Participant C would not pay attention to the activities in the classroom; he would instead stare in another direction, play with his own hands on the carpet, or, as in one of the sessions, he walked up to the board at the front of the classroom and tore down the monthly calendar.

On the first day of observation, Participant C was the first participant to say anything. A teacher from another classroom came into Participant C's classroom and he ran to her. The teacher picked Participant C up and asked, "What do you want?" Participant C just looked away from her. The teacher prompted, "Round and round." Participant C then uttered his best equivalent of "round and round," and the teacher spun him around in her arms. The teacher and Participant C continued this game for a few minutes until he was able to say "round and round" without any prompting. Participant C did not have any other verbalizations during the first observation.

During the second, third and fourth observation sessions, Participant C made verbalizations during the circle time activities. The class was learning the letter B, and the

teachers had many manipulatives associated with B such as a stuffed bat and a plastic banana. When the teacher held up a ball, Participant C shouted out, “Ball!” The teachers then brought Participant C a ball that had water in it. Participant C had to ask for the ball to be allowed to play with it, which he did time and again. Participant C also identified colors accurately when asked by the teacher during circle time. He also named items in videos and books that the teacher showed him (e.g., “cat,” “horse,” “bike”).

Participant C, like Participant A, was motivated to talk by rewards. Most of the talking that Participant C did during circle time was done to earn a chip or cookie or some other item that he wanted. When prompted by a teacher offering chips, Participant C was able to say, “I want.” To earn a Starburst, Participant C had to tell the teacher what color he wanted. At first he would not respond, so the teacher took the Starburst away, so Participant C finally said “orange.” Participant C’s favorite reward to earn was a cookie. During the final observation session, Participant C did not talk much, but two of the three verbalizations that final day were “want” and “cookie.”

Participant C did not initiate speech; most of the time he would only talk if a teacher had prompted him to. However, Participant C also produced negations. He said “no” to a teacher on four of the observation days. Participant C also told a teacher on day six, “I can’t” when they were doing a craft activity.

Participant D

Participant D had a diagnosis of autism and was considered to be on the severe end of the spectrum. Table 4 shows Participant D’s joint attention behaviors throughout the research.

Table 4. Participant D's Joint Attention Behaviors.

Participant D	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Total for Behavior
Focus on Face	12	8	10	14	8	8	15	18	93
Turn Taking with Peers	0	0	0	0	0	0	0	0	0
Turn Taking with Adults	0	0	0	0	0	0	0	0	0
Responding with Peers	0	1	0	0	0	0	0	0	1
Responding with Adults	1	2	3	0	10	4	5	4	29
Initiating with Peers	0	3	2	2	0	0	1	1	9
Initiating with Adults	0	2	1	1	2	1	0	3	10
Total for each day	13	16	16	17	20	13	21	26	142

As shown in the table, Participant D did not exhibit very many joint attention behaviors over the course of the observations. A large majority of Participant D's joint attention behaviors were focusing on face. Participant D looked directly at someone during communication 93 times total during the sessions. Most of the other children with autism looked away when someone tried to gain their attention; however, Participant D would turn and look whenever someone called his name or told him to do something. Participant D looked directly at people constantly. Participant D, on the other hand, did not seem interested in the circle time activities. If the teacher was reading a book or leading a song, Participant D looked off in the other direction and hummed to himself.

Participant D also exhibited a few behaviors of responding to joint attention with adults. The teachers and aides prompted him to participate in activities and engage in communication

with them. Participant D occasionally responded to the joint attention initiations from the teachers and aides, especially if a reward was offered.

Participant D exhibited no behaviors of turn taking with either adults or peers. During activities that required him to take turns, Participant D was looking in the opposite direction, not participating. He did not engage in any prolonged communication during any of the observation sessions. Participant D also only engaged in communication with peers ten times during the course of the observations. The few times that Participant D initiated joint attention with peers, he would get their attention and make a sound or hum at them, and then turn away.

The participating preschool categorized Participant D as “nonverbal”. He did not say words during any of the observation sessions. Participant D also did not use signs to communicate. Although he was not able to talk, Participant D made sounds frequently. He sat through every circle time and shouted, screamed or hummed. Most of the sounds Participant D made were vowel sounds, such as prolonged /i/ and /a/ sounds. Occasionally, Participant D produced consonant-vowel combinations, such as /hi/ and /wa/. During session three, he said the syllable /ja/ repeatedly while the other children were singing along with a song.

On day five of the observation, Participant D was given an iPad that had Proloquo2go on it. Proloquo2go is an augmentative communication device that downloads straight onto an iPad. Participant D had to press certain buttons to produce select verbal outputs. During the fifth session, a teacher started working with Participant D to show him how to use it. The teacher would put a piece of candy on the table. Then Participant D would have to touch the buttons for “I want”, then “something to eat”, then “snack”, and then “candy.” The system also allowed Participant D to ask to go to the potty and play with a certain toy and get something to drink. During the final few observation days, Participant D only used the Proloquo2go system when he

was doing his one-on-one session with the head teacher or during snack time. Participant D did not use the system during circle time activities.

Participant E

Participant E was considered to have a moderate autism spectrum disorder. Table 5 shows Participant E’s joint attention behaviors throughout the observation period.

Table 5. Participant E’s Joint Attention Behaviors.

Participant E	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Total for Behavior
Focus on Face	2	15	9	4	3	7	15	4	59
Turn Taking with Peers	1	1	0	0	0	0	0	0	2
Turn Taking with Adults	0	4	0	0	0	2	0	1	7
Responding with Peers	2	2	0	0	0	0	0	0	4
Responding with Adults	4	21	18	6	15	11	22	8	105
Initiating with Peers	0	0	1	0	2	0	0	0	3
Initiating with Adults	0	0	0	1	3	2	4	1	11
Total for each day	9	43	28	11	23	22	41	14	191

As shown in the table above, Participant E produced a moderate number of joint attention behaviors (relative to the other participants) during the course of the observation sessions. There were two behaviors that Participant E produced more frequently during the sessions: focusing on face and responding to joint attention with adults. He exhibited 59 focusing on face behaviors throughout the course of the observation. Participant E exhibited responding with adults 105 times, which accounted for more than half of his total joint attention behaviors. Participant E exhibited very few turn taking behaviors, behaviors that involved engaging in communication

with peers, and behaviors where he had to initiate the joint attention. He only had nine total turn-taking behaviors, seven total behaviors when he was engaging with peers, and only fourteen behaviors when he initiated the joint attention.

Similar to Participant C, Participant E made most of his verbalizations during circle time when prompted by a teacher. Participant E mostly produced single word utterances. During the first observation session, Participant E uttered only single word utterances (i.e., “hot,” “sheep,” “shoe”). These utterances were all responses to questions from teachers. The second session showed the same type of single word utterances, but session three showed Participant E using short phrases to speak to his teachers. Participant E said, “I want” and “Thank you” before and after earning a reward. As the observation period progressed, Participant E became more involved with the circle time activities. He went from three responses on the first day to eleven on day four to fifteen on day seven. Although his number of utterances increased, the complexity of the utterances did not change. Participant E continued to use only single word utterances or short two word phrases.

The data collected about joint attention behaviors and expressive language skills was analyzed to observe trends and draw conclusions that will be helpful to future research studies and intervention techniques. The analysis is detailed in the Discussion section below.

Discussion

Introduction

The data that was detailed in the Results section was examined to determine the trends between each participant's joint attention and expressive language. The data was compared to observe findings within each participant's repertoire and between the different participants. Many significant findings were determined from the results of the study.

Joint Attention

The most significant finding observed during the study was the lack of consistency for each of the participants. The study sought to examine the relationship between joint attention and expressive language. The results showed that both the joint attention behaviors and the expressive language abilities of the participants did not increase or decrease significantly but fluctuated throughout. For example, Participant B exhibited 50 joint attention behaviors during the first session, 52 during the second session, 73 during the third session, 54 during the fifth session, 77 during the sixth session, 62 during the seventh session and 40 during the final session. From the first session to the third session, the number of behaviors increased, but after that they decreased, then increased, then decreased again. Most of the other participant's behaviors fluctuated also. Only one participant, Participant D, had a pattern to the joint attention behaviors he exhibited. Participant D's joint attention behaviors increased steadily from 13 on day one to 26 on day eight. The only day that Participant D's behaviors did not show an increase was session six, when the number dropped down to 13 again. The literature on autism spectrum disorders supports this variability. Children with autism spectrum disorders vary significantly. Each child cannot be compared to other children, and each child experiences "good days" and "bad days" with fluctuations in behavior (Crandell, 2010).

A second finding regarding joint attention behaviors was the lack of turn taking observed in many of the participants. Two of the participants, participant A and participant D, exhibited zero turn-taking behaviors throughout the entirety of the study. While the other participants exhibited some turn-taking behaviors, turn taking was the least exhibited behavior throughout the range of participants. Turn taking with others constituted interacting over a period of time, with back and forth interaction, something that children diagnosed with autism spectrum disorders are known to have difficulties with (Bono, et al. 2004).

A third finding in the joint attention behaviors of the participants was that focusing on face and responding with adults were the most exhibited behaviors by each of the participants. Focusing on face had the highest number for each of the participants, which was an unexpected result. Children diagnosed with autism are known to avoid social interactions that involve making eye contact with others (National Institute of Mental Health, 2004). Given this knowledge, the results of the study were surprising because one would expect the participants to avoid focusing on the face of others. It is not as unexpected, however, for the children to respond with adults more often than they exhibit the other joint attention behaviors, because following the progression of joint attention in children, children typically respond to joint attention before they initiate it (Bono et al. 2004). Consequently, the participants initiated joint attention with peers and adults less than they responded to joint attention. For example, participant C responded to joint attention 54 times with adults, but initiated with adults only seven times. Participant C responded to joint attention with peers 13 times, but initiated with peers only three times. Children, both typically developing and with autism, respond to joint attention before they initiate it. This behavior, therefore, follows the pattern indicated by the literature on development of joint attention.

The fourth and final finding that was observed concerning the joint attention behaviors of the participants was that the participants initiated and responded to joint attention with adults more often than with peers. For example, participant E responded to joint attention with adults 105 times, but with peers responded only four times. Participant E initiated with adults 11 times, but with peers initiated only three times. This could have happened because the adults were making more attempts at communication as part of the circle time and craft time activities. This also fits with the literature on ASD, which indicates that individuals with ASD find interaction with adults easier than interaction with peers. In a study conducted by Hadley, Rice, and Sell (1991), children with language impairments, such as those associated with autism spectrum disorders, who have limited communication are more likely to interact with adults than with peers.

Expressive Language

There were several trends observed concerning the expressive language of the participants. The participants had many different levels of language development among them. Participant D did not produce words, only single sounds and syllables. Participants C and E produced single word utterance and few simple phrases. Participant A produced single word utterances, simple phrases and some simple sentences. Participant B produced longer phrases and more complex sentences for most of the utterances observed.

Throughout the observation period, some of the participants showed minimal language growth. Participant E, during the first two observation sessions, only produced single word utterances (i.e., “sheep”). He progressed to two and three word utterances (i.e. “I want,” “forget it”) in the later sessions. Participant B, after he was moved to the older classroom, began producing more complex sentences (i.e. “Watch out, there is a dragon!”, “Where are you

going?") On the other hand, participant C's language demonstrated regression during the study period. Participant C started out in the first three sessions producing simple phrases (i.e. "I want," "We build," "Round and round"). During the last few sessions, participant C was only producing single word utterances and sounds (i.e. "key", /i/).

The final finding observed concerning the expressive language of the participants was the pattern of only providing responses to teachers when a desired reinforcer was offered to the participants. Participant A, for example, during the fourth observation session, said, "I want an Oreo" and "I want chip" after being prompted by a teacher. The issue is whether participant A produced these utterances spontaneously or if the utterances were examples of rote language. As mentioned by Pollard, Betz and Higbee (2012) in a study about joint attention bids in children with autism, children with autism often display rote and repetitive language. They will use the same phrases their teachers taught them in specific situations.

Limitations

There are several factors that could have affected the results of the study. Because the investigator was simply observing the implementation of the joint attention techniques instead of implementing them, the investigator had no control over what happened during the intervention.

During one of the observation sessions, day six, one of the teacher's aides led the circle time activities, instead of the classroom teacher leading the activities. This change in leadership could have accounted for the fact that all of the participants exhibited lower number of joint attention behaviors that session. For example, Participant A exhibited only two joint attention behaviors during session six, which was significantly lower than the other observation sessions.

During the first observation session, the teacher informed the investigator that participant E was not behaving like he typically did. The teacher had information from the parent that

participant E might have been sick on the day of the first observation session. This supposed sickness could have caused participant E to exhibit fewer joint attention behaviors because he was not feeling well. Similarly, during the second observation session, the teacher informed the investigator that participant C was taking a new medication, which the teacher believed to be affecting his behavior. The teacher believed that the new medication was making participant C grumpy and lethargic. This change in medicine could have caused participant C to exhibit fewer joint attention behaviors than he typically would.

One of the biggest factors that could have affected the behavior of participant B was a change in environment. The second day of observation, participant B was moved from the classroom with the other participants, which was the youngest classroom at the preschool, to the classroom with the oldest children at the preschool. The children in the older classroom were much more advanced in both their language and their joint attention skills. Participant B could have been influenced by the peers in the older classroom to exhibit more joint attention behaviors following observation day one. The difference in the effects of the different age levels could be researched more thoroughly in a subsequent study.

A factor that could have affected the joint attention behaviors of participant D could be the addition of the Proloquo2go communication system that was introduced to him during session five. Prior to using the Proloquo2go system, participant D made very few attempts at communicating with adults or peers. After the implementation of the new communication system, participant D jumped from joint attention numbers in the teens to numbers in the 20s. This increase in joint attention behaviors could have been prompted by the addition of Proloquo2go.

The study had a number of other limitations based on the scope of the research. Because the study only went on for two months, the true nature of the changes in language and joint attention were not realized. In order to really make observations about changes in language and joint attention, the study would need to be executed over a significantly longer period of time, such as six months to a year. Then, significant differences would be more observable. Another limitation because of scope was the fact that all the participants in the study were males. Having a mix of males and females could have provided a better range of observations over the course of the study. However, males are more likely to be diagnosed with autism, so it is statistically more likely for the participants in the study to be males. Another limitation is the sample size of the study. Because there were only five participants in the study, generalizations cannot be made to the autism population. The study merely provides information describing these particular children in this particular setting. Finally, this study did not compare the intervention methods utilized to another program. Further research is warranted to systematically compare various intervention approaches and determine which is most effective.

Clinical Implications

As stated above, in order to truly understand the nature of the effectiveness of the joint attention intervention technique, the study would need to be carried out for longer with a larger, more diverse group of participants. However, some clinical implications can be drawn from the results of the study. First, clinicians (as is known from the literature) should expect heterogeneity in children with ASD. All of the participants produced joint attention behaviors most when a desired reinforcer was offered; also, clear progress during this program was not evidenced. It is known in the literature on ASD that children with autism often learn by rote and have great difficulty with generalization (i.e., extending their learning from one setting to another). In other

words, while these children may “learn” to produce certain behaviors in this preschool setting, if the variables are changed (i.e., you remove the teacher, reward, the preschool, etc) the new skill will not be retained. This type of “learning” may not benefit the child in his or her life outside of the therapy room. If intervention methods were more natural instead of based on reinforcement, learned abilities might be more likely to generalize to settings outside of the preschool setting.

Conclusion

This study sought to investigate both the joint attention skills and the expressive language abilities of five, preschool aged boys diagnosed with autism spectrum disorders. To do so, the investigator observed the implementation of a joint attention intervention technique at a reverse inclusion preschool for an hour and a half twice a week for five weeks, for a total of eight sessions. The results of the observations for each of the participants were varied. Each participant displayed different levels of skill with both joint attention and expressive language. Most of the participants had varied behavior over the course of the study; however, one participant showed steady improvement in joint attention skills along the observation period. The study’s findings supported the existing literature about joint attention skills in children with autism, and also allowed for further expansion on the nature of specific joint attention intervention techniques.

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Appendix

Data Collection Sheet

Participant:

Date:

Joint Attention Behaviors:

Focusing on face																				
Turn-taking with peers																				
Turn-taking with adults																				
Responding to joint attention with peers																				
Responding to joint attention with adults																				
Initiating joint attention with peers																				
Initiating joint attention with adults																				

Language Sample:

Comments: