

**The Impact of Early Intervention Programs
on Young Children with
Speech and Language Delay:
Comparison and Analysis**
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Abstract

Speech and language delays and disorders occur when a child's speech and language develop abnormally. Some causes of speech and language delay include mental retardation, hearing loss, autism spectrum disorder, and sensory integration disorder. Research shows that early intervention is critical in mitigating the effects of delayed development. In order to promote initial speech and language acquisition and minimize the social problems associated with such disorders, early intervention is thus strongly recommended. Here I detail the program objectives and methodology of the Early Intervention Clinic (EIC) at the Center for Speech, Language, and Occupational Therapy (CSLOT) in Fremont, California. At CSLOT children from 18-36 months of age with mild to severe speech and language developmental delays receive treatment in the EIC. I compare the methods used at CSLOT in summer 2006 to those utilized by other programs to determine the effects these different approaches to intervention have on children. This comparison makes use of the following considerations: curricula, philosophy, program structure, manners of measuring progress, ratio, age range of children, diagnosis, parent participation, and period of treatment. The literature as well as my research shows that although there are many different early intervention programs available, each with distinct curricula and philosophies, the majority feature similar basic content areas with comparable treatment outcomes. Thus early intervention is found to be effective, regardless of the various methods employed in regards to those considered here. In this study I show that multiple treatment methods are used by early intervention programs and most of them have positive outcomes. However, more research is needed in order to determine which methods are most effective for different types of children.*⁸

INTRODUCTION

Speech and language are universal traits of humans, without which normal life would never be the same. Regardless of gender or culture, normally developing language

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grows in the same basic manner (Bzoch & League, 1970). The most important, basic language skills emerge throughout the first 3 years of life, by which time a child should be able to express him/herself intelligibly and effectively communicate¹ with others. If a child has not mastered expressive communication by this time, then it is apparent that there are basic developmental problems in normal speech and language acquisition (Bzoch & League, 1970). In fact, speech and language disorders are the most prevalent developmental problems during this period of life. If a speech and/or language delayed child receives no treatment, it is very likely that he/she will not only continue to experience difficulties with relation to language, but also with psychological and social development (Lombardino & Vaudreuil, 1998).

As I strongly believe in the power and importance of communication, I became interested in the field of speech and language pathology. Therefore I decided to experience this work myself, which led to a very interesting internship at the Center for Speech, Language, and Occupational Therapy in Fremont, California in the summer of 2006.

SPEECH AND LANGUAGE DELAY

To understand speech and language delay it is important to first begin with a basic understanding of the differences between speech and language. Speech refers to the ability to produce speech sounds whereas language refers to the cognitive system that allows people to understand language systems (ASHA.org, accessed November 13, 2007).

¹ For the purposes of this paper, communication will be defined as any meaningful exchange of information based on an accepted system between at least two people.

The most frequent cause of speech and language delays are language environments or physical disabilities, and research shows that regardless of the cause of speech or language delay, the first three years are a critical period for development (Bzoch & League, 1970). Regardless of one's culture or mother-tongue, or the cause of any speech/language delay, the first three years of speech and language development occur in a fairly predictable pattern and rate. Researchers have determined the progression of normal speech and language development, breaking them down into different developmental milestones. Milestones are characterized as the development of specific speech and language skills, and each milestone is expected to develop within a certain period of time during development. Milestones are also used to assess children's developmental levels, thus a child is considered to be speech or language delayed if he/she falls well below the normal milestone for his/her chronological age (Bzoch & League, 1970). This topic will be discussed further in the next section.

It should also be noted that these milestones are guidelines, and that every individual develops at different rates. Some children's development coincides closely with the milestones, while others may develop slower or faster than expected. Thus if a child has not reached a certain developmental level by the exact time indicated, there may not be need to worry. However, it is at the discretion of the caregivers and the decision of the speech therapist as to whether a child should receive treatment, and it is also likely that different practitioners will offer different advice.

Some causes of speech and language delay include autism spectrum disorder (ASD) and specific speech/language disorders. ASD is a subtype of pervasive

developmental disorder, and is classified as a life-long disability (Dawson & Osterling, 1997). Some traits of ASD include a diminished use of emotion and attention, limited use of eye gaze, sounds, words, gestures, object use, and understanding of spoken language, as well as a tendency to repeat patterns of actions or words. Children with ASD also have difficulty with imaginative and symbolic play, as well as other abstract concepts. There exists a tendency to be anti-social, and to show more interest in non-human objects than in people. Researchers are not sure whether or not speech and language delay is a result of a low desire to interact and communicate with others, or if this avoidance is fueled by the inherent difficulties with speech and language (Daly Russo & Bailey, 2000).

During my time at CSLOT I had direct interaction with children who had ASD. Oftentimes, many of the children with ASD were difficult to engage. At times it appeared that no matter what I did I could not interest some children in engaging in social interaction. For example, while trying to engage Sammy² I would position myself in front of him at eye-level; however he always looked beyond me, focusing his gaze on objects around the room. At times I had his attention, and he would make eye contact and smile broadly at me, but only for a brief moment. Throughout the clinic sessions he showed no interest in the therapists or other children, and had very little expressive vocabulary.

Another boy, Frankie, was also on the autism spectrum, but he was very different from Sammy. He had a very high expressive and receptive vocabulary, but tended to be very fixated on certain objects. One day before a session began he was sitting quietly, staring up at the ceiling in fascination. I asked him what he was looking at, and he pointed to something that I couldn't see. Since the session was starting and he was still very distracted, I stood up to take a closer look. It turned out that a barely-visible strand

of dust was the source of his distraction. These are only two individuals, but they demonstrate that the trait of being fixated on objects is characteristic to many diagnosed with autism.

Specific speech/language disorders include expressive and receptive disorders. Expressive refers to the ability to vocalize and “express” oneself, whereas receptive refers to one’s ability to understand communication. An example of an expressive speech disorder is apraxia, in which the muscles involved in speaking are weak. Those with apraxia may have speech that is limited to bilabial and alveolar plosives (Daly Russo & Bailey, 2000). At CSLOT I met a bright young girl named June, who was diagnosed as being speech and language impaired (SLI). It is also a possibility that she had apraxia, but this was not an official diagnosis. June had a very high receptive vocabulary, but demonstrated much difficulty expressing herself verbally. When attempting to vocalize she appeared to concentrate all of her energy in pronouncing the desired word, squinting her eyes and contorting her expression. Her phonetic repertoire was limited to bilabials, alveolars, fricatives, and back vowels, which she used to produce monosyllabic CV³ approximations of words,⁴ such as /ta/ to mean “car” and /du/ for “juice.”

PATTERN OF LANGUAGE DEVELOPMENT

² All names have been changed to respect the privacy of the individuals discussed.

³ The designation C refers to consonants and V refers to vowels.

⁴ Approximations are words that are intended by the speaker to be a certain word, but are not pronounced correctly.

As stated earlier, many investigations have found language to develop in a highly predictable pattern and at a highly predictable rate (Bzoch & League, 1970). This section aims to give some background information on typical language development during the first three years of life.

Even during fetal development, a fetus begins to soak up the sounds around them (Lecanuet, et al., 1995). From birth through three months of age phonemic imprinting begins to occur. As an infant interacts with others in his/her environment, he/she begins to recognize the speech patterns associated with this mother-tongue. An infant also directs his/her attention to any source of sound, listening attentively. By the end of five months of age, infants deliberately turn their heads to the source of sound and are able to determine the source with accuracy. Infants may also respond to speech by making eye contact with the speaker, or smiling in response to friendly sounding vocal patterns. Furthermore, infants begin to recognize and distinguish different voices. Indeed, this demonstrates that newborn children already possess fine auditory discrimination skills (Bzoch & League, 1970).

During the first month of life, most expressive language consists of cooing, crying and random vocalizations. At this time most vowels are front, such as [æ] and [ɛ], and most consonants are back, such as [k] and [g]. By the end of the third month an infant should begin expressing more back vowels, such as [u] and [ɑ], and front consonants, such as [m] and [b], and use these phonemes in CV patterns (Bzoch & League, 1970).

Between six to eight months of age morphemic imprinting develops, and thus receptive vocabulary increases. Before this time an infant may appear to understand

certain words, but it is more likely that he/she is responding to the emotional inflections in speech patterns as infants are able to distinguish between voice patterns and respond accordingly. For example, an infant will become upset upon hearing angry voices and conversely will become happy upon hearing a friendly tone. After this time an infant will recognize names of familiar people, as well as respond to their own name. Infants will also respond to simple commands by gesturing, and by nine months of age he/she will be able to actively respond to speech-gesture games, such as “pat-a-cake” (Bzoch & League, 1970).

Expressive language continues to develop, and by six months of age infants should be engaging in what is known as “babbling.” In everyday vernacular this is known as “goo-goo-gah-gah,” a phrase which actually correctly reflects the nature of babbling. This is an important step in expressive language development, and refers to when an infant repeats syllables. He/she may repeat the same syllable, which is known as reduplicative babbling, or a few different syllables, known as variegated babbling (Baron, 1992). This also explains why some of infants’ first words are composed of repeated syllables, such as [mama]. When babbling first develops, infants will babble while playing alone, and later on they will also use babbling to interact with others. As development progresses, babbling also increases in complexity, from reduplicative babbling to variegated babbling, and then shifting to jargon around eight months of age. Jargon is similar to babbling, but these sentence-like utterances begin to reflect the prosody of adult speech (Bzoch & League, 1970).

During my research I met Timmy. Timmy was over 2 years old, and although jargon should have developed into meaningful words by this time, it continued to

constitute the majority of his vocalizations. Upon first hearing him speak I thought that he was using actual speech due to his prosody, but in reality he was only pronouncing random phonemes. We had a few conversations in which he would clearly name a few objects of interest that were in the classroom or outside the window, but he would mostly use jargon to communicate. Based on his intonation and facial expression, it appeared as if he understood exactly what he was saying. Other than this language delay, Timmy had no other disabilities.

Perhaps one of the most important milestones to a parent is when a child says his/her first word, which typically occurs around 12-15 months of age. Also around 12 months of age, evidence of toddlers' continued interest in communication grows more and more apparent. Infants are now able to sustain listening for longer periods of time without being distracted, and are able to respond appropriately to simple requests (i.e. "Point to the ball"). Receptive vocabulary inventory continues to grow, recognizing referents of many familiar objects. By 16 months of age toddlers are capable of displacement, the ability to recognize referents without the referent being present. This demonstrates an increase in semantic level development (Sachs, 1987). Syntax also begins to develop, with single word utterances expanding into two to four word utterances with basically correct syntax. By 18 months children can respond to up to two related commands or requests given in a single utterance (i.e. "Bring the teddy bear and the ball"). Also during this time, approximations and correct pronunciation of words become more prominent, and sentence utterances lengthen. Variegated jargon is still used (Bzoch & League, 1970).

From 18 to 24 months of age, children begin to use more correctly pronounced words over approximations and jargon. By 33 months of age, children also begin to develop a concept of verbs as well as adjectives and prepositions, and are able to follow verb commands. New words are acquired every day, reflecting knowledge of common objects in the environment, as well as daily interactions with others. By 36 months of age, children are able to respond to up to three commands or requests given in a single utterance, and are also able to express two to four word sentences that reflect proper syntax, pronouns, and plural forms. However, errors in verb tense may still occur (i.e. "I goed to school") (Bzoch & League, 1970).

EARLY LANGUAGE INTERVENTION

In numerous studies, early language intervention has proven to be essential to language development in children with language delay. Without intervention, these children develop language at slower rates than their normally developing peers, and some developmental milestones aren't reached until much later than normal (Fey, 1986). In addition, social and psychological problems, such as behavior disorders, may develop as a result of inability to communicate effectively. Language development also promotes certain aspects of cognitive development⁵ (Warren & Yoder, 1996). As time passes, these problems are not simply outgrown; they persist throughout life, translating to a limited ability to communicate with others as well as poor academic success. As observed from

⁵ For further reading please see Bates, Elizabeth. 1979. *The emergence of symbols: Cognition and communication in infancy*. New York: Academic Press.

various research, communication skills impact all areas of development (Lombardino & Vadreuil, 1998; Kaiser & Hester, 1994).

The administration of any form of therapy assumes that in spite of present delays it is still possible to change the course of one's development. As for early language intervention it has been determined that the quality and quantity of input from the language environment greatly affect development. If a child grows up in a language deprived environment, regardless of natural ability he/she certainly will be at risk for environmental language delay. Conversely, if a child grows up in a rich language environment, his/her speech and language developmental will benefit from this. This is not to say that enriching the language environment is a panacea for all speech and language deficits, but it is certainly beneficial and essential to a child's development (Warren & Yoder, 1996; Nelson, 1989).

As for early language intervention programs themselves, there is a great diversity. This is due to the fact that there are varying views on how normally developing children acquire language, therefore programs follow different theoretical models, sometimes implemented in a very strict manner, and other times more loosely followed. Some programs choose to follow more than one model, incorporating elements as they see fit. Even if a program claims to follow a certain model, it is very likely that this model will be influenced by the experience of the clinicians (Cole & Dale, 1986; Friedman & Friedman, 1980).

Since there are a plethora of early intervention programs available, each with different theoretical approaches, each program has its own definition of early language intervention. Instead, I offer a broad definition given by Fey:

...language intervention occurs when some intervention agent stimulates or responds to a child in a manner that is consciously designed to facilitate development in areas of communication ability that are viewed as being at risk for impairment. There are two important parts to this definition: the agent must be doing something *consciously* designed to aid in development, and she must be doing this because the child is believed to be at risk for language impairment (1986).

Thus, Fey considers early language intervention to be a deliberate process with a genuine purpose and with definite goals in mind.

As for what is meant by *early*, there is more than one interpretation. According to Warren and Yoder (1996), early intervention should take place within the first 48 months of life. As for early intervention with deaf children, it is agreed that early intervention should begin as soon as hearing-loss is detected (Greenberg, et al., 1984). They also noted that for many years researchers have performed early intervention with children over 36 months, even into adolescence. While there is disagreement in the field, for the purpose of this paper I will assume that treatment occurring before the age of 36 months, but not limited to this period, will be considered early intervention. This notion is also supported by the relatively recent idea that intervention is more beneficial if administered as early before 36 months of age as possible as this is a crucial period in which basic language processes develop (Warren & Yoder, 1996).

Since every individual child has differences in ability levels, it is also important to note that some children who enter early intervention programs may not necessarily have a strong need for intervention. Based on available evaluation methods, it is difficult to accurately diagnose children at a very young age. Thus when being evaluated for intervention, therapists can only make educated guesses (Fey, 1986). As each program is based on different theories, it may be possible that those who truly need intervention are

deemed not to need it, and that some who don't require it still receive it. Some programs may take a "wait-and-see" approach, but depending on the age of the child this may not be advisable. For example, if the child is 12 months old a therapist may not deem the child's situation dire. But if a child is close to 36 months and still has not reached certain developmental milestones, it is very likely that intervention would be recommended.

To give an example, one child in the EIC, Bobby, was considered environmentally at risk for speech and language delay because both of his parents were deaf and had difficulty speaking. Even though Bobby exhibited no apparent signs of speech or language delay, the therapists recommended therapy in order to prevent possible future problems. This is not to say that receiving therapy was a waste of time and resources. On the contrary, Bobby could express himself verbally as well as communicate with his parents using sign language. Arguably, Bobby's experience in the EIC put him ahead of his normally developing peers, and many researchers have evidence to prove this (Goodwyn, et al., 2000).

MEASURING DEVELOPMENT

It is essential to treatment that individual ability levels be identified (Bzoch & League, 1970). By measuring ability levels, appropriate goals can be chosen to meet each child's individual needs. There are many forms of assessments available, each with their own strengths. Some assessments are used for diagnostic purposes, some for planning intervention goals, and some encompass both. Certain tests are better suited for children with certain diagnoses, while other assessments are developed for specific age

groups. Even still, there are those researchers who choose to assess children based on observational data over quantifiable data, and some prefer a combination of these. Since there are many forms of assessment tools available, and just as many early language intervention programs, each program prescribes to its own methods. In addition, this fact makes it difficult to compare data across different programs.

As for the most frequently used assessments at the Center for Speech, Language, and Occupational Therapy's Early Intervention Clinic (EIC), they were the MacArthur Communicative Development Inventory (CDI) (See Appendix A) and the Batelle Developmental Inventory (BDI). In order to assess developmental level and progress, the CDI and BDI administered before a child enters the program and upon leaving the program.

There are two versions of the CDI, which are "Words and Gestures" and "Words and Sentences." The format considered here is the CDI: Words and Gestures, which is best suited for children 8-16 mos. old, however this version of the test is used at CSLOT regardless of age. This facilitates calculating progress in relation to pre- and post-treatment data, as well as the fact that for the purposes of CSLOT, measuring words and sentences would not be a fruitful indicator of developmental level as the children probably would not have reached this point yet (Fenson, et al., 1994). Gestures are considered in addition to words as they indicate a child's intent to communicate, regardless of expressive language level (Fenson, et al., 1994). The CDI features a checklist of items that researchers deem a normally developing child is to know. Questions are formulated to determine a child's receptive and expressive language level.

Before treatment begins, parents are given this checklist of 19 semantic categories and indicate the child's ability level in relation to the questions. For example, one item may be "car," and the parent indicates whether the child understands (receptive language), or understands and says it (expressive language) (Fenson, et al., 1994).

The BDI is designed to comprehensively assess developmental level in children from 18 months to 8 years, regardless of ability level. The areas of development monitored are personal-social development, fine and gross motor abilities, adaptive, communication development, and cognitive development, the levels for which are determined by developmental milestones. For example, according to the personal-social domain a child should develop the desire for personal attention between the ages of 6 and 11 months (Newborg, et al., 1988).

The BDI is administered through a structural administration, in which the therapist works one-on-one with the child to determine ability level based on tasks outlined in the test. As a child may be unwilling to perform at his/her ability level for the therapist, observational data as well as interviews with parents and caregivers is used to gain a more complete picture of the child's abilities (Berls et al., 1999).

It is interesting to note that the director of CSLOT, Brendan O'Connor Webster, Speech and Language Pathologist (SLP), Certified Clinically Competent (CCC), does not prefer this method of testing, but would rather use the Vineland Social Maturity Scales as she feels it is more reliable (Personal Communication, 2007). Rather, it was used because the overseeing authority in that area, the Regional Center of the East Bay (RCEB), agreed that this was the most suitable test for their purposes. In spite of this, agreeing on

accepted assessment methods allows for easier evaluation of program efficacy, as well as providing a common ground for these professionals to discuss their work.

THE EARLY INTERVENTION CLINIC

The Center for Speech, Language, and Occupational Therapy (CSLOT) is located in Fremont, California, and provides therapy for at risk children through its Early Intervention Clinic (EIC). The EIC was designed for children 18-36 months of age who have mild to severe speech and language developmental delays, and possibly other diagnoses. Therapy was administered in English, although during my time at CSLOT some of the children came from monolingual English-speaking homes, while others came from bilingual homes. Some of these languages included Vietnamese and Spanish. Information on social status was not available. The goals of the EIC included creating an environment which fosters development in language, speech and communication skills, as well as developing self-help skills, socialization, and motor skills, with emphasis on how these relate to communication. More precisely, the EIC aimed to develop language, speech, and communication skills corresponding to a child's intellectual development, or within three to six months of chronological age (O'Connor Webster, 2005).

Children could enter the EIC program any time before their third birthday. After three years of age a child is discharged from the EIC, and if necessary he/she could receive additional services within the public school system. This is because under the Individuals with Disabilities Education Act (IDEA), Congress deemed that infants and

toddlers found to be at risk for disabilities must receive treatment during the first three years of life (1997). Each clinic met for 4.5 hours per week, and the actual length of treatment depended on how long before a child's third birthday he/she began treatment, as well as progress made. In addition, individual speech and language therapy and/or occupational therapy were provided as necessary.

Class size ranged from 6-10 children, with a ratio of 2:1 children per therapist and assistant. CSLOT typically preferred a smaller class size, but during my time there in the summer of 2006 it was necessary to balance this desire with the demand for treatment. It is important to note that in any speech and language clinic the need to make decisions such as this arises from time to time, and clinicians make these choices with the children's best interests in mind.

The program curriculum focused on developing children as a whole, especially pertaining to speech and language development. Thus CSLOT's program was multi-faceted, including focus on physical development (eg. fine motor skills, auditory development, etc); pragmatic language and social language targets (eg. expressing needs and desires, making eye contact, etc.); auditory processing and auditory memory targets (eg. responding to one's name, pointing to pictures or objects that were just named, etc.); cognitive problem solving targets (eg. understanding simple cause and effect relationships, etc.); vocabulary and concept targets (eg. understanding objects and their function, understanding linguistic concepts such as time, etc.); grammar and syntax reception and expression (eg. possessives, locatives, etc.); functional communication (eg. alternative communication systems such as picture communication, gesturing, and sign language); oral motor (eg. blowing, sucking, etc.); articulation (eg. CVC words, CVCV

words, vowels, nasals, fricatives, etc.); psychosocial development (eg. building self-esteem, learning to share with others, etc.); self-help and feeding (eg. communicating needs such as hunger, self-feeding, communicating toileting needs, etc.).

The EIC class routine was designed with the aforementioned goals in mind. Each session began with opening circle/group time, followed by gross motor activities, fine motor activities, snack time, and a closing circle or “goodbye” time, with transitions in between activities.

During opening circle time, the children gathered together and faced the speech therapist and aides. Parents, family members and/or guardians were encouraged to participate in their child’s therapy, thus they could also be present during this period. In order to decrease likelihood of distraction, however, caregivers were seated behind the child.

All EIC activities were set up to be a natural environment, and upon first glance the clinic seemed to be a typical preschool classroom. There were toys in cabinets and on shelves, cubbies for children to store their belongings, and small chairs, among other things. The therapy procedures were implemented throughout each session in the context of regular classroom activities. This design created many opportunities for intentional communication, whether or not it was verbal. In addition, the clinicians followed the child’s attentional lead, continuously adjusting activities based on the individual child’s interests and needs. This model is known as Pre-linguistic Milieu Teaching (PMT), and according to evidence from research as well as empirical data it has several benefits, which will be further detailed throughout the program review (Warren, et al., 2006; Warren & Yoder, 1996).

Milieu is French for *environment*, and thus is an appropriate name for this method of teaching as it manipulates the environment to provide many opportunities for social interactions and the modeling of appropriate behavior. This environment is created to be as natural a setting as possible, such that skills can be generalized to real-life situations. Thus PMT is also referred to as a form of naturalistic language intervention. Studies have also shown that children respond better to interactions with caregivers than with therapists, therefore by creating a pattern of interaction that reflects this positive relationship children will be more responsive (Hepting & Goldstein, 1996; Dawson & Osterling, 1997).

As mentioned in the curriculum above, although speech and language development is the primary goal of intervention, the EIC also aimed to develop children as a whole, therefore oftentimes language was not the primary focus of the activities. In fact to watch the session unfold one might be completely unaware that the purpose of the activities was for speech and language development. For instance, the therapist began Circle Time with a greeting song, calling each child by name and directing the other children to name their classmates. This may seem unrelated to speech and language development, but in reality it focuses on auditory processing and memory targets by encouraging children to respond to their name, recall the names of others, and to listen to and follow directions. This is also beneficial as it is difficult for autistic children to focus on people (Prizant & Wetherby, 1989). In addition to this song of greeting, other songs also implemented the use of props and/or symbolic gestures⁶. For example, for the “Eensy Weensy Spider,” therapists and aides modeled hand gestures to symbolize the

spider climbing, rain, and the sun, among others. The children would also be given small spider toys to act out the song. While handing out the toys the therapist would ask, “Who wants a spider?” In order to receive a toy, the child would have to appropriately draw attention to him/herself either verbally or through gesture. It may seem obvious, but providing the desired consequence in response to a child’s expressive communication motivates language use. By associating a desired outcome with an attempt at communication, this reinforces the idea that communication is a necessary thing (Koegel & Johnson, 1989). When a child showed interest in the toy but did not attempt to communicate this desire, the therapist or aides would use the hand-over-hand method, which is a kind of prompt used to demonstrate appropriate behavior (Dawson & Osterling, 1997). The therapist would then direct the question to this particular child, asking, “Who wants a spider?” Then the therapist or aide would gently move the child’s hand to form the gesture for “me.” Some children were unable to contain their excitement, choosing to both gesture and shout “me!” at the same time.

The hand-over-hand method seemed very effective, although there were some anomalies. One child, Kevin, interpreted the hand-over-hand method in an interesting way. Instead of gesturing on his own, Kevin would take the aides’ or therapists’ hands, forming them into the appropriate gesture. Although he was corrected each time, he would only occasionally form the gesture on his own.

As the children made their spiders “crawl up the water spout,” they were also being encouraged to use imaginative play. This is an important step in development, but for autistic children this is a difficult concept to grasp (Dawson & Osterling, 1997).

⁶ For the purpose of this paper, I will use the terms *symbolic gestures* and *gestures* to mean any physical gesture that is used as a communicative tool, regardless of structure. In addition, *signing* and *sign language* will be used to refer to American Sign

In addition to singing, the therapist also read a picture book to the children. The book chosen related to the monthly theme, thus the same book was read for the duration of the month. It may seem that reading the same book all the time would become boring very quickly, however research shows otherwise. In reality, it is very beneficial to provide a predictable routine, especially for autistic children (Dawson & Osterling, 1997). This, as well as other methods used to accommodate the learning styles of the autistic, will be discussed in further detail later.

Reading to the children was beneficial to both language and social development. To encourage receptive and expressive vocabulary, the therapist asked individual children to point to certain pictures in the book. If the child appeared not to understand, hand-over-hand was used to gently direct the child's hand to the appropriate picture. If the child was verbal, he/she would also be encouraged to name the object in the picture. This activity, as well as Circle Time in general, also encouraged the important social behavior of sitting patiently for the task at hand (Dawson & Osterling, 1997).

Following Circle Time was Gross Motor Time. Children began by dancing and marching to their favorite songs, some of which included gesturing. Balls, swings, a see-saw, balance beams, and other toys were provided for the children such that they would develop physically, as well as develop a sense of symbolic and imaginative play. Such playtime situations also provided opportunities for the children to interact with one another verbally, as well as in socially appropriate manners. The specific benefits of these activities were discussed above.

The aides interacted with the children very much during Gross Motor Time. In addition to monitoring behavior and making sure no one got hurt, the aides and I would follow the children around as they roamed from activity to activity. I would try to see what interested the children, and played with them while talking about the activity.

Oftentimes during Gross Motor Time, Timmy, mentioned earlier, enjoyed looking out the window at cars. In addition to jargon, he would point at each vehicle and say, “Car!” I joined him, naming the different colors of cars, as well as pointing out the occasional motorcycle, truck, or fire engine. This technique is also a part of PMT, known as repeating and expanding. I repeated Timmy’s utterance about the cars, and then expanded upon it by elaborating details in full, grammatical sentences. Repeating and expanding follow the child’s interests, with the goal of encouraging receptive and expressive language. This technique has shown to improve the development of syntactic and semantic structures. However, the child was never required to respond to this language stimulation, as is recommended by PMT (Hepting & Goldstein, 1996; Warren & Yoder, 1996).

Also, if a child showed little interest in playing with the other children, I would try to interest him/her in an activity that the other children were taking part in. Rachel would often wander aimlessly around the play area, seemingly unaware of the people or activities around her. Eric was already playing with a ball, so I took Rachel over to play with him. However, she left and continued wandering. So in order to encourage her to interact with others, I sat down on the floor and placed her on my lap, while another aide sat down behind Eric. The aide helped Eric roll the ball to Rachel and me, and I used hand-over-hand to encourage her to roll it back. Rachel seemed to be enjoying herself,

but without encouragement she quickly lost interest in the game. For subsequent sessions she remained aloof and still needed much encouragement to interact with others.

Gross motor activities were followed by Fine Motor Time. The therapist prepared an art activity such as cutting, gluing, or drawing, or an activity that involved playing with items such as clay, sand, or water. In addition to developing fine motor skills, such activities also served to develop tactile skills. It is characteristic of some children with speech and language delay to experience apprehension around certain textures, so this is also beneficial (Ornitz, 1989). Again, there were many opportunities for verbal interaction with peers, therapists and aides.

The next activity was snack time, focusing on the important developmental step of self-feeding as well as incorporating methods to encourage expressive communication attempts from the children. Highly motivating stimuli, such as food, can be presented as what Koegel and Johnson refer to as a “communicative temptation” (1989). Just as children were offered spider toys in the example about the “Eensy Weensy Spider” song, a communicative temptation was provided to motivate communication. While the children were offered the toy during singing time, food was not specifically offered during snack time. Instead, the snacks were visibly placed in the environment. In order to obtain the snack, he/she had to communicate this desire either through verbal communication, gesture, or the use of picture icons. For those children who were nonverbal, icons representing the available snack items were presented to the child, such as juice or cereal. For example, if a child desired cereal, he/she had to present the

corresponding icon to the aide or therapist. If a child desired more of the same item, he/she could also use the gesture for “more.” If a child had difficulty understanding the concept of using icons, the hand-over-hand method was used. The aide or therapist would sit behind the child and gently directing his/her hand to grasp the icon, consequently presenting it to a therapist or an aide in the child’s visual field. In addition, only a small amount of food was given per request in order to encourage more frequent communication attempts.

Sometimes due to personal preferences or dietary needs, children would bring in their own snack. Since there were no specific icons for these outside foods, the caregiver would place the items in the visual field, but just out of reach, and wait for the child to request the item. One day at snack time I asked a boy, “Does James want crackers, or cookies?” However the therapist corrected me, instructing that the best way to phrase the question was, “What does James want?” It turns out that the way in which I had originally formed my question was prompting imitation, which followed James’ interest but actually gave him the word to imitate. While some programs use prompting imitation, the procedure used in the CSLOT EIC was that of using “mands.” Mands are questions phrased in a way that will compel the child to respond in more complex ways. By being more open-ended in my statement this would allow the child to attempt more and varied language use (Hepting & Goldstein, 1996).

Snack time also served to observe the children’s oral motor ability, as skills such as lateralization of food across the midline, lip rounding, proper lip closure, jaw stability, protrusion of the tongue and tongue retraction indicate both development in feeding skills, oral motor, and articulation (Fiocca, 20007).

During the final activity, Closing Circle Time, children once again sang, utilizing gestures as well as encouraging verbal attempts. The song followed the same melody as the “Hello” song, naming each child, but “hello” was simply changed to “goodbye.” At this point in the session they would usually be very anxious as they knew that it was time to see their loved ones again.

In order to transition from one activity to the next, teachers would assist the children by walking through it with them. For some activities, such as the end of gross motor play, the “Clean-Up” song was used as an auditory cue to signal the end of the activity.

When new children joined the group, some of them were particularly mischievous. After a few sessions it became apparent that with the addition of these children the group dynamics had shifted, and that their behavior encouraged the other children to misbehave as well. As a result of this the children ignored the “Clean-Up” song. So the therapists decided to add shutting off the lights to the repertoire of such cues. The children were startled and fascinated by this change, and it caught their attention long enough so that the therapists and aides could successfully transition to the next activity.

Transitions between activities are of particular concern for children with ASD, as such children are apt to become confused and distressed when activities are presented in an unpredictable manner. It is theorized that this is caused by an inability to concretize abstractions, such as time (Prizant & Wetherby, 1989). Conversely, children with ASD are more socially responsive and attentive when they are able to predict what will occur next (Dawson & Osterling, 1997). During this particular EIC’s treatment, the use of icon

charts to assist with activity transition was initiated. The icon charts featured each child's photo, along with visual representations of the day's activities. For example, circle time was represented with an icon featuring a book. Before each activity began, the children would go to his/her respective chart and take note of the upcoming activity. When one activity was through, the children would remove the icon and take note of the next activity. The use of an icon chart is potentially advantageous with autistic children since a relative strength of this disability is that of visual-spatial ability. As mentioned above, autistic people have difficulty with abstractions, including speech and transient visuals. However, visuals that are constantly displayed are easily understood (Charlop-Christy & Jones, 2006). Since receptive verbal communication is weak and visual-spatial ability is normal to advanced, the use of visuals are used to improve communication (Prizant & Schuler, 1987). In addition, it is difficult for autistic children to make eye-contact, as one usually does when communicating verbally, further complicating language development. But when using icons, it is not necessary to establish eye-contact, thus making it easier for the autistic child to communicate.

As children are continually entering and exiting the program, for some children this occurred at the beginning of treatment, while for others it occurred more towards the middle or end. It appeared to be helpful for some of the newer children; however as implementing the use of an icon chart was actually a break from the normal routine of most of the children and thus unanticipated, instead of assisting with transitions it only created confusion and opposition. Furthermore, the chart often fascinated the children to the point of distraction. While it appeared to the therapists that the icon chart was not necessary for transition, the program director insisted on its continued use. She felt that in

time the children would grow accustomed to this as a part of the normal routine, and that as new children entered the program it would not be a hindrance, but prove useful. Her decision was also based upon the previous success of the icon chart in other programs (Prizant, et al., 2006). In addition, other programs have experienced success with the use of visual daily schedules (Dawson & Osterling, 1997).

As for parent support, during this time the CSLOT EIC provided monthly training nights. The training nights were based on the philosophy that children will make further progress if the parents also understand how to facilitate language development. The program director admitted that there is room for improvement in this area, and since I have left the clinic new changes have been implemented to improve parent resources.

THE EARLY INTERVENTION CLINIC: DATA

Above I presented rationale for the program structure of the EIC. Now I will present statistical data from the BDI and CDI to show the progress of 26 children through the program. As described earlier, the BDI assess children's total development, considering personal-social development, fine motor and gross motor abilities, adaptive development, communicative development, and cognitive development. The CDI is more focused on language development, measuring the progress made in receptive and expressive language skills. The 26 children in this study entered and exited the program between January, 2004 and March, 2007, therefore I am personally acquainted with a small number of them. However, I chose to also include those children I did not observe in order to increase the amount of data available for analysis. In addition, the children represented here include those with speech and language delay, autism, regulatory

disorder, and Fragile X Syndrome. Children with regulatory disorder exhibit abnormal reactions to sensory input, such as under- or overreaction to sound input (Zeanah, 2000). Fragile X syndrome causes mental retardation, as well as autism (Clapp & Tranfaglia, 2007). In addition to being treated in the EIC, some children also received individual speech therapy and/or occupational therapy. The children came from monolingual or bilingual homes in which English may or may not have been the primary language. Other languages included Vietnamese, Spanish, Urdu, Tagalog, Amharic, Tigrigna, Hindi, Telegu, Punjabi, and Oriya.

The children included in this study began treatment anywhere from 18 to 32 months of age, with the average age at entry being 26.8 months. The average age at discharge was 34.3 months. Children were treated an average of 7.9 months.

In terms of development in expressive and receptive language, the CDI measurements here indicate that there were overall gains (Figures 1 and 2). The BDI data show that the children made overall gains within these domains as well (Figures 3-8). Of course, some children made more gains than others, and there were some outliers. Unfortunately there was no untreated control group with which this data can be compared, so it was not possible to determine to what extent these gains were significant. Therefore further research is required to support the significance of these claims. However in creating a control group, the question of ethics arises as it may be considered unethical not to give treatment to those in need.

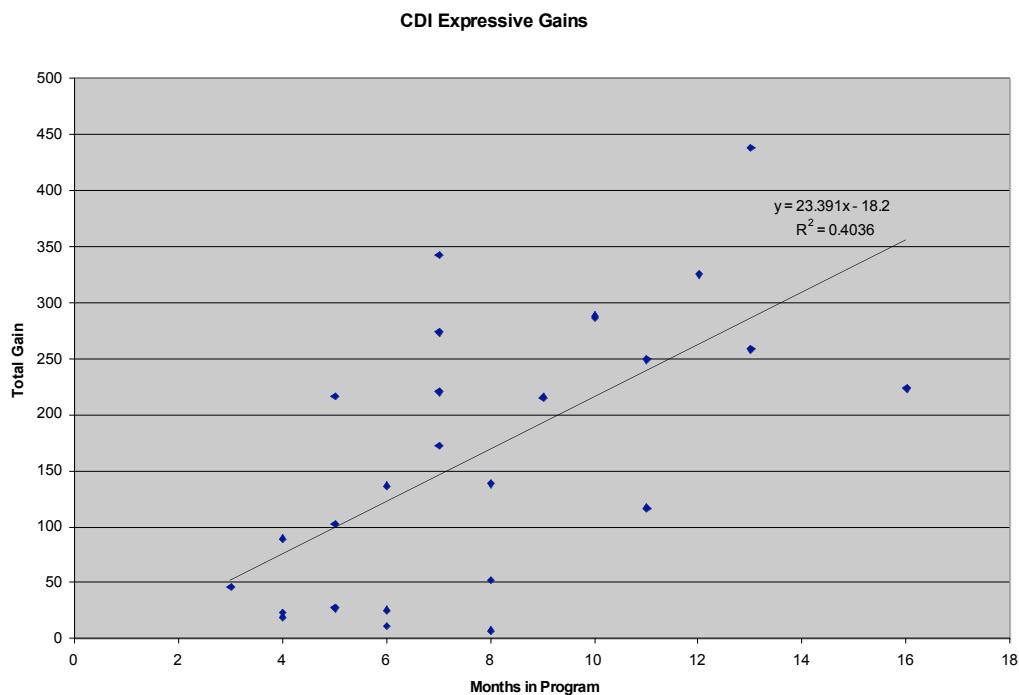


Figure 1. Progress made in the domain of expressive vocabulary over time as measured by the MacArthur Communicative Developmental Inventory (n=26).

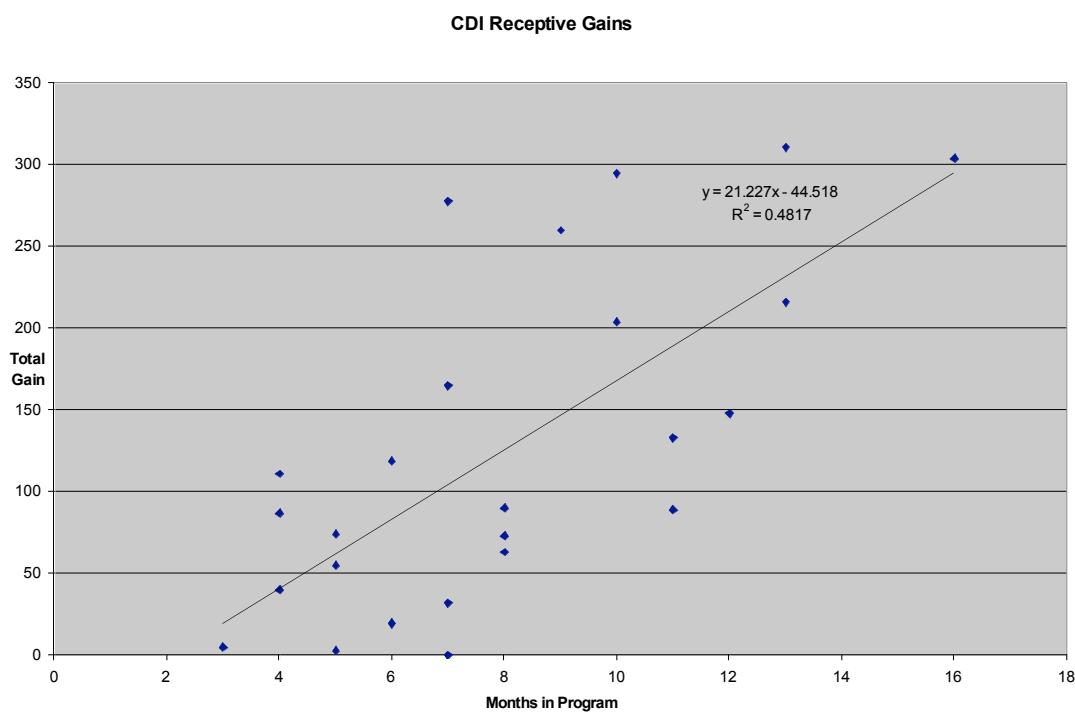


Figure 2. Progress made in the domain of receptive vocabulary over time as measured by the MacArthur Communicative Developmental Inventory (n=26).

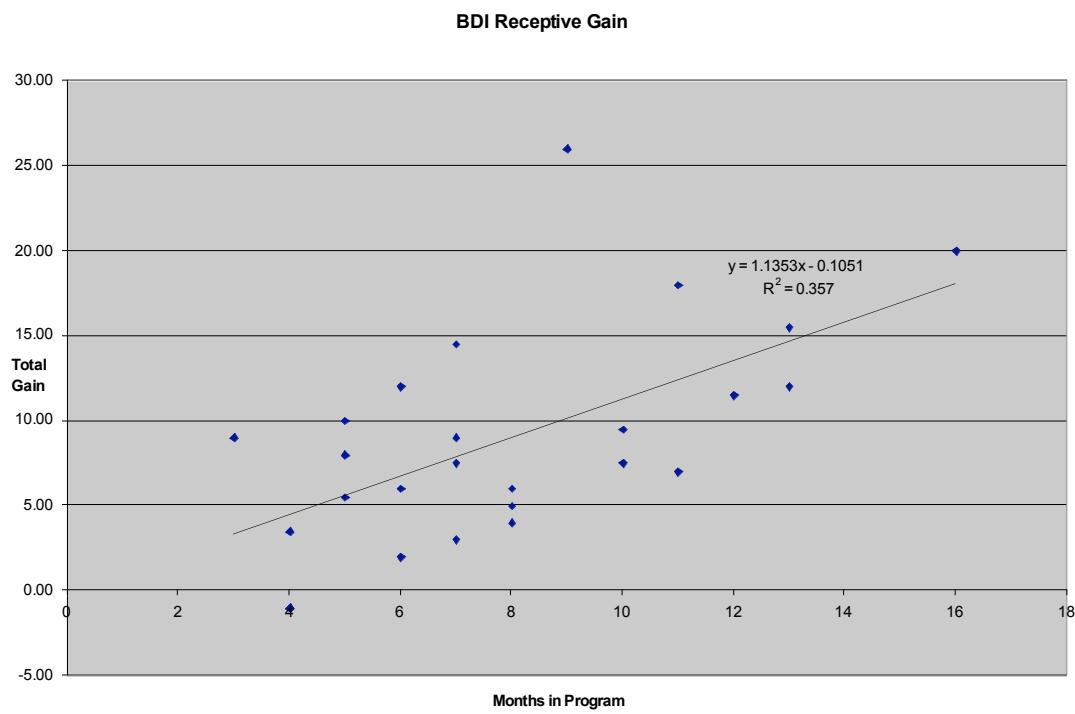


Figure 3. Progress made in the domain of receptive communication over time as measured by the Batelle Developmental Inventory (n=26).

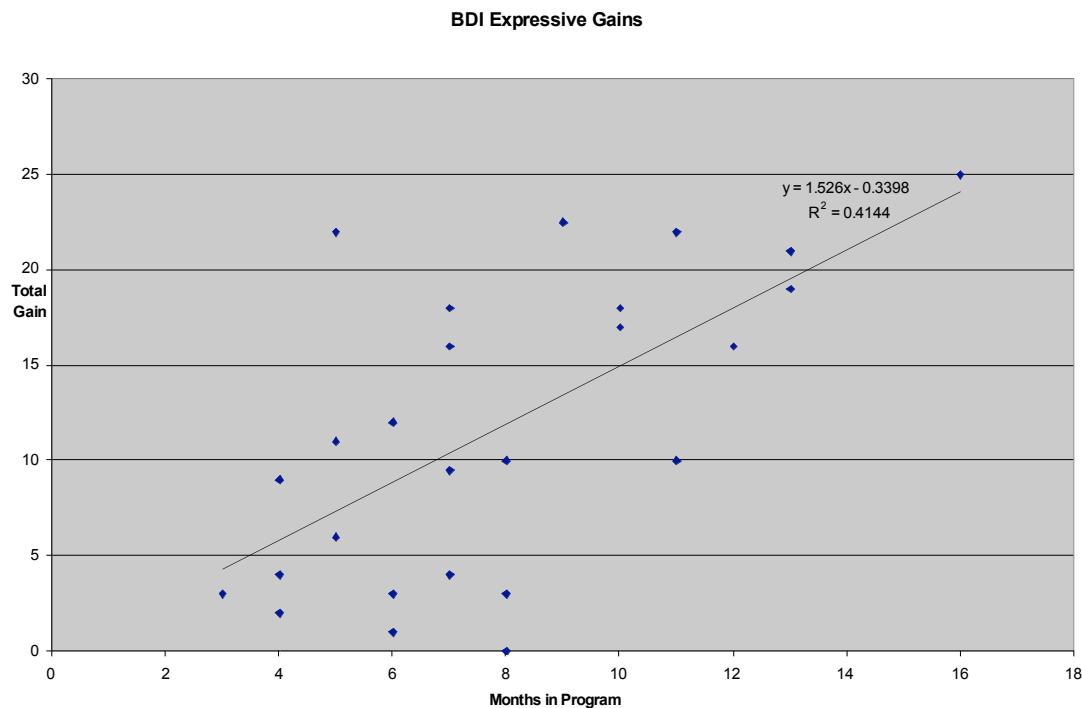


Figure 4. Progress made in the domain of expressive communication over time as measured by the Batelle Developmental Inventory (n=26).

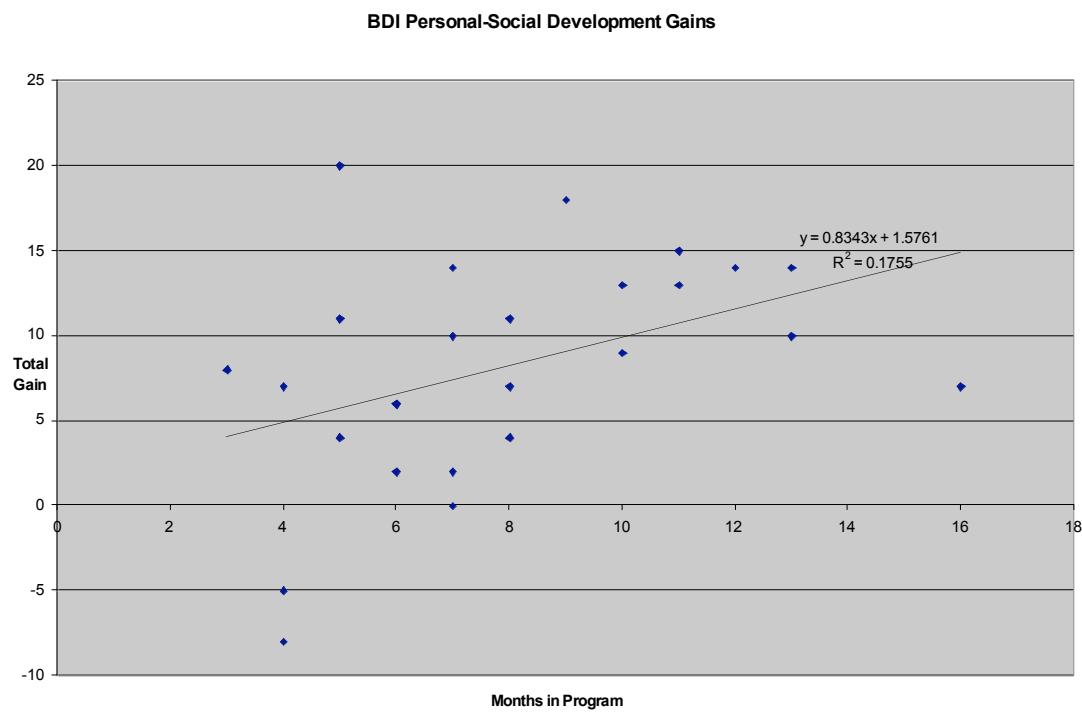


Figure 4. Progress made in the domain of personal-social development over time as measured by the Batelle Developmental Inventory (n=26).

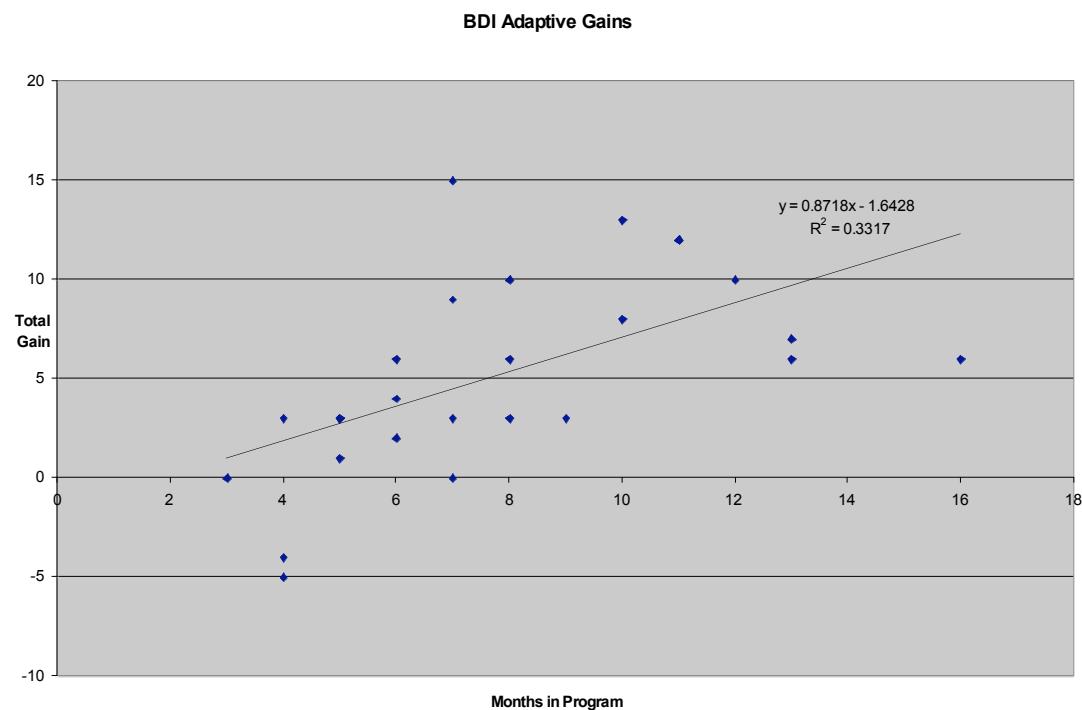


Figure 5. Progress made in the domain of adaptive skills over time as measured by the Batelle Developmental Inventory (n=24).

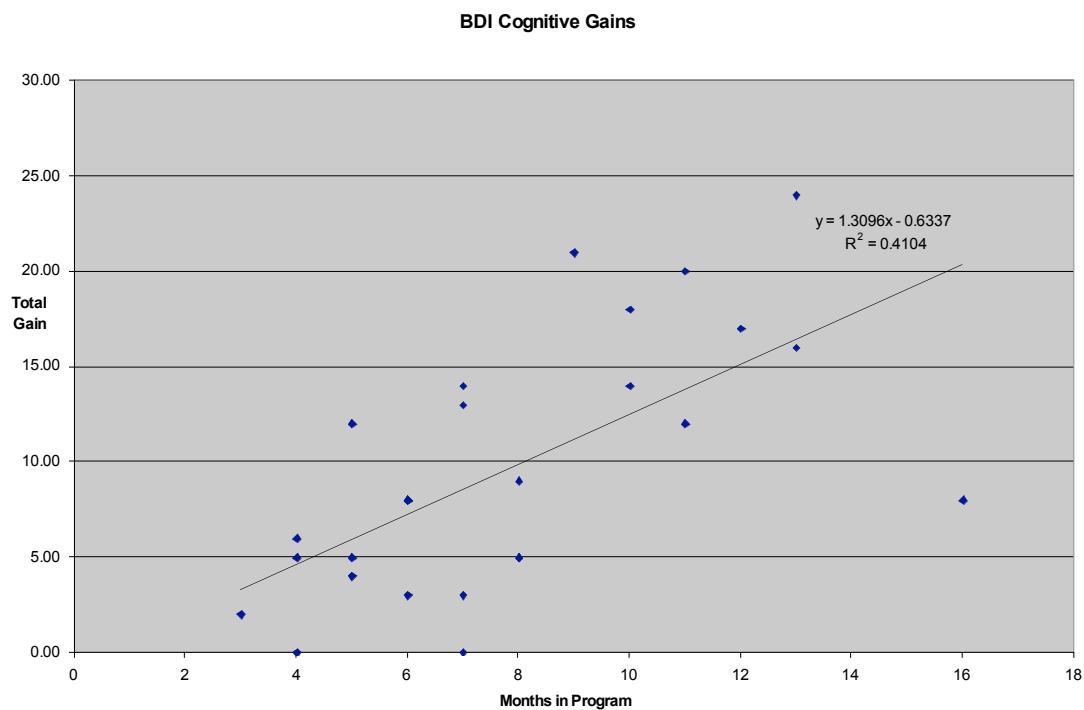


Figure 6. Progress made in the domain of receptive communication over time as measured by the Batelle Developmental Inventory (n=25).

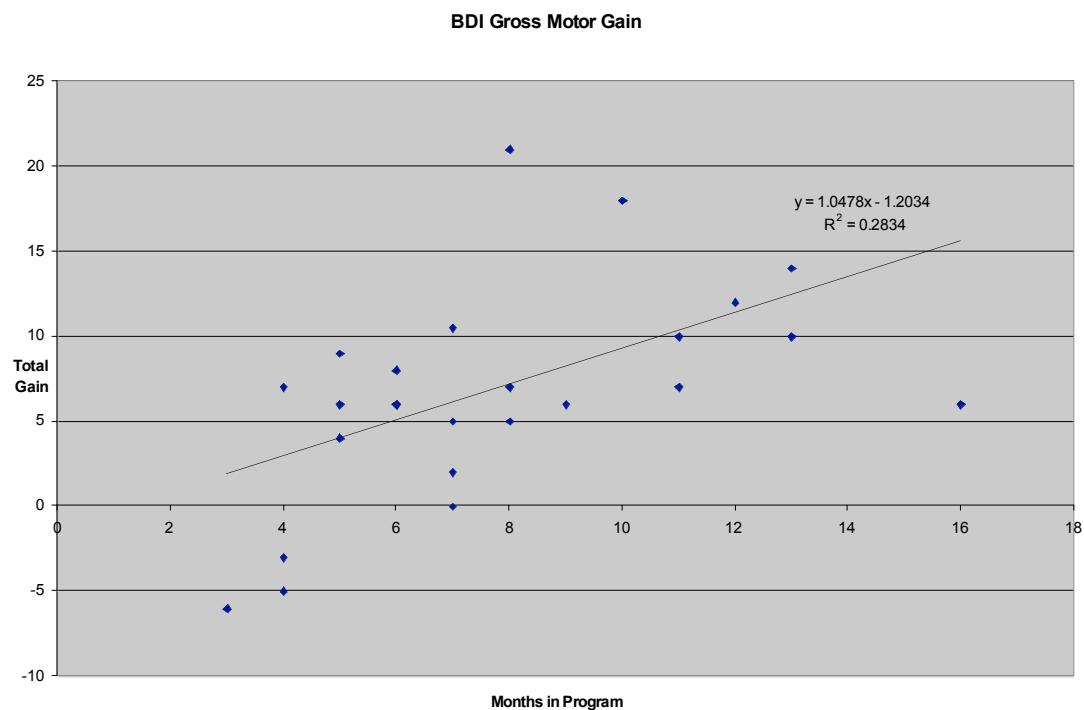


Figure 7. Progress made in the domain of gross motor skills over time as measured by the Batelle Developmental Inventory (n=25).

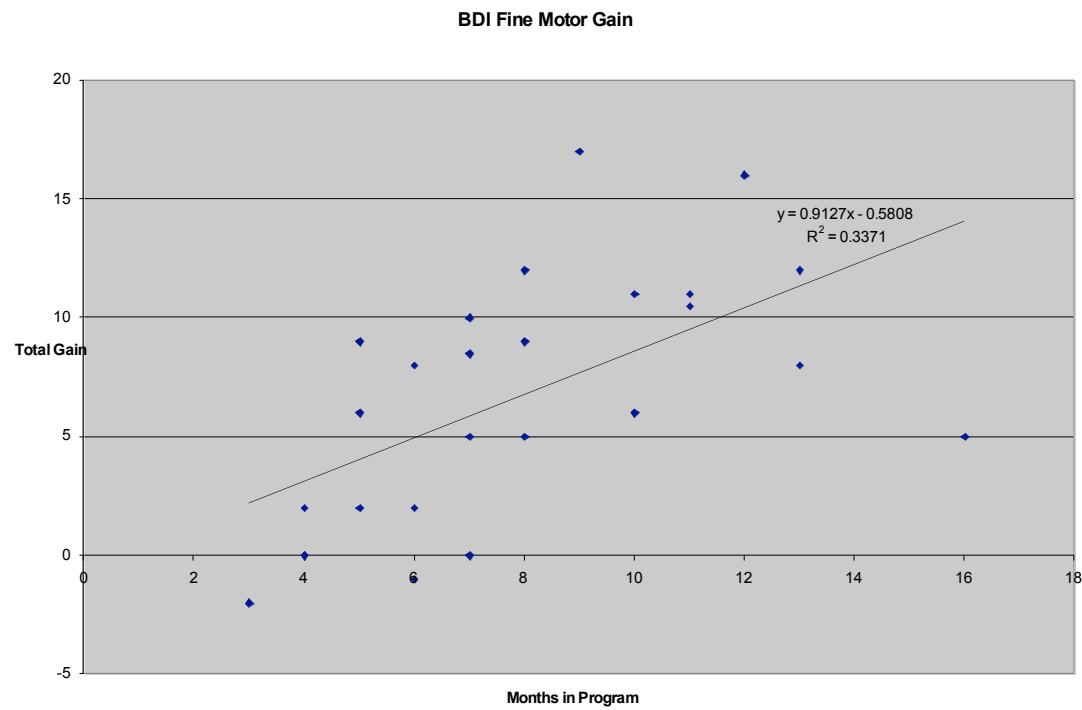


Figure 8. Progress made in the domain of fine motor skills over time as measured by the Batelle Developmental Inventory (n=24).

OTHER EARLY INTERVENTION PROGRAMS

As mentioned earlier, there are many early language intervention programs available. Below I will outline details from several different studies of early intervention programs, outlining the curricula, philosophies, ratio, age range of children, treatment period, diagnosis, and parent participation. I realize that the information here is not as detailed as the CSLOT EIC program overview, however I am drawing the information from the original papers as these are the best sources of information available. It is also

necessary to point out that it is difficult to directly compare the effectiveness of these programs, one reason being the differences in measuring progress.

The first study compared the effectiveness of intervention in a group environment against intervention in an individual setting. Similar to CSLOT, the programs focused on lexical acquisition (Wilcox, et al., 1991). The second study focused on early intervention for children with ASD, for whom speech and language delays are prevalent (Dawson & Osterling, 1997). Although the focus of the program was not language intervention per se, I chose to include this as there are many similarities between the programs in this study and the CSLOT EIC.

In a study by Wilcox, Kouri and Caswell (1997), early intervention programs in a group setting and in an individual setting were compared for effectiveness. The 20 children, aged 20-47 months, who participated in this study, were determined to have speech and language delay based on scores from the Sequenced Inventory of Communication Development⁷ and the Batelle Developmental Inventory (BDI). As mentioned earlier, the BDI was also used at CSLOT. Of these 20 children, 3 had Chronic Otitis Media, which is an inflammation of the middle ear that results in hearing impairment (Mogford-Bevan, 1993). Therapy was administered twice a week for 24 weeks, with individual therapy sessions lasting 45 minutes and group therapy sessions lasting three hours. However, due to absences the actual treatment period varied from 12-16 weeks per child. There was no mention of parent involvement or support.

⁷ For further reading see Hendrick, D., E. Prather and A. Tobin. 1984. Sequenced inventory of communication development. Seattle: University of Washington Press.

As both programs focused on lexical acquisition, the program goal was for each child to demonstrate appropriate use of at least ten core words, referred to as “target words.” After assessing the children’s linguistic level based on sampling sessions, each child’s phonetic inventory was determined. Thus the ten target words were chosen based on the phonemic inventory of each individual, particularly focusing on vocabulary common to toddlers such as toys, animals, and food. No verbs were included as “they are less readily acquired during initial lexical acquisition than object words.” For example, Jeff’s phonemic inventory included [b, h, t, d] and his core words were “sand,” “box,” “boat,” “bus,” “hat,” “water,” “towel,” “dog,” “ball,” and “bunny.” For children in the group setting, the researchers made the core words overlap when possible. Take Amy’s phonetic inventory for example, which included /s, /ʃ, b, t, h/. Her core words were “sand,” “box,” “shovel,” “ball,” “hat,” “baby,” “towel,” “bubble,” “bunny,” and “horse,” of which five were the same as Jeff’s. As children progressed through the program and demonstrated mastery of the target words, new core words were added to increase their vocabulary. Although the authors of this study presented their rationale for choosing these target words, I found many of their choices included phonemes not in the child’s inventory, or phonemes that are particularly difficult for one with such an inventory to pronounce.

For all therapy sessions, the classroom was designed to resemble a playroom. This was done in order to create a more natural environment, thus encouraging more natural interactions. For the group therapy session only, the program structure followed what the authors described as a “typical preschool classroom,” including free-play, Circle Time, Gross Motor Time, Snack Time, Toilet Training, Storytime, Art, Music, and Closing

Circle Time. The authors do not further describe these activities. The ratio was not reported, although it was stated that “an early childhood special educator and a speech-language pathologist” provided instruction. Although ten of the 20 children in the study were assigned to the group therapy sessions, these children were not in the same classroom. Children were placed in to different classrooms based on chronological age, with up to four of the children in a single classroom of 12-14 children total. The other children in the classroom included typically developing peers and children with moderate to severe disabilities, although these disabilities are not defined. This is known as an “integrated classroom.” A major advantage of including typically developing peers is that those children who are delayed may benefit from the examples set forth by their peers (Dawson & Osterling, 1997). In fact, CSLOT holds an integrated early intervention clinic at its Los Altos, California location.

Also like CSLOT, the program administered speech and language therapy within the context of other activities, modeling each child’s core words at least ten times each. The sessions were designed to include activities that would especially elicit the target words. Referring to Jeff and Amy’s target words above, these were put in the context of “A day at the beach.” The clinician presented a box to the children, and gave them sand, water, and toy dogs to put inside, thus modeling “box,” “sand,” “water,” and “dog.” In order to model the words, the clinician would begin by attempting to interest the children in the present activity. The clinician would use complete sentences to introduce the objects, but most of the time would model the words “in the form of reduced input,” such as by omitting parts of speech. For example, to model “box” the clinician said, “Who will help me get the surprise box?” Once the children focused their attention on the box, she

said, “Box. Box.” Once a child spontaneously imitated the model, the clinician would expand the utterance, such as by saying “Here box...Who wants to open box?...Open box.” If a child referred to an object incorrectly, the clinician would correct him/her, although not with a corrective tone.

Just like the group therapy sessions, speech and language therapy was administered throughout the activities. Instead of a structured day, the individual therapy sessions involved “free-play” activities. Objects meant to encourage production of the target words, such as toys and books, were placed around the classroom. The child was allowed to choose from among these activities, and could select a different activity as he/she pleased. The ratio for these sessions was 1:1, with the clinician following the child’s lead, engaging in play to model the core words. The same procedure for modeling was followed in the individual setting as in the group setting.

This study measured progress based on the overall productive use of target words per session (Table 1) as well as by the total number of target words that each child was able to progress to (Table 2). Table 1 shows the means, standard deviations, and ranges of productive use of target words for each treatment condition. The researchers also observed the children’s language behavior at home to serve as a control, and the average of these measures was included to gain a more accurate picture of the children’s abilities. Table 2 details the number of target words that each child was able to progress to in each session, as well as how many models were given on average before a child demonstrated productive use of the target word. Based on these measurements, Wilcox et al. found that the children in the group condition exhibited a greater productive use of target words than did the children in the individual condition. The researchers also noticed a disparity in

word use in the clinic and at home, with expressive language being less common at home ($M=3.90$) than in the clinic treatment ($M=2.75$). However, this difference was greater for children in the group treatment.

Setting			
Treatment Condition	Treatment	Home	Treatment and Home
Group			
Mean	3.00	5.00	5.70
SD	2.40	3.12	3.68
Range	0-7	0-10	0-11
Individual			
Mean	2.50	2.80	3.60
SD	2.32	1.93	2.59
Range	0-6	0-5	0-7

Table 1. Means, standard Deviations, and ranges of the overall productive use of target words per session for each treatment condition. There were a total of 24 intervention sessions, and n=10 for each condition.

Treatment Condition	Average Number of Words	Average Number of Models
Group		
Mean	12.6	270.88
SD	2.11	45.99
Range	10-17	203-360
Individual		
Mean	11.5	291.26
SD	1.84	122.72
Range	10-16	71-436

Table 2. Means, standard deviations, and ranges of the average number of target words that children in each condition were able to progress to per session, as well as the average number of models demonstrated. There were a total of 24 intervention sessions, and n=10 for each condition.

Based on the data in this study, it has been shown that early language intervention was effective. However, the children in the classroom condition made more progress than the children in the individual condition. In addition, the children in the individual condition required more modeling in order to progress. The researchers considered

several reasons for these differences. Although the attempt was made to create a natural environment, they hypothesized that the free-play setting of the individual treatment may not fit this criterion. They also considered the effect of the difference in session length for each condition. Group treatment was three hours at a time, whereas individual treatment was 45 minutes. Perhaps the most salient hypotheses were those related to the differences in program structure. Children in the group condition benefited from a variety of activities in which they could use the target words in context, as well as examples set by the diverse conversational partners. The authors also cite evidence from other research that a structured routine facilitates language growth (Snow, et al., 1987).

In addition to the overall differences between the two treatment conditions, the authors also noted that there was individual variation in progress made by the children. This demonstrates that although all of the children made progress to some degree, the program was more effective for certain children. The authors found that in general, lower functioning children derived more benefit from the structure of the group condition, whereas higher functioning children tended to benefit more from the individual condition.

As autism is a disorder that causes difficulties not only with speech and language but also with social interactions, it is also common to find early intervention programs designed for autistic children that also reflect characteristics of early language intervention programs. This is particularly true in the case of CSLOT's EIC program, as it focuses on complete child development in addition to speech and language. In a 1997 study by Dawson and Osterling, they analyzed eight early intervention programs

designed for autistic children, evaluating the programs' effectiveness in relation to the philosophy of intervention as well as to children's developmental levels.

These programs feature similarities as well as differences. The ages of the children ranged from 30-66 months, with an average age of 42-48 months. Classroom ratios varied, and some classrooms included normally developing children. Some programs treated only those children diagnosed with autism, which is a subtype of Pervasive Developmental Disorder (PDD). In addition to treating those with ASD, other programs also treated children diagnosed with other forms of PDD, but did not indicate the specific diagnoses. Treatment times varied, with children receiving anywhere from 15-40 hours of intervention per week. Unfortunately, none of the programs save one reported total duration of treatment. Each program assessed development in different manners, including standardized assessments and/or observational data. All programs assessed symptoms of autism, verbal ability level, and adaptive behaviors, and some programs decided to assess other areas in addition to these, such as developmental domains. All programs also assessed IQ, but the actual tests varied. Most used the Stanford-Binet IQ test, while others used the Merrill-Palmer or McCarthy IQ scales. Dawson and Osterling also noted that due to the variation in the IQ tests themselves, there may be discrepancy in the reported IQ scores. This is particularly true since children with autism tend to perform better on nonverbal tasks, thus IQ tests that focused on such questions may have resulted in an unnaturally high score. As far as data beyond the realm of IQ scores, different programs chose to focus on different areas. As is noted in the program overviews below, some programs focused on change in IQ, integration into classrooms with typically developing peers, or both. Although not noted in the

program overview, some programs also measured progress based on standardized test scores or developmental gains observed in the classroom. Therefore while all programs may exhibit different signs of success, it is difficult to directly compare these outcomes based on this diverse set of data.

The first program reviewed in Dawson and Osterling's study was the Douglass Developmental Disabilities Center (DDDC) located at Rutgers University in New Brunswick, New Jersey. In this study, the DDDC provided therapy for 36 autistic children, between the ages of 30 and 62 months. Children received therapy 25 hours per week, including classroom and in-home instruction. There were also bimonthly home visits by clinic staff, but this is not reflected in the total amount of therapy given per week.

The program consisted of three stages, which were sequenced based on developmental level. The first stage was intensive discrete trial training with a 1:1 child-teacher ratio. Instruction is provided both in the classroom and at home. Once the child was deemed ready to progress, he/she was moved to a classroom with a 2:1 child-teacher ratio. This stage of treatment was described as preparing children to function satisfactorily in the third stage of treatment, which is an integrated classroom. Integrated classrooms included those children diagnosed with autism, as well as typically developing peers. In the integrated classroom the ratio of children with autism to typically developing children was 6:8. DDDC provided resources for family and caregiver support, such as support groups.

This program, and other programs in this study, quantitatively measured developmental gains based on IQ scores. The children enrolled in this program had a

range in IQ from 36-105 points, with a mean of 61. There was found to be an average gain of 19 IQ points after 1 year of treatment.

The next program investigated in this study was the Health Sciences Center (HSC) program at the University of Colorado. HSC provided treatment for 49 children with a mean age of 46 months (age range is not reported). The children in the program were diagnosed with autism or pervasive developmental disorder (PDD). Children received treatment for 22.5 hours per week, in a classroom with a ratio of 3:6. HSC's curriculum focuses on social-emotional, communicative, and cognitive development, and aims to achieve these goals by interacting with the children through play. Some children also receive occupational therapy and/or psychotherapy. As for caregiver support, support groups and consultations with psychologists or psychiatrists were offered.

Upon enrollment, the children were found to have an average IQ of 70 points, with no range reported. IQ change after treatment was not stated, however there were reported increases in language, cognitive, social, and motor skills, as well as increased rate of development.

The Learning Experiences-An Alternative Program for Preschoolers and Parents (LEAP) was the third early intervention program reviewed. 48 children with autism or PDD from ages 30-64 months were treated for 15 hours a week. The setting was an integrated classroom, with a ratio of 3:6:10, that is, staff per children with autism per typically developing children. In this curriculum the primary goal was for the children to function in a typical classroom setting. Thus the children participated in typical preschool

activities, such as play areas with different themed activities, with these activities being adapted for the autistic children only when deemed necessary. These activities were child-directed, meaning that the child was allowed to decide what activity to partake in at any time. In addition to using peers as models, children were also prompted (eg. “Does Jon want crackers? Say ‘crackers.’”), with fading eventually being implemented. That is, prompts were gradually less relied upon as the children demonstrated increased knowledge. Also, desired behaviors were reinforced. As to how reinforcement was provided, this is not elaborated upon.

Parent participation in the LEAP curriculum was very involved. Caregivers were advised on techniques for managing their child’s behavior, as well as for teaching new skills at home. In addition, family service coordinators worked with the caregivers to assist with instruction in the home environment, as this was considered a more natural context. Support groups were also available.

Children entering LEAP demonstrated a range of IQ levels, from 6-119 points, with a mean of 61 points. Developmental gains were not reported on, however approximately 50% of the 48 children began to attend school with their typically developing peers.

The May Institute treated children with autism and PDD. The 42 children received intervention for 30 hours each week. Just as the DDDC program structure, the May Institute’s program was also developmentally sequenced. The May Institute has clinics located in various states, but the location of this particular clinic was not explicit.

The first stage of the May Institute Program was intensive in-home training in which the therapist and caregivers instructed the child in the areas of language, self-help, play, and appropriate behavior. Children shifted to the next stage of treatment after 6 months in stage 1, or concurrently. The second stage of treatment took place in the classroom, with two possible settings. One classroom, called the “Step 1” classroom, focused on skills such as following directions, working in groups, and imitation. The structure in the “Step 1” classroom was teacher-directed in small groups, although the ratio was not explicitly defined. Most children remain in this classroom for approximately 1 year, after which they could proceed to the integrated classroom. The main goal of the integrated classroom was for the children to become comfortable in a typical classroom. The ratio of this classroom was 3:6:7. Support groups and educational discussion sessions were provided to the caregivers, and a service coordinator visited the child’s home each month to discuss developmental progress.

The IQ range for the children upon entering the program was 37-71 points, with a mean of 49 points. No quantitative data was given in relation to progress, but it was noted that almost 14 children were able to enter normal classrooms.

The Princeton Child Development Institute (PCDI) at Princeton University treated 32 autistic children, ages 30-58 months. Children received 27.5 hours of treatment per week, and the teaching ratio was 1:5. In this curriculum individual behavior programs were designed based on applied behavior analysis and behavior intervention approaches. Some behaviors focused on included following directions, toileting, and motor and verbal imitation. Throughout the day, children moved among different activity centers and

classrooms. To assist with transition from one activity to the next, icon charts were employed. The icon charts were also used to make choices among a number of available options. As children made progress, their individual behavior programs were accordingly revised to include new goals. Instructors visited the child's home twice a month to assist the caregivers in using classroom techniques in the child's natural environment. This helps the child by encouraging generalization of skills, that such behavior is not limited to the classroom environment. In addition, meetings for caregivers were held monthly.

At the onset of the program, the children exhibited IQ's in the range of 36-83 points, with a mean of 57 points. Children who were nonverbal and received intervention by the age of 3 years showed an average gain of 22-24 IQ points by the time they turned 7 years old. In addition, 12 children were able to move on to traditional public school.

The sixth program in this study was the Treatment and Education of Autistic and Communication-Handicapped Children (TEACCH), located at the University of North Carolina at Chapel Hill. The number of treatment hours per week varied, as did the teacher to child ratio. TEACCH focused on creating an environment that promoted skill acquisition and independence. The teaching environment was highly structured, and individual attention was often given. Just as in the LEAP program, fading was used to gain greater independence and generalization. Similar to the icon charts used at PCDI and CSLOT, visual cues were used to signal the beginning and end of activities. There was no strong indication of parent involvement in this program.

Upon entering the program, the children exhibited IQ's from 36-83 points, with a mean of 57 points. Children who received intervention by the age of 4 years were found to gain an average of 15-19 IQ points by the age of 9 years.

The Walden Preschool at the Emory University School of Medicine treated 27 autistic children, ages 30-66 months. The ratio was 1:3. Walden's curriculum was much like that of CSLOT's EIC, focusing on both language and social development, and employing an incidental teaching method to reach these goals. In addition, the classroom was integrated. The classroom contained several activity stations which the children were allowed to move among freely. Each activity station was designed to meet a specific learning goal; however, these goals were not expounded upon. Teachers assisted with transitioning from station to station.

Caregivers were allowed to choose at which level they wish to be involved in the clinic. For example, home visits were offered, as well as regular meetings with teachers.

At intake the children at the Walden Preschool exhibited a range in IQ from 29-91 points, with a mean of 57 points. Upon discharge, empirical data showed that language use increased three-fold. Also, 12 children were able to enter school along with their typically developing peers.

The eighth and final program reviewed in this study was the Young Autism Program (YAP) at the University of California, Los Angeles treated 19 autistic children with a mean age of 32 months. The ratio was 1:1, and children received intervention for 3 years, 40 hours per week. YAP's curriculum was based on principles of applied behavior

analysis, which focuses on modifying the environment in order to improve behavior as well as social skills and language development. YAP also employed B.F. Skinner's discrete trial training strategies.⁹ The first year of the program involved individual discrete trial training, and focused on improving behavior, as well as encouraging imitation. In order to increase treatment hours, parents were also instructed on how to properly use this method (this is not included in the 40 hour count). In the second year of the program, children were placed in preschool programs in order to become more accustomed to interacting with peers in appropriate manners. Both expressive and abstract language (e.g. discussing the concept of colors or the passage of time) was also focused on. The final year of therapy emphasized observational learning and the appropriate expression of emotion. There was no mention of caregiver involvement in this program.

Upon entering the program, children exhibited IQ's in the range of 30-82 points, with a mean of 53 points. Children were reported to have gained an average of 20 IQ points before entering the first grade (exact age not given), with nine of the children being able to enter the first grade with their typically developing peers.

From their research, Dawson and Osterling made several interesting observations. Based on the body of data in this study similar gains were made across all programs, thus early intervention appeared to be successful regardless of program philosophies or intervention methods. This statement is based on the fact that children made significant developmental gains and/or were successfully integrated into a classroom with normally

⁹ For further reading please see Cooper, J.O., T.E. Heron and W.L. Heward. 1987. Applied Behavior Analysis. Columbus, OH: Merrill Publishing Co.

developing peers. However it is still not clear whether the progress observed was more so related to the developmental levels of the children. Furthermore, only the Young Autism Program had a control group of autistic children who did not receive early intervention, so overall it is difficult to determine the degree to which early intervention played a role in development. Once again, although the programs reviewed in this study were early autism intervention programs, they shared many features with the CSLOT EIC program as speech and language pose great difficulty to the autistic child.

The authors also found that while the philosophies of these eight programs differ, they share common elements. They hypothesized that this is because clinicians shared similar experiences working with autistic children; therefore they also shared basic beliefs pertaining to treatment. Dawson and Osterling also found little evidence to support one program's philosophy and methods over another. For example, while the number of treatment hours per week varied from 15 to 40 hours, there appeared to be no significant developmental differences among children based on this variable. However, the fact that many caregivers were given instruction on techniques to use at home should also be considered in this interpretation. This makes the total number of treatment hours difficult to quantify, and perhaps calls for debate on what qualifies as actual treatment time; should intervention be considered any intentional therapy, or limited to therapy of a professional nature? Even though caregivers were instructed in certain techniques, they clearly lack the experience of the clinician and consequently may make mistakes. Therefore based on such factors present in this study, no conclusive statement can be made as to optimum treatment time.

Below I will briefly outline those common elements of these eight programs that most highly reflect early language intervention methods.

One common element of all of the early intervention programs was to encourage children to attend to elements of the environment, such as paying attention to people or the task at hand. As mentioned earlier, those with autism not only have difficulty interpreting emotions and other social stimuli, but they also tend to ignore these elements. By ignoring such beneficial interactions, speech and language acquisition suffers. Therefore the first step toward overcoming this barrier is for the child to attend to the environment and pay attention to what is going on around them. After this is accomplished, clinicians can further hone social skills by encouraging children to imitate others. The programs also agreed that since autistic children show little interest in socializing or verbal communication, different methods of communication should be provided, such as the use of icons or gestures. Clinicians also concur that motivational techniques are a must, however the actual techniques varied among the programs. Unfortunately, the study does not go into detail about these methods.

Mentioned earlier, autistic children have difficulty interpreting abstract concepts, and thus have difficulty with imaginary and symbolic play. Children may also exhibit stereotypic patterns of play, and do not enjoy playing with others. Therefore clinicians agree that it is necessary to encourage the ability to play appropriately with toys, as well as to play with others.

I recall one particular EIC session with Sammy (mentioned earlier) in which the children were playing with blocks. Sammy had an affinity for certain shapes and colors of blocks, and thus collected as many as he could to make his building. This also meant

that he took blocks that other children were using, but he seemed unaware of this fact. Unfortunately this greatly upset one of the other children, Daniel. The first time Sammy took some of Daniel's blocks, Daniel destroyed Sammy's building. However, Sammy appeared not to notice Daniel's aggression, nor did he seem to mind that his building was toppled over. Instead, he concentrated on the blocks and built the structure in the exact manner as before. Despite our efforts to keep them separated, this happened a few times; as long as Daniel had the blocks that Sammy desired, Sammy wouldn't give up, and as long as Sammy had the blocks that were taken from Daniel, Daniel wouldn't give up. Finally, Daniel became physically aggressive with Sammy. We stopped Daniel before he could reach Sammy, but he still managed to grab his sleeve. Surprisingly, Sammy paid this physical contact no mind and continued with his building.

This anecdote demonstrates several characteristics of the autistic child, thus supporting the rationale for the aforementioned program focus. To begin with, Sammy was fixated on a particular object, the blocks, and there was little anyone could do to shift his focus. While making a building exhibits ability of imaginative play, the fact that he made the exact same structure over and over shows idiosyncratic behavior. Sammy did not have a concept of sharing, and was unable to interpret the emotions of others, due in part to him paying no attention to the people in his environment.

Another major program element that all programs followed was providing a highly supportive teaching environment that would eventually lead the children to make generalizations about their environment. By providing a highly supported teaching environment with a high degree of individual attention, desired behaviors can be acquired at a higher rate. Eventually such structure is faded out to resemble a more natural

environment. However, the authors argued that such a highly supportive environment is unnatural, and due to complex neurological processes the autistic child will have difficulty spontaneously expressing this behavior on his/her own. It is also noted that this gives a biased expression of ability level. They also argued that based on the unique characteristics of autism, such a strategy is not the most beneficial, even though fading is involved. Overall, the authors recommended a more natural environment.

As mentioned earlier, it is a well-known fact that those with autism perform better when information is presented in a highly predictable manner. Therefore programs followed daily routines, and transitions were eased into by using visual cues such as picture schedules, or by walking the children through the transition.

Many of the programs in this study measured success based on whether or not a child was prepared to study in a classroom with his/her typically developing peers. In other words, was the child able to function in a socially acceptable way? Thus the programs all focused on a number of basic social skills that would augment this development. Such skills included listening to and following directions, taking turns, and sitting quietly for activities. Such skills were also focused on in the EIC.

Parent and caregiver involvement is also advocated in all of the programs here, although not all programs go into detail about the involvement. While it may seem like an obvious choice, there is also evidence to support caregiver involvement throughout the course of therapy. Researchers have found that children responded more to parent interaction than to therapist interaction, and thus made more progress. In addition, if parents are trained in proper intervention methods then therapy can be extended into the

home, thus achieving a greater generalization of skills. As discussed in the program overviews, each program achieved the goal of parent involvement in different ways.

CONCLUSION

The focus of this paper was to show that regardless of the method of treatment employed, early language intervention is vital to children with speech and language delay. Based on the above cited research, it appears that in spite of the varying approaches to early language intervention, intervention in general has an overall positive effect. It also appears that the degree of success may vary with the methods used and the unique characteristics of the child. However based on the studies discussed here, as well as the body of research, there was no compelling evidence to support any specific program (Nye, et al. 1987).

The programs considered here varied in the amount of structure implemented, therefore it is difficult to directly compare their effectiveness for several reasons. Throughout the range of programs considered here, there were differences in the forms of assessment, diagnoses, period of treatment, age range, ratio of clinicians to children, and parent support and participation. Based on the individual assessment methods, these sets of data show that children made overall gains in each program. However, as each program employed different tests to measure progress it was not possible to directly compare the effectiveness of one program to another. In addition, as no untreated control group was available, it was not possible to determine the commensurate effect of early

language intervention. However, in spite of these drawbacks there is still evidence that early language intervention in different forms is beneficial.

Based on the research presented here, it is undeniable that the speech and language delayed children made progress in these early language intervention programs. Therefore it can be determined that intervention is critical to the development of those with speech and language delay. As these diverse programs all resulted in developmental gains it is necessary to understand why this was possible. According to researchers, differences measured in many tests appear to be most influenced by the language environment rather than physical disabilities (Lombardino & Vadreuil, 1998; Bzoch & League, 1970). Several theories, including those by Bloom, Brown, Chomsky and Piaget, argue that “speech and language acquisition are not results of direct teaching by caregivers, but result from children ‘discovering language by observing and interacting with others’” (Prizant & Wetherby, 1989). It is for this reason that intervention is possible in spite of other obstacles.

Based on my experiences at CSLOT I believe that such theories hold weight. For example, after observing the children for many weeks some appeared to be making progress while others were still nonverbal. One child who had SLI and PDD, Dylan, received both group and individual therapy. I often observed him humming nursery rhymes, or softly singing songs with word-approximations, but never heard him express himself with words, or with the intention of communicating a need or desire. Others had observed him using jargon and a few words, however during group therapy he would often use the icons to express himself. After observing him receive individual therapy I

felt certain that all of the individual attention and extra focus on problem areas would result in quick progress, but Dylan usually appeared unaffected. Then one day after group therapy Dylan suddenly spoke very clearly. There appeared to be no pressing motive to speak, such as to express an immediate need or desire, but simply to express a thought. He pointed towards the window and said, “Mom! Car! Look! Car!” I was shocked as he started speaking, mostly one-word utterances but also sprinkling in a few two-word utterances. Apparently the therapists had seen this happen many times before, as I seemed to be the only person surprised at this. This leads me to believe that children may not necessarily develop as a direct result of deliberate teaching, but by the sum of their experiences and interactions with others. However, this is not a recommendation for no intervention.

While early language intervention appears to be beneficial, there are several things to consider about the programs discussed here, as well as programs in general. Even if a program has been shown to be effective for previous children, each time a child is treated in a program it is like a completely new experiment. The child has his/her individual personality and unique developmental abilities. While certain methods may have worked well with children with similar diagnoses in the past, the same may not hold true for different children, although generalizations are possible. The same is true for a widely accepted model; with different locations, settings, and clinicians, it is as if the experiment is conducted repeatedly. Therefore while it is possible to make generalizations about which methods of intervention work best based on research and theories about language development, it is necessary to attend to the needs of each individual.

As for heeding individual differences, the data that many studies present is based on a collective body of scores, averaging the data in their analysis. This makes it difficult to assess and track individual trends, in turn making it difficult to make generalizations about suitable treatment methods. However in practice, paying such close attention to every individual is very time consuming, not to mention costly. While in theory this is most advantageous, it would be very difficult to actually implement such a practice.

To facilitate future studies in early language intervention, it would be ideal for programs to utilize a standard assessment tool. Not only would it be easier to compare differences across programs, but it would also be possible for different clinics to collaborate and improve on current methods. Also, in order to further understand the profoundness of early intervention it would be beneficial to perform a longitudinal study with the children at the Center for Speech, Language, and Occupational Therapy's Early Intervention Clinic.

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Appendix A

Child's Name _____ Sex _____

Birthdate _____ Today's Date _____



MacArthur-Bates CDI Words and Gestures

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PART I EARLY WORDS

A. FIRST SIGNS OF UNDERSTANDING

Before children begin to speak, they show signs of understanding language by responding to familiar words and phrases. Below are some common examples. Does your child do any of these?

Yes No

1. Respond when name is called (e.g., by turning and looking at source).
2. Respond to "no no" (by stopping what he/she is doing, at least for a moment).
3. React to "there's mommy/daddy" by looking around for them.

B. PHRASES (28)

In the list below, please mark the phrases that your child seems to understand.

understands	understands	understands
Are you hungry? <input type="radio"/>	Don't touch. <input type="radio"/>	Open your mouth. <input type="radio"/>
Are you tired/sleepy? <input type="radio"/>	Get up. <input type="radio"/>	Sit down. <input type="radio"/>
Be careful. <input type="radio"/>	Give it to mommy. <input type="radio"/>	Spit it out. <input type="radio"/>
Be quiet. <input type="radio"/>	Give me a hug. <input type="radio"/>	Stop it. <input type="radio"/>
Clap your hands. <input type="radio"/>	Give me a kiss. <input type="radio"/>	Time to go night night. <input type="radio"/>
Change diaper. <input type="radio"/>	Go get _____. <input type="radio"/>	Throw the ball. <input type="radio"/>
Come here/come on. <input type="radio"/>	Good girl/boy. <input type="radio"/>	This little piggy. <input type="radio"/>
Daddy's/mommy's home. <input type="radio"/>	Hold still. <input type="radio"/>	Want to go for a ride? <input type="radio"/>
Do you want more? <input type="radio"/>	Let's go bye bye. <input type="radio"/>	
Don't do that. <input type="radio"/>	Look/look here. <input type="radio"/>	

C. STARTING TO TALK

1. Some children like to "parrot" or imitate things that they've just heard (including new words that they are just learning, and/or parts of sentences, for example, repeating "work now" after mother says "Mommy's going to work now.") How often does your child imitate words?

Never Sometimes Often

2. Some children like to go around naming or labeling things, as though proud of knowing the names and wanting to show this. How often does your child do this?

D. VOCABULARY CHECKLIST

The following is a list of typical words in young children's vocabularies. For words your child understands but does not yet say, place a mark in the first column (understands). For words that your child not only understands but also uses, place a mark in the second column (understands and says). If your child uses a different pronunciation of a word (for example, "raffe" for "giraffe" or "sketti" for "spaghetti"), mark the word anyway. Remember, this is a "catalogue" of words that are used by many different children. Don't worry if your child knows only a few right now.

1. SOUND EFFECTS AND ANIMAL SOUNDS (12)

	under-stands and says	under-stands and says		under-stands and says	under-stands and says
baa baa	<input type="radio"/>	<input type="radio"/>	meow	<input type="radio"/>	<input type="radio"/>
choo choo	<input type="radio"/>	<input type="radio"/>	moo	<input type="radio"/>	<input type="radio"/>
cockadoodledoo	<input type="radio"/>	<input type="radio"/>	ouch	<input type="radio"/>	<input type="radio"/>
grrr	<input type="radio"/>	<input type="radio"/>	quack quack	<input type="radio"/>	<input type="radio"/>
				uh oh	<input type="radio"/>
				vroom	<input type="radio"/>
				woof woof	<input type="radio"/>
				yum yum	<input type="radio"/>

2. ANIMALS NAMES (Real or Toy) (36)

	under-stands and says	under-stands and says		under-stands and says	under-stands and says
animal	<input type="radio"/>	<input type="radio"/>	duck	<input type="radio"/>	<input type="radio"/>
bear	<input type="radio"/>	<input type="radio"/>	elephant	<input type="radio"/>	<input type="radio"/>
bee	<input type="radio"/>	<input type="radio"/>	fish	<input type="radio"/>	<input type="radio"/>
bird	<input type="radio"/>	<input type="radio"/>	frog	<input type="radio"/>	<input type="radio"/>
bug	<input type="radio"/>	<input type="radio"/>	giraffe	<input type="radio"/>	<input type="radio"/>
bunny	<input type="radio"/>	<input type="radio"/>	goose	<input type="radio"/>	<input type="radio"/>
butterfly	<input type="radio"/>	<input type="radio"/>	horse	<input type="radio"/>	<input type="radio"/>
cat	<input type="radio"/>	<input type="radio"/>	kitty	<input type="radio"/>	<input type="radio"/>
chicken	<input type="radio"/>	<input type="radio"/>	lamb	<input type="radio"/>	<input type="radio"/>
cow	<input type="radio"/>	<input type="radio"/>	lion	<input type="radio"/>	<input type="radio"/>
deer	<input type="radio"/>	<input type="radio"/>	monkey	<input type="radio"/>	<input type="radio"/>
dog	<input type="radio"/>	<input type="radio"/>	mouse	<input type="radio"/>	<input type="radio"/>
donkey	<input type="radio"/>	<input type="radio"/>	owl	<input type="radio"/>	<input type="radio"/>
				penguin	<input type="radio"/>
				pig	<input type="radio"/>
				pony	<input type="radio"/>
				puppy	<input type="radio"/>
				sheep	<input type="radio"/>
				squirrel	<input type="radio"/>
				teddy bear	<input type="radio"/>
				tiger	<input type="radio"/>
				turkey	<input type="radio"/>
				turtle	<input type="radio"/>

3. VEHICLES (Real or Toy) (9)

	under-stands and says	under-stands and says		under-stands and says	under-stands and says
airplane	<input type="radio"/>	<input type="radio"/>	car	<input type="radio"/>	<input type="radio"/>
bicycle	<input type="radio"/>	<input type="radio"/>	firetruck	<input type="radio"/>	<input type="radio"/>
bus	<input type="radio"/>	<input type="radio"/>	motorcycle	<input type="radio"/>	<input type="radio"/>
				stroller	<input type="radio"/>
				train	<input type="radio"/>
				truck	<input type="radio"/>

4. TOYS (8)

	understands and says		understands and says		understands and says
ball	<input type="radio"/>	book	<input type="radio"/>	<input type="radio"/>	pen
balloon	<input type="radio"/>	bubbles	<input type="radio"/>	<input type="radio"/>	toy
block	<input type="radio"/>	doll	<input type="radio"/>	<input type="radio"/>	

5. FOOD AND DRINK (30)

	understands and says		understands and says		understands and says
apple	<input type="radio"/>	chicken	<input type="radio"/>	<input type="radio"/>	meat
banana	<input type="radio"/>	coffee	<input type="radio"/>	<input type="radio"/>	milk
bread	<input type="radio"/>	cookie	<input type="radio"/>	<input type="radio"/>	noodles
butter	<input type="radio"/>	cracker	<input type="radio"/>	<input type="radio"/>	orange
cake	<input type="radio"/>	drink	<input type="radio"/>	<input type="radio"/>	peas
candy	<input type="radio"/>	egg	<input type="radio"/>	<input type="radio"/>	pizza
carrots	<input type="radio"/>	fish	<input type="radio"/>	<input type="radio"/>	raisin
cereal	<input type="radio"/>	food	<input type="radio"/>	<input type="radio"/>	spaghetti
cheerios	<input type="radio"/>	ice cream	<input type="radio"/>	<input type="radio"/>	toast
cheese	<input type="radio"/>	juice	<input type="radio"/>	<input type="radio"/>	water

6. CLOTHING (19)

	understands and says		understands and says		understands and says
beads	<input type="radio"/>	hat	<input type="radio"/>	<input type="radio"/>	shoe
bib	<input type="radio"/>	jacket	<input type="radio"/>	<input type="radio"/>	shorts
boots	<input type="radio"/>	jeans	<input type="radio"/>	<input type="radio"/>	sock
button	<input type="radio"/>	necklace	<input type="radio"/>	<input type="radio"/>	sweater
coat	<input type="radio"/>	pajamas	<input type="radio"/>	<input type="radio"/>	zipper
diaper	<input type="radio"/>	pants	<input type="radio"/>	<input type="radio"/>	
dress	<input type="radio"/>	shirt	<input type="radio"/>	<input type="radio"/>	

7. BODY PARTS (20)

	understands and says		understands and says		understands and says
arm	<input type="radio"/>	finger	<input type="radio"/>	<input type="radio"/>	nose
belly button	<input type="radio"/>	hair	<input type="radio"/>	<input type="radio"/>	owie/boo boo
cheek	<input type="radio"/>	hand	<input type="radio"/>	<input type="radio"/>	tooth
ear	<input type="radio"/>	head	<input type="radio"/>	<input type="radio"/>	toe
eye	<input type="radio"/>	knee	<input type="radio"/>	<input type="radio"/>	tongue
face	<input type="radio"/>	leg	<input type="radio"/>	<input type="radio"/>	tummy
foot	<input type="radio"/>	mouth	<input type="radio"/>	<input type="radio"/>	

8. FURNITURE AND ROOMS (24)

	understands and says		understands and says		understands and says
bathroom	<input type="radio"/>	drawer	<input type="radio"/>	<input type="radio"/>	refrigerator
bathtub	<input type="radio"/>	garage	<input type="radio"/>	<input type="radio"/>	rocking chair
bed	<input type="radio"/>	high chair	<input type="radio"/>	<input type="radio"/>	sink
bedroom	<input type="radio"/>	kitchen	<input type="radio"/>	<input type="radio"/>	stairs
chair	<input type="radio"/>	living room	<input type="radio"/>	<input type="radio"/>	stove
couch	<input type="radio"/>	oven	<input type="radio"/>	<input type="radio"/>	table
crib	<input type="radio"/>	play pen	<input type="radio"/>	<input type="radio"/>	TV
door	<input type="radio"/>	potty	<input type="radio"/>	<input type="radio"/>	window

9. SMALL HOUSEHOLD ITEMS (36)

	understands and says		understands and says		understands and says
blanket	<input type="radio"/>	<input type="radio"/>	glasses	<input type="radio"/>	<input type="radio"/>
bottle	<input type="radio"/>	<input type="radio"/>	hammer	<input type="radio"/>	<input type="radio"/>
bowl	<input type="radio"/>	<input type="radio"/>	keys	<input type="radio"/>	<input type="radio"/>
box	<input type="radio"/>	<input type="radio"/>	lamp	<input type="radio"/>	<input type="radio"/>
broom	<input type="radio"/>	<input type="radio"/>	light	<input type="radio"/>	<input type="radio"/>
brush	<input type="radio"/>	<input type="radio"/>	medicine	<input type="radio"/>	<input type="radio"/>
clock	<input type="radio"/>	<input type="radio"/>	money	<input type="radio"/>	<input type="radio"/>
comb	<input type="radio"/>	<input type="radio"/>	paper	<input type="radio"/>	<input type="radio"/>
cup	<input type="radio"/>	<input type="radio"/>	penny	<input type="radio"/>	<input type="radio"/>
dish	<input type="radio"/>	<input type="radio"/>	picture	<input type="radio"/>	<input type="radio"/>
fork	<input type="radio"/>	<input type="radio"/>	pillow	<input type="radio"/>	<input type="radio"/>
glass	<input type="radio"/>	<input type="radio"/>	plant	<input type="radio"/>	<input type="radio"/>

10. OUTSIDE THINGS AND PLACES TO GO (27)

	understands and says		understands and says		understands and says
backyard	<input type="radio"/>	<input type="radio"/>	park	<input type="radio"/>	<input type="radio"/>
beach	<input type="radio"/>	<input type="radio"/>	party	<input type="radio"/>	<input type="radio"/>
church *	<input type="radio"/>	<input type="radio"/>	pool	<input type="radio"/>	<input type="radio"/>
flower	<input type="radio"/>	<input type="radio"/>	rain	<input type="radio"/>	<input type="radio"/>
garden	<input type="radio"/>	<input type="radio"/>	rock	<input type="radio"/>	<input type="radio"/>
home	<input type="radio"/>	<input type="radio"/>	school	<input type="radio"/>	<input type="radio"/>
house	<input type="radio"/>	<input type="radio"/>	shovel	<input type="radio"/>	<input type="radio"/>
moon	<input type="radio"/>	<input type="radio"/>	sky	<input type="radio"/>	<input type="radio"/>
outside	<input type="radio"/>	<input type="radio"/>	slide	<input type="radio"/>	<input type="radio"/>

* or word used in your family

11. PEOPLE (20)

	understands and says		understands and says		understands and says
aunt	<input type="radio"/>	<input type="radio"/>	grandma *	<input type="radio"/>	<input type="radio"/>
baby	<input type="radio"/>	<input type="radio"/>	grandpa *	<input type="radio"/>	<input type="radio"/>
babysitter	<input type="radio"/>	<input type="radio"/>	lady	<input type="radio"/>	<input type="radio"/>
babysitter's name	<input type="radio"/>	<input type="radio"/>	man	<input type="radio"/>	<input type="radio"/>
boy	<input type="radio"/>	<input type="radio"/>	mommy *	<input type="radio"/>	<input type="radio"/>
brother	<input type="radio"/>	<input type="radio"/>	child's own name	<input type="radio"/>	<input type="radio"/>
child	<input type="radio"/>	<input type="radio"/>	people	<input type="radio"/>	<input type="radio"/>
daddy *	<input type="radio"/>	<input type="radio"/>	person	<input type="radio"/>	<input type="radio"/>
girl	<input type="radio"/>	<input type="radio"/>	sister	<input type="radio"/>	<input type="radio"/>

* or word used in your family

12. GAMES AND ROUTINES (19)

	understands and says		understands and says		understands and says
bath	<input type="radio"/>	<input type="radio"/>	night night	<input type="radio"/>	<input type="radio"/>
breakfast	<input type="radio"/>	<input type="radio"/>	no	<input type="radio"/>	<input type="radio"/>
bye or bye bye	<input type="radio"/>	<input type="radio"/>	patty cake	<input type="radio"/>	<input type="radio"/>
dinner	<input type="radio"/>	<input type="radio"/>	peekaboo	<input type="radio"/>	<input type="radio"/>
don't	<input type="radio"/>	<input type="radio"/>	please	<input type="radio"/>	<input type="radio"/>
hello	<input type="radio"/>	<input type="radio"/>	shh/shush/hush	<input type="radio"/>	<input type="radio"/>
hi	<input type="radio"/>	<input type="radio"/>	thank you	<input type="radio"/>	<input type="radio"/>
lunch	<input type="radio"/>	<input type="radio"/>	wait	<input type="radio"/>	<input type="radio"/>
nap	<input type="radio"/>	<input type="radio"/>	wanna want to	<input type="radio"/>	<input type="radio"/>

13. ACTION WORDS (55)

	under-stands and says	under-stands and says		under-stands and says	under-stands and says		under-stands and says	under-stands and says
bite	<input type="radio"/>	<input type="radio"/>	help	<input type="radio"/>	<input type="radio"/>	show	<input type="radio"/>	<input type="radio"/>
blow	<input type="radio"/>	<input type="radio"/>	hit	<input type="radio"/>	<input type="radio"/>	sing	<input type="radio"/>	<input type="radio"/>
break	<input type="radio"/>	<input type="radio"/>	hug	<input type="radio"/>	<input type="radio"/>	sleep	<input type="radio"/>	<input type="radio"/>
bring	<input type="radio"/>	<input type="radio"/>	hurry	<input type="radio"/>	<input type="radio"/>	smile	<input type="radio"/>	<input type="radio"/>
bump	<input type="radio"/>	<input type="radio"/>	jump	<input type="radio"/>	<input type="radio"/>	splash	<input type="radio"/>	<input type="radio"/>
clean	<input type="radio"/>	<input type="radio"/>	kick	<input type="radio"/>	<input type="radio"/>	stop	<input type="radio"/>	<input type="radio"/>
close	<input type="radio"/>	<input type="radio"/>	kiss	<input type="radio"/>	<input type="radio"/>	swim	<input type="radio"/>	<input type="radio"/>
cry	<input type="radio"/>	<input type="radio"/>	look	<input type="radio"/>	<input type="radio"/>	swing	<input type="radio"/>	<input type="radio"/>
dance	<input type="radio"/>	<input type="radio"/>	love	<input type="radio"/>	<input type="radio"/>	take	<input type="radio"/>	<input type="radio"/>
draw	<input type="radio"/>	<input type="radio"/>	open	<input type="radio"/>	<input type="radio"/>	throw	<input type="radio"/>	<input type="radio"/>
drink	<input type="radio"/>	<input type="radio"/>	play	<input type="radio"/>	<input type="radio"/>	tickle	<input type="radio"/>	<input type="radio"/>
drive	<input type="radio"/>	<input type="radio"/>	pull	<input type="radio"/>	<input type="radio"/>	touch	<input type="radio"/>	<input type="radio"/>
eat	<input type="radio"/>	<input type="radio"/>	push	<input type="radio"/>	<input type="radio"/>	watch	<input type="radio"/>	<input type="radio"/>
fall	<input type="radio"/>	<input type="radio"/>	put	<input type="radio"/>	<input type="radio"/>	walk	<input type="radio"/>	<input type="radio"/>
feed	<input type="radio"/>	<input type="radio"/>	read	<input type="radio"/>	<input type="radio"/>	wash	<input type="radio"/>	<input type="radio"/>
finish	<input type="radio"/>	<input type="radio"/>	ride	<input type="radio"/>	<input type="radio"/>	wipe	<input type="radio"/>	<input type="radio"/>
get	<input type="radio"/>	<input type="radio"/>	run	<input type="radio"/>	<input type="radio"/>	write	<input type="radio"/>	<input type="radio"/>
give	<input type="radio"/>	<input type="radio"/>	say	<input type="radio"/>	<input type="radio"/>			
go	<input type="radio"/>	<input type="radio"/>	see	<input type="radio"/>	<input type="radio"/>			

14. WORDS ABOUT TIME (8)

	under-stands and says		under-stands and says		under-stands and says		under-stands and says	
day	<input type="radio"/>	<input type="radio"/>	night	<input type="radio"/>	<input type="radio"/>	tomorrow	<input type="radio"/>	<input type="radio"/>
later	<input type="radio"/>	<input type="radio"/>	now	<input type="radio"/>	<input type="radio"/>	tonight	<input type="radio"/>	<input type="radio"/>
morning	<input type="radio"/>	<input type="radio"/>	today	<input type="radio"/>	<input type="radio"/>			

15. DESCRIPTIVE WORDS (37)

	under-stands and says		under-stands and says		under-stands and says		under-stands and says	
all gone	<input type="radio"/>	<input type="radio"/>	empty	<input type="radio"/>	<input type="radio"/>	old	<input type="radio"/>	<input type="radio"/>
asleep	<input type="radio"/>	<input type="radio"/>	fast	<input type="radio"/>	<input type="radio"/>	pretty	<input type="radio"/>	<input type="radio"/>
bad	<input type="radio"/>	<input type="radio"/>	fine	<input type="radio"/>	<input type="radio"/>	red	<input type="radio"/>	<input type="radio"/>
big	<input type="radio"/>	<input type="radio"/>	gentle	<input type="radio"/>	<input type="radio"/>	scared	<input type="radio"/>	<input type="radio"/>
blue	<input type="radio"/>	<input type="radio"/>	good	<input type="radio"/>	<input type="radio"/>	sick	<input type="radio"/>	<input type="radio"/>
broken	<input type="radio"/>	<input type="radio"/>	happy	<input type="radio"/>	<input type="radio"/>	sleepy	<input type="radio"/>	<input type="radio"/>
careful	<input type="radio"/>	<input type="radio"/>	hard	<input type="radio"/>	<input type="radio"/>	soft	<input type="radio"/>	<input type="radio"/>
clean	<input type="radio"/>	<input type="radio"/>	hot	<input type="radio"/>	<input type="radio"/>	thirsty	<input type="radio"/>	<input type="radio"/>
cold	<input type="radio"/>	<input type="radio"/>	hungry	<input type="radio"/>	<input type="radio"/>	tired	<input type="radio"/>	<input type="radio"/>
cute	<input type="radio"/>	<input type="radio"/>	hurt	<input type="radio"/>	<input type="radio"/>	wet	<input type="radio"/>	<input type="radio"/>
dark	<input type="radio"/>	<input type="radio"/>	little	<input type="radio"/>	<input type="radio"/>	yucky	<input type="radio"/>	<input type="radio"/>
dirty	<input type="radio"/>	<input type="radio"/>	naughty	<input type="radio"/>	<input type="radio"/>			
dry	<input type="radio"/>	<input type="radio"/>	nice	<input type="radio"/>	<input type="radio"/>			

16. PRONOUNS (11)

	under-stands and says		under-stands and says		under-stands and says		under-stands and says	
his	<input type="radio"/>	<input type="radio"/>	me	<input type="radio"/>	<input type="radio"/>	this	<input type="radio"/>	<input type="radio"/>
her	<input type="radio"/>	<input type="radio"/>	mine	<input type="radio"/>	<input type="radio"/>	you	<input type="radio"/>	<input type="radio"/>
I	<input type="radio"/>	<input type="radio"/>	my	<input type="radio"/>	<input type="radio"/>	your	<input type="radio"/>	<input type="radio"/>
it	<input type="radio"/>	<input type="radio"/>	that	<input type="radio"/>	<input type="radio"/>			

17. QUESTION WORDS (6)							
	understands and says	understands and says		understands and says	understands and says		understands and says
how	<input type="radio"/>	<input type="radio"/>	when	<input type="radio"/>	<input type="radio"/>	who	<input type="radio"/>
what	<input type="radio"/>	<input type="radio"/>	where	<input type="radio"/>	<input type="radio"/>	why	<input type="radio"/>

18. PREPOSITIONS AND LOCATIONS (11)							
	understands and says	understands and says		understands and says	understands and says		understands and says
away	<input type="radio"/>	<input type="radio"/>	inside	<input type="radio"/>	<input type="radio"/>	there	<input type="radio"/>
back	<input type="radio"/>	<input type="radio"/>	off	<input type="radio"/>	<input type="radio"/>	under	<input type="radio"/>
down	<input type="radio"/>	<input type="radio"/>	on	<input type="radio"/>	<input type="radio"/>	up	<input type="radio"/>
in	<input type="radio"/>	<input type="radio"/>	out	<input type="radio"/>	<input type="radio"/>		

19. QUANTIFIERS (8)							
	understands and says	understands and says		understands and says	understands and says		understands and says
all	<input type="radio"/>	<input type="radio"/>	none	<input type="radio"/>	<input type="radio"/>	same	<input type="radio"/>
another	<input type="radio"/>	<input type="radio"/>	not	<input type="radio"/>	<input type="radio"/>	some	<input type="radio"/>
more	<input type="radio"/>	<input type="radio"/>	other	<input type="radio"/>	<input type="radio"/>		

PART II ACTIONS AND GESTURES

A. FIRST COMMUNICATIVE GESTURES		
When infants are first learning to communicate, they often use gestures to make their wishes known. For each item below, mark the line that describes your child's actions right now.		
1. Extends arm to show you something he/she is holding.	<input type="radio"/> Not Yet	<input type="radio"/> Sometimes
2. Reaches out and gives you a toy or some object that he/she is holding.	<input type="radio"/>	<input type="radio"/>
3. Points (with arm and index finger extended) at some interesting object or event.	<input type="radio"/>	<input type="radio"/>
4. Waves bye bye on his/her own when someone leaves.	<input type="radio"/>	<input type="radio"/>
5. Extends his/her arm upward to signal a wish to be picked up.	<input type="radio"/>	<input type="radio"/>
6. Shakes head "no".	<input type="radio"/>	<input type="radio"/>
7. Nods head "yes".	<input type="radio"/>	<input type="radio"/>
8. Gestures "hush" by placing finger to lips.	<input type="radio"/>	<input type="radio"/>
9. Requests something by extending arm and opening and closing hand.	<input type="radio"/>	<input type="radio"/>
10. Blows kisses from a distance.	<input type="radio"/>	<input type="radio"/>
11. Smacks lips in a "yum yum" gesture to indicate that something taste good.	<input type="radio"/>	<input type="radio"/>
12. Shrugs to indicate "all gone" or "where'd it go".	<input type="radio"/>	<input type="radio"/>

B. GAMES AND ROUTINES		
Does your child do any of the following?		
1. Play peekaboo.	<input type="radio"/> Yes	<input type="radio"/> No
2. Play patty cake.	<input type="radio"/>	<input type="radio"/>
3. Play "so big".	<input type="radio"/>	<input type="radio"/>
4. Play chasing games.	<input type="radio"/>	<input type="radio"/>
5. Sing.	<input type="radio"/>	<input type="radio"/>
6. Dance.	<input type="radio"/>	<input type="radio"/>

C. ACTIONS WITH OBJECTS

C. ACTIONS WITH OBJECTS			
Does your child do or try to do any of the following?		Yes	No
1.	Eat with a spoon or fork.	<input type="radio"/>	<input type="radio"/>
2.	Drink from a cup containing liquid.	<input type="radio"/>	<input type="radio"/>
3.	Comb or brush own hair.	<input type="radio"/>	<input type="radio"/>
4.	Brush teeth.	<input type="radio"/>	<input type="radio"/>
5.	Wipe face or hands with a towel or cloth.	<input type="radio"/>	<input type="radio"/>
6.	Put on hat.	<input type="radio"/>	<input type="radio"/>
7.	Put on a shoe or sock.	<input type="radio"/>	<input type="radio"/>
8.	Put on a necklace, bracelet, or watch.	<input type="radio"/>	<input type="radio"/>
9.	Lay head on hands and squeeze eyes shut as if sleeping.	<input type="radio"/>	<input type="radio"/>
10.	Blow to indicate something is hot.	<input type="radio"/>	<input type="radio"/>
11.	Hold plane and make it "fly".	<input type="radio"/>	<input type="radio"/>
12.	Put telephone to ear.	<input type="radio"/>	<input type="radio"/>
13.	Sniff flowers.	<input type="radio"/>	<input type="radio"/>
14.	Push toy car or truck.	<input type="radio"/>	<input type="radio"/>
15.	Throw a ball.	<input type="radio"/>	<input type="radio"/>
16.	Pour pretend liquid from one container to another.	<input type="radio"/>	<input type="radio"/>
17.	Stir pretend liquid in a cup or pan with a spoon.	<input type="radio"/>	<input type="radio"/>

D. PRETENDING TO BE A PARENT

Here are some things that young children sometimes do with stuffed animals or dolls. Please mark the actions that you have seen your child do.

D. PRETENDING TO BE A PARENT		
Here are some things that young children sometimes do with stuffed animals or dolls. Please mark the actions that you have seen your child do.		
	Yes	No
1. Put to bed.	<input type="radio"/>	<input checked="" type="radio"/>
2. Cover with blanket.	<input type="radio"/>	<input checked="" type="radio"/>
3. Feed with bottle.	<input type="radio"/>	<input checked="" type="radio"/>
4. Feed with spoon.	<input type="radio"/>	<input checked="" type="radio"/>
5. Brush comb its hair.	<input type="radio"/>	<input checked="" type="radio"/>
6. Pat or burp it.	<input type="radio"/>	<input checked="" type="radio"/>
7. Push in stroller-buggy.	<input type="radio"/>	<input checked="" type="radio"/>
8. Rock it.	<input type="radio"/>	<input checked="" type="radio"/>
9. Kiss or hug it.	<input type="radio"/>	<input checked="" type="radio"/>
10. Try to put shoe or sock or hat on it.	<input type="radio"/>	<input checked="" type="radio"/>
11. Wipe its face or hands.	<input type="radio"/>	<input checked="" type="radio"/>
12. Talk to it.	<input type="radio"/>	<input checked="" type="radio"/>
13. Try to put diaper on it.	<input type="radio"/>	<input checked="" type="radio"/>

E. IMITATING OTHER ADULT ACTIONS (Using real or toy implements)

Does your child do or try to do any of the following?

E. IMITATING OTHER ADULT ACTIONS (Using real or toy implements)		
Does your child do or try to do any of the following?	Yes	No
1. Sweep with broom or mop.	<input type="radio"/>	<input type="radio"/>
2. Put key in door or lock.	<input type="radio"/>	<input type="radio"/>
3. Pound with hammer or mallet.	<input type="radio"/>	<input type="radio"/>
4. Attempt to use saw.	<input type="radio"/>	<input type="radio"/>
5. "Type" at a typewriter or computer keyboard.	<input type="radio"/>	<input type="radio"/>
6. "Read" (opens book, turns page).	<input type="radio"/>	<input type="radio"/>
7. Vacuum.	<input type="radio"/>	<input type="radio"/>
8. Water plants.	<input type="radio"/>	<input type="radio"/>
9. Play musical instrument (e.g., piano, trumpet).	<input type="radio"/>	<input type="radio"/>
10. "Drive" car by turning steering wheel.	<input type="radio"/>	<input type="radio"/>
11. Wash dishes.	<input type="radio"/>	<input type="radio"/>
12. Clean with cloth or duster.	<input type="radio"/>	<input type="radio"/>
13. Write with a pen, pencil, or marker.	<input type="radio"/>	<input type="radio"/>
14. Dig with a shovel.	<input type="radio"/>	<input type="radio"/>
15. Put on glasses.	<input type="radio"/>	<input type="radio"/>