

2012

Effects of Early Intervention Services on Adaptive Functioning

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Philadelphia College of Osteopathic Medicine

Department of School Psychology

EFFECTS OF EARLY INTERVENTION SERVICES ON ADAPTIVE FUNCTIONING

By Oslynn Sam

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

November 2012

**PHILADELPHIA COLLEGE OF OSTEOPATHIC MEDICINE
DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Oslynn Sam-Henry on the 10th day of May, 2010, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.

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Acknowledgements

I would like to thank God, for without him none of this would be possible. To my family, thank you for your support and encouragement. To my husband, Ian and my children, Davay, Dillian and Davian, who are the reasons why I chose to pursue my doctoral degree. To my mother, Lynette Bowen-Sam, for reviewing and editing all of my papers and for providing me with positive affirmations throughout the years.

And finally, I would like to express my gratitude to the members of my dissertation committee. To Dr. Rosemary Mennuti and Dr. George McCloskey for their guidance and patience throughout this rewarding experience.

ABSTRACT

In 1986, Congress enacted Public Law 99-457, Part H of the Individuals with Disabilities Education Act (IDEA). This law, currently referred to as Part C, was established in response to the growing number of children born with developmental delays. Infants born prematurely, addicted to drugs, or with conditions such as Down Syndrome face challenging lives. Part C allows for eligible infants, ages birth to three years to receive free early intervention services to address their individual delays. Previous studies have shown that children who have participated in early intervention programs have benefited in various areas of their overall development. The purpose of this study is to examine parents' perceptions of the effects of early intervention services on adaptive functioning in toddlers who are enrolled in a center-based early intervention program.

The present study utilized archival data from a random sample of children ($N=75$) who were enrolled in a center-based program at the Infant and Child Learning Center located in Brooklyn, New York. The majority of participants in the sample were African-American ($f=93.3\%$) and male ($f=73.3\%$). The children ranged in age from four to twenty-eight months prior to beginning the program, with a mean age in months of $M=19.24$ ($SD=5.02$). At post-intervention, the children ranged in age from twenty-one to thirty-seven months, mean age in months $M=32.12$ ($SD=1.99$). The mean duration of enrollment in the program in months was $M=11.83$ ($SD=2.65$) and ranged from seven to eighteen months. The results of this study showed that parents did, in fact, believe that their children made improvements after attending the program.

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Effects of Early Intervention Services on Adaptive Functioning

Chapter 1: Introduction

Statement of the Problem

According to the Summary Health Statistics for the United States population during the year 2005, there were about 4.3 million children under the age of eighteen who received Special Education or Early Intervention services (Summary Health Statistics, 2005). This equals approximately six percent of all children in the United States. In this population, boys are twice as likely to receive services than girls. The 1980's United States Census revealed similar results, which indicated that about 4.2 million children ages three to seventeen received Special Education services. Once again, over half of the children were males. The government has addressed these alarming statistics by amending previous and current legislations.

In 1975, the Education for All Handicapped Children Act was passed by Congress, which ensured that all children would receive a free and appropriate education. In 1986, Congress enacted Public Law 99-457, Part H of the Individuals with Disabilities Education Act (IDEA). This law, conventionally referred to as Part C, was established in response to the growing number of children born with developmental delays. Infants born prematurely, addicted to drugs, or with conditions such as Down Syndrome face challenging lives. The Part C program under IDEA recognized the "urgent and substantial need to: enhance the development of infants and toddlers with disabilities, to minimize their potential for developmental delay, and to recognize the significant brain development that occurs during the first three years of life" (Sonnier, 1991, p. 1). Another purpose was to minimize the cost of special education services when these infants were ready to attend school. In an annual report to Congress on the Implementation of the Education of the Handicapped Act in 1985, the United States Department of Education estimated

saving \$16,000 per child when early intervention services were initiated at birth instead of at age six (Annual Report to Congress, 1985). Still another concern was increasing the potential of people with disabilities so that they could live independently in society. In addition, the Part C program under IDEA was designed to improve families' abilities to meet their children's needs.

Bryant and Graham (1993) stated that, "Public Law 99-457 is the most important legislation enacted for the developmentally vulnerable young child" (p. 10). Even though Part C is optional and not mandated by law, all states participate in this program. In 2001, the United States Department of Education reported that nearly 250,000 children under the age of thirty-six months were enrolled in the Part C program. These children were identified as being at risk of or having a developmental disability. A survey conducted by Boyle and Cordero (2005) revealed that children from low socioeconomic backgrounds, whose mother's education level was below the tenth grade, were at greater risk of mental retardation and poor school readiness. Similarly, Ramsey & Landesman Ramey (1998) stated that when children are unprepared to enter school, they have difficulties meeting curricular demands. This increases the likelihood of retention, referral and placement in special education, and eventually dropping out of school. As these children become older, the risks may also include teenage pregnancy, juvenile delinquency, and unemployment. Research has shown that early intervention programs can alleviate some of these issues.

The main purpose of the Part C Early Intervention program is to provide services to children and their families. Based on an infant's needs, services may include special instruction, speech/language therapy, feeding therapy, occupational and physical therapy, social work, and family training. Services can also teach parents appropriate methods of caring for their children, so that they can enhance and support their children's development. Services such as parent

training and family counseling can address those needs. Early Intervention services can be provided in the families' homes, the children's daycare or in early intervention centers. Parents have an important role in deciding which services are appropriate for their children, and where those services should be provided. It is recommended that services take place in children's natural environments. Parents also determine the objectives and goals that they want their children to achieve while receiving services. Infants and their families who participated in receiving early intervention services appear to have benefited from the various services (New York State Department of Health, 2005).

Over the last decade, several studies conducted attempted to assess the effectiveness of early intervention programs. A majority of these studies have shown positive effects for children who were enrolled in such programs. Some of the largest studies were conducted by the Infant Health and Developmental Program (IHDP). In 1994, IHDP published the results of a study that followed low birth weight premature infants until the age of five. The results showed that when early intervention services were implemented during the first three years, heavier low birth weight premature infants achieved higher IQ scores than lighter low birth weight premature infants (Brooks-Gunn et al., 1994). Three years later, IHDP re-evaluated the children at age eight. They found that the entire cohort obtained similar scores on outcome measures (McCarton et al., 1997).

One of the five areas that are addressed by early intervention services are children's adaptive functioning. In 1983, Begab et al defined adaptive behavior as, "the effectiveness or degree with which individuals meet the standards of personal independence and social responsibility expected for age and cultural group" (p. 1). Adaptive skills are essential for adequate independent functioning. Children who lack appropriate adaptive skills will have

difficulty in many aspects of their lives. For example, it may be harder for them to interact with their peers, take care of their personal needs, and learn new skills (Harrison and Boney, 2004).

Sattler (1992) reported that it is difficult to define adaptive behavior, and that it should be viewed in a developmental context. Also, since adaptive behavior contains various skills, such as independent functioning, physical and language development, it cannot be measured with one assessment.

A commonly used measure of adaptive behavior is the Vineland Adaptive Behavior Scales. This scale is used to assess the social competence of handicapped and non-handicapped individuals from birth through age nineteen (Sattler, 1992). The Vineland uses an adaptive scale to measure four domains; Communication, Daily Living Skills, Socialization, and Motor Skills. Each of the domains assesses different adaptive skills, and is divided into sub-domains. The Communication domain includes questions related to receptive, expressive, and written communication skills. The Daily Living Skills domain includes the sub-domains of personal, domestic, and community. The Socialization domain includes the sub-domains of interpersonal relationships, play and leisure time, and coping skills. Lastly, the Motor Skills domain includes the sub-domains of gross and fine motor skills. Administration of the Vineland requires a trained interviewer and a respondent who is familiar with the child's daily behaviors. The respondent is usually the child's biological parent or caregiver (Sattler, 1992).

Since the Part C program encourages parents to participate in decisions regarding their children's educational needs, it is essential to investigate how parents feel about their children's development. Traditionally, parents rated their children's abilities as higher than indicated by evaluators. More recently, studies have shown that there are positive and strong relationships between parental opinions and professional judgments.

Purpose of the Study

The general aim of this study is to examine parents' perceptions of the effects of early intervention services on adaptive functioning in toddlers enrolled in a center-based early intervention program. The purpose of the examination is to provide information on the specific strengths and weaknesses in the areas of communication, daily living skills, socialization, and motor skills.

As previously stated, parents are expected to be actively involved in their children's educational decisions. Since the initiation of "Family as Partners" to New York City's early intervention programs in September 2006, parents' obligations to participate in their children's development has become even more predominant. "Family as Partners" was developed from research that concluded that, "family involvement predicts children's academic achievement and social development as they progress from early childhood programs through K-12 schools and into higher education" (Harvard Family Research Project, 2006, p.1). Families are expected to make time in their schedules to participate in parent training sessions with their children's therapist. During these sessions, therapists train family members to incorporate therapeutic activities into their children's daily routines. In addition, parents are also expected to monitor their children's progress through monthly calendars that are submitted to their service coordinators. Since parents are becoming more actively involved in their children's services, it is important to consider their views as to whether or not their children have made improvements in their adaptive functioning.

Research Questions/Hypotheses

This study will attempt to answer the following research questions:

- 1) Do parent perceptions of their child's development reflect growth in the four domains of the Vineland from the beginning to the end of the program?
- 2) Do parent perceptions of their child's development reflect growth in the various sub-domains of the Vineland from the beginning to the end of the program?
- 3) Do parent perceptions of their child's development vary based on the child's gender?
- 4) Do parent perceptions of their child's development vary based on the child's disability classification?

Chapter 2: Review of Literature

It is well-documented that children develop at their own pace. Though the majority of children achieve their developmental milestones within an appropriately defined time period, some children experience developmental delays. A developmental delay is defined as “observed disparity between a child’s actual development, particularly in language and cognition or motor skills, and the level usually seen in children developing normally” (Begab et al., 1983, p.168). Before going into further discussion of developmental delays, it is necessary to first look at how typical children develop.

Jean Piaget (1896-1980), a scientist, proposed stages of child development, which have been widely accepted throughout the world. He believed that in order to teach and work with children, you must first understand their cognitive development. One important realization is that “cognitive development is cumulative, understanding a new experience grows out of what was learned during the previous one” (Singer & Revenson, 1996, p. 15). Piaget proposed four stages of a child’s development: sensory-motor, preoperational, concrete, and formal. This research will focus on the two stages that are relevant to the ages of the children in this study, sensory-motor and preoperational.

The sensory-motor period begins at birth and ends when a child is two years old. Piaget believed that intelligence started at birth, based on an infant’s ability to perform simple reflex behaviors (Wadsworth, 1984). Reflexes, such as sucking, grasping, crying, and moving body parts, all emerge during the first month after birth. Over the next several months, infants begin to develop hand-mouth coordination and eye-hand coordination (four-to-eight-months). As infants begin to develop their own schema or mental images, they become more aware of the objects in

their environment. During the eight-to-twelve-month period, infants begin to register object permanence, when they search for objects that have disappeared.

During the end of the first year, “the child has the ability to combine behaviors he previously acquired in order to achieve goals” (Wadsworth, 1984, p.50). They also begin to anticipate events, such as visits to the doctor, feedings, or their caregiver leaving. They can also prolong and repeat activities that attract their interest, for example, understanding how to operate cause-and-effect toys.

During the second year, cognitive development continues on the cumulative path. As new schemas are formed, so is a higher level of problem solving. Infants now begin to experiment through a trial-and-error process when confronted with a new situation. Piaget felt that this process is an important part of an infant’s cognitive development. He suggested that “behavior become intelligent when the child acquires the ability to solve new problems” (Wadsworth, 1984, p. 59). Through the development of sequential displacements, the infant begins to look for an object in the last place it was seen and not in its usual place (twelve-to-eighteen-months).

During the eighteen-to-twenty-four-month period, children begin to problem solve through representation. That is, children begin to use the mental image of objects and events to solve problems cognitively. Prior to this, problem solving was done through active experimentation rather than actual thinking. This new ability to problem-solve introduces Piaget’s concept of invisible displacement. Children can now find an object that they see hidden, look for an object in various places, and even find objects that they did not see hidden.

Piaget’s next stage of cognitive development is preoperational, which covers the ages of two-to-seven years. During this phase, there are several important concepts that explain how toddlers develop their higher levels of cognitive function. In deferred imitation, children

remember events that have not occurred for a period of time and begin to imitate the event. The idea of deferred imitation leads us to believe that a child has developed the ability to remember and repeat previously observed behaviors. Another important concept that two-year-old children develop is symbolic or pretend play. During symbolic play, children use objects not intended for play, for example, pretending that a box is a car.

Another significant milestone in development during this stage is verbal language, as children begin to use words to represent familiar objects. Piaget believed that verbal communication had an essential effect on children's cognitive development. They can now communicate with others, which also enhance their socialization.

Stanley I. Greenspan, M.D. is a clinical professor of psychiatry who also researched and developed theories on how children learn. Greenspan (1998) developed six stages that explained how he viewed the developmental levels of the mind. He stated, "This process consists of six specific stages that together prepare the baby to translate the raw data of her senses and inner feelings into images that represent them both to herself and others" (pp. 42-43). Greenspan's theories were formed after studying different groups of infants and children, including children from disadvantaged backgrounds. In addition, once each stage is learned it forms the mental system that is necessary for developing "conscious and unconscious symbolic thought" (p. 43).

During the first level, Making Sense of Sensations, from birth to three-months, an infant learns how to manage her "sensations as well as the body's responses." (Greenspan, 1998, p. 44) With the ability to see, hear, and control some body movements, an infant learns how to track objects and to recognize images and familiar sounds. This is also the time when relationships with their caregivers start to form. When caregivers provide the infant with feelings of joy and when they respond to their distress, a sense of security develops. In contrast, when an infant

experiences neurological or emotional inadequacies, they may struggle to establish relationships and/or understand their environment. An infant is ready for the next stage when they are able to focus to their environment.

During the second level, Intimacy and Relating, from three-to-six-months, an infant begins to become more aware of the people around them, which allows for intimate relationships to form. They also begin to show a preference for their caregivers. At this point in their development, the relationship between an infant and their caregivers is not yet interactive, since the infant's actions are not completely deliberate. If an infant is not provided with the opportunity to become close with at least one individual, they may never experience feelings of "human closeness" (Greenspan, 1998, p. 51), which in turn may lead to the belief that others do not experience the same feelings as they do.

During the third level, Buds of Intentionality, from six-to-twelve-months, an infant begins to utilize expressions and gestures in order to participate in a preverbal dialogue. The infant's and their caregiver's actions are now interactive, as they take part in a "two-way exchange" (Greenspan, 1998, p. 55). Another significant development occurring at this time is the infant's ability to separate themselves from others. In addition, the infant's central nervous system begins to function on a higher level, which allows for "social cuing and response" (Greenspan, 1998, p. 58), and the ability to coordinate their muscles increases, which facilitates motor movement. Infants move to the next level when they are able to "connect their sensations and emotion to intentional action" (Greenspan, 1998, p. 60).

During the fourth level, Purpose and Interaction, from twelve-to-eighteen-months, a toddlers' social interaction increases, as they learn more gestures and to recognize the pattern of others' behaviors. They can also differentiate other people's emotions, which allow them to

figure out if their caregiver is happy or angry, or if they would be accepted or rejected. Toddlers are also learning the norms of their caregiver's culture. As the central nervous system continues to advance in complexity toddlers acquire the abilities of pattern recognition and of imitation, as well as advanced cognitive and language skills.

During the fifth level, Images, Ideas and Symbols, from two-to-three-years, children begin to understand symbolic meaning, which allows them to experience behaviors, ideas, and the knowledge that an image can represent an actual object. We can recognize when children transition to this stage when they engage in pretend play. Their play gradually begins to incorporate the basic themes of life, such as "nurturance and dependency, assertiveness and aggression, curiosity and intrigue, empathy and loving, limits and boundaries, fears and anxieties" (Greenspan, 1998, p. 82). In addition, children begin to form memories that involve images and emotions.

During the sixth and final stage, Emotional Thinking, from three-to-four-years, children begin to connect their ideas and thoughts with others. They also begin to think about their experiences and "consider actions before carrying them out" (Greenspan, 1998, p. 85). They also become more elaborate in real-life and pretend-play situations. Moreover, children's sense of reality becomes more defined, as children understand that people exist both in real life and as an internal representation.

Developmental Delays

There are several circumstances that can cause children to experience developmental delays or disabilities. Boyle and Cordero (2005) defined a disability as, "an activity limitation associated with a long-term physical, sensory or cognitive impairment" (p. 1885). Risk factors that can cause developmental delays; are children born prematurely, with low birth weight, with

positive toxicology, genetic disorders such as Down Syndrome, or who experience a lack of environmental stimulation.

Tervo reported that the three most common developmental disabilities are mental retardation, cerebral palsy, and communication disorders. The study also reported that two-to-three children out of a hundred will have a mental handicap, and that eleven percent of toddlers will have a speech and language impairment (Tervo, 2006). Edwards and Sarwark reported that twelve-to-sixteen percent of American children will have a motor delay (Edwards & Sarwark, 2005).

Each year the percentage of infants born prematurely has increased significantly, and reports show that the reason is unclear. In September 2005, the March of Dimes reported that in a single year, nearly half-a-million infants were born prematurely. Infants are considered premature when they are born before completing a 37-week gestational period. When infants are born prematurely, they face a higher risk of death and disability. Furthermore, premature birth is known to be the number-one killer of newborns. Infants who survive premature birth may face detrimental consequences, such as learning disabilities, mental retardation, cerebral palsy, and blindness. Due to advancements made in neonatal and maternal health, the infant mortality rate decreased between 1980 to 2000 which increased the likelihood of premature infants surviving after their birth.

In addition, premature birth also puts infants at risk of a low birth weight. Infants born with a birth weight of less than 1,500 grams (3.3 pounds) are considered to have a very low birth weight; infants born with less than 2,500 grams (5.5 pounds) are considered to have a low birth weight; and above 2,500 grams is considered normal. In regard to gestational periods, infants born at less than 32 weeks are classified as very preterm, at less than 37 weeks as preterm, and at

37 weeks or later as term (Reichman, 2005). Infants born with very low birth weight who are also preterm are thirty percent more likely to develop cerebral palsy.

According to Reichman (2005), infants born with a very low birth weight are more at risk of disabilities than infants who are born heavier. Since these infants face a higher risk of disabilities, this in turn can impair their performance in school. Furthermore, many of these infants may later be diagnosed as having learning disabilities. Premature infants were found to have more difficulties in reading, spelling and math. They also face the likelihood of having language difficulties. Moreover, these children may display behavioral concerns, such as aggression, hyperactivity, and inattention (Reichman, 2005). Huber, Holditch-Davis, and Brandon (1993), reported that infants born prematurely are at an increased risk for motor problems, cognitive delays and poor behavioral adjustments (Huber, Holditch-Davis, & Brandon, 1993).

The American Academy of Pediatrics(2000), suggests that by the end of their second year, children should use two-to four-word sentences, recognize names of familiar people, objects and body parts, and follow simple instructions (American Academy of Pediatrics, 2000). Raymond reported that there are several reasons why children experience speech and language delays. Hearing loss caused by frequent ear infections, cognitive delays, autism, and being in a poorly language-enriched environment are a few reasons. Children with cognitive disabilities such as mental retardation acquire language in the same pattern as a typical child, but at a slower pace (Tervo, 2006). Children with autism exhibit significant delays in their ability to communicate and socialize with others. Research has also shown that children from disadvantaged environments are more likely to experience health and developmental problems compared with children raised in more advantaged environments.

Tervo (2000) also found that between six to eighteen months of age, referrals for motor delays are more common (Tervo, 2006). Edwards and Sarwark reported that it is crucial to refer and evaluate children at the earliest possible signs of a developmental delay, so they can benefit from therapeutic intervention (Edwards & Sarwark, 2005). The American Academy of Pediatrics (2000) suggested that by the end of their second year, children should walk alone, begin to run, walk up and down stairs with support, and climb onto and down from furniture (American Academy of Pediatrics, 2000). Children diagnosed with cerebral palsy, ataxia, hypotonic or spina bifida may not reach these milestones age-appropriately.

Cerebral palsy is a “delay caused by abnormal tone in some muscle groups and the lack of coordination between muscle groups to allow for directed movement.” Cerebral palsy was also reported as the leading cause of childhood disabilities. Ataxia is “a movement disorder that reduces motor skill activity,” and is a localized disorder of the cerebellum. Hypotonia is more common in newborns and infants. Spina bifida is a neural tube defect, which causes muscle weakness (Tervo, 2006, p. 514)

Even though communication, motor, and cognitive delays are more prominent in these children, they also experience delays in social-emotional functioning. The American Academy of Pediatrics (2000) suggested that by the end of their second year, children should enjoy the company of other children, imitate behaviors, become increasingly independent, and begin to show defiant behaviors (American Academy of Pediatrics, 2000).

In a study conducted by Crnic, Hoffman, Gaze, and Edelbrock (2004), the authors reviewed research on behavioral problems in children with developmental disabilities. They found that incidences of behavioral problems are higher in children with developmental delays. Young children were found to display many behavioral difficulties, including attention deficit

hyperactivity disorder, anxiety, oppositionality, and poor peer-relations. Risk factors for behavioral problems included cognitive delay (endogenous factors), family stress, and limited support systems (exogenous factors). When these factors are combined, children struggle to regulate their behavior and adapt to difficult events (Crnic, et al).

In a study conducted by Briggs-Gowan , Carter, Bosson-Heenan, Guyer and Horwitz, (2006) researchers looked at patterns of persistence of psychopathology in young children. In the first year, children between the ages of twelve to thirty-five months, and in the second year, children between the ages of twenty-four to forty-seven months were administered the internalizing, externalizing and dysregulation domains of the Infant-Toddler Social and Emotional Assessment (ITSEA). There were 1,280 families who participated in the first year, and 1,169 families the second year. The results of the study showed that approximately half of the participants reported as manifesting behavioral problems continued to have the same problems one year later (Briggs-Gowan, et.al,2006).

Early Intervention

In 1986 Congress established the Part C Program under IDEA. This was in recognition of “an urgent and substantial need to: enhance the development of infants and toddlers with disabilities, to minimize their potential for developmental delay, to recognize the significant brain development that occurs during the first three years of life” (Sonnier, 1991, p. 1). Other aims were to minimize the cost of special education services when these infants were ready to attend school, to increase the potential for people with disabilities to live autonomously in society, and to improve families’ abilities to meet their children’s needs. Through this program, the United States government has provided federal grants to assist states in operating early intervention programs for infants and toddlers aged birth to three. Blann(2005) describe the term

early intervention as, “special services for children birth to three years of age who have developmental delays or are at risk for delays”(p. 264).

The Early Intervention Program is offered in every state. Its main purpose is to provide various kinds of services to infants and toddlers with disabilities and their families. These services can also teach parents appropriate ways to care for their children, and to enhance and support their children’s development. The Early Intervention program provides services such as special instruction, speech/language therapy, feeding therapy, and occupational and physical therapy based on the children’s needs. Other services provided include parent training, family counseling, and play therapy. Services can be provided in the children’s homes, at their daycare facilities, or in early intervention centers. Parents play an important role in deciding which services are appropriate and where the services are to be provided. They help in deciding what goals and outcomes they would like their children to achieve throughout the program. Parents also have the right to decline any service without jeopardizing other services that may be identified as useful or important to their child.

In order for children to receive services, they must first be deemed eligible. One criterion is that children must be under the age of three years. They also must have a disability, meaning that they must have been diagnosed with a physical or mental deficit. They may also have a developmental delay, meaning they are behind age-appropriate milestones in one or more of the five developmental areas. These areas, as indicated earlier, include physical, cognitive, adaptive, social-emotional and communication development. Children can also have an environmental risk, in which their delays are due to deprivation and their social environment (Bryant & Graham, 1993).

In order for a child to be classified as having a disability or a developmental delay, they must be evaluated by a qualified clinician, using age-appropriate assessments and clinical opinions. In New York City, children qualify for services if they are found to meet the following criteria: a 12-month delay in one area; 33% delay in one area; 25% delay in two areas; a standard score of 2.0 standard deviations below the mean population; or 1.5 standard deviations below the mean in two areas.

Effects of Early Intervention

A review of the literature reveals several studies conducted to assess the effectiveness of early intervention on premature and low birth weight infants. The Infant Health and Development Program (IHDP) was one of the most extensive research projects conducted to study the effects of early intervention on low birth weight infants. In 1994, the project selected eight medical institutions in the largest cities in the United States to participate in a randomized clinical trial. The subjects included 985 infants whose birth weight was equal to or less than five pounds five ounces and born at less than 37 weeks gestation. The infants were randomly assigned, thus 1/3 of the subjects received intervention and 2/3 received medical and follow-up services only. The majority of the infants were from low socioeconomic families; 53% were African American and 10% Hispanic. During the first year, infants received weekly home visits, and in the following years they were visited twice a month. When the subjects were twelve months old, they began attending a Child Development Center where the Partners for Learning curriculum was followed. The subjects attended the center until they were thirty-six months old. Results showed that when early intervention services were provided during the first three years, heavier low birth weight premature infants achieved higher IQ scores than lighter low birth

weight premature infants. Three years later, IHDP re-evaluated the children at the age of eight. They found that the entire cohort obtained similar scores on outcome measures (Farran, 2000).

In 2003 researchers studied the effects of high participation in an Early Intervention program. Based on previous research that showed that the effects of early intervention diminished by the time the children were in elementary school, the goal of this study was to determine if children who attended their center-based programs most frequently, became more developmental advanced than those with less frequent attendance. The study examined 1082 infants who were born at least three weeks premature and did not exhibit any significant health concerns. Infants were randomly assigned to groups and divided into lighter birth weights (>2,000grams) and heavier birth weights (2,001-2,500grams). Researchers used standardized cognitive measures such as the Stanford-Binet Intelligence Scales, the Wechsler Preschool and Primary Scales of Intelligence-Revised, the Wechsler Intelligence Scales for Children, the Woodcock-Johnson Psycho-Educational Battery, and the Child Behavior Check list. Children attended an early intervention center-based program and were grouped according to their attendance. The low- frequency group attended 100-300 days, and the high-frequency group attended more than 350 days. The results of the study indicated that the children who attended more days at the early intervention center had “larger and longer-lasting effects than lower levels of participation” (Hill, Brooks-Gunn, & Waldfogel, 2003)

Brooks-Gunn, Kato Klebanov, Liaw, and Spiker (1993) also used data from the IHDP program to study the effects of cognitive and behavioral changes over the first three years. The participants were 985 infants, who were randomly placed in intervention and follow-up groups. Children in the intervention group attended early intervention centers five days a week for no less than four hours a day. Participation in the program began at twelve months and continued

until thirty-six months. The Bayley Scale of Infant Development was used to assess cognitive development at twelve and twenty-four months. The Stanford-Binet Intelligence Scale, Third Edition was used at thirty-six months. Children's behavior was assessed using the Behavior Check list (BCL) during twenty-four and thirty-six months visits. Results of the study showed that early intervention services benefited participants more during the second and third years than during their first in terms of their cognitive development. In terms of participants' behavior, there was a significant decrease in reported problem behaviors in both groups from twenty-four to thirty-six months (Brooks-Gunn, Kato Klebanov, Liaw, & Spiker, 1993).

Five Domains

Early Intervention center-based programs are designed to enhance all five domains of a child's development. Attending highly structured therapeutic programs in which children engage in various age-appropriate activities during a two-hour period has shown professionals and parents that children can make significant progress in their development. Special Education teachers, speech therapists, occupational therapists, physical therapists, psychologists, and social workers collaborate as a multidisciplinary team so that children can achieve goals that have been identified and stated on their Individualized Family Service Plan (IFSP). As previously stated, the goal of early intervention is to reduce the need for special education services in the future.

Research has shown that academic success is not based only on cognitive functioning. Appropriate social-emotional development is an important factor in how successful children will be in their later school years (Harvard Family Research Project, 2006). Exposure to other children in daycare settings, at babysitters, and in center-based programs can promote socialization and enhance social-emotional development. Speech and language acquisition can also be improved through classroom activities such as repetition, imitation, and the use of

descriptive language. Daily living skills such as feeding, dressing, and toilet training also improve when children are provided with adaptive tools. Gross and fine motor skills such as running, stair climbing, using a spoon, zipping up a jacket, etc., can also be developed through modeling and exercises intended to normalize muscle strength and tone.

Center-based programs provide children with developmental delays an opportunity to learn. Dombro, Colker, and Dodge (1997) emphasized that when children are provided with an environment which allows them to follow their own interests, not only do they learn from their experience, but their chances for learning throughout their lives are increased (Dombro, Colker, & Dodge, 1997).

Operational Definitions

Expressive Language Disorder:

Kaplan, Sadock and Grebb (1994) defined an expressive language disorder as, “the child is below the expected ability in vocabulary, the use of correct tenses, the production of complex sentences, and the recall of words.” (p.1088). This can occur anytime during childhood, and may be developmental or appear without any apparent cause. In order for a child to meet the criteria for an expressive language disorder, they must achieve below-average scores on a standardized test that is intended to measure expressive language. Boys are more likely than girls to have this disorder, and children whose family history includes communication disorders are at greater risk. There is no known cause of the development of expressive language disorders, which leads to the belief that genetic factors play a major role.

Kaplan et al. (1994) also stated that “Severe forms of the disorder are evident before the age of 3 years” (p.1089). The disorder is more evident when a child does not mimic single words, make sounds, or spontaneously utterances by 18 months. A child with this disorder does

not even say such common words as “mama” and “dada.” The child’s receptive skills are usually intact, as the child maintains appropriate eye contact and interacts well with familiar people.

Children with expressive language disorders continue to have difficulties communicating as they get older. When they are four years old, they usually communicate using short phrases, and sometimes forget words already known when they learn new ones. Children with this disorder may also exhibit behavioral challenges such as temper tantrums, short attention span, and hyperactivity. It is recommended that speech and language therapy begin soon after a diagnosis is made.

Mixed Receptive/Expressive Language Disorder:

Kaplan et al. (1994) defined mixed receptive/expressive language disorder as, “the child is impaired in both the understanding and expression of language” (p.1090). Similarly to expressive language disorder, the mixed disorder requires below-average scores on standardized tests and must be severe enough to impair academic achievement or daily social communication. The cause of this disorder is unknown, and again is more common in boys than in girls.

The disorder becomes evident when children between the ages of 18 to 24 months fail to imitate language and spontaneously use single words. These children may also have auditory sensory difficulties, which suggests that they are unable to process visual symbols such as pictures. They are also unable to point to common objects or to follow simple directives.

Developmental Coordination Disorder (Gross/Fine Motor Delay):

Kaplan et al, (1994) defined developmental coordination disorder as “characterized by markedly lower than expected performance in activities requiring motor coordination.” (p.1050) Children with this disorder may experience a delay in achieving developmental milestones such as sitting up, crawling, and walking. They exhibit difficulties in their gross and fine motor skills,

which can interfere with their functioning in daily life or school performance. More boys present with developmental coordination disorder than girls, and about six percent of school-age children have the disorder.

In order to make the diagnosis of developmental coordination disorder, a history of the child's developmental milestones and direct observations of the child's motor abilities are required. Also, scores that are below-average on standardized subtests can help to support the diagnosis. Signs of the disorder can be identified as early as infancy, since children will not achieve milestones such as rolling/turning, sitting up, and crawling.

Infant and Child Learning Center

There are hundreds of Early Intervention programs across New York State. This study will focus on one particular program, the Infant and Child Learning Center (ICLC). ICLC is located in SUNY Downstate Medical Center and Kings County Hospital Center in Brooklyn, New York. ICLC's unique location allows the program to service children with different medical conditions. Early Intervention and Preschool Special Education services are provided to children born prematurely, with neurological impairment, congenital anomalies, orthopedic impairment, or HIV infection. ICLC offers services that are home-based, center-based, and hospital-based, which includes services in the Neonatal and Pediatric Intensive Care Units at both hospitals. ICLC serves families from various cultures and ethnic backgrounds, the majority are African-American from low to middle socioeconomic backgrounds.

ICLC is an innovative program, integrating inpatient hospital services with a community-based early intervention program for medically involved and handicapped children and their families. ICLC was founded in 1987 by Joan Hittelman, Ph.D. and Aruna Parekh, M.D. to provide services to children who had difficulty finding necessary assistance from by other

organizations. At the time, the growing number of HIV-infected children made the need for special services especially urgent. ICLC was one of the first schools in New York State to offer services to medically involved children who spent so much time in the hospital that they could not be adequately cared for by existing programs. A team of master's level school psychologists, speech therapists, occupational therapists, physical therapists, service coordinators and registered nurses provided services to children at the two hospitals, which are located directly across the street from each other.

ICLC's assessment and evaluation unit offers neurodevelopmental evaluations, diagnosis, and referrals for children. Parents and caregivers are provided with the information and support needed to help advocate for appropriate services for their children. This program evaluates approximately 500 infants, 200 preschool children and 400 school-aged children each year.

The hospital-based program works with children at their bedsides in the neonatal and pediatric intensive care units of Downstate Hospital, Kings County Medical Center, and Long Island College Hospital. Therapists from ICLC's staff monitor the progress of children discharged from these units in their High Risk clinics. ICLC's team works closely with hospital staff to ensure patient care and family support. The hospital program provides service to approximately 80 infants during the course of a year.

The home-based program provides special instruction and therapy to infants and children to enhance their development. This program is designed to meet the needs of parents who want to receive services for their children at home and in daycare. Parents are encouraged to become active participants in their children's treatment. This program provides services to approximately 450 children and their families in their community each year.

The center-based program provides parent-child and toddler groups for children with developmental and therapeutic needs. The center provides opportunities to enhance each child's social and cognitive skills in an enriched learning environment. Each child receives an individualized educational and therapeutic program, as well as exposure to arts, crafts, and music. ICLC integrates early intervention and special education into a general education/daycare setting. This program provides services to 100 infants and 25 preschool children each year.

The majority of the children referred for evaluations and services are referred by pediatricians in the hospitals or by parents who are concerned about their child's development. Most referrals are based on concerns regarding a child's speech and language acquisition. In some cases, assessment results may indicate a delay in other areas, such as cognition or physical development. It is also common to have assessment results reveal symptoms of pervasive developmental disorders.

The Pre-Intervention Assessment Phase:

During the pre-intervention stage, a referral is made by a referral source, which is usually a parent or a doctor. The referral is usually made based on a concern that a child may have a developmental delay or a disability. Once the referral is submitted to the early intervention program, an initial service coordinator is assigned to the family. When an initial service coordinator at the Infant and Child Learning Center receives a referral, they give the family a choice as to where they would like to have their first meeting. A family can choose to come into the agency's clinic, which is located in Downstate Hospital, or they can choose to have the service coordinator come to their home. During the first meeting, the initial service coordinator provides the family with information about the early intervention program, which includes paperwork outlining the family's rights. Health insurance information is obtained, along with a

brief family history. If the family decides to have their child evaluated, the initial service coordinator has the parent sign a consent form, so that the evaluation can be scheduled at the agency's clinic. However, if the family would prefer their child's evaluation to be conducted at a different agency, the initial service coordinator will contact the agency and schedule the evaluation.

When the family attends the evaluation, they are met by their service coordinator, a social worker and a school psychologist. Once the parent consents to have their child evaluated, the school psychologist conducts an overall assessment, which determines whether the child displays a delay in one of the five developmental domains. The assessment includes a standardized test (Bayley Scale of Infant Development) and the Vineland. If the school psychologist determines that there is a delay in the child's speech and language development, a speech and language pathologist is available to further assess the concern, and determine if the delay warrants therapeutic intervention. If the speech pathologist concludes that there is a delay, then the service coordinator schedules an audiological appointment to determine whether the child's hearing is adequate. In addition, a physical therapist can determine if there is a gross motor delay, and an occupational therapist can determine whether fine motor or sensory integration delays are apparent. Also during the evaluation process, the family meets with an early intervention social worker, who conducts a parent interview or a family assessment. The purpose of this assessment is to determine if the family is in need of any other services, such as housing, food stamps, or immigration services. The social worker can connect the family and their service coordinator with agencies that can further assist the family with meeting their needs.

After the evaluation is completed, the initial service coordinator reviews the evaluations with the family, and prepares them for their child's IFSP (Individualized Family Service Plan)

meeting. At the IFSP meeting, the family, service coordinator, an evaluation representative from ICLC and an early intervention official meet to discuss the child's strengths and weaknesses, and to determine the appropriate services to assist the child in meeting their full potential. In addition, the family provides a list of realistic goals or desired outcomes that they would like their child to achieve within a six-month period. Once the plan is developed, the family chooses an ongoing service coordinator who will monitor the case and ensure that the child receives the services as per their IFSP. Some of the services that the early intervention program provides may include: special instruction, speech, physical, occupational, and vision therapy, nursing and nutrition services, assistive technology devices, family training and counseling, and parent support groups. Therapy services can be provided in a family's home or in a center-based program.

Intervention Phase

When a child attends ICLC's center-based program, their overall development is addressed throughout a two-hour period. A special education teacher and a teacher's assistant work together on improving cognitive skills by introducing tasks that involve problem solving, matching, object identification, cause and effect, and identification of primary colors and shapes. Some of the toys used are puzzles, shape sorters, pop-up toys, musical toys, nesting cups, and ring stackers. Children learn awareness of classroom routines through a highly structured environment, to which they are exposed several days during the week. Routines begin as soon as children leave the school bus. Children learn to identify themselves through photographs, as they are prompted to find their pictures on the cubbies where they hang up their book bags and coats. Next, children are instructed to form a line to wash and dry their hands. As they enter the classroom, they are exposed to several age-appropriate toys, which challenge their cognitive

abilities. During this period of time, children engage in independent play activities while teachers provide support, explanations and assistance as needed.

In the classroom, delays in children's self-help skills are addressed during several different activities. During meal time, children are encouraged to use a spoon to feed themselves, and to drink from a cup. After play activities, children are instructed to clean up and put toys back in their appropriate places. Children are also taken to the bathroom, and encouraged to indicate if they want to use the toilet, or whether their diapers need to be changed.

Children are provided with many opportunities to socialize with their peers and adults during the time they spend in the center. During circle time, children may be asked to pass a toy to their peers, or during play activities, encouraged to socialize by taking turns and sharing toys. During music activities, children dance together and cooperate with one another while playing instruments.

Professionals constantly engage children in conversations in an attempt to elicit speech development. During circle time activities, teachers sing songs, ask students questions and encourage speech through imitation and repetition. Children with significant speech delays also work with speech therapists individually or in their classroom. Through play activities, children are encouraged to use words to describe what they are doing. When they are looking through books or being read a story, they are prompted to identify and name familiar pictures.

In term of gross motor skills, the Hawaii Early Learning Profile (HELP)(1994) checklist lists age-appropriate milestones as, "jumps from bottom step, walks on tip-toes a few steps, jumps backward, hops on one foot, climbs jungle gyms and ladders, catches eight inch ball, avoids obstacles in path and runs on toes." In terms of their fine motor skills, children are expected to, "imitate circular scribble, build a tower with several cubes, hold a crayon with

thumb and fingers, string three one-inch beads, snip with scissors, putting objects into small container, copies a circle and place six square pegs in a pegboard” (HELP, 1994, p.5).

Each day, students spend thirty minutes in the gym, where they have the opportunity to ride on tricycles or scooters. There are stairs they can go up and down, a slide, and swings. There are also large and small balls, and mats they can roll around on. In the classroom, fine motor skills are developed by enhancing cutting, pulling, pushing, tearing, and using a mature grasp. Teachers allow children to use crayons, markers, scissors, pop-beads, pegboards, puzzles and other age-appropriate toys to develop appropriate fine motor skills. Physical and occupational therapists assist children in developing muscle strength and normalizing their muscle tone, so that they can achieve the above goals.

In addition, twice each week students have the opportunity to participate in music therapy. Music therapy is a clinical and evidenced-based intervention, which stimulates all of the senses. It also can encourage socialization, self-expression, communication, and motor development. A music therapist involves the students in singing, listening, moving, and playing instruments in their classroom.

Post Assessment Intervention Phase

As previously stated, the early intervention program services children from the ages of birth to three years. Prior to a child turning three, the family’s ongoing service coordinator schedules an evaluation to determine whether the child will need continued therapeutic services, or if their overall development is within normal limits. If the family chooses to have their child evaluated again, they have to sign consent. The ongoing service coordinator schedules an appointment for the child to be assessed in the agency’s clinic. A school psychologist conducts the evaluation, which includes a standardized cognitive assessment and the Vineland, which is

used to determine appropriate adaptive functioning. Additional evaluations, such as a speech, physical, and occupational therapy assessments can be conducted if warranted. Once the evaluations are completed, they are submitted to the Committee on Preschool Special Education, which services children from the ages of three through twenty-one.

Hawaii Early Learning Profile Checklist

According to the HELP, which is a curriculum-based assessment system for children ages birth to three years, children's cognitive, language, gross motor, fine motor, social, and self-help skills can be measured to determine if they are developing normally. The remaining portion of this section will focus on these areas of development (Hawaii Early Learning Profile [HELP], 1994).

Based on the HELP checklist, children between the ages of two and three years should be able to complete a variety of activities, depending on whether or not their cognitive development is age-appropriate. Some of the activities that children learn at this age level include the ability to: demonstrate awareness of class routines, understand the concept of one, demonstrate the use of objects, find details in a picture book, engage in simple make-believe activities, know several body parts, match shapes, know their own sex, listen to stories, complete three or four-piece puzzles, and look at books independently.

At ICLC a special education teacher and a teacher's assistant work on improving cognitive skills by introducing tasks that involve problem solving, matching, object identification, cause and effect, and identification of primary colors and shapes. Some of the toys used are puzzles, shape sorters, pop-up toys, musical toys, nesting cups, and ring stackers.

Children learn awareness of classroom routines through the highly structured environment, which they are exposed to several days during the week. Routines begin as soon as

children leave the school bus. Children learn how to identify themselves in a photograph as they are prompted to find their pictures on the cubbies where they hang up their book bags and coats. Next, children are instructed to form a line to wash and dry their hands. As they enter the classroom, there are several age-appropriate toys set up which challenge their cognitive abilities. During this period of time, children engage in independent play activities while teachers provide support, explanation, and assistance as needed. In accordance with Piaget's preoperational stage of development, children begin to develop pretend-play with toys such as kitchen sets, food, pots, utensils, plates, and cups. They also are encouraged to utilize medical sets, fire trucks, houses, people, and school buses.

According to the Vineland, children's daily living skills (self-help) are adequate after acquiring numerous personal, domestic, and community skills. Children between the ages of two and three years can: feed themselves with a spoon; demonstrate interest in changing clothes when very wet or muddy; use the toilet or potty-chair; bathe with assistance; ask to use toilet; put on "pull-up" garments with elastic waistbands; demonstrate understanding of the function of money; put possessions away when asked (Sparrow, Balla, & Cicchetti, 1984).

The HELP Checklist also identifies self-help skills that determine whether children are functioning within normal limits. Some examples that the assessment lists are: helps put things away; pulls pants down with assistance; unbuttons large buttons; washes and dries hands; insists on doing things independently; knows proper place for their own things; uses fork, napkin, and pours liquid from a small container (HELP, 1994).

In the classroom, delays in children's self-help skills are addressed during several different activities. During meal time, children are encouraged to use a spoon and to drink from a cup. After play activities, children are instructed to clean up and put toys in their appropriate

places. Children are also taken to the bathroom and encouraged to say if they want to use the toilet or if their diapers need to be changed.

According to the Vineland, children between the ages of two and three develop interpersonal relationships and engage in play and leisure time activities to comprise the socialization domain. During this period of time, children laugh or smile appropriately in response to positive statements; addresses at least two familiar people by name; shows desire to please caregivers; participate in at least one game or activity with others; imitates a relatively complex task several hours after it was performed by another; imitates adults' phrases heard on previous occasions; engages in elaborate make-believe activities alone or with others; and shows a preference for some friends over others (Sparrow et al., 1984).

Based on the HELP checklist, children should be able to enjoy a wide range of relationships, tend to be physically aggressive, dramatizes using a doll, and initiates their own play, but requires supervision to carry out ideas, values their own property, uses word "mine," separates easily in familiar surroundings, begins to obey and respect simple rules, participates in circle games, and plays interactive games (HELP, 1994).

Children are provided with many opportunities to socialize with their peers and adults during the time they spend at the center. During circle time, children may be asked to pass a toy to a peer, or during play activities may be shown how to take turns and share toys. During music activities, children dance together and cooperate while playing instruments.

According to the Vineland, children between the ages of two and three should say at least fifty recognizable words. They should spontaneously relate experiences in simple terms, deliver a simple message, use sentences of four or more words, and point accurately to all body parts when asked. As they approach the age of three, children should say at least one hundred words,

speak in full sentences, use “a” and “the” in sentences, follow direction in “if-then” form, state their own first and last name when asked, and ask questions beginning with “what, where, who, why and when” (Sparrow et al., 1984).

The HELP checklist identifies similar outcomes for children between the ages of two and three. For example, children should use two-word sentences, relate experiences using unintelligible speech and clear words, name three pictures, imitate four-word phrases, sing parts of songs, answer questions, vocalize for all needs, give their full name on request, relate experiences more frequently using short sentences, and ask questions beginning with “what, where, when” (HELP, 1994)

Professionals constantly engage children in conversations in an attempt to elicit speech development. During circle time activities, teachers sing songs, ask students questions, and encourage speech through imitation and repetition. Children with significant speech delays are also work with speech therapists individually or in the classroom. Through play activities, children are encouraged to use words to describe what they are doing. When they are looking through books or being read a story, they are prompted to identify and name familiar pictures.

The Vineland identifies several gross and fine motor milestones that children achieve between the ages of two and three. For example, children should walk up and down stairs, putting both feet on each step. They should run smoothly, with changes in speed and direction, open doors by turning then pulling doorknobs, jump over small objects, screw and unscrew lids of jars, pedal a tricycle, hop on one foot at least once while holding on to a stable object, build three-dimensional structures with at least five blocks, and open and close a scissors with one hand (Sparrow et al., 1984).

In term of gross motor skills, the HELP checklist identifies milestones as jumps from bottom step, walks on tip-toes a few steps, jumps backward, hops on one foot, climbs jungle gyms and ladders, catches an eight-inch ball, avoids obstacles in their path, and runs on toes. In terms of their fine motor skills, children should imitate circular scribble, build a tower with several cubes, hold a crayon with thumb and fingers, string three one-inch beads, snip with scissors, put tiny objects into a small container, copy a circle, and place six square pegs in a pegboard (HELP, 1994).

Each day, students spend thirty minutes in the gym, where they have the opportunity to ride on tricycles or scooters. There are stairs they can go up and down, a slide, and swings. There are also large and small balls, and mats to roll on. In the classroom, fine motor skills are developed to enhance cutting, pulling, pushing, tearing, and using a mature grasp. Teachers encourage children to use crayons, markers, scissors, pop-beads, pegboards, puzzles, and other age-appropriate toys to develop appropriate fine motor skills. Physical and occupational therapists assist children in developing muscle strength and normalizing muscle tone, so that they can achieve those goals.

Vineland Adaptive Behavior Scales

Sparrow, et.al. (1984) defined adaptive behavior as, “the performance of the daily activities required for personal and social sufficiency” (p. 6). The authors also pointed out that there are three components of this definition. First, they noted that adaptive behavior is age-related. Adaptive behavior usually evolves and becomes more complex as a child grows older and becomes independent in essential activities, such as dressing and interacting with their peers. The next component is that adaptive functioning is characterized by the expectations of the child’s caregiver. The child’s caregiver is the most appropriate person to evaluate the child’s

adaptive functioning, since they live with and interact with the child on a daily basis. The caregivers base their judgments on their own values and principles. Finally, the authors stated that adaptive functioning looks at a child's typical performance, not their ability. The rationale for this distinction is that if a child has the ability to perform a task but rarely does, they are lacking in that particular area.

The Vineland Adaptive Behavior Scale is a tool commonly used to assess adaptive functioning of individuals from birth to adulthood. The Vineland is frequently used to assist in the diagnoses of mental retardation and to determine the extent of developmental disabilities in young children. The scale is divided into four domains: Communication, Daily Living Skills, Socialization and Motor Skills. There is also an optional Maladaptive Behavior domain, which assesses unfavorable behaviors. The main purpose of the Vineland is to assess an individual's personal and social sufficiency, which is based on the responses elicited from a person familiar with the individual's behavior.

The Vineland has three versions, the Interview Edition, Survey Form and the Classroom Edition. The Survey Form is typically used when evaluating children from birth to three. The child's caregiver participates in a semi-structured interview lasting from 20 to 60 minutes. There are 297 items in the Survey Form, which assists in determining an individual's strengths and weaknesses. The Survey Form was standardized using 4,800 handicapped and nonhandicapped individuals across the nation. The authors used the U.S. Census in 1980 in order to obtain a sample representation of the United States population.

The first domain in the Vineland is Communication, which is divided into three subdomains: receptive, expressive, and written. The receptive subdomain assists in determining what a child understands. The expressive subdomain assists in determining what a child can say,

and the written subdomain identifies what a child can read and write. The next domain is Daily Living Skills, is also divided into three subdomains. The Personal subdomain looks at how a child eats, dresses, and practices personal hygiene. The Domestic subdomain observes what household tasks the child performs. The Community subdomain examines how a child uses the telephone and other community skills. The next domain is the Socialization Domain, again divided into three subdomains. The Interpersonal Relationships subdomain assesses how a child interacts with others. The Play and Leisure Time subdomain assesses how the child plays and uses leisure time. The Coping Skills subdomain observes how a child demonstrates responsibility and sensitivity to others. Lastly, the Motor Skills domain has two subdomains. The Gross Motor subdomain evaluates how the child uses their arms and legs for movement and coordination. The Fine Motor Skills subdomain assesses how a child uses their hands and fingers to manipulate objects.

In 1935, Edgar A. Doll developed the Vineland Social Maturity Scale as a tool to evaluate intellectually disabled individuals. Doll believed that the importance of evaluating intellectually disabled individuals was to gain a sense of their capacity for taking care of themselves. The Vineland provided the interviewer with several outcomes. For example, standard scores, percentile ranks, adaptive levels, and age equivalents can all be determined. Age equivalents and adaptive levels can also be found for each subdomain. The standard scores use a mean of 100 and a standard deviation of 15.

A review of the literature revealed that even though many studies used the Vineland to assess children with autism, medical conditions, and other disorders, few studies focused on children younger than three years with developmental disabilities. In 2005, Bildt, Kraijer, Sytema, & Minderaa, studied the psychometric properties of the Vineland. More specifically,

researchers investigated the reliability and validity of the Vineland, and whether the original population of typically developing children could be replicated with a population of children with mental retardation. The participants included eight hundred and twenty-six children and adolescents, ranging in age from four to eighteen. All participants were suspected to be mentally retarded. The results of the study indicated that there were high correlations between each domain and the total score of the Vineland, which suggested that the domains were not separate from each other. Overall, authors found that the reliability and validity of the Vineland to be good in the total population assessed.

Parent Perceptions

Many studies have emphasized the need for early detection of developmental problems to decrease the risk of future academic and behavioral problems. Since the law encourages parent participation in the decisions made regarding their children's educational needs, it is essential to investigate how parents feel about their children's development. Traditionally, parents have viewed their children's abilities to be higher than measured by evaluators during assessments (Sexton and Thompson, 1990). More recently, studies have shown positive and strong relationships between parental opinions and professional judgments (Hundert, Morrison, Mahaney, Mundy, & Vernon, 1997).

In 2005, Tervo conducted a study with one hundred and eighty parents of children ages sixteen to seventy months. The purpose of the study was to describe parental reports and determine if the reports could predict developmental delays. The Child Development Inventory (CDI) was given to parents to complete in order to assess their children's development over nine scales, namely social, self-help, gross motor, fine motor, expressive language, language comprehension, letters, numbers and general development. Parents also completed the Child

Behavior Checklist (CBCL), which allowed parents to rate the concerns that they have regarding their children. Results of the study concluded that parental reports about their children's development indicated justifiable difficulties. Parents reported concerns in the areas of speech and language, attention problems, gross motor difficulties, and self-help skills.

In 1995, Glascoe and Dworkin examined the role that parents play in detecting developmental and behavioral problems. In a review of seventy-eight research articles, researchers found that there are many ways of collecting information from parents. One of the most efficient techniques for pediatricians is to listen to parent's concerns and to utilize a standardized parent report measure. They found that pediatricians can better identify children with developmental or behavioral problems by asking parents about any concerns they may have. Also, the use of a parent report allows pediatricians to assess the child's development over various domains.

In a similar article, Williams and Holmes (2004) reviewed literature to determine why children with mild delays were not identified during doctor visits. Pediatricians may not address parents' concerns if they believe the delay is mild and will eventually correct itself. When children with mild delays attend school, they may experience learning disabilities, behavioral challenges, motor delays, and poor social relations. The authors also discussed the use of parent reports to assist pediatricians or other health care providers in identifying delays. According to the authors, "Early identification allows intervention strategies to be commenced before serious long-term difficulties have time to develop" (p. 38)

In a more recent study, Befkoff, Leslie, and Stahmer (2006) were interested in the accuracy of caregivers' identification of developmental delays in young children involved with child welfare services. The authors found that even though caseworkers, primary care clinicians,

or caregivers can identify a developmental delay, it is unclear who is responsible to report the findings. The authors used data from the National Survey of Child and Adolescent Well-Being. They used 2,189 subjects, aged birth to fourteen years, who experienced child abuse or neglect in thirty-six states. Fifty-three percent of the sample was birth to two years old. The results indicated that forty-five percent of the children in the study experienced a delay in either language, cognitive, adaptive, or behavior. Befkoff et.al. suggested that caregivers can provide an accurate account of children's delays.

Sexon and Thompson (1990) conducted a study that viewed fifty-three children and compared maternal opinions about their development with professional estimates. Participants were enrolled in early intervention programs and ranged in age from twenty-three to sixty-six months. The authors used the Battelle Developmental Inventory to assess the five developmental domains, and the Developmental Profile-II was administered to each mother in the study. The results suggested that there are, "large correlations between parents' developmental estimates and those derived from direct testing"(p.85).

In summary, children born with developmental disabilities benefited from receiving appropriate interventions in order to enhance their overall development. The law has allowed for states to provide early intervention services to eligible children under the age of three. Children who attend center-based programs have the opportunity to improve their adaptive functioning through socialization with peers, exposure to cognitive, language, fine and gross motor activities. The Vineland is a measure that assesses adaptive functioning based on parental reports. It is important to consider parents' thoughts about their children's development when determining if therapeutic intervention is warranted. Parents and caregivers spend the most time with their children, and therefore are more familiar with their daily functioning. This study will provide

information on how parents view their children's overall development before and after they have attended a center-based early intervention program. It will also provide some insight about which areas show greater improvement than others.

Chapter III

METHODOLOGY

This chapter will present the methodology of the study. It is divided into seven sections: participants and setting, overview of the research design, measures, procedures, plan for data analysis, anticipated outcomes, and limitations.

Participants and Setting

The present study utilized archival data from a random sample of children (N=75), who were enrolled in a center-based program at the Infant and Child Learning Center (ICLC), located in the State University of New York Downstate Medical Center and Kings County Hospital Center in Brooklyn, New York. ICLC offers center, home, and hospital-based services and serves a racially/ethnically, culturally, and socioeconomically diverse population.

Brief Description of Intervention Program:

The ICLC center-based early intervention program is designed to enhance five domains of a child's development, which are the cognitive, communication, daily living, socialization, and motor skills. The goal of the program is to reduce the need for special education services in the future. Services are provided to families who have children born prematurely, with neurological impairment, congenital anomalies, orthopedic impairments, and HIV infection. Specifically based on the children's needs, services may include special instruction, speech/language therapy, feeding therapy, occupational and physical therapy, social work, and

family training. The ICLC program provides services to approximately 70 infants and 25 preschool children each year.

Parents are an integral part of the program. They are taught appropriate methods of caring for their children so they can enhance and support their children's development. They are also an integral part of the multidisciplinary team in setting developmental goals and objectives that they would like to see their children achieve while receiving services. In addition, they participate in family training sessions with their children's therapist, where they learn how to incorporate therapeutic activities into their children's daily routines.

The multidisciplinary team included masters'-level special educational teachers, speech therapists, occupational therapists, physical therapists, psychologists, as well as social workers and registered nurses. They work collaboratively to provide opportunities to enhance the children's social and cognitive skills and to facilitate achievement of the developmental goals and objectives stated in their individualized family service plans (IFSP). They create an enriched learning environment supported by a structured therapeutic program in which children engage in various age-appropriate activities over a two-hour period. They receive an individualized educational and therapeutic program, as well as arts and crafts and music that are centered on skills development in the stated domain areas. Children are eligible to receive services until their third birthday. Table 1 presents an overview of the ICLC center-based early intervention program.

Table 1.

Overview of ICLC Center-based Early Intervention Program

Content Area	Operationalized
Communication	Speech and language skills developed through classroom activities, repetition, imitation and use of descriptive language.
Daily living skills	Encourage independent activities, i.e. feeding, dressing, and toilet training when provided with adaptive tools.
Motor skills	Develop muscle strength and tone through therapeutic exercises and modeling. Also physical activities such as running, jumping, and stair climbing.
Socialization	Exposure to other children in center-based program to enhance social skills and socio-emotional development; engage in independent play activities, group activities, and cooperation through creative arts.

Study Participants:

Data was collected between July 2001 and June 2002. All participants were initially evaluated by either a school psychologist or a special education teacher, and were determined to have a developmental delay.

Participant data will not be excluded based on race, gender or disability. The only exclusion criterion for this study related to children whose attendance at the center-based program were three days or less, since they would not have benefited from the intervention.

Overview of Research Design

The present study proposed that based on parent perceptions, the center-based early intervention program described above would improve the developmental status of the children

enrolled. To determine this effect, a one-group pre-test-post-test research design was used to answer the following research questions:

- 1) Do parent perceptions of their child's development reflect growth in the four domains of the Vineland from the beginning of the program to the end of the program?
- 2) Do parent perceptions of their child's development reflect growth in the various subdomains of the Vineland from the beginning of the program to the end of the program?
- 3) Do parent perceptions of their child's development vary based on the child's gender?
- 4) Do parent perceptions of their child's development vary based on the child's disability classification?

All data obtained for this study was retrieved from archived structured recorded interviews. Demographic characteristics were recorded at the time of entrance into the program, and include information on: race, gender, type of medical insurance, age before and after the intervention, as well as length of time in the program. The reason for referral to the program was recorded as a speech, physical, or overall developmental delay, or premature birth. In addition, data was obtained regarding pregnancy-related characteristics, such as type of pregnancy, gestational age, birth weight, and exposure to drugs in utero.

Measures

Vineland Adaptive Behavior Scale: Interview Edition Survey Form (Vineland Scale): The Vineland Scale was used to assess adaptive behavior, and included 297 items examining several domains. About 4,800 handicapped and non-handicapped individuals were used to obtain norm-referenced information in the development of the Vineland Scale (Sparrow et al., 1984). The

Vineland Scale was used to assess children's overall functioning, and was appropriate for evaluating individuals from birth through age 18 years 11 months, as well as low-functioning adults. Due to the variability in age and functional status in the population to whom the Vineland Scale was administered, specific questions were used as appropriate for the individual.

The Vineland Scale, a behavioral checklist, indicated whether certain behaviors were present or not. Each item was scored by the interviewer based on the responses provided by the interviewee (the child's parent/guardian). All data included in this study were parental assessments of the child's ability to perform the indicated task. Raw scores were entered as follows: a score of "2" indicated that the individual can perform the activity; "1" indicated that the individual was beginning to perform the activity; and "0" indicated that the individual has never performed the activity. A score of "no opportunity" and "don't know" can also be used when appropriate.

Since the Vineland did not assess cognitive ability, this study was focused on only four of the domains, communication, daily living skills, socialization, and motor skills. Table 2 provided a description of the domains and sub-domain items.

Table 2.

Description of Vineland Scale Domain and Subdomain Items Used in the Current Study

Domain Sub-domain	Description of Assessment	# Items	Score Range
Communication		44	0-88
Receptive	Understanding of language	13	0-26
Expressive	Ability to verbally express themselves	31	0-62
Daily Living		63	0-126
Personal	Ability to complete self-help tasks: eating, dressing, practicing personal hygiene, etc	36	0-72
Domestic	Ability to assist with simple household chores, such as putting things away when asked.	10	0-20
Community	Ability to sense danger, understand the function of a telephone, money, and time.	17	0-34
Socialization		37	0-74
Interpersonal Relationships	Ability to interact with others	20	0-40
Play and Leisure Time	Ability to participate in simple games with others and engage in pretend play.	12	0-24
Coping Skills	Ability to demonstrate responsibility and sensitivity to others	5	0-10
Motor		36	0-72
Gross	Ability to use their arms and legs for movement and coordination	20	0-40
Fine	Ability to use their hands and fingers to manipulate objects	16	0-32

Procedures

Human Subjects Protection: Permission was granted by the Institutional Review Board of the State University of New York Downstate Medical Center (site of ICLC) and Philadelphia College of Osteopathic Medicine to use the archival data for this study (**Appendix**).

Participants' personal information, such as name, address, and phone number were not identified; all information was kept confidential, and charts were stored in a locked file cabinet.

Data Collection: A trained interviewer (school psychologist) conducted the interview, which took approximately 20 to 60 minutes to complete, with the participant's parent, and recorded the data on the Vineland Scale. All of the ICLC's participant records were reviewed (N=90); however, only those that contained complete Vineland Scales and whose attendance was three days or more were used (n=75). Each participants' record was reviewed to retrieve Vineland raw scores, standard scores, and adaptive levels from their initial evaluations (pre-test) and when the participants completed the early intervention program (post-test). A data collection and coding sheet were developed to simplify the collection and data entry process. (**Appendix**)

Plan for Statistical Analysis

Treatment of the Data: The data was entered and analyzed using the SPSS for Windows, Version 16.0. Data was organized into sub-domain and domain variables (see Table 2). Raw scores were entered, and a total score for each sub-domain and domain was obtained. The Vineland provided standard scores with a mean of 100 and a standard deviation of 15. These scores were obtained by dividing the national standardization sample (N=3,000) into 15 age groups of 200 children and selecting as the anchor group each age group whose mean raw score was nearest to the center of the total raw score distribution. Raw score distributions for the remaining age groups were then converted to the designated anchor age group with the standard linear transformation, and an aggregate distribution of the estimated anchor-level raw scores for all 3,000 cases was developed, resulting in the derivation of standard scores for the entire standardization sample (Sparrow et al., 1984).

Data Analysis: Descriptive statistics (means, standard deviations, and percentage) were used to describe the sample in terms of demographic characteristics, as well as raw scores, for Research Questions #1-2. Paired sample t-tests were used to assess changes in mean scores across raw scores at both time points (pre-and post-intervention). Vineland Domain raw scores were corrected for length of time in the program by transforming each raw score into a growth ratio score. Pre-and post-program VABS Domain growth ratio scores were compared using paired sample t-tests. Cohen's d was used to determine effect size. For Research Question #3, pre-and post-difference growth ratio values were used as the independent variable and compared for male and female groups for each domain using independent sample t-tests. For Research Question #4, pre-and post-difference growth ratio values of the speech and the overall developmental delay groups were used as the independent variable and tested for statistical significance for each Vineland Domain using t-test. The significance level will be set to $p=.05$.

Chapter IV

RESULTS

This chapter provides a summary of the demographic characteristics of the children in the sample, and presents the results of data analyses conducted to address the four research questions.

Description of the Sample

The sample for this study was comprised of toddlers (N=75) who were enrolled in the Infant and Child Learning Center's (ICLC) early intervention center-based program, located in the State University of New York Downstate Medical Center and Kings County Hospital Center in Brooklyn, New York. Participant demographic data was obtained from the sociodemographic portion of the data collection instrument, and included race, gender, type of medical insurance, age before and after the intervention, as well as length of time in the program. In addition, data was obtained regarding pregnancy-related characteristics such as type of pregnancy, gestational age, birth weight, and exposure to drugs in utero. The reason for referral to the program also was provided. Table 3 summarizes the demographic characteristics of the sample.

The majority of participants in the sample were African-American (n=70, f=93.3%), male (n=56, f=73.3%), and on Medicaid (n=61, f=81.3%). The children's ages ranged from 4 to 28 months prior to beginning the program, with a mean age in months of $M = 19.24$ ($SD = 5.02$). At post-intervention, the children's ages ranged from 21 to 37 months, mean age in months $M = 32.12$ ($SD = 1.99$). The mean duration for enrollment in the program in months was $M = 11.83$ ($SD = 2.65$) and ranged from 7 to 18 months.

Table 3.

Sociodemographic Characteristics of Sample

Demographics	N	F	M	SD	Range
Race					
African-American	70	93.3%			
Hispanic	4	5.3%			
Caucasian	1	1.3%			
Gender					
Male	56	74.7%			
Female	19	25.3%			
Insurance					
Medicaid	61	81.3%			
Private	14	18.7%			
Age at Pre-test (in months) ^a			19.24	5.02	4 - 28
Age at Post-test (in months) ^a			32.15	1.99	21 - 37
Time in Program (in months) ^a			11.83	2.65	7 - 18
Reason for Referral					
Speech delay	35	46.7%			
Physical delay	5	6.7%			
Overall developmental delay	28	37.3%			
Premature birth	7	9.3%			
Pregnancy-related characteristics					
Type of Pregnancy					
Normal	65	86.7%			
Complicated	10	13.3%			
Gestational Age					
Full-term birth	57	76.0%			
Premature birth	18	24.0%			
Birth Weight					
Normal	34	45.3%			
Low birth weight	41	54.7%			
Positive Toxicology					
No	73	97.3%			
Yes	2	2.7%			

Most of the participants experienced a normal pregnancy ($n=65, f=86.7\%$), were full-term, ($n=57, f=76.0\%$), and were not exposed to drugs in utero ($n=73, f=97.3\%$). Slightly over half of the participants were low birth weight ($n=41, f=54.7\%$) compared to those that were normal birth weight ($n=34, f=45.3\%$). The two most common reasons for referral to the early

intervention program were for a speech delay and an overall developmental delay ($n=35, f=46.7\%$ and $n=28, f=37.3\%$, respectively).

Results for each Research Question

Research Question 1: Do parent perceptions of their child's development reflect growth in the four domains of the Vineland from the beginning of the program to the end of the program?

The first research question examined whether parents perceived improvements in the four domains of development after attending a center-based early intervention program. To answer this question, children's developmental improvement was evaluated based on the mean differences of pre-and post-program Vineland Adaptive Behavior Scales (VABS) Domain scores. VABS Domain raw scores were corrected for length of time in the program by transforming each raw score into a growth ratio score. As illustrated in Table 4, pre-and post-program VABS Domain growth ratio scores were compared using paired sample t-tests. Cohen's d was used to determine effect size.

Table 4.

Mean Differences between VABS Domain Growth Ratio Scores and Results of Paired T-tests

Domain Standard Score	Mean Difference (Post-test-Pre-test)			
	M_D	SD	t -statistic	d -values
Communication Skills Total	-2.16	1.58	-11.80**	1.36
Daily Living Skills Total	-1.52	1.11	-11.78**	1.30
Socialization Skills Total	-.96	1.19	-6.95**	.80
Motor Skills Total	-2.24	2.25	-8.60**	.99

Note: $df=74$; * $p<.05$; ** $p<.01$.

The results indicate that there were significant improvements in parents' rating of participants' communication skills $M_D = -2.16$ ($SD = 1.58$), daily living skills $M_D = -1.52$ ($SD = 1.11$), socialization skills $M_D = -.96$ ($SD = 1.19$) and motor skills $M_D = -2.24$ ($SD = 2.25$). The

values of Cohen's *d* reported for each Domain indicate that the effect sizes, indicating the degree of impact of intervention on parent ratings, were large.

To provide a clearer understanding of the impact of intervention on parent ratings, Table 4.1 shows the level of participant improvement in each of the four VABS domains of development-based pre-and post-intervention growth ratio score difference ranges.

Table 4.1.

Percentage of Parent Ratings showing specific amounts of improvement in each VABS Domain.

Amount of Improvement from Pre- to Post- Intervention	Communication		Daily Living Skills		Socialization		Motor	
	<i>n</i>	<i>Percentage</i>	<i>n</i>	<i>Percentage</i>	<i>n</i>	<i>Percentage</i>	<i>n</i>	<i>Percentage</i>
No growth or some regression	4	5%	7	9%	12	16%	7	9%
.1 to .49 raw score points per month	3	4%	5	7%	12	16%	10	14%
.50 to .99 raw score points per month	9	12%	10	13%	18	24%	6	8%
1.0 to 1.49 raw score points per month	15	20%	19	25%	11	15%	16	21%
1.5 to 1.99 raw score points per month	7	9%	11	15%	8	11%	6	8%
2.0 or more raw score points per month	37	50%	23	31%	14	18%	30	40%

Based on the analysis, the ratings of 50% of the parents indicated a large growth in the communication domain, the ratings of 31% of parents indicated a large growth in the daily living skills domain, the ratings of 24% of parents indicated a moderate growth in the socialization domain, and the ratings of 40% of parents indicated a large growth in the motor domain.

Research Question 2: Do parent perceptions of their child's development reflect growth in the various subdomains of the Vineland from the beginning of the program to the end of the program?

The second research question examined parent perceptions of the developmental progress of their child within the subdomains of each of the four VABS Domains. To answer to this question, parent ratings of their children's levels of performance on each of the VABS Subdomains prior to and at the conclusion of the intervention were compared. Parent perceptions of changes in developmental status were statistically tested using paired sample *t*-tests. Domain raw scores were corrected for length of time in the program by transforming each raw score into a growth ratio score. Cohen's *d* was used to determine effect size. The results of the analyses are presented below.

Communication Skills Subdomains

The Communication Skills Subdomain mean scores and standard deviations are presented in Table 4.2. The receptive subdomain pre-and post-intervention ratings mean difference was statistically significant ($t(74) = -10.26, p = <0.1$), and reflected a large effect size ($d = 1.18$). The expressive subdomain pre-post intervention ratings mean difference also was significant ($t(74) = -10.90, p = <0.1$) and also reflected a large effect size ($d = 1.26$). These results suggest that on average parents reported an improvement in the participant's communication skills after the intervention, specifically in their understanding of language and in their ability to verbally express themselves.

Table 4.2.

Mean Differences between VABS Communication Subdomain Growth Ratio Scores and Results of Paired T-tests

Communication Skills Sub-domain	Pre-test		Post-test		<i>t</i> -statistic	<i>d</i> -values
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)		
Receptive (Raw)	1.24	.531	1.79	.567	-10.24	1.18
Expressive (Raw)	.901	.517	2.51	1.45	-10.90	1.26

Note: *df*=74; Results are presented as Mean and Standard Deviations; **p*<.01.

To provide a clearer understanding of the impact of intervention on parent ratings, Table 4.3 shows the level of participant improvement in each of the VABS Communication Skills subdomains of development based on pre-post intervention growth ratio score difference ranges.

Table 4.3.

Percentage of Parent Ratings showing specific amounts of improvement in each VABS Communication Skills Subdomain.

Amount of Growth	Receptive Subdomain		Expressive Subdomain	
	<i>n</i>	<i>Percentage</i>	<i>n</i>	<i>Percentage</i>
No growth or some regression	9	12%	3	4%
.1 to .49 raw score points per month	26	35%	10	13%
.50 to .99 raw score points per month	24	32%	17	23%
1.0 to 1.49 raw score points per month	14	18%	9	12%
1.5 to 1.99 raw score points per month	2	3%	8	11%
2.0 or more raw score points per month	0	0%	28	37%

Results indicated that only 12% of parents perceived no growth in receptive language skills, and only 4% of parents perceived no growth in expressive skills. In contrast, 53% of parents perceived growth of .5 or more points per month in receptive language skills, and 83% of parents perceived growth of .5 or more points per month in expressive language skills.

Daily Living Skills Subdomains

In terms of parent ratings of participants' daily living skills, Table 4.4 shows that there were significant increases in the subdomains of personal, domestic, and community daily living skills after completion of the intervention. Specifically, the mean differences of growth ratio scores for the personal ($M_D = -.842$ $SD = .884$), domestic ($M_D = -.362$ $SD = .747$), and community subdomains ($M_D = -.315$ $SD = .443$) were all statically significant ($t(74) = -8.24, p < 0.1, t(74) = -4.19, p < 0.1$ and $t(74) = -6.16, p < 0.1$, respectively). The personal subdomain mean difference reflected a large effect size ($d = .95$), and the domestic and community subdomain mean differences reflected moderate effect sizes ($d = .48$ and $d = .71$ respectively). These statistically significant results suggest that on average, the program was effective in improving parents' perceptions of the participants' ability to complete self-help tasks, such as feeding, dressing, and assisting with simple chores.

Table 4.4.

Mean Differences between VABS Daily Living Skills Subdomain Growth Ratio Scores and Results from Paired T-tests

Daily Living Skills Subdomains	Pre-test		Post-test		<i>t</i> -statistic	<i>d</i> -values
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)		
Personal	1.72	.78	2.56	1.03	-8.24	.95
Domestic	.201	.449	.564	.584	-4.19	.71
Community	.117	.357	.433	.366	-6.16	.59

Note: $df=74$; Results are presented as Mean and Standard Deviations; * $p < .01$.

Table 4.5.

Percentage of Parent Ratings showing specific amounts of improvement in each VABS Daily Living Skills Subdomain.

Amount of Growth	Personal Subdomain		Domestic Subdomain		Community Subdomain	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No growth or some regression	13	19%	19	25	17	23%
.1 to .49 raw score points per month	7	9%	32	43	39	52%
.50 to .99 raw score points per month	23	31%	11	15	11	15%
1.0 to 1.49 raw score points per month	18	24%	10	13	8	10%
1.5 to 1.99 raw score points per month	8	11%	1	1	0	0%
2.0 or more raw score points per month	6	8%	2	3	0	0%

Percentages were used to show specific amounts of growth in the VABS Daily Living Skills Subdomains based on parent perceptions. On average, 31% of parents perceived a moderate amount of growth in the Personal Subdomain compared to 43% and 53% of parents who indicated a small amount of growth in the Domestic and Community Subdomains, respectively.

Socialization Skills

In terms of parent ratings of participants' socialization skills, Table 4.6 shows that there were significant increases in the subdomains of interpersonal relationships, play and leisure, and coping skills after completion of the intervention. Specifically, the mean difference of growth ratio scores for the Interpersonal Relationship $M_D = -.407$ $S D = .688$, Play and Leisure $M_D = -.310$ $S D = .452$, and Coping Skills subdomains $M_D = -.244$ $S D = .367$ were all statistically

significant ($t(74) = -5.13, p = <0.1$, $t(74) = -5.94, p = <0.1$ and $t(74) = -5.75, p = <0.1$, respectively). The Interpersonal Relationships, Play and Leisure, and Coping Skills subdomains mean difference reflected a moderate effect size ($d = .59$), ($d = .69$), and ($d = .66$), respectively. These statistically significant results suggest that on average, the program was effective in improving parents' perceptions of the participants' ability to interact with others, engage in pretend play, and label their feelings.

Table 4.6.

Mean Differences between VABS Socialization Skills SubDomain Growth Ratio Scores and Results from Paired T-tests

Socialization Skills Subdomains	Pre-test		Post-test		<i>t-statistic</i>	<i>d-values</i>
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>		
Interpersonal Relationships	1.87	.62	2.27	.805	-5.13	.59
Play & Leisure	1.12	.451	1.43	.494	-5.94	.69
Coping Skills	.041	.211	.285	.380	-5.75	.66

Note: $df=74$; Results are presented as Mean and Standard Deviations; $*p<.01$.

To provide a clearer understanding of the impact of intervention on parent ratings, Table 4.7 shows the level of participant improvement in each of the VABS Socialization Skills Subdomains of development based on pre-and post-intervention growth ratio score difference ranges.

Table 4.7.

Percentage of children showing specific amounts of growth in the VABS Socialization Subdomains based on parent perception.

Amount of Growth	Interpersonal Subdomain		Play and Leisure Subdomain		Coping Subdomain	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
No growth or some regression	18	24%	17	23%	28	37
.1 to .49 raw score points per month	21	28%	37	49%	33	44
.50 to .99 raw score points per month	25	33%	15	20%	11	15
1.0 to 1.49 raw score points per month	7	9%	5	7%	1	1
1.5 to 1.99 raw score points per month	3	4%	1	1%	2	3
2.0 or more raw score points per month	1	2%	0	0%	0	0

Percentages were used to show specific amounts of growth in the VABS Socialization Skills Subdomains based on parent perception. Results indicated that 48% of parents perceived growth of .5 or more points per month in the Interpersonal subdomain, in contrast to 28% in the Play and Leisure subdomain, and 19% in the Coping skill subdomain.

Motor Skills

The Motor Skills Subdomain mean scores and standard deviations are presented in Table 4.8. The Gross Motor Skills subdomain pre-and post-intervention rating mean difference was statistically significant, $t(74) = -8.25$, $p < .01$ and reflected a large effect size ($d = .95$). The Fine Motor Skills subdomain pre-and post-intervention rating mean differences also were significant, $t(74) = -7.56$, $p < .01$ and reflected a large effect size ($d = .87$). These results

suggest that on average, parents perceived that the program was effective in improving participants' Gross and Fine Motor Skills after the intervention.

Table 4.8.

Mean Differences between VABS Motor Skills Subdomain Growth Ratio Scores and Results from Paired T-tests

Motor Skills Subdomains	Pre-test		Post-test		<i>t</i> -statistic	<i>d</i> -values
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)		
Gross	1.79	.964	3.28	1.736	-8.25	.95
Fine	1.03	.559	1.79	.863	-7.56	.87

Note: *df*=74; Results are presented as Mean and Standard Deviations; **p*<.01.

To provide a clearer understanding of the impact of intervention on parent ratings, Table 4.9. shows the level of participant improvement in each of the VABS Motor Skills Subdomains of development based on pre-and post-intervention growth ratio score difference ranges.

Table 4.9.

Percentage of Parent Ratings showing specific amounts of improvement in each of the VABS Motor Skills Subdomains based on parent perceptions.

Amount of Growth	Gross Motor Subdomain		Fine Motor Sub-domain	
	<i>n</i>	%	<i>n</i>	%
No growth or some regression	10	13%	8	11%
.1 to .49 raw score points per month	12	16%	23	31%
.50 to .99 raw score points per month	16	21%	20	26%
1.0 to 1.49 raw score points per month	8	11%	12	16%
1.5 to 1.99 raw score points per month	2	3%	2	3%
2.0 or more raw score points per month	27	36%	10	13%

Percentages were used to show specific amounts of growth in the VABS Motor Skills Subdomains based on parent perceptions. In the Gross Motor Subdomain, 36% of parent perceived growth of 2.0 points per month, and in the Fine Motor Skills Subdomain, 58% of parents' perceived growth of .5 or more points per month.

Question 3: Do parents' perceptions of their child's development vary based on the child's gender?

The third research question sought to determine if parent' perceptions of changes in skill development reflected any differences in terms of the gender of the children being rated. To answer this question, pre-and post-difference growth ratio values were used as the independent variable, and compared with male and female groups for each domain using independent sample t-tests.

As indicated in Table 4.10, there were no significant differences in parent perception of growth for male and female children across the four VABS Domains. Both groups reflected significant increases in parent perceptions of growth in all domains after participation in the program.

Table 4.10.

Means and Standard Deviations of VABS Domain Growth Scale Value Differences by Gender

Domain	Gender				t
	Female (n=19)		Male (n=56)		
	<i>M_D</i>	SD	<i>M_D</i>	SD	
Communication Skills	2.07	1.65	2.43	1.39	.402
Daily Living Skills	1.42	1.08	1.79	1.18	.213
Socialization Skills	.917	1.171	1.09	1.29	.028
Motor Skills	2.25	2.27	2.22	2.27	.497

Note: Results are presented as Mean (*SD*); * $p < .05$, ** $p < .01$.

Question 4: Do parents' perceptions of their child's development vary based on the child's disability classification?

The fourth research question examined whether parents' perceptions of their children's development varied based on the child's disability classification. To answer this question, pre-and post-difference growth ratio values of the speech delay and the overall developmental delay groups were used as the independent variable and tested for statistical significance for each VABS Domain using t-tests.

Table 4.11.

Means and Standard Deviations of VABS Domain Growth Scale Value Differences by Type of Developmental Delay

Domain	Type of Developmental Delay				F
	Speech Delay (n=35)		Overall Developmental Delay (n=28)		
	M_D	SD	M_D	SD	
Communication Skills	2.31	1.61	2.13	1.61	.120
Daily Living Skills	1.29	.962	1.51	1.01	.234
Socialization Skills	.80	1.38	1.23	.980	1.32
Motor Skills	2.23	2.66	2.18	1.68	8.28

Note: Results are presented as Mean (SD); * $p < .05$, ** $p < .01$

As indicated in Table 4.11, there were no significant differences between parent perception of growth of children in the program with speech delays and children in the program with overall development delays. Results indicate that both groups showed significant increases in parent perception of growth in all VABS Domains after participation in the program.

Chapter V
DISCUSSION

Major finding of the Study:

The primary intent of this study was to determine whether parents of children who attended a center-based early intervention program perceived an improvement in their children's adaptive functioning. The results of this study showed that parents did, in fact believe that their children made improvements after attending the program. In this study, seventy-five children spent an average of 11.8 months enrolled in an early intervention center-based program that focused on addressing their developmental delays. The children's adaptive functioning levels were initially assessed prior to their attending the program, $M = 19.2$, ($SD = 5.0$), and again when they aged out of the program, $M = 32.1$, ($SD = 1.9$).

The first research question examined parents' perceptions of growth in their children's development in the four domains of the Vineland from the beginning of the program to the end of the program. The second research question sought to determine if parents perceived growth in their children's development in the various subdomains of the Vineland from the beginning to the end of the program. Based on statical analyses utilizing t-tests with a significance level of $p = 0.5$, results indicated that parents felt that their children made improvements in all of the VABS subdomains.

The third research question asked whether parents perceived any difference in improvements of the overall development of the children who participated in the program based on gender. In addition, the fourth research question examined the possibility of differences based on the children's disability classification. Based on the analyses of the results, there were no

significant differences based on gender and/or type of developmental delay. The results suggest that parent perceptions of improvements related to the benefits of the intervention program applied equally to males and females with any type of developmental delay.

Interpretation of Findings:

Results of this study suggest that parents perceived that after attending an early intervention center-based program, improvements were seen in the Communication, Daily Living, Socialization and Motor Skill Domains. When a child attends ICLC's center-based program, their overall development is addressed throughout a two-hour period. A special education teacher, a teacher's assistant, as well as speech, occupational, and physical therapists work together on alleviating the child's delays.

In terms of the participant's Communication and Motor abilities, improvements may not only be related to attending the program, but also to weekly therapy sessions, since the developmental delays in the Communication and Motor Skills areas exhibited by these children qualified them for weekly individualized therapy sessions. Children who presented with delays in their expressive and receptive language abilities received one to three thirty-minute speech therapy sessions per week. Furthermore, it appeared that parents perceived a larger growth in their children's expressive language skills (83%) compared to their receptive language skills (53%). A reason that parents may have perceived a larger growth in the expressive language area could relate to sudden or gradual increases in the number of words their children began to use over the course of the program. Receptive skills gains may have been less noticeable to parents, especially if children are not given many commands or requests, or have difficulty paying attention during conversations.

Children who exhibited fine and/or gross motor delays received either occupational or physical therapy or both for thirty minutes one to three times per week. These therapy sessions were in addition to the classroom motor activities. Also, unless there is an underlying medical condition, children's speech and physical abilities are expected to progress, so that ultimately they catch up with their peers.

Interestingly, 54.7% of participants in this study were born with a low birth weight, which often leads to hypotonia or low muscle tone. In addition, 46.7% of the participants were referred based on having a speech delay. In terms of the participant's Daily Living Skills, on average, parents saw more of an improvement in the Personal (74%), as compared to the Domestic (32%) and Community subdomains (25%). The daily living domain, specifically the Personal subdomain, measures what children can do for themselves, such as feeding, dressing, and toileting. Children at ICLC are encouraged, prompted, and shown how to use utensils, how to take off and put on their coats, and how to indicate when they need to use the bathroom. These skills are practiced on a daily basis; however, they may not require individualized attention. The Domestic and the Community subdomains measure skills that may not have been introduced at home yet, such as cleaning up after themselves, or talking on the phone with a familiar person. Therefore, it would be difficult for parents to observe improvements in areas that their children may not have been exposed to yet.

In regard to the Socialization Domain, on average, parents saw more improvement in the Interpersonal subdomain (48%), compared to the Play and Leisure subdomain (28%) and the Coping Skills subdomain (19%). The Socialization Domain measures how children interact with adults and their peers. It also measures their ability to imitate tasks and engage in pretend play activities. Once again, children at ICLC are exposed to adults and peers on a daily basis. They

are given the opportunity to engage in free-play activities, which allow them to socialize and imitate each other. It is possible that parents perceived more improvement in the Interpersonal subdomain, because this area deals with more behaviors that are likely to be observed directly in the home, such as the child's ability to smile appropriately, address at least two familiar people by name (mommy/daddy), show a desire to please others, and show a preference for some people over others. The Play and Leisure subdomain measures the children's interaction with peers. It is possible that parents may not have many opportunities to observe how their children interact with other children, especially if they do not have any siblings or extended family members. The Coping Skills subdomain did not require parents to answer multiple questions for children in this study's age range. One of the items that was addressed was whether children have the ability to use the word "please" appropriately when asking for something. Children with expressive language delays may be less likely to use this term appropriately. Consequently, this may be the primary reason why parents did not indicate a larger growth in this area.

Previous Studies:

This research was consistent with the findings of other studies in terms of participants showing improvements in their development after attending an early intervention program. Previous studies, however, have focused only on cognitive development, but this study's primary intent was to measure parents' perceptions of their children's adaptive functioning. Other studies utilized cognitive assessments, such as the Stanford-Binet Intelligence Scales, the Wechsler Preschool and Primary Scales of Intelligence-Revised, and the Wechsler Intelligence Scales for Children. Some of these studies also used the Child Behavior Checklist to assess children's social-emotional development. The present study focused instead on adaptive functioning, using

the VABS to measure how parents perceived their children's facility with communication, daily living, socialization, and motor skills.

The findings of this study are also consistent with the findings of more recent studies related to parent perceptions. Traditionally, parents have viewed their children's abilities to be higher than measured by evaluators during assessments (Sexton & Thompson, 1990). More recent studies have shown a strong relationship between parental opinions and professional judgment (Hundert, Morrison, Mahaney, Mundy, & Vernon, 1997.).

Limitation of the Study:

This study has several limitations that should be mentioned. The first limitation is related to the study's small sample size; therefore some degree of caution should be used when interpreting the results. In addition, since the majority of participants were African-American, caution should be exercised when generalizing results to other populations. Methodologically, this study utilized a pre-and post-test design, which did not include assessment with a control group. In addition, even though only raw scores were used when analyzing the data, standard scores were also recorded on the data collection sheet. The data file showed that there were inaccuracies between some of the raw scores and the standard scores; due to these discrepancies, the results of this study must be interpreted with great caution. Lastly, due to the absence of a long-term follow-up, this study cannot determine the lasting benefits that participants may have experienced.

Suggestions for Future Research:

Future research should focus on collecting additional demographic information, such as parent education, parent age, and if there are other children in the family with disabilities. This information may provide further insight into the family's household situation and dynamics that may influence child development. In addition, cognitive testing should be included, so that comparisons can be made with adaptive functioning, as well as to other studies that assessed cognitive functioning. Lastly, a longitudinal study, with a larger sample, with multiple early intervention programs, and including children of various backgrounds should be conducted in order to improve the study's general application.

Conclusion:

Parents in this study acknowledged that their children were experiencing one or more developmental delays. Since all of the participants met the criterion of attending a center-based program, the professionals who conducted the evaluations also believed that the children were delayed in their development. In terms of the participants' improvements, as previously stated parents believed that their children improved after attending the program. This study did not assess whether professionals believed that the participants made improvements, since its primary focus was on parents' perception.

The findings of this study are important; because traditionally parents were not included in the decisions made about the services their children would receive to address their delays. Also since, "Family as Partners" initiated in New York in September 2006, parents are expected to express their opinions regarding their children's development.

Others studies have shown that based on assessments conducted by professionals, children have made gains. Again, this study showed that parents tend to agree with professionals and acknowledged that early intervention programs are beneficial. Therefore, this study adds to previous research by demonstrating that children benefit from attending early intervention programs.

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