Speech Perception in Children with Autism

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Abstract

This study involved a) a detailed analysis of current research regarding speech perception in children with autism spectrum disorders (ASD), b) a literature review on current approaches to therapy for children with ASD, and c) a series of observations in clinic and school settings. Observations were made at the Independence Academy and Riley Children’s Hospital. The review of current research showed that while children with ASD are less influenced by visual cues than typically developing children, they still benefit from the addition of visual cues to speech perception and do not lack auditory-visual integration skills. Two approaches to therapy, the Picture Exchange Communication System (PECS) and the Developmental, Individual Difference Relationship-Based Model (DIR), have been described in the literature to be beneficial when working with children with ASD. PECS has been shown to encourage speech in children, and DIR is developmentally based, created for the individual, and focuses on relationships. Both approaches to therapy have been shown to improve communication in children with ASD. Riley Children’s Hospital administered PECS; however, neither observation site administered DIR. The clinical observations showed how therapy can be administered under auditory-visual conditions for children across the spectrum, even in different environments and with differently structured therapy sessions.
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Introduction

Research on Autism Spectrum Disorders (ASD) has always been important and it has become extremely relevant in recent years as the number of children diagnosed has risen steeply. While prevalence figures vary, the range of children diagnosed with autism “may be from less than 1 to 1,300 per 10,000 people” (Castrogiovanni, 2008). The American Speech-Language Hearing Association (ASHA) defines autism as “a neurodevelopmental disorder defined by impairments in social and communication development, accompanied by stereotyped patterns of behavior and interest” (Castrogiovanni, 2008). The onset of most Autism Spectrum Disorders occurs within the first years of a child’s life and may cause many social difficulties (Mongillo et al., 2008). Children with ASD usually have difficulty with language and communication. While much research has been done in the past to establish what social skills are affected in children with ASD and how those children tend to behave, it seems that not as much research has been done to discover how their minds work.

To be even more specific, it seems as though there are gaps in the existing research in terms of what children with ASD can understand. Relatively little is known about things such as auditory attention and speech perception in children with ASD. The purpose of this thesis is to investigate auditory and visual speech perception in children with ASD. Research in this area can hopefully help children with ASD communicate more effectively. Once speech-language pathologists (SLPs) understand how children with ASD perceive speech and language, they can administer different therapeutic techniques in treatment to allow children with ASD to develop higher levels of speech and language functioning.
According to Mongillo et al. (2008), there are two theories that describe how spoken language is processed. One theory is that speech perception is multimodal, meaning that speech information is perceived auditorily and visually. The second theory is that speech is amodal, meaning that speech information is perceived via the articulatory gestures apparent in a speaker's face and voice. What most often is the case is that listeners use both auditory and visual aspects of the speech signal to understand speech and to communicate effectively. However, it is unclear as to whether children with ASD perceive speech in this multimodal way. It has been noted that they sometimes have difficulty with eye contact and therefore with interpreting the visual aspects of the speech signal together with the auditory aspects of the speech signal. They may also have difficulties 'reading' a speaker's face and voice in social situations. According to Williams, Massaro, Peel, Bosseler, & Suddendorf (2004), children with ASD can imitate, but their imitation tends to be unimodal. "Imitation often seems to be unimodal in that autistic children either mimic the sound or sight of the action but not an audio-visually integrated form" (Williams et al., 2004, p. 560).

The purpose of this thesis is to investigate whether children with ASD have trouble with auditory-visual speech perception and integration. This thesis is designed to learn more about the details of the specific skills of auditory attention and auditory-visual speech perception in children with ASD. Of great interest is whether children with ASD are able to put the two sides together (i.e., achieve auditory-visual integration).
Methodology

The research for this thesis had three main components. The first component was a detailed analysis of current research on speech perception in peer-reviewed literature. Conducting a literature review of research on the population of children with ASD and how their minds work compared to the minds of typically developing children, in terms of speech perception, was the first part of the thesis. Existing literature in speech pathology, psychology, and cognitive sciences was investigated and synthesized. The research into children with ASD spans many fields, and, as such, it is sometimes difficult as a reader to get a clear picture of the current scientific findings. This thesis attempted to reconcile the most recent research across these various disciplines that sometimes operate in parallel.

The second component of the thesis was a detailed review of the literature on current approaches to therapy. The resources were current journal articles about children with ASD, as well as books and articles that offered historical perspective to this study of ASD.

The third component of this thesis was a series of clinical observations in both clinic and school settings. Observing speech therapy sessions in these settings meant sitting in on therapy sessions and viewing firsthand children with ASD and the type of intervention techniques speech language pathologists were currently using. These observations functioned with two important purposes: to learn more about the population of children with ASD and how they function in everyday settings, and also to observe current approaches to speech and language therapy. These observations allowed for a
better understanding of children with ASD in terms of how they function, a deeper understanding of the therapy techniques employed with them, and a basis for comparison between the current research and observations. Please see the attached Appendix of the structured observation form used to record each observation. This form included basic information such as the clinician’s name, number of children in the therapy session, the date, and the location of the observation. Recorded on this form was information about the approach to therapy, objective(s)/intervention techniques of the therapy session, methods and materials used, the setup of the session, reinforcement and cues, an evaluation of the therapy session, and comments about behavior management techniques in regard to both social and linguistic behaviors. The observation form required the clinician’s signature and number of minutes (hours) observed. These observations were carried out at the Independence Academy, a school setting, and Riley Children’s Hospital, a clinical setting, in Indianapolis. Ten observations were obtained and recorded over the course of the fall semester of 2011. Please refer to the attached Appendices of the recorded observations to read notes on each therapy session.

\[1\] Typed observation forms do not include signatures, but they can be found on the recorded forms.
Theoretical Perspectives Regarding Children with ASD

Over the years, many theories have been developed in order to explain the behaviors seen in children with ASD. One such theory, as stated by Baron-Cohen, Leslie, and Frith (1985), is that children with ASD lack a ‘theory of mind’. Premack and Woodruff (1978) said that having a ‘theory of mind’ meant being able to understand that people know, want, feel or believe things. The definition of theory of mind, as stated by Premack and Woodruff (1978), is “the ability to impute mental states to oneself and to others” (p. 515). Since children with autism have difficulty in social interactions and with social relationships, they are said to lack ‘theory of mind’.

Baron-Cohen, Leslie, and Frith (1985) predicted that children with ASD would not have a theory of mind. They conducted an experiment involving dolls protagonists named Sally and Anne. The researchers first asked a naming question to ensure the children knew which doll was Sally and which was Anne. Sally put a marble in her basket and then left. Anne then took the marble and put it in her box. After this, Sally returned. The experimenter then asked a belief question: “Where will Sally look for her marble?” The experimenter also asked a reality question: “Where is the marble really?” and a memory question: “Where was the marble in the beginning?” (Baron-Cohen, et al., 1985). The results of the study showed that all of the participants passed the naming question. However, 16 of the 20 children with ASD failed the belief question on both trials (they pointed to where the marble actually was). For the participants with Down’s Syndrome and the normal children, 12 out of 14 normal children and 23 out of 27
children with Down’s Syndrome passed the belief question on both trials. Baron-Cohen et al. concluded that the children with ASD did not utilize a theory of mind and did not understand the difference between the doll’s knowledge and their own knowledge. As such, they illustrated a cognitive deficit in children with ASD.

Muratori and Maestro (2007) wrote about another theory. The purpose of the paper by Muratori and Maestro was to explore the possibility of autism being a ‘downstream’ effect of abnormal interaction as an infant. They aimed to find an answer as to why infants who start off with a desire for social connection lose that desire. Muratori and Maestro proposed that the differences in behavior, emotion or brain functions seen in children on the autism spectrum compared to typically developing children may be due to a lack of intersubjective behaviors during the first year of life. They noted infants with autism show deficits in responding to social stimuli and are more attracted by objects than normal children. This preference for nonsocial stimuli can negatively impact the development of primary and secondary intersubjectivity, as well as impede attention and social contact. They hypothesized that the use of motherese can lead to social connections and brain development. Muratori and Maestro discussed motherese and its role in caregiver-infant connections. They said motherese could perhaps “help the child out of autism” (Muratori & Maestro, 2007, p. 104) because motherese helps a child focus on faces, pay attention and respond to social, human stimuli. When motherese is not used, or when there are impairments in intersubjectivity, Muratori and Maestro hypothesized that downstream effects such as the development of ASD may occur.
Their paper was largely theoretical, but Muratori and Maestro (2007) made a strong point that it is necessary to study infants in the first year of life. Even though babies cannot talk at that age, the first year of life can be extremely important for the development of communication skills. It seems as though studying infants in the first year of life would be beneficial to developing intervention and therapy programs related to social development for infants with autism. Perhaps working on social skills, interaction and intersubjectivity at such an early stage would prevent autism spectrum disorders from progressing.

*Listening Preferences of Children with ASD*

Current researchers sought to investigate listening patterns and preferences of children with ASD. Klin (1991) wanted to determine listening preferences for children with autism compared to mentally retarded and normally developing children. Klin presented a preferential listening task to the three groups of children wherein each child was presented with his or her own mother’s voice and an alternative sound of superimposed voices. Klin examined each child’s preference, or lack of preference, for speech sounds over “babble”. Klin obtained data through monitored spontaneous play with an audio device called the “Playtest.” During a control task and familiarization session with the Playtest, the children were presented with a children’s song versus synthetic hum in order to determine that all children were capable of selecting their preferred auditory stimulus. During the experimental task, each child was presented with his or her mother’s voice versus babble (Klin, 1991). The results showed that in the control task, all children demonstrated a listening preference for the children’s song over the hum by 70% or more. In the experimental task, results showed that five children with
autism favored babble and the other seven children with autism showed a lack of preference. This was based on cutoff of 60% of listening time to determine preference (Klin, 1991). The mentally retarded and normally developing children all preferred their mothers’ speech over the babble (Klin, 1991). The results showed that the children with autism listened and interacted a lot with the Playtest; they figured out the device and played with it. Therefore, the results of Klin’s study had little to do with attention or ability to play with the test device. The children with autism were perfectly capable of interacting with the Playtest and their attention to it was sufficient. It wasn’t their listening time that differed from the other children; it was their listening pattern (Klin, 1991). Klin posed the question of whether children with autism are less attracted to speech sounds because of their disorder, or if social unresponsiveness contributes to autism spectrum disorders. Klin asked if the preference for babble (or lack of preference to mothers’ speech) leads to autism, or if children exhibit that reaction because of the disorder.

In a follow-up study done by Klin (1992), the purpose of the study was to differentiate between the children with ASD and the children who were mentally-handicapped based on their listening preference for speech sounds. Four children participated in the study; two who were later diagnosed as having either global mental retardation or developmental receptive language disorder, and two who were later diagnosed with autism (Klin, 1992). The Playtest was again used in the study. The results showed that the two children who were later diagnosed with other disorders exhibited a listening preference for their mother’s speech, while the two children with ASD preferred the babble (Klin, 1992). Therefore, Klin was in line with the original
study (Klin, 1991): preference for speech versus non-speech sounds was largely different when a child had ASD as compared to different clinical diagnoses.

Kuhl, Coffey-Corina, Padden, & Dawson (2005) also completed a study to determine if there was an association between social and linguistic processing in children with ASD. Kuhl et al. examined auditory preference in preschool children with ASD, typically developing chronologically matched (TDCA), and typically developing mental age matched (TDMA) children, using speech and non-speech signals. Kuhl et al. also examined speech-discrimination abilities through the mismatch negativity (MMN) paradigm in an event-related potential (ERP) study; the children listened to synthetic syllables (/ba/ and /wa/) and the ERP data were taken as indicators of speech discrimination abilities. Finally, Kuhl et al. paired motherese speech samples and non-speech analog signals of the motherese samples and predicted that children with ASD would show a preference for the non-speech signals whereas the typically developing (TD) children would not. Last, Kuhl et al. examined possible associations between the two linguistic measures described above, and various social measures. As a result of the event-related potential test, children with ASD demonstrated no reaction or activity when the syllable stimulus changed. The results showed that children with ASD demonstrated a preference for the non-speech analog signals over motherese, in keeping with their hypothesis (Kuhl et al., 2005). Kuhl et al. then separated the children with ASD into subgroups based on their listening preference; the children with ASD who preferred the motherese speech signals over the non-speech analogs (seven of the 29 tested) were seen to have similar results on the ERP test compared to their age-matched peers. Kuhl et al. concluded that children with ASD may differ from TD children in their neural and
behavioral responses to speech; children with ASD preferred the non-speech analog signals compared to the motherese speech samples. However, when children with ASD were split into subgroups, they found different neural patterns among the children. The children with ASD who preferred motherese had brainwaves similar to those of the typically developing children, whereas the children with ASD who preferred non-speech showed the ERP pattern. Kuhl et al. also showed positive correlations between the linguistic measures in this study and various social measures.

Paul, Chawarska, Fowler, Cicchetti, & Valkmar (2007) aimed to investigate whether or not children with ASD demonstrated the “tuned” auditory preferences similar to typically developing infants. They believed children with ASD would not have the same auditory preferences as typically developing children. In the experiment, the children heard natural CD (motherese) speech and “rotated” samples of the same speech (Paul et al., 2007). Rotated speech samples were the original speech sounds, but they had been manipulated, meaning that they had some of the same acoustic properties, but they did not sound like speech anymore. The results showed that even though all of the groups tested preferred the natural speech as compared to the rotated speech, the children with ASD demonstrated the least noticeable preference (Paul et al., 2007). On the other hand, the typically developing age-match group displayed the most marked preference for the motherese (Paul et al., 2007).

**Auditory-Visual Speech Perception in Children with ASD**

Current research suggests speech is a multimodal process; auditory and visual aspects of speech affect speech perception. Several studies have focused on testing
adolescents with ASD in auditory-only and audiovisual conditions. Smith and Bennetto (2007) tested adolescents with high-functioning autism and TD adolescents using a speech in noise paradigm. Smith and Bennetto believed visual information would improve an adolescent’s ability to understand what was being said. They examined speech reception thresholds (SRTs) – the signal-to-noise ratio (SNR) at which a listener could understand about half of what was said to him or her (Smith & Bennetto, 2007).

While the two groups had similar SRTs in the auditory-only condition, in the audiovisual condition, however, the adolescents with high-functioning autism had higher SRTs than the adolescents with typical development (i.e., they needed a higher SNR than the other group). The individuals with autism still benefited from the added visual component. Smith and Bennetto concluded that autism, even of the ‘high-functioning’ type, could affect early language development and add challenges to everyday communication. This study showed that individuals with autism may perform as well as individuals with typical development on a test of speech perception in noise; in fact, the individuals with autism performed about the same as the typically developing adolescents in the auditory-only listening condition. However, when visual information was added to the speech signal, the adolescents with autism benefited from the addition of visual cues to speech, but not as much as the adolescents with typical development benefited from those cues.

Other papers reinforced Smith and Bennetto’s (2007) findings. The purpose of a study done by Mongillo et al. (2008), for example, was to examine audiovisual processing in children with ASD. They presented audiovisual mismatches to determine if children with ASD had a greater processing difficulty with stimuli involving human faces and voices or with stimuli involving objects, such as a bouncing ball. There were six
perceptual tasks: a visual Male/Female Face Classification Task, McGurk Task, and the Gender, Vowel, Ball Size, and Ball Composition Match/Mismatch Tasks. The Male/Female Face Classification Task was a visual task where the participants were presented with pictures of a male or a female face, and they had to choose whether each picture was male or female. The McGurk Task was an audiovisual task where the participants were presented with mismatched audiovisual versions of /ba/, /da/, /va/ and /tha/, and they had to choose whether they heard /ba/ or something else. The Gender Match-Mismatch Task required participants to identify matches and mismatches of voice and sex. The Vowel Match-Mismatch Task required participants to identify the matched audio paired with visual vowels. For instance, if the speaker said /a/ and the video showed the speaker saying /a/, that was a match. If the speaker said /i/ but the visual cue was /a/, that was a mismatch. In the Ball Size Match-Mismatch Task, participants were presented with audiovisual stimuli of bouncing balls that were either correctly or incorrectly matched by shape of ball and bouncing sound. Last, in the Ball Composition Match-Mismatch Task, participants were presented with audiovisual stimuli of bouncing balls that were either correctly or incorrectly matched by type of ball and bouncing sound. Results showed that the ASD group performed significantly less accurately on the Male/Female Face Classification Task, the McGurk Task, and the AV Vowel Match/Mismatch Task than the control group (Mongillo et al., 2008). Children with ASD experienced less visual influence overall than the control group. Both the ASD and control groups performed similarly on matched trials and performed very differently on trials with mismatched stimuli. While children with ASD scored lower than children without ASD on most of the tasks involving human faces and voices, the children with
ASD scored similarly to children without ASD on the two tasks involving non-human stimuli (AV Ball Size and Ball Composition Match-Mismatch Task) (Mongillo et al., 2008).

Iarocci, G., Rombough, A., Yager, J., Weeks, D., & Chua, R. (2010) also found that children with autism were less influenced by visual speech than their typically developing peers. The purpose of the study done by Iarocci et al. was to examine the bimodal speech perception in children with ASD compared to mental age-matched typically developing children. Iarocci et al. studied audiovisual perception of simple consonant-vowel syllables and whether unusual patterns of auditory or visual influence would emerge in children with autism compared to mental age-matched typically developing children. In that study, however, participants were presented with only the mouth region of the face. The study incorporated incongruous auditory and visual sounds, such as auditory /ba/ with visual /tha/, /va/, or /da/. Iarocci et al. hypothesized the children with autism would be less influenced by auditory-visual signals than the typically developing children. They also expected that lack of bimodal speech integration would not be due to unimodal difficulties. Children participated in three experimental conditions: unimodal visual, bimodal audiovisual condition, and unimodal auditory. In the unimodal visual condition, participants had to lip read consonant-vowel sounds. In the bimodal audiovisual condition, participants had to report what they heard. In the unimodal auditory condition, participants looked at a blue screen and reported what consonant-vowel sound they heard (Iarocci et al., 2010). Results showed that in the unimodal auditory condition children with autism were able to identify auditory stimuli as well as typically developing children, but children with autism struggled significantly
more than typically developing children with lipreading. Iarocci et al. also found that in the bimodal condition, children with autism gave audio compatible responses much more than the typically developing children. Overall, children with autism were less influenced by visual speech than the typically developing children. Poor lip reading ability was linked to low visual influence for both groups, however (Iarocci et al, 2010).

**Neurobiology Inquiries Regarding Children with ASD**

Many researchers have set out to discover if there are differences in the neurobiology of children with ASD compared to TD children. One such group of people was Boddaert et al. (2004). Boddaert et al. discovered that while listening to speech-like stimuli, there was activation of the auditory cortex in the bilateral superior temporal gyrus in the control children and the group with autism. Left-biased asymmetry, however, was not observed in children with autism, and the children with autism also had activation in areas of the brain besides the auditory cortex. They had activation in the left temporal pole, the bilateral cingulum, the bilateral posterior parietal, the cerebellar hemispheres, and the brainstem. According to Boddaert et al., their findings meant children with autism have less activation in “left speech-related areas” of the brain compared to the control group. (Boddaert et al., 2004, p. 2119). Boddaert et al. discovered that the brains of individuals with autism have dysfunctions involving perception and integration of sounds.

Ceponiene et al. (2003) studied event-related brain potentials to observe the “sensory and early attentional processing of sounds of different complexity in high-functioning children with autism” (Ceponiene et al. 2003, p. 5567). They sought to do
this because attentional deficit is one of the hallmark deficits of autism. The purpose of this study was to discover if the sensory processing of information was damaged in individuals with autism and if the deficiency could connect with attention abnormalities. Ceponiene et al. wanted "to determine whether children with autism have a disadvantage in the sensory representation of, and attentive orienting to, speech sounds (vowels) as compared with the sensory representation of, and attentive orienting to, acoustically matched complex and simple non-speech sounds (tones)" (p. 5568). While linguistic stimuli were not extremely meaningful to children with autism, persons with autism perceived music well and performed extremely well in pitch discrimination and in sections of melodies (Ceponiene et al., 2003). Therefore, it seems that persons with autism had the capability to process nonverbal auditory input. The results showed that sensory sound processing was complete and un-impaired in children with high-functioning autism, but children with ASD did have an impaired attentional orienting to sound changes, including vowels (Ceponiene et al., 2003).

The purpose of the study by Williams et al. (2005) was to determine if dysfunction in mirror neurons could link imitative impairment and autistic spectrum disorder to each other. Williams et al. wanted to determine whether individuals with autism spectrum disorders use the mirror neuron system differently during imitation. They did this through a functional magnetic resonance imaging (fMRI) scanning protocol. There were three stimulus types; the first was animation of a left hand at rest with either the index or middle finger lifted; the second was the hand at rest with a black cross marking either the index or middle finger; and the third was a plain background with a cross on the left or right side of the screen (Williams et al., 2005). There were
three execution conditions and three observation conditions. In the execution conditions, participations were asked to raise the finger of their right hand based on what they saw on the screen. The imitation condition was in tested the first stimulus (Williams et al., 2005). The results showed that both the ASD and control groups showed greater activity in the right somatosensory cortex during imitation than execution but it was less extensive in the ASD group (Williams et al., 2005). The ASD group also presented with minimal activation during non-imitative action execution. Furthermore, the ASD group showed more activity of the dorsal premotor cortex during imitation than the control group did (Williams et al., 2005). Williams et al. suggested that the ASD group was relying on visuomotor learning more than the control group in order to complete imitative tasks. Overall, Williams et al. determined there were differences in the patterns of brain activation associated with imitation between control and ASD groups.

Taken together, this work suggests that while children with ASD may have had a listening preference for non-speech analog signals over motherese, aspects of their speech perception abilities were similar to TD children. Children with ASD benefited from visual cues, even if the benefit was not as much as TD children received. In summary, children with ASD did perceive speech in an auditory-visual manner.

Studies regarding brain activity and association determined there were speech-related differences in the brain between children with ASD and control groups. These types of studies could lead to researchers investigating the neurobiology of children with ASD more intricately to figure out exact patterns and differences.
According to current research, there were many different approaches to therapy utilized by speech-language pathologists and other professionals when working with children with ASD. Two different approaches to therapy, namely, the Picture Exchange Communication System (PECS) and the Developmental, Individual Difference Relationship-Based Model (DIR; also referred to as ‘Floortime’), have become instrumental to effective therapy. While these two approaches to therapy were quite different, they each had unique benefits and have been shown to improve communication abilities in children with ASD.

A widely used approach to therapy was PECS, which was developed in the Delaware Autistic Program (DAP) (Bondy & Frost, 1994). According to Bondy and Frost (1998), “The Picture Exchange Communication System (PECS) was developed as a means to teach children with autism and related developmental disabilities a rapidly acquired, self-initiating, functional communication system” (p. 373). PECS included behavioral therapy while using an augmentative/alternative communication program. PECS emphasized four ideas: the use of effective reinforcers that teach requesting, spontaneous communication that the child initiates, avoiding prompt dependency, and ease of training before administering the therapy (Bondy & Frost, 1998). One of the first goals of PECS was to teach children how to initiate communication by requesting in a social context (Bondy & Frost, 1998). After teaching spontaneous requesting, the program advanced to sentence structure and other important communication concepts.
In the literature, PECS was very different from traditional approaches to therapy designed to help children with autism learn language, and this was in one main way. Bondy and Frost (1998) said, “Although the initial goal may be speech, it is often viewed as essential for these children to develop eye contact and imitation prior to working directly on speech acquisition” (p. 375). PECS focused on aspects of communication, such as eye contact and imitation, before teaching speech to children with ASD. Also, PECS was designed to ensure that children do not become ‘prompt dependent’ (Bondy & Frost, 1998). When teachers always lead or initiated the lessons and exercises, it could be easy for a child to become prompt dependent.

According to research, the first step in PECS was to teach the child to initiate communication with the therapist and in turn, receive a reinforcer (Bondy & Frost, 1998). For instance, if the child wanted bubbles, the therapist would put a picture of bubbles in front of the child while also holding real bubbles. The child would take the picture and hand it to the therapist and in turn, receive the tangible bubbles. After the child mastered this skill, PECS advanced to working on generalization and prompting. Also, the therapist would create a communication binder, which would hold all of the child’s pictures (Bondy & Frost, 1998). At this stage, it was important to work on improving eye contact with the child. This seemed to be quite easy to do with PECS since the child has to initiate the communication. When the child began to initiate communication, the therapist simply had to “actively look away from the child, and even to exaggerate this action by lowering her head toward her lap” (Bondy & Frost, 1998, p. 378). This forced the child to get the therapist’s attention another way before handing them the picture.

Next, PECS aimed to teach children how to discriminate between pictures. The therapist
would add one picture that was non-preferred or extremely less desired than the original reinforcer. This training could continue for quite a while because the therapist could keep increasing the number of pictures (Bondy & Frost, 1998).

After the child has mastered requesting items, the next goal was to teach the child commenting. The therapist did this through the use of a sentence strip and the icon “I want.” The child had to create the phrase, “I want ...” using the desired item and hand the phrase to the therapist (Bondy & Frost, 1998). After that, the therapist taught a few harder skills for children with ASD to master, such as how to respond to a question and how to spontaneously comment (Bondy & Frost, 1998).

There were many reported benefits to using PEeS in therapy. PEeS was reported to have reduced behavior management problems. Also, it has been shown that after using PEeS, a large number of children developed speech (Bondy & Frost, 1998). “Within the first few months of our using PEeS with young children with autism, we observed several of these children beginning to speak without any direct formal speech training” (Bondy & Frost, 1994, p. 10). Bondy and Frost (1994) followed 85 children who initially used PEeS to communicate. Of the 85 children, 76% solely used speech to communicate or use speech supplemented with the picture-based system (Bondy & Frost, 1994).

There were other studies supporting the fact that PECS improves communication difficulties in children with ASD. Ganz and Simpson (2004) studied PECS in regard to increasing number of words spoken, increasing the complexity and length of phrases, and decreasing non-word vocalizations. Three children with ASD and developmental delays
(DD) with characteristics of ASD participated in the study. Four phases of PECS were taught to the children: basic picture exchange, increasing distance, picture discrimination and sentences (Ganz & Simpson, 2004). Looking at all three participants’ data, it could be seen that they all increased their average number of intelligible words per trial, the were using higher levels of words at the end of the study as compared to the beginning, and that they increased the complexity of their sentences. There was, however, no certain relationship between increased spoken words and decreased non-word vocalizations. Nonetheless, these results overall supported the hypothesis that PECS can encourage speech in children with ASD (Ganz & Simpson, 2004).

Another current therapy method in the literature was DIR/Floortime. According to Greenspan and Robinson (2004), DIR “focuses on constructing an assessment and treatment program that works with all facets of the child’s disorder and identifies and intervenes with the child and family’s unique pattern” (p. 2). The purpose of this model was to influence the core developmental processes that were disrupted in children with ASD (Greenspan & Robinson, 2004). DIR seemed to be different from other therapeutic methods because it was developmentally based, created for the individual, and focused on relationships.

According to Wieder and Greenspan (2003, p. 425), DIR was carried out through ‘floor time’ play sessions. It could be described as follows: “Adults follow the child’s lead utilizing affectively toned interactions through gestures and words to move the child up the symbolic ladder by first establishing a foundation of shared attention, engagement, simple and complex gestures, and problem solving to usher the child into the world of ideas and abstract thinking” (Wieder & Greenspan, 2003, p. 425). Wieder and Greenspan
stated that play was crucial to childhood, especially for children with ASD. That was because interactive play involved relating and communicating, two core deficits of autism. The three components of the DIR model were developmental capacities (D), individual differences (I) in sensory and motor processing, and the relationships and environment (R) involved in the therapy model (Wieder & Greenspan, 2003).

There was also evidence to suggest that the DIR model was effective. In 2007, the Play and Language for Autistic Youngsters (PLAY) Project Home Consultation (PPHC) program trained parents of children with ASD on DIR. They used DIR as their social-pragmatic approach to therapy, and the DIR framework was used to improve their play-based therapy as well (Solomon, R., Necheles, J., Ferch, C., & Bruckman, D., 2007). The parents of children with ASD were trained on the DIR model in seven steps and also had monthly home visits from PLAY Project’s home consultants. The PPHC program lasted for 8-12 months. The Functional Emotional Assessment Scale (FEAS) was used at the beginning and end of the study to measure changes and progress in the child’s development and progress for the caregivers (Solomon et al., 2007). At the end of the program, there was no difference in the parents’ FEAS scores, but there was an increase in the children’s FEAS scores. Also, the children’s progress using the functional developmental levels (FDL) also increased (Solomon et al., 2007). The PLAY Project created a training method to help families learn DIR in an efficient and cost effective way (Solomon et al., 2007).

In conclusion, there were many different approaches to therapy when working with children with ASD. PECS and DIR were two main approaches. Previous work has shown extensive research on systems such as PECS, while current research was starting
to focus on DIR/Floortime. PECS focused on requesting, initiating and spontaneous communication, while DIR was developmental, individual, and relationship-driven.

PECS has been shown to encourage speech and language development in children (Ganz & Simpson, 2004). The PLAY Project demonstrated how they could teach families DIR in an efficient manner. Taken together, these approaches to therapy have unique benefits and have demonstrated their abilities to improve aspects of communication in children with ASD.
Observations

As part of this thesis, I completed a series of clinical observations. I observed speech therapy sessions of children with ASD at the Independence Academy and Riley Children's Hospital and viewed the type of intervention techniques speech language pathologists are currently using in the school and medical settings, respectively. These observations enabled me to understand the current therapy techniques employed when working with children with ASD and allowed for a basis of comparison between what I read in terms of current research approaches to therapy and what I observed.

Independence Academy

At the Independence Academy I observed an excellent learning environment for students with ASD. The primary goal seemed to be for students to graduate and become somewhat independent, if not totally independent. The focus was on how to manage the students' behavior. I observed their main method, which was the use of a system to teach and manage social boundaries for behaviors. Behaviors were placed into five categories as follows: 1’s and 2’s were normal, typical behavior; 3’s were behaviors that depend on the environment (ex: picking nose); 4’s were threatening or intimidating behaviors; 5’s were behaviors against the law or behaviors that would get the students in trouble. The teachers utilized this system by labeling a student’s behavior as a 1, 2, 3, 4 or 5. Teachers were always sharing successful techniques for behavior management.

The Independence Academy also had a sensory break system in place, whereby the teachers prompted younger students to take breaks if they needed them and older students would ask to take a break. The goal was to have students accommodate
themselves. Break was not a punishment. For instance, if they started laughing or fidgeting a lot, they were either asked to take a break or they asked the teachers if they could take a break. When students took a break, they could go downstairs where there was an exercise bike, beanbags, and other sensory items.

There were also life and social skills classes at the Independence Academy. The teachers were training the students' brains to cues on the social aspects of their lives. For instance, the teachers wanted the students to ask each other social questions, respond appropriately and ask follow up questions. The teachers taught the students how to make good choices on social behaviors, and they worked on social skills throughout the day. The teachers asked specific people questions and asked students to raise hands and speak clearly. If someone asked an irrelevant question, they refocused and redirected the group. The students received points for good choices and behaviors that could be redeemed toward candy, soda, casual day, free time, lunch with a teacher, or video games. The teachers also worked on taking turns, staying on topic, etc. They were extremely straightforward when correcting social and behavior skills. For example, one teacher began ignoring the boy who was talking out of turn after awhile. Another teacher raised her hand when someone talked out of turn to show them what to do. During the Monday morning meeting, the students were constantly reminded they could only ask "large group questions." Also, the teachers were very good at redirection. They were very good at taking what a child said, even if was not relevant or related to the lesson, and making it relevant to what they were talking about.

Teachers enforced common intervention techniques. For instance, they focused on whole body listening and having the students pay attention and sit still. They also
asked a lot of questions to make sure the students understood what they were teaching. They were extremely encouraging and gave positive reinforcement for good choices. Another technique the teachers employed was to have directions for activities or notes on the overhead for visual cues.

The SLP that came to the Independence Academy focused on the students’ goals and implemented all the techniques and rules of the Independence Academy. The students mainly had pragmatic goals; therefore, they worked on role-playing and games like charades. They also had social interaction and vocabulary goals. She praised them for correct responses, redirected them to activities, and worked on attention. The SLP referenced the point system, and the students could take sensory breaks. If certain students were unresponsive, she asked questions directly to them. She was always working on improving eye contact. She used their names so others did not interrupt or take over the whole conversation. For attention issues, she pointed to the paper. She had to tell them to keep their head up, hands not over face, etc. One boy made a rude interjection, and she explained to him that it was inappropriate.

*Riley Children’s Hospital*

The three SLPs at Riley Children’s Hospital all used similar strategies to work with children with ASD. They used the Picture Exchange Communication System (PECS). This was because children with ASD are very visual, and research says an augmentative system like PECS moves language development along. The pictures bridge the gap between gestures and language. There are different levels for the PECS system, and the therapists worked at different levels depending on their client. For instance, one
child could work with just one card, or another child could work with two cards. With two cards, the SLP could work with two items that are preferable to the child or one item that is preferred and one item that is non-preferred. This helped the child work on making choices. With the PECS system, the child had to pull off the picture tab in order to receive the item they preferred.

The SLPs all worked on providing words for their clients instead of asking them what they want. They did not want the children to become prompt dependent. They said, “Use your words” if the child just went for the objects. With the PECS system, the SLP wanted the child to grab a picture, and she would say what they were doing: “I want puzzle.” The SLPs always emphasized the words, which was critical to PECS. The SLP used physical prompting (moving hand) and then said the item when the client got it; he/she heard the item paired with the picture.

They also all worked with a waiting card. Kids with autism responded well to visual support. If they were playing a game and had to take turns, the SLP would take the waiting card away when it was his turn and put it in front of him when it was her turn. If he reached for the objects or game, she would move his hands back. She’d say, “good waiting” if he waited.

The activities during therapy sessions with the different SLPs were also very similar. The SLPs usually used toys, such as Mr. Potato Head, bubbles, shapes, puzzles, games, books, marbles, etc.

In regard to behavior management, the SLPs all pushed their client’s chair in and pulled the client closer when he/she started moving around. They might even surround
the chair with her legs to lock the client in. They also all worked with a schedule to show the client that there was an end to all of his/her hard work. The SLPs hid other toys so the clients did not get distracted. The SLPs all were very enthusiastic, warm, friendly and excited. They clapped for their client or gave them high-fives. The SLPs said, “good working”, “very nice”, “you found it”, etc. They were constantly talking to get the clients to verbalize.

*Reflections over both observation sites*

Overall, both observation sites had valid therapy and behavioral systems set in place, although they were structured very differently. While the teachers and SLP at the Independence Academy worked with high-functioning children with ASD and the SLPs at Riley Children’s Hospital worked with mostly non-verbal children with ASD, they all fundamentally provided similar therapeutic methods and techniques. Even though the specifics of the methods were quite different, the end goals were the same. All of the teachers and SLPs worked on behavioral techniques, eye contact, attention, appropriate social contact and independence. The Independence Academy and Riley Children’s Hospital were two sites where children with ASD could go to receive therapy, and the Independence Academy could also help a child succeed academically.
Discussion

Relating the observations to the literature on therapy with children with ASD, it was quite easy to pinpoint the therapy done at Riley Children’s Hospital, as all of the SLPs that I observed used PECS. While the SLPs worked at different levels of PECS depending on their client, they all explained PECS and how to administer it in the same way and just how it was explained by Bondy and Frost (1994; 1998). I was able to see a session of PECS using 1 picture, PECS working on discrimination (preferred versus non-preferred pictures), PECS working on commenting, and the therapists let me look at one of their communication binders with many pictures. Last, I observed the SLPs using the WAIT card technique, which was described in Bondy and Frost (1998), as well as learning attributes, such as color and size. According to Bondy and Frost (1998, p. 382), “The rapid acquisition of requesting with PECS provides opportunities to change the way other communicative functions are taught.” The SLPs at Riley also emphasized to me the importance of not allowing the children to become ‘prompt dependent’, which was also highlighted in the literature on PECS. Overall, the SLPs at Riley were excellent examples of everything I read in the literature about PECS and how to administer therapy.

Observing at the Independence Academy, however, was very different from Riley Children’s Hospital in regard to therapy. First of all, I only observed one session with the SLP because she only came two afternoons a week. Teachers and administrators ran the school. Second, the Independence Academy focused on social behavior and academic work. Third, the children were all high-functioning children with ASD. When I observed the SLP, she was not using PECS or any certain therapeutic system; she was
following the Independence Academy’s rules and goals. This certainly was a well-designed program since Independence Academy’s main goal was to have the children become independent.

The therapies I observed at Riley Children’s Hospital and Independence Academy were quite different. This was because of many reasons. The environments (school versus medical/clinical) were extremely different. The therapy sessions, one-on-one at Riley Children’s Hospital versus 24 students (4-3 students per class) at the Independence Academy were also not the same. The children were also very different; the students at the Independence Academy were high-functioning children with autism, while the clients at Riley Children’s Hospital were non-verbal children with autism. Therefore, the last difference was that the goals of the two programs were dissimilar due to the starting points of the children.

The literature I read focused on PECS and DIR/Floortime. While I observed multiple sessions of PECS, I did not see a single session of DIR/Floortime. I believe DIR/Floortime would be a useful and beneficial method of therapy for the children at Riley Children’s Hospital, but it would be a program the SLPs would have to teach the parents and then the parents would have to use it at home. I think DIR/Floortime would be excellent for the children because they essentially would be receiving twice the therapy – if they came to their regular sessions at Riley Children’s Hospital and received DIR/Floortime at home.

In regard to auditory-visual speech perception, both sites administered therapy audiovisually. Both sites also were constantly working on eye contact. At the
Independence Academy, they would ask the students to look at them while they were talking. At Riley Children’s Hospital, the SLPs would often box the children in or surround them with their legs and face the child toward them so they could be face-to-face during therapy. At the Independence Academy, the children were set up in classrooms where they could all see and hear the teacher quite well. At Riley Children’s Hospital, the clients were in individual therapy rooms with just the SLP and family member who brought them. Also, with the children who were non-verbal, the SLPs would sometimes say certain sounds to see if the child would repeat them. For instance, if they were using the PECS picture of a ball, the SLP would say, “Say ba-ba-ba ball.” Overall, my observations were supported by the current literature on therapy with children with ASD.
Conclusion

The purpose of this thesis was to investigate speech perception in children with ASD through a) a detailed analysis of current research regarding speech perception in children with ASD, b) a literature review on current approaches to therapy for children with ASD, and c) a series of observations in clinic and school settings. Existing literature in speech pathology, psychology, and cognitive sciences was investigated and synthesized, along with other journal articles and books regarding the history of ASD. The series of observations at the Independence Academy and Riley Children’s Hospital settings meant viewing and learning about the approaches to therapy speech language pathologists were currently using and learning more about the population of children with ASD. Recorded observations were taken at each session.

The review of current research showed that while children with ASD are less influenced by visual cues than typically developing children, they still benefit from the addition of visual cues to speech perception and do not lack auditory-visual integration skills. Studies regarding neurobiology determined there were differences in the brain between children with ASD and control groups. The literature review on current approaches to therapy showed that PECS and DIR have become instrumental approaches to effective therapy. PECS, a behavioral therapy program combined with the use of a augmentative/alternative communication system, focused on requesting, initiating and spontaneous communication, and DIR was developmental, individual, and relationship-driven. While quite different, each approach has unique benefits and has been shown to improve communication abilities in children with ASD. The SLPs at Riley Children’s Hospital administered PECS, but neither site used DIR. The clinical observations
demonstrated how therapy can be administered for children across the spectrum, even in different environments and with differently structured therapy sessions.

*Future Directives*

Taken together, these studies demonstrated that while there has been a vast amount of research carried out on children with ASD, there is much more to be discovered. These studies were mostly completed with children with high-functioning autism, but many authors mentioned completing studies with children on different levels of the autism spectrum. It seems as though running similar, or even the same, tests on children with different functional levels of autism could lead to further understanding of autism spectrum disorders and how to more effectively implement therapy procedures to children at all levels on the autism spectrum. Comparing different functional types of autism could lead to more information about audiovisual speech integration and language development in children with ASD.

Iarocci, G., Rombough, A., Yager, J., Weeks, D.J., & Chua, R. (2010) expanded past research by finding lip reading difficulty in children with autism even when presented with just the mouth instead of the whole face. Disadvantages in lipreading could affect speech comprehension, language acquisition, and language performance. Iarocci et al. suggested future research as to how visual cues impact language acquisition developmentally. Researchers would need to examine very young children with autism in order to do this. It seems as though if this was researched, speech language pathologists could start intervention techniques and working on visual cues very early on in treatment to hopefully improve language acquisition in children with autism.
The study by Williams et al. (2005) could lead to further investigation of theory of mind and other social cognitive developmental delays in ASD. It would be interesting to determine what areas of the brain are activated during auditory-only tasks versus audiovisual tasks in children with ASD compared to control groups and determine if that has any connection to the study done by Williams et al. The findings of Williams et al. lead toward abnormal areas of visual analysis, motor action, proprioception and emotional processing in those with ASD. These abnormal patterns could have consequences for theory of mind.
References


Ganz, J., & Simpson, R. (2004). Effects on communicative requesting and speech development of the picture exchange communication system in children with


### Appendix

**Observation Report**

<table>
<thead>
<tr>
<th>Clinician’s Name</th>
<th>Number of children</th>
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</thead>
<tbody>
<tr>
<td>Date</td>
<td>Location</td>
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Approach to therapy:

Objective(s)/Intervention Techniques:

Methods/Materials/Setup:

Reinforcement/Cues:

Evaluation/Comments:

Behavior Management Techniques (Social/Linguistic):

Clinician Signature:

Number of Minutes (Hours) observed:
Appendix

Observation Report

Clinician’s Name: All teachers
Date: 10/10/2011

Number of children: 24
Location: Independence Academy

Approach to therapy: Academics – trying their best; socially – making good choices. To squash behaviors before they become a problem.

Objective(s)/Intervention Techniques: Whole body listening – pay attention and sit still. Morning walk/eat snacks.

Methods/Materials/Setup: Morning meeting, literature, algebra and science. In the morning meeting, they are all in once classroom. Not everyone was in a good position to see the teachers.

Reinforcement/Cues: Very encouraging, “large group” questions only for morning meeting, ask a lot of questions to make sure the students understand. Positive reinforcement for good choices – “I’m glad you…”

Evaluation/Comments: The teachers are very straightforward with the students, but never talk down to them. The teachers are very positive, patient and helpful.

Behavior Management Techniques (Social/Linguistic): Everyone can chew gum. “Shh”, no fidgeting. They ask specific people questions. Choices – want 1’s or 2’s on behavior scale. Asks students to raise hands, speak clearer, refocuses group if they ask irrelevant questions. Kids get points for good choices and behaviors (for candy, soda, casual day, free time, lunch with a teacher, video games, teach a lesson, etc.). Sensory items – gum, beanbags, dog, etc. Take a break when start to laugh; worked on taking turns, raising hands, staying on topic, etc. Mr. Bonner would say, “That’s off topic.” Doesn’t beat around the bush with correcting social and behavior skills. Started ignoring the boy who was talking out of turn.

Clinician Signature: ____________________________

Number of Minutes (Hours) observed: 4 hours
Appendix

Observation Report

Clinician's Name Life & Social Skills
Date 10/10/2011

Number of children 7
Location Independence Academy

Approach to therapy: Life and social skills training. They want the kids to learn appropriate social skills for everyday life.

Objective(s)/Intervention Techniques: They struggled with picking partners, so they talked about participating positively and why it doesn’t matter who their partner is.

Methods/Materials/Setup: Acting activities: partners, 1 is a sculptor and 1 is a figurine; sculpting emotions. They have small class sizes and can really work with every child.

Reinforcement/Cues: “What made this easy or difficult?” The teacher had to constantly reinforce the students to act positively and that their actions have consequences.

Evaluation/Comments: This was one of my favorite observations. The students didn’t always know how to act or handle themselves appropriately, and it was a good lesson for me to see. The teacher handled the situation extremely well.

Behavior Management Techniques (Social/Linguistic): Deep breaths to calm down. One boy was asked to leave the class because he wouldn’t participate positively. Teacher told them how sounds and facial expressions can affect others.

Clinician Signature: ____________________________

Number of Minutes (Hours) observed: 45 minutes
Appendix

Observation Report

Clinician’s Name  Mrs. Le Vay
Date 11/4/2011

Number of children 24
Location Independence Academy

Approach to therapy: A 5 is Against the Law. The teachers want students to make 1’s and 2’s for choices (normal behavior). 3’s, 4’s and 5’s are behaviors that are inappropriate based on the environment, threatening/intimidating or against the law.

Objective(s)/Intervention Techniques: Have book on projector and underline important things and write notes in margins for them to visually see what she’s teaching.

Methods/Materials/Setup: Geography and literature. They have small class sizes so the students can learn and focus. It is a typical setup with tables and chairs.

Reinforcement/Cues: Mrs. Le Vay is always ready for whatever the students are doing that day. She cued them to raise their hands or asked them if they needed breaks.

Evaluation/Comments: Mrs. Le Vay is a wonderful teacher and deals well with outbursts or inappropriate behavior.

Behavior Management Techniques (Social/Linguistic): “Hold on” or “My turn” or “Raise your hand please” for interruptions. Fidgets (little toys) if they need to take a break.

Clinician Signature:

Number of Minutes (Hours) observed: 2 hours
Appendix

Observation Report

Clinician’s Name: All teachers
Date: 11/14/2011

Number of children: 24
Location: Independence Academy

Approach to therapy: A 5 is Against the Law (social boundaries for behaviors): 1 and 2 are normal typical behaviors; 3’s are behaviors that depend on the environment (e.g., picking noise); 4’s are threatening or intimidating behaviors; 5’s are behaviors that are against the law or would get you in trouble. IA has a sensory break system. They prompt younger students to take breaks; older kids will ask to take a break. The goal is to have them accommodate for themselves. Break is not a punishment. Life and Social Skills classes work on conversations, turn taking, being aware of environment and training their brains to cue the social aspect: Did you ask a social question? Respond to a question? Ask a follow up question?

Objective(s)/Intervention Techniques: Teachers are always sharing techniques. Their largest goal is for the students to graduate and become somewhat independent, if not totally independent.

Methods/Materials/Setup: Math problems, zoos, literature, occupations - school related topics. The students are set up in typical classroom (sit at tables, teacher in front).

Reinforcement/Cues: Directions for activities on the overhead (visual cues). Says, “That’s an excellent question.”

Evaluation/Comments: Independence Academy has a really strong system in place for a good learning environment for kids with ASD, and also how to manage their behavior.

Behavior Management Techniques (Social/Linguistic): During the morning meeting, they are reminded they can only ask “large group questions.” During class, they are reminded to raise their hands, not to interrupt. Mrs. LeVay is very good at taking what a child says, even if it’s not relevant/related, and making it relevant to what they are talking about (redirection). They have to deal with special interests (special/unique coins and jewelry) – had to limit student to wearing 2 pieces of jewelry. Mrs. Hale raised her hand when someone talked out of turn to show them what to do. She motioned for one boy to take deep breaths to calm down. She allowed everyone 1 off-topic comment.

Clinician Signature: ________________________________

Number of Minutes (Hours) observed: 3 hours and 15 minutes
Appendix

Observation Report

Clinician’s Name  Kimberly Arnold  Number of children 8 total (3 groups)
Date 12/13/2011  Location Independence Academy

Approach to therapy: Her overall approach to therapy is to focus on their goals and implement all the techniques and rules of IA. She has to work on social skills. Proper posture helps them focus.

Objective(s)/Intervention Techniques: The boys have pragmatic goals, so they worked on role-playing and games like charades. They also have social interaction and vocabulary goals.

Methods/Materials/Setup: There were three groups of boys (high school, 7th & 8th, 5th & 6th). They started with a conversation, and she was working on eye contact with them. They worked on making inferences. They read a story aloud and answered questions/made inferences about the reading. They had to define vocabulary words and find antonyms. They all sat around one table so they could easily see her. She moved around at times to work individually with the students.

Reinforcement/Cues: She praises them for correct responses. She redirects them to activities and tries to get their attention.

Evaluation/Comments: There were a lot more behavior issues as the groups got younger. She changed the way she asked questions/what questions she asked based on the group.

Behavior Management Techniques (Social/Linguistic): She references IA’s point system. They can take sensory breaks. If certain boys are unresponsive, she asks questions directly to them. She uses their names so others don’t interrupt or take over the whole conversation. For attention issues, she points to the paper. She has to tell them to keep their head up, hands not over face, etc. One boy made a rude interjection and she explained to him that it was inappropriate. He was also very negative, so she had to keep saying, “no.”

Clinician Signature:

Number of Minutes (Hours) observed: 1 hour and 45 minutes
Appendix

Observation Report

Clinician’s Name: Lynn Marsh
Date: 10/17/2011
Number of children: 1
Location: Riley Children’s Hospital

Approach to therapy: PECS (3 pictures) – have to pull off picture tab to receive the item. Research says augmentative system moves language along – Picture Exchange Communication System – children with autism are visual. Back things down to his level with everything.

Objective(s)/Intervention Techniques: Never say, “What do you want?” or “Do you want ___?” Don’t want them to become prompt dependent. Provide words instead: “I have the ball.” Pictures bridge the gap between language. His goals are to work on matching/identifying/following 1-step directions.

Methods/Materials/Setup: Toys, Mr. Potato Head, bubbles, shapes and puzzles. Special activity was Zingo. The child sits at a table right next to the SLP so they can work side by side and have eye contact.

Reinforcement/Cues: Says, “You’re your words” if he just goes for the objects. She says, “Good working” and she is always excited and happy; claps for him.

Evaluation/Comments: Lynn did a really good job of ignoring his outbursts. She was very playful and full of energy.

Behavior Management Techniques (Social/Linguistic): She pushes his chair in and pulls him closer when he starts moving around. AAC schedule – hand over hand prompting with pointing; working on independence. She hides other toys so he doesn’t get distracted. She surrounds his chair with her legs to lock him in when he moves around a lot. He threw a temper tantrum, so she gave him a stopping point and he calmed down.

Clinician Signature: ____________________________

Number of Minutes (Hours) observed: 1 hour
Appendix

Observation Report

Clinician’s Name: Lindsay Clark
Date: 11/7/2011
Number of children: 1
Location: Riley Children’s Hospital

Approach to therapy: PECS – 1 picture. He grabs the picture and she’ll say what they’re doing: “I want puzzle.” The toys were used to get him engaged and participating with the PECS system.

Objective(s)/Intervention Techniques: To work on play, expanding interests, turn taking, table readiness, responding to name, and following 1-step directions. To work on basic communication functions.

Methods/Materials/Setup: They did puzzles, played with toys, and played a game. They sat at a little kid’s table. Lindsay sat at one end and he sat next to her. She could look him in the eyes very easily.

Reinforcement/Cues: She says, “Good! Very nice! You found it!” She is very enthusiastic, warm and friendly. “Nice working.” She’d say, “You’re your words please” if he just reached for the pieces.

Evaluation/Comments: Lindsay always emphasizes the words which is critical to PECS. With PECS, she uses physical prompting (moving hand) and then says item when he gets it. He hears the item paired with the picture.

Behavior Management Techniques (Social/Linguistic): She scoots him into the table in the chair to sort of box him in (strapped in chair seat) because toys distract him. She uses a schedule board. If he stops doing the activity, she’ll say, “I have more.” She has a waiting card when it’s not his turn. Kids with autism respond well to visual support. During the game, they had to take turns putting animals in the farm. She took the waiting card away when it was his turn and put it in front of him when it was her turn. If he reached for the animals, she would move his hands back. She’d say, “Good waiting” if he waited. She gave him high-fives.

Clinician Signature:

Number of Minutes (Hours) observed: 45 minutes
Appendix

Observation Report

Clinician’s Name Lindsay Clark
Date 11/28/2011
Location Riley Children’s Hospital

Number of children 1

Approach to therapy: PECS – 2 preferred or 1 prefer, 1 non-prefer – has to make choices. He progressed from using just 1 picture.

Objective(s)/Intervention Techniques: She asks what he wants and he has to make a choice.

Methods/Materials/Setup: They played Go Fish first (pictures: fish and folder). They played with toys (bubbles or animals; bus or cars; bubbles or cars). They matched colors – she’d give him a ring and he’d put it on the right peg.

Reinforcement/Cues: If he chooses the non-preferred item, she says: “That’s no fun! I think you want __.” She says, “Good working” or “My turn” or “You’re waiting” and “Bye fish!” She’d say, “Good looking!”

Evaluation/Comments: Lindsay was constantly talking to get him to verbalize. She’d say the colors or describe what they were doing.

Behavior Management Techniques (Social/Linguistic): Wait picture. If he gets distracted, she puts his hand on the PECS board to get his attention. She uses a schedule.

Clinician Signature: ________________________________

Number of Minutes (Hours) observed: 45 minutes
Appendix

Observation Report

Clinician’s Name Laura Augillon

Date 12/1/2011

Number of children 1

Location Riley Children’s Hospital

Approach to therapy: Therapy is play-based. She used applicable games and activities to work on social skills.

Objective(s)/Intervention Techniques: To work on conversation – initiating and maintaining, games and turn taking. Laura has to redirect him when he talks about other topics during their conversation.

Methods/Materials/Setup: She practiced having a conversation with him with a conversation tree (conversation grows like the tree grows). They played Trouble to work on turn taking. They sat side by side at a little table.

Reinforcement/Cues: Laura complimented him and he got to put a piece of the tree together when he asked a good question or answered questions appropriately.

Evaluation/Comments: I thought the activities were perfect to work on maintaining and initiating a conversation and then turn taking. Laura did a great job at redirecting him.

Behavior Management Techniques (Social/Linguistic): She uses visual supports for redirection. She uses a schedule. She uses a reward system for task completion. There is a countdown board so they can see there’s an end. She incorporates their interests into the session to help with motivation. She uses a "wait" card for turn taking.

Clinician Signature: __________________________

Number of Minutes (Hours) observed: 1 hour
Appendix

Observation Report

Clinician’s Name: Laura Augillon       Number of children: 1
Date: 12/1/2011                     Location: Riley Children’s Hospital

Approach to therapy: Therapy is play-based; uses a picture schedule and a modified PECS system. Verbally says, “I want” (more advanced).

Objective(s)/Intervention Techniques: To increase verbal speech, work on appropriateness of speech, and work on language – vocabulary, verbs and nouns – in sentences. She uses, “I want ___” so he makes choices and appropriately speaks.

Methods/Materials/Setup: They read a book called Froggy Gets Dressed. They played a Mix & Match Doughnuts game. They played marbles and played with Mr. Potato Head. Laura sat directly next to him so she could see him directly.

Reinforcement/Cues: She uses visual cues and prompts for the book. There was a visual card for game directions. He had your turn/my turn cards for turn taking. She takes his finger to point to what he’s supposed to do (keep it, put it back, etc.). She said lots of praises to him – “Good job! Awesome!”

Evaluation/Comments: There weren’t many behavior issues with him, but Laura was very good at getting him to complete tasks and challenging him to move forward.

Behavior Management Techniques (Social/Linguistic): She says, “Use your words.”

Clinician Signature: ____________________________

Number of Minutes (Hours) observed: 1 hour