EARLY RISK FACTORS OF CHILDREN IN POVERTY: THE EFFECTIVENESS OF EARLY INTERVENTION

by

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(Under the Direction of Stacey Neuharth-Pritchett)

ABSTRACT

A number of research studies in early childhood education have examined the negative influence of poverty on child development. The children who live in poverty are more likely to have lack of socio-emotional support as well as cognitive stimulation from their parents or from the society. Lack of economic resources also place children in hazardous living environments. However, many early intervention study results suggested that children who are placed at risk may demonstrate better outcomes when interventions begin earlier in children’s lives and in a more intensive and direct manner. Early Head Start (EHS) program is one of the representative early intervention programs for infants and toddlers of poverty. While the EHS program is still a relatively new program and despite the positive findings of the program, there have been no recent examinations of how specific groups of children exposed to differential levels of risk fare in EHS. What is missing from the literature is an examination of the outcomes for children enrolled in EHS with regard to early risk variables including premature birth, low birth weight, being born to a teenager, poor maternal nutrition during pregnancy, and maternal substance abuse during pregnancy.
To conduct this research, demographic information, Bayley Scales of Infant Development, and Denver Developmental Screening Test results of Russell County EHS program participants were collected. In order to gauge the degree of risk based on early risk factor for each, a risk index was created. The index was comprised of five separate ratings of five variables that included: prematurity, low birth weight, the nutritional status of the mother, the age of the mother, and substance abuse by the mother during pregnancy. The unique way of organizing the data in a continuous manner provided for better understanding and control of the contributions of the risk variability.

The results of the present study indicated that resilience in the group of at risk children was enhanced by a high quality early intervention program that minimized the resultant effects of early exposure to risk by supporting sound development in cognitive, physical, socio-emotional, and parental development.

INDEX WORDS: Early Head Start, Early intervention, Infant and toddler development, Children at risk
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CHAPTER 1
INTRODUCTION

For many children who live in poverty, exposure to multiple genetic and environmental risks often places constraints on children’s optimal cognitive, physical, and socio-emotional development. The research literature is replete with studies that document poverty’s negative influence on child development. Among the many negative outcomes, studies suggest that many children who live in poverty are more likely to experience violence, family disruption and separation, harsh parenting, and a lack of social support (Atkinson, Liem, & Liem, 1986; Brody et al., 2001; Conger & Elder, 1994; Liaw & Brooks-Gunn, 1994; Magnusson & Duncan, 2002; McLoyd, 1998; Osofsky, 1995; Rutter, 1981; Sampson, Raudenbush, & Earls, 1997; Sinclair et al., 1994; U.S. Census Bureau, 2000; Wright et al., 1998). Children who live in poverty, as a group, also experience less cognitive stimulation. Studies suggest that children who live in poverty often have home environments that have deficits of educational resources such as books (Coley, 2002), often have parents who are less involved in school activities (Benveniste, Carnoy, & Rothstein, 2003; U.S. Department of Health and Human Services, 1999), and often have school teachers or childcare providers with lower levels of formal education and with more limited teaching skills (Ingersoll, 1999; Lee & Croninger, 1994; Phillips et al., 1994).

Lack of economic resources also place children in hazardous living environments that include risk factors such as crowded homes (Children’s Defense Fund, 1995) and unsafe neighborhoods (Federman et al., 1996; Sampson et al., 1997). Other constraining living conditions and economic deprivation may also foster family discord and harsh parenting that
may affect children’s socio-emotional and cognitive development (Emery & Laumann-Billings, 1998; Grant et al., 2003; Repetti, Tylor, & Seeman, 2002; Taylor, Repetti, & Seeman, 1997). Substandard housing quality also contributes to serious physical health issues such as the development of asthma, allergies; and developmental delay associated with exposure to hazardous toxins such as lead and radon (Lawrence, 2002; Matte & Jacobs, 2000).

Despite this very bleak outlook, in the United States we are fortunate to have well-designed early educational intervention programs that may buffer the risks of poverty and facilitate healthy development of children. When interventions begin earlier in children’s lives and in a more intensive and direct manner, children who are placed at risk may demonstrate better cognitive, behavior, and socio-emotional outcomes (Ramey & Ramey, 1992). Programs that enroll children during infancy and provide co-occurring education for their families have been shown to produce greater benefits than programs that enroll children who are older (Campbell & Ramey, 1995; Garber, 1988; Hauser-Cram et al., 1991; Wasik et al., 1990). The research literature also suggests that programs that are more intensive and multi-generational produce better outcomes than do less intensive interventions (Blair, Ramey, & Hardin, 1995; Gray, Ramey, & Klaus, 1982; Weikart, Bond, & McNeil, 1978).

Intensive programs include participation of parents along with their children and intervention that is administered on a frequent basis usually for longer than one year. Intensive full-day programs rather than half-day programs or frequent home visits produce better developmental outcomes for children at risk (The Infant Health and Development Program, 1990; Ramey et al., 1992). Direct intervention provides larger benefits than intervention provided through intermediary routes. Research suggests that through placement in high quality educational settings and through interaction with well-trained staff, children at risk may enhance
their development more efficiently than those children who might only have the benefit of indirect interventions such as those provided through parent education programs (Casto & Lewis, 1984; Madden, Levenstein, & Levenstein, 1976; Scarr & McCartney, 1988; Wasik et al., 1990). Despite the differences in intervention programs, continuity of intervention approaches including parent involvement is important (Neuharth-Pritchett & Mantzicopoulos, 1998).

The Abecedarian Project (Ramey & Campbell, 1972) and the Perry Preschool Program (Weikart, 1959) are excellent examples of early intervention programs for children at risk, especially with regard to infants, toddlers, and preschoolers. Both programs are examples of intensive and direct intervention to high risk young children who are from families with limited economic resources. In both of these projects, participants had development that was physically or mentally delayed. Children in the two projects received high-quality child care or frequent home visits. Abecedarian children were provided with cognitive stimulation through professionally designed curriculum and access to a high quality childcare center that operated 8 hours a day, 5 days per week, and 50 weeks per year. Perry Preschool children were provided with a center-based program where they learned actively and constructed their own knowledge through developmentally appropriate practice. In addition, the children also received home visits where their parents were provided with child development information.

Both intervention programs had both short- and long-term effects on the cognitive and socio-emotional development of children. By 18 months and thereafter through age 8, the Abecedarian children displayed a significant advantage in intelligence and outperformed the preschool control group in both reading and mathematics. The likelihood of a child being retained in grade during the first 3 school years was negatively and significantly related to the amount of educational intervention experienced by the child in the project. Children’s
intelligence and academic achievement gains were maintained through their seventh year in school. Additionally as young adults, the Abecedarian participants attained higher scores on cognitive tasks, reading skills, and mathematics skills. Abecedarian children attained more years of education, were more likely to attend a 4-year college or university, and were less likely to become teen parents (Campbell & Ramey, 1994; Campbell et al., 2002).

A second study that produced similar results to the Abecedarian study was the Perry Preschool study. In this study, the Perry Preschool children performed better on achievement tests and received better ratings from their teachers throughout their school years. Children involved in the intervention were less likely to be placed in special education (Barnett & Escober, 2002). As one of the most well-documented studies in early childhood education, positive outcomes from the Perry Preschool project were found for the participants through age 27. At 27, participants were less likely to show anti-social behaviors like criminal incarceration, receipt of welfare assistance, or receipt of other social services as adults. As a group, these children had better educational performance and higher levels of education. The female participants of Perry Preschool Program were less likely to have out-of-wedlock births in comparison to females in the control group (Weikart & Schweinhart, 1997).

Building on these localized early intervention projects, the United States government’s largest effort to promote healthy child and family development is Early Head Start (EHS). Early Head Start, begun in 1994, is a federally-funded community-based program for low-income families with infants and toddlers as well as pregnant women. In 2005, EHS operated 708 programs that serve 62,000 children under the age of three and their families. At an average cost per child of more than $10,000, the goals of the program are to promote healthy prenatal outcomes for pregnant women, to enhance the development of very young children, and to
promote healthy family functioning. The services provided by EHS include quality early education both in and out of the home, parenting education, and comprehensive health and mental health services. These services are also provided to women before, during, and after pregnancy and include nutrition education and family support services. To qualify for EHS, children must be from low-income families. The federal EHS performance standards also mandate that 10% of the program’s slots be reserved for children with disabilities. The infants and toddlers enrolled in the program receive center-based day care or home-based education services for no cost. Each EHS program is supervised by U.S. Department of Health and Human Services and is routinely monitored to ensure high quality service provision (Irish, Schumacher, & Lombardi, 2003).

The Head Start Bureau conducted a national evaluation study of 3,000 children and families in 17 sites in 1995 (Early Head Start, 2001 & 2002). According to the study, the EHS program demonstrated strong positive impacts on young children’s families as well as children’s development. When compared with a randomly assigned control group not enrolled in EHS, EHS children performed significantly better on a range of measures of cognitive and socio-emotional development. For 3-year-old children, EHS programs largely sustained the statistically significant, positive effects on cognitive development found at assessments at age 2. In addition, a smaller percentage of EHS children scored in the at-risk range of developmental functioning. By moving children out of the lowest functioning group, experience in EHS may reduce a child’s risk of poor cognitive and school outcomes. Along with positive cognitive benefits, EHS programs also had favorable impact on several aspects of social-emotional development. EHS children were observed to engage their parents more and were more attentive to objects during
play. EHS children were rated lower in aggressive behavior and perceived more positively by their parents than were the children in the control group.

Because the EHS program is a two-generational program designed for the parents as well as for young children, parental and family outcomes were also assessed. The national study indicated that EHS programs had significant benefits on a wide range of parenting outcomes. EHS parents were observed to be more emotionally supportive and to provide more support for language and learning than control group parents in areas such as reading to their child. EHS parents were less likely to engage in negative parenting behavior and were less likely to demonstrate detached relationships with their children. EHS mothers were more emotionally responsive, displaying greater warmth, praise, and affection toward their children. These mothers reported a greater repertoire of discipline strategies, including milder and fewer punitive strategies. EHS also increased mothers’ knowledge of infant-toddler development and developmental milestones.

The results from the national study also indicated that EHS parents reported lower levels of family conflict and parenting stress which impacted parents’ progress toward self-sufficiency through participation in education and job training activities. This self-sufficiency resulted in more EHS parents being employed than control group parents. Although the program did not result in significant improvements in income during the evaluation study period, the improvement of parents’ self-sufficiency was thought to provide access to empower the family and support children’s healthy development.

Rationale for the Study

Research evidence suggests that by providing intensive early childhood education for children and families at risk, we may minimize long-term negative developmental outcomes.
While the demonstrated benefits of early intervention programs in the United States are gaining more and more attention, there are still significant issues for young children and their families who live in poverty with regard to child and family outcomes. One of these major issues centers on the amount of risk that is associated with a child as they develop. In high-quality early intervention programs, are the outcomes the same for children who enroll in such programs who have different levels of risk?

Statement of the Problem

While the EHS program is still a relatively new program and despite the positive findings of the program, there have been no recent examinations of how specific groups of children exposed to differential levels of risk fare in EHS. What is missing from the literature is an examination of the outcomes for children enrolled in EHS with regard to early risk variables. For this study contributors to early risk status include premature birth, low birth weight, being born to a teenager, poor maternal nutrition during pregnancy, and maternal substance abuse during pregnancy. It is widely known that the first three years of life are very important because preschool years through adolescence and even adulthood are affected by this crucial starting point (Carnegie Corporation of New York, 1994). However, there is a much more limited body of evidence on the influences of early risk factors with regard to successful early intervention programs.

Research Questions

This study will examine the relationship between early risk factors and the development of EHS children. Research questions for this study are:

(1) Does differing level of early risk have an impact on EHS children’s cognitive development?
(2) Does differing level of early risk have an impact on EHS children’s physical development?

(3) Does differing level of early risk have an impact on EHS children’s socio-emotional and health development including: (a) child behavior, (b) diagnosed disability, (c) number of child protective service referrals, (d) parent-child interaction, (e) children’s program involvement through attendance, (f) parent involvement in the program, and (g) parental knowledge of child development?

(4) Does differing level of early risk have an impact on EHS children’s parental outcomes including: (a) parents’ general health, (b) parents’ mental health, (c) number of crisis visits from family service worker, (d) family access to community services, and (e) family crisis rating?
In the United States, more than one-third of children live in low-income families in which the parents earn less than 200% of the federal poverty line (National Center for Children in Poverty, 2004). These figures are even more staggering for children and families as the degree of poverty increases. According to national statistics, 42% of infants and toddlers from birth to 2 years in the United States are from low-income families, while 38% of school-age children and 32% of adolescents live under such economic conditions (National Center for Children in Poverty, 2004). In general, poverty is perceived to be detrimental to children’s development because it often results in poor physical and academic outcomes. In addition, poverty is highly correlated with a myriad of other risk factors. The parents of children from low-income families are likely to be less educated, engaged more in part-time unskilled jobs, enter earlier into parenthood, and are more often a single parent as a result of unmarried birth, divorce, separation, death, or imprisonment (Lu & Koball, 2003).

Kids Count, a publication of the Annie E. Casey Foundation in 2004, identified eight risk factors of children from the 1990 Census and the Census 2000 Supplementary Survey (Annie E. Casey Foundation, 2004). These risk factors included children: (1) living in poverty; (2) living in single-parent families; (3) living in families where no parent has full-time, year-round employment; (4) living with a household head who is a high school dropout; (5) living in families where the provider has limited occupational skills; (6) living in households without a
telephone; (7) living in households without a vehicle; and (8) living in a family where English is not the first language. While the extrapolation of these data is based solely on demographic information, other researchers and organizations have defined risk more broadly to include such factors as: families with limited income; single-parent families; children of divorced parents; children who have experienced abuse; children with low birth weight and premature birth; children with physical disabilities, mental disabilities, disease, malnutrition, and injury; children with lack of appropriate care and education in a quality learning environment (National Center for Children in Poverty, 2004; Annie E. Casey Foundation, 2004). Such factors are perceived to influence all facets of young children’s lives and impact children’s physical, cognitive, and socio-emotional development.

This chapter provides a summary of research on the effects of poverty and the development of young children and their families. This review will situate the current study so as to provide the background information to examine the impact of a high-quality early childhood education intervention and the developmental outcomes of children who had early risk factors.

The History of Early Head Start

Given the number of risk factors that may impact the lives of very young children, early intervention programs may play an important part in the healthy nurturing and development of children and families, one of these such programs is Early Head Start (EHS). EHS, which was implemented in 1995, provides comprehensive intervention programs pregnant women and young children from birth to 3 years old and their families. The children who participate may receive high quality childcare services, health and nutrition services, and emotional support by caregivers. One other major program option is a home-based program. The parents of the children in the home-based option are provided with parent education programs. Pregnant
women are provided with intensive education that begins in the prenatal period and continues through postpartum care. The comprehensive intervention of EHS enables the protection of children from many risk factors. According to the evaluation study (Early Head Start, 2002), children who participated in EHS demonstrated better development than other children at risk although both are exposed to similar risk factors such as poverty and disability.

The origin of EHS goes back to 1960s. In 1964, President Lyndon B. Johnson declared a War on Poverty in his State of the Union Address. President Johnson proposed the Economic Opportunity Act of 1964 for consideration by Congress, which would begin a new course of action against poverty in the United States. He proposed that the Office of Economic Opportunity be established and act as the national headquarters for the war against poverty. At that time, part of the new government thinking on the nature of poverty and education, born of the civil rights movement, was that the government was obligated to help disadvantaged groups to compensate for inequality in social or economic conditions (Illinois Head Start Association, 2003). The Economic Opportunity Act is responsible for national programs such as the Job Corps, the Work-Study program and the Work-Training program. Project Head Start became one of the many community action programs to form under the Office of Economic Opportunity. Factors such as a growing awareness of poverty in the United States, the tremendous amounts of remedial work in school rather than prevention, and the possible link between poverty and the learning process led to the development of Project Head Start (Richmond, 1966). As stated in a report to congress:

The Economic Opportunity Act of 1964 provides for: A program to be known as ‘Project Head Start’ focused upon children who have not reached the age of compulsory school attendance which (a) will provide such compressive health, nutritional, education, social,
and other services as the director finds will aide the children to attain their full potential and (b) will provide for direct participation of the parents of such children in the development, conduct, and overall program direction at the local level (United States General Accounting Office, 1975).

Project Head Start began as an eight-week summer program designed to help break the cycle of poverty. The program targeted children aged three to school entry age. The eight-week program served 561,000 children across the country (Richmond, 1966). In July of 1966, the Economic Opportunity Act was amended requiring the Office of Economic Opportunity to operate a permanent Head Start program. In 1969, Head Start was transferred from the Office of Economic Opportunity to the Office of Child Development in the Department of Health, Education and Welfare. The Economic Opportunity Act was amended in 1972 to expand the program in order to provide opportunities for children with disabilities. This legislation stated that at least ten percent of the national enrollment in Head Start must be made up of children with disabilities. Head Start’s home based program option was added in 1973. The Head Start Program Performance Standards were issued in July of 1975 and largely amended in 1996 (Early Head Start, 2001).

During the 80s and 90s, there were many studies about brain functioning and infant and toddler development. A Carnegie Corporation research report, “The Quiet Crisis”, strongly affected the launching of EHS. After release of this report, a comprehensive self-examination of Head Start services was conducted by the Advisory Committee on Head Start Quality and Expansion. According to the report, “American children under the age of three and their families are in trouble, and their plight worsens everyday” (Carnegie Corporation of New York, 1994). The half of American infants and toddlers have one or more major risk factors such as
inadequate prenatal care, isolated parents, substandard child care, poverty, and insufficient attention. Meanwhile, the first three years of life is very important because preschool years through adolescence and even adulthood are affected by this crucial starting point. Babies who have been raised in caring and safe environments become better learners than those raised with less secure settings. The protective factors such as good nutrition, sensitive caring, and safe environment help children to achieve good outcomes and avoid bad ones. However, the nationwide investments for children are not sufficient. In contrast to all the leading industrialized nations, the United States was failing to support children under the age of three and their families. To overcome ‘the quiet crisis’, the Carnegie report suggested that the nation must promote opportunities for responsible parenthood, guarantee quality child care choices for children under three, ensure good health and protection for infants and toddlers, and mobilize communities to support young children and their families (Carnegie Corporation of New York, 1994).

With “The Quiet Crisis” report, there was an Advisory Committee on Head Start Quality and Expansion in which serving families with children under age three was recommended in 1994. After then, Congress established EHS to serve pregnant women and low-income families with infants and toddlers with the reauthorization of the Head Start (Early Head Start, 2000). The first 68 EHS programs began in 1995 under the collaborative work of the Advisory Committee and the Administration on Children, Youth and Families. Goals were established focusing on providing safe, healthy, enriching environments for all children, caregivers, and service providers; offering personal and professional support to children, families, communities, and staff; and promoting relationship-building between children, parents and caregivers (Early Head Start, 2003). Administration on Children, Youth and Families created an infrastructure for supporting the new EHS programs in achieving high program quality by providing training and
technical assistance, revised Head Start Performance Standards, and program monitoring to ensure compliance with the standards. EHS programs follow and are monitored according to the revised Head Start Program Performance Standards. At the time of the site visits in fall 1997, the revised Head Start Program Performance Standards had been published (Early Head Start, 2000). Up to present, more than 8,000 pregnant women, and more than 60,000 children and their families having low-income have been served through EHS programs all over the country (Irish et al., 2003).

The Effects of Early Head Start

The research on the EHS program in which high quality comprehensive early intervention services are provided has indicated strong positive benefits for young children and their families. To document the outcomes of the program and its effectiveness, EHS conducted a national evaluation study, including about 3,000 children and families in 17 sites in 1995 (Early Head Start, 2001 & 2002). When compared with a randomly assigned control group not enrolled in EHS, EHS children performed significantly better on a range of measures of cognitive, language, and socio-emotional development.

For 3-year-old children, EHS programs largely sustained the statistically significant, positive outcomes on cognitive development that had been found at age 2 for intervention children. EHS children scored higher, on average, on the mental development index (MDI) of the Bayley Scales of Infant Development (mean of 91.4 for the EHS group vs. 89.9 for the control group). In addition, a smaller percentage of EHS children (27.3 vs. 32.0 percent) scored in the at-risk range of developmental functioning (below 85 on the Bayley MDI). By moving children out of the lowest functioning group, EHS may be reducing their risk of poor cognitive and school outcomes later on. However, it is important to note that although the EHS children scored
significantly higher than their control group peers, they continued to score below the mean of the national norms (a score of 100) (Early Head Start, 2002).

EHS participation also promoted language development. At age 3, EHS children scored higher on a standardized assessment of receptive language, the Peabody Picture Vocabulary Test (PPVT-III; 83.3 for the EHS group vs. 81.1 for the control group). In addition, significantly fewer EHS program (51.1 percent) children scored in the at-risk range of developmental functioning than control children (57.1 percent). Again, despite these positive findings, EHS children still scored well below national norms (mean score of 100), although they scored higher than children in the control group (Early Head Start, 2002).

Data from the national study also suggested that EHS programs promoted favorable outcomes on several aspects of social-emotional development at age 3 (more than at age 2). EHS children were observed to engage with their parents more, were less negative to their parents, and were more attentive to objects during play. EHS children also were rated lower in aggressive behavior by their parents than control children (Early Head Start, 2002).

Because the EHS program is for parents as well as for young children, parental and family outcomes were also assessed. The EHS parents scored significantly higher than control group parents on many of the measures of the home environment, parenting behavior, and knowledge of infant-toddler development. EHS families were more likely to attend school or job training and had lower levels of parenting stress and family conflict (Early Head Start, 2002). In addition, EHS parents were observed to be more emotionally supportive and had significantly higher scores than control parents had on a commonly used measure of the home environment (HOME). EHS parents provided significantly more support for language and learning than control group parents as measured by a subscale of the HOME. EHS parents were also more
likely to report reading daily to their child (56.8 vs. 52.0 percent). They were less likely than control group parents to engage in negative parenting behaviors. EHS parents were less detached in their relationships with their children than control group parents. EHS mothers were more emotionally responsive, displaying greater warmth, praise, and affection toward their children, according to direct observations made during the interview process. EHS increased mothers’ knowledge of infant-toddler development and developmental milestones. EHS parents created more structure in their children’s day by setting a regular bedtime. EHS mothers were less likely to have subsequent births during the first two years after they enrolled: 22.9 percent of the program group vs. 27.1 percent of the control group mothers gave birth to another child within two years after beginning the study. EHS parents reported lower levels of family conflict and parenting stress (Early Head Start, 2002).

EHS programs had some impact on parents’ progress toward self-sufficiency. The significant positive impacts on participation in education and job training activities continued through 26 months following enrollment. Of EHS parents, 60 percent participated in education or job training (vs. 51.4 percent of control group parents); and 86.8 percent of program parents (compared with 83.4 percent of control parents) were employed at some time during the first 26 months after random assignment. These impacts did not result in significant improvements in income during this period, however.

Although EHS children and their families showed better outcomes than the control group overall, there was variability in the results with regard to how long the child was in the program. The earlier the child and family were enrolled and participating in the program, the greater the benefits for the child (Early Head Start, 2001&2002). This result is consistent with many other studies. That is, early intervention programs that enroll children during their infancy produce the
greater benefits than those that enroll older children (Campbell & Ramey, 1995; Garber, 1988; Hauser-Cram et al., 1991; Wasik et al., 1990). Those research results demonstrate the importance of intervention during the early years of the human life span development. While there were a number of positive outcomes from the national evaluation of the EHS program, there are a number of single studies not connected with EHS that document the impact of poverty on children and family developmental outcomes. The following sections review the literature on physical development, cognitive development, and socio-emotional development by summarizing how risk in association with poverty influences developmental outcomes in particular domains.

Physical Development of At Risk Children

Physical development is influenced by a number of issues related to poverty. These issues include children being born prematurely and with low birth weight, malnutrition, and disease. Low birth weight (LBW) babies are often born to mothers who have received inappropriate or limited prenatal care during their pregnancies (Lamb et al., 2002). LBW babies are clinically described as being born with less than 2500 grams of body weight and premature physical development (Aylward, 2002). For example, a child who is born premature may have underdeveloped lungs or may suffer from trauma such as over-oxygenization that may result in eye problems. Prevalence of resulting conditions like cerebral palsy is often associated with children who are LBW. According to National Institute of Neurological Disorders and Stroke (2004), children with cerebral palsy are also affected by other medical disorders, including seizures or mental impairment. Infants with cerebral palsy are frequently slow to reach developmental milestones such as learning to roll over, sit, crawl, smile, or walk. Cerebral palsy negatively affects children’s socio-emotional development as well. Disturbed behaviors or
emotional maladaptations are reported in 30 – 80 % of children with cerebral palsy. The parents of these children are more likely to report behavior problems in the domains of dependency and stubbornness (McDermott et al., 2002).

With regard to physical development, children with LBW are considered vulnerable and have an elevated risk of permanent neurological impairment (Zigler, Finn-Stevenson, & Hall, 2002) and often present higher rates of visual motor problems (Aylward, 2002). The LBW risk factor is also related to children’s diminished cognitive and socio-emotional development. Research has indicated that children of LBW have lower intelligence quotient scores and as a group receive more special education services because of resultant learning disabilities (Taylor et al., 1995). In addition, children of LBW are often found to exhibit more behavioral and attentional problems such as Attention Deficit/Hyperactivity Disorder (Aylward, 2002). Low birth weight is a factor that clearly influences children through out their early formative years.

While babies who are typically developing are born about 40 weeks after the mothers’ last menstrual period and their body weights are usually over 2,500 grams (about 5.5 lbs.), approximately 11% of the births in the United States are born prematurely, and 7% are born with low birth weight (Lamb et al., 2002). According to Morbidity and Mortality Weekly Report (2002), the rates of low birth weight and preterm birth have increased from 1980 – 2000. Those increases are resulted from technological advances in neonatal care that promote the viability of premature babies (Lamb et al., 2002). Preterm birth is defined as birth before the thirty-seventh week of gestation and the majority of the premature babies have low birth weight (Zigler, Finn-Stevenson, & Hall, 2002). Along with the weight ranges, low birth weigh is categorized as Low Birth Weight (LBW; < 2500g.), Very Low Birth Weight (VLBW; < 1500g.), and Extremely Low Birth Weight (ELBW; < 1000g.) (Aylward, 2002).
Low birth weight babies are biologically vulnerable and have an elevated risk of permanent neurological impairment (Zigler, Finn-Stevenson, & Hall, 2002). As a result, the low birth weight babies have average hospital stays of 45 to 50 days, and between one third and one half experience one or more rehospitalizations during the first 3 years of life (Lamb et al., 2002). They are exposed to the high risk of disabilities that include moderate/severe mental retardation, sensorineural hearing loss/blindness, cerebral palsy, and epilepsy (Aylward, 2002). They also have difficulty regulating emotions and responding to parents and other adults. Parents often find low birth weight babies difficult to care for. They may be hard to calm, lethargic, and unresponsive to playful overtures on the part of the parents, which can lead to disappointment and frustration (Zigler, Finn-Stevenson, & Hall, 2002).

The factors that closely related to low birth weight are ethnicity, maternal age, malnutrition, maternal distress, substance abuse, and multiple birth. African-American babies have a two- to threefold higher risk than Whites for low birth weight. According to statistics (Morbidity and Mortality Weekly Report, 2002), 16.07% of African-American newborn babies were low birth weight in 2000 while 7.64% of Caucasian babies were low birth weight. However, ethnicity per se is a mediating variable rather than a causal factor because it implies SES level, maternal medical conditions, stress, and/or social support.

Lamb and colleagues’ study (2002) describe other factors. Younger and older mothers have higher risk for low birth weight. Even after controlling for sociodemographic and medical risk factors, older mothers ( > 35-year-old) were still significantly more likely to give births to low birth weight babies than those who younger than 35 years old. Adolescent mothers were also at risk of having low birth weight babies. Mothers who are 17 years old or younger were more likely to give births to low birth weight babies than among 20- to 24-year-old mothers after
controlling statistically for mothers’ ethnicity, incomes, and marital status. Diet and nutritional conditions during pregnancy are other factors of low birth weight/premature birth. Women whose diets are rich in protein bear healthier babies. Malnutrition, especially deficiencies in protein, zinc, and folic acid, is linked to prematurity. Prenatal malnutrition that begins later is associated with low birth weight while malnutrition that begins early in pregnancy affects neural tube defects and hydrocephalus. Chronic distress during pregnancy turns out to be associated with low birth weight through an experiment with Rhesus monkeys. Maternal distress affects maternal hormones, which in turn affect the fetus. This factor can be affected by other factors such as marital status, income level, or social support. Nicotine from cigarette smoking is believed to constrict placental blood vessels, temporarily depriving the developing fetal brain of oxygen, stimulating the cardiovascular system and depressing the respiratory system. As a result, women who smoke have a higher incidence of preterm births and low birth weight. Prenatal drug abuse such as cocaine, heroin, or methadone exposure is also linked to low birth weight. Exposure to polychlorinated biphenyls (PCBs) is also associated with low birth weight. Through multiple births, the mother’s reproductive system may not have sufficient time to recover from a previous pregnancy and it affects the next birth as prematurity and low birth weight.

Low birth weight babies are at risk of cognitive and motor development deficits. They had poor motor development, and had reduced cognitive test scores than normal birth weight children from infancy to school age (Erickson et al., 2003; Bhutta et al., 2002). These delayed developments affect low birth weight children’s school achievement. Low birth weight children’s IQ scores were significantly lower than normal weight children. As a result, their academic achievement scores were also lower than control group. Especially, low birth weight children showed poor performance in mathematics when they were at school age (Taylor et al.,
1995; McGrath & Sullivan, 2002). The poor school achievement is positively correlated to poor development of visual motor skills and language, learning disabilities, and behavior problems of low birth weight children. The majority of extremely low birth weight and very low birth weight babies manifest some type of visual motor problems. These deficits include problems on neuropsychological tasks such as copying, perceptual matching, spatial processing, finger tapping, pegboard performance, visual memory and visual-sequential memory (Aylward, 2002).

Assessed at 5 years of age, children with LBW’s vocabulary delays were evident (Briscoe, Gathercole, & Marlow, 2001). Low birth weight children were more likely to have poor speech and language abilities than their normal counterparts (Yliherva et al., 2001). When they entered elementary and secondary schools, low birth weight children experienced more retention, received more special education services, and more often diagnosed as learning disabilities than normal counterpart (Taylor et al., 1995; Brown et al., 2003). These higher rates of learning disabilities were obtained even after controlling demographic factors. Extremely low birth weight children had more learning disabilities than very low birth weight children (Taylor et al., 1995). That is, the lighter birthweight, the more frequent learning disabilities were found in low birth weight children. Attention deficit hyperactivity disorders (ADHD) occurred 2.6 times more frequently in very low birth weight and extremely low birth weight children. Conduct disorders, shyness, unassertiveness, withdrawn behavior, and social skills deficits were also more frequently found in low birth weight children (Aylward, 2002). Parents of low birth weight children reported significantly higher scores for their children’s ADHD and depression than control group parents (Saigal et al., 2003).

Another such factor that has great impact on early developmental milestones is that of malnutrition. Malnutrition is a health condition which is the result of a combination of
inadequate dietary intake and infection. In living areas where there is a lack of food, unsafe water supplies, and inadequate sanitation, the risk of malnutrition is high (Viva Network, 2004). Good nutrition is vital for the physical and cognitive development of children. The first two years of life are an essential period of rapid growth and development that impact all systems of the developing child (Berkman et al., 2002). If a child is not provided with sufficient and consistent nutrition during the critical period, this child may be placed at risk of cognitive development as well as further physical development insults. One of these outcomes is delayed physical growth that is manifested in children of short stature or stunting (Berkman et al., 2002). In addition, this impact of child growth is also significantly associated with lower cognitive skills. For example, Drewett and colleagues (2001) found that two year-old children’s Bayley Scale scores were significantly correlated to body weight as predicted by malnutrition (Drewett, Wolke, & Asefa, 2001). Additional work in this area has revealed that at age nine, scores on the Weschler intelligence battery were associated with children’s early growth development. (Berkman et al., 2002).

The impact of malnutrition is one contributor to an increased risk status. Another such factor is chronic disease. While there are a number of childhood chronic diseases, some that disproportionately impact groups of children, the most of common is childhood asthma. Asthma has the highest prevalence rate of all childhood chronic diseases (Roder et al., 2003) particularly among the children enrolled in Early Head Start (Early Head Start, 2003). Its influence on other developmental pathways such as physical growth and other limitations it may place on a child’s attendance in child care may also negatively affect young children’s development. Due to their shortness of breath, children with asthma may avoid physical activities that reduce their already poor physical condition. In addition, the physical restriction can increase children with asthma’s
socio-emotional problems like low self-esteem, and poor social competence (van Veldhoven et al., 2001). At school age, children with asthma more often show poor school performance not because of diminished cognitive capacity but rather because of attendance issues. In addition, these children often feel socially isolated because they are frequently absent from school (Roder et al., 2003).

The contributions of poverty and other risk factors on the physical development of very young children cannot be understated. While physical disabilities are not necessarily always tied to cognitive disabilities, the difficulties that cognitive disabilities place on the development and progress of very young children can be quite influential.

Cognitive Development of At Risk Children

Some of the most common cognitive risk factors with which a young child can struggle are those of mental retardation, intellectual disability, or cognitive delay. Cognitive delay is defined as certain limitations in mental functioning and in skills such as communicating, self-help skills, and social skills. These limitations will cause a child to learn and develop more slowly than a typically developing child. Children with cognitive delay may take longer to learn to speak, to walk, and to take care of their personal needs such as dressing or eating. As children age, they are more likely to have trouble learning in school (American Association on Mental Retardation, 2002). It is known that 3 out of every 100 people in the United States have cognitive delay and that they are more often from low SES families. This finding is associated with poor pre- and perinatal care and/or health problems as well as genetic conditions (National Dissemination Center for Children with Disabilities, 2004). In addition to poor school achievement issue, cognitive delay can put the children at socio-emotional risks such being bullied and behavioral problems (Mishna, 2003; Trout et al., 2003).
In addition to the genetic influences on cognitive development, lack of education is also a prime risk factor for children living in poverty. Early and high quality education is necessary for children at risk to overcome their risky circumstances and to accomplish resilient development. Several early intervention results show the importance of early education for children at risk. In one such example, the Perry Preschool Project, preschoolers from families with limited incomes were found to have higher IQ scores than children in the control group and with which the effect was long lasting (Barnett & Escober, 2002). Similar findings were observed in the Abecedarian Project where an intensive high quality education program for infants at risk was provided for eight years, and for which the participating children performed better with regard to higher achievement later in school (Campbell et al., 2002). Children who lack access to high-quality early education when it cannot be provided by parents, are often deprived of such an education because of cost and accessibility. Lack of education results in delayed cognitive development, limited language skill, and poor socio-emotional development (Early Head Start, 2002).

In addition to the cognitive issues that may inhibit a child’s progress, there are also risks associated with poor socio-emotional development. Two main categories of risk that impede healthy development in the socio-emotional domain include maltreatment and family disintegration.

Socio-Emotional Development of At Risk Children

The federal government defines child maltreatment in the Child Abuse Prevention and Treatment Act as the physical and mental injury, sexual abuse, negligent treatment, or maltreatment of a child under the age of 18, by a person who is responsible for the child’s welfare, in such a manner that results in indication that the child’s health or welfare is harmed or threatened (National Association of the Counsel for Children, 2004). This term is often referred
to as abuse or neglect. According to Manly and colleagues (2001), children who experience abuse or neglect often have adverse outcomes. Children who have experienced abuse or neglect often exhibit more behavior problems and are characterized as more aggressive, more withdrawn, and less cooperative than children who have not experienced abuse or neglect. With regard to personality functioning, children who have been victims of abuse or neglect are characterized by lower levels of ego resiliency and more ego undercontrol than are typically developing children (Manly et al., 2001). In infancy, this state of affairs is characterized by insecure and disorganized or disoriented attachments to caregivers. In the toddler period, children who have been abused or neglected exhibit disturbances in the development of the self or other regulatory systems (Egeland et al., 2002). While abuse and neglect is a powerful predictor of future developmental issues, so is the disintegration of the family unit.

Family disintegration is defined as separation and/or divorce of parents, death of a family member, and being the child of an unmarried and/or single parent (Viva Network, 2004). Family disintegration may contribute stressors to children’s lives because children may experience feelings of loss and may be unable to access sufficient parental care. The relationship between a child and his/her divorced parent is less intimate than intact families’ child – parent relationship and the children of divorced families may often feel more disconnected from their families. Research has indicated that social and academic functioning of children from divorced families is also significantly negatively impacted when compared to the social and academic functioning of children of intact families (Guttman & Rosenberg, 2003). Forty-nine percent of single parent families headed by single mothers live in poverty. Much of this poverty is due to radical change in family circumstances such as divorce or death of a parent (Annie E. Casey Foundation, 2004).
Summary

Given the research on the negative outcomes of poverty on physical, cognitive, and socio-emotional development, and the relative lack of information on how much accumulated risk is associated with such outcomes, what is needed is research that examines the outcomes for children enrolled high-quality early intervention programs who have such differing levels of risk.
CHAPTER 3
METHODOLOGY

Community Context

This study took place in a metropolitan community, Russell City in Russell County (a pseudonym), in the southeastern United States. The community was defined as metropolitan because of the size of its population. Russell County housed a research university with demographics of college-affiliated citizens and a range of other citizens with varying occupational and socioeconomic distinctions. The community population totaled 101,489 on the 2000 U.S. Census. Of that number, 31,288 were students at the local university.

The ethnic distribution of Russell City was 68.1% Caucasian, 27.4% African American, and 4.5% identified as other. Children under 5 years of age comprised 5.4% of the total population. When considered within the total population, the percentages of children by ethnic group were almost 4 percent (3.6%) white, 8.2 percent African American, and 12.5 percent Hispanic.

Across the United States, Russell County had the 117th highest percentage of residents living in persistent poverty among the nation’s 3,141 counties in each of the last three U.S. Census. The percentage of the total population living below the federal poverty level was 28%, with 28% of children aged birth to 17 living in poverty. Of the population under age 5, 27.9% of children lived in poverty. Within the local school system, 61% of children were eligible for free or reduced lunch services. In 2002, the unemployment rate in the community was 3.4% (below the state average of 5.1 percent).
Over half of the children in the school system come from single-parent households. In addition, of those children diagnosed with special needs, 58.9% of those identified had intellectual or cognitive disabilities. For very young children, including infants and toddlers, the main types of disabilities were hydrocephalus, seizure disorders, and Down Syndrome. Youth in the community have limited school success with high school dropout rates of 10.7 percent and 13.6 percent for the two high schools. Among the members of the high school graduating classes, only 58.8 percent and 56.8 percent of students graduate with the classmates with whom they started school. These figures demonstrated drastic differences among African American and Caucasian youth with 33% of African American students not completing high school compared to only 11.1% of Caucasian students.

The community also dealt with a number of social issues. The number of adolescents who had witnessed domestic violence, were living in shelters, or who were homeless included data on 1,289 crisis calls to social service agencies in 2004. From 1992-2002, there were 3,761 substantiated cases of child abuse or neglect in the community. In 2001, the community had 171 open case files on children, 286 closed cases on children, 995 cases investigated, and 395 screened out cases. In sum, 1390 reports were called into the county’s child protection services. Of the number of arrests in the community, 12.5% were to juveniles with greater rates among African Americans than Caucasians.

**Early Head Start Programming**

The community’s Early Head Start program at the time of the study accommodated 80 children and their families in two main service options—home-based programming and center-based care. Home-based families received home visits more than once a week from trained Child Development Specialists and twice a month children and parents were brought together for group
socialization experiences. Home-based educator’s training ranged from a high-school diploma to an individual with a four-year collegiate degree.

Children in the center-based option were provided with free child care from 7:30 a.m. to 2:30 p.m. five days a week. Center-based teachers were required to meet with parents in their homes twice a year. Center-based teachers had a minimum of an associate’s degree. Ratings of the quality of the classroom environment and caregiver sensitivity indicated that the classrooms were perceived to be developmentally appropriate. Family service specialists assisted both home-based and center-based families with crisis intervention as needed.

Early Head Start also provided families with access to health and dental case management, special education services if warranted, and resource coordination for social services in the community. The Early Head Start program was part of a larger division within the school system that also contained programs such as Even Start, Universal Prekindergarten, Migrant Education, and GED/Adult Education. Federal monitoring of the Early Head Start program indicated that the program meet the standards for program implementation set forth by the Head Start Bureau, U.S. Department of Health and Human Services.

Study Participants

All participants in the Early Head Start program were asked for their consent to participate in the current study. Of the 80 children, 70 had families that agreed to participate. The mean age of children in the total sample was 1.79 years (SD=1.01 years). Of the total sample, 20 percent of the families spoke Spanish as their primary language (N=14). The primary language spoken in the home was significantly correlated with the risk index variable (r=-.27, p=.02) where no children rated as having the highest levels of risk were from families where Spanish was the primary language. All children in the study were classified as United States citizens. The
children were relatively balanced by gender in the sample with 38 males (54.3 percent) and 32 females (45.7 percent). Close to two-thirds of the sample was African-American (74.3 percent). Sixteen children were identified as Latino (22.9 percent) and 2 children were identified as white (2.9 percent). Regarding the home-based or center-based options in the program, 32 children (45.2 percent) were participating in the center based option, while 38 children (54.8 percent) were enrolled in the home-based option. A significant correlation was found between the risk index and the program option in which the child was enrolled ($r=-.25, p=.04$). More children categorized as having greater levels of risk were enrolled in the center-based option of the Early Head Start program.

Concerning the marital status of the mother’s in the sample, 49 of the 70 mothers were not married (70 percent), 20 of the mothers were either married or living with a partner (28.6 percent), while one mother was divorced. Parental education in the sample suggested a wide range of educational achievement from completion of grades 1-4 in elementary school to some college experience. In the total sample, the mothers reported the following educational achievements: Grades 1-4 ($N=3, 4.3\%$), Grades 5-8 ($N=4, 5.7\%$), Grades 9-12 ($N=45, 64.3\%$), GED diploma ($N=4, 5.7\%$), high school graduate ($N=9, 12.9\%$), and some college ($N=3, 4.3\%$). Data were not provided by two mothers.

Data were also collected on the average attendance patterns among the children in the program. These ratings were provided by Early Head Start program staff and suggested that two-thirds of the children had good to excellent attendance in the program. Slightly over 30 percent of the children were rated as having poor or fair attendance. Analysis suggested that the level of risk was not associated with daily attendance in the program ($r=.07, p=.58$). Federal performance standards required a certain number of hours per day in the center-based option. Attendance is
also required to be tracked by Early Head Start program staff. Anecdotal information from program staff suggest that center-based children have more regular attendance because failure to attend the program would allow for their child care slot to be given away by being disenrolled in the program. Attendance issues and rescheduling of home visits were cited as a concern among the home-based parents.

In order to gauge the degree of risk based on risk early risk factor for each, a risk index was created. This index was comprised of five separate ratings of five variables that included: prematurity, low-birth weight, the nutritional status of the mother, the age of the mother, and substance abuse by the mother during pregnancy. Each variable by child was rated on a one to six scale, where a value of six indicated the greatest amount of risk. Scores on the five subscales were summed to create a total risk index (See Table 1).

Table 1

<table>
<thead>
<tr>
<th>Index name</th>
<th>Index score and range</th>
<th>Rated by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prematurity</td>
<td>1: 37 weeks of gestational age</td>
<td>Birth record</td>
</tr>
<tr>
<td></td>
<td>2: 36-37 week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3: 35-36 week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: 34-35 week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5: 33-34 week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: less than 33 week</td>
<td></td>
</tr>
<tr>
<td>Low birth weight</td>
<td>1: &gt;3,001g</td>
<td>Birth record</td>
</tr>
<tr>
<td></td>
<td>2: 2,501-3,000g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3: 2,001-2,500g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: 1,501-2,000g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5: 1,001-1,500g</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: &lt;1,000g</td>
<td></td>
</tr>
</tbody>
</table>
Table 1  *Continued*

<table>
<thead>
<tr>
<th>Nutritional status of the mother</th>
<th>1: excellent nutritional status during pregnancy</th>
<th>Self report by the mother</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2: good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: fair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: poor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age of the mother</th>
<th>1: older than 21 years when the child was born</th>
<th>Birth record</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2: 20 years old</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3: 19 years old</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: 18 years old</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5: 17 years old</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: younger than 16 years</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substance abuse during pregnancy</th>
<th>1: none substance abuse during pregnancy</th>
<th>Self report by the mother</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2: prescription drug</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4: alcohol/smoking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6: cocaine</td>
<td></td>
</tr>
</tbody>
</table>

| Total risk index | 5 – 30 points | Sum of the five sub indices scores |

For the prematurity index, the modal score for the sample of 70 children, was a risk index of 1. Only 6 children received a score higher than 1. Prematurity was measured by the number of weeks the child was born premature. In the total sample, 26 children (37.1 percent) were born prematurely. This variable was defined as being born before 37 weeks. The distribution of the children across the risk index is presented in Figure 1.
Figure 1. Distribution of Children’s Ratings on Prematurity Index

A second index was calculated to examine the distribution of birthweight across the sample. Within the sample, 64.3 percent of the children were rated as having the lowest risk. The remaining 35.7 percent were rated as having higher levels of risk associated with their birthweight. The birthweights ranged from 9 ounces to 136 ounces ($M=106.76$, $SD=19.70$). The data for this risk are displayed graphically in Figure 2.
Ratings were also provided with regard to mother’s nutritional status during her pregnancy. These data indicated that more variability with regard to the nutrition of the mother during the critical fetal developmental period. Only 7 mothers were rated as having the lowest level of risk concerning their nutrition. Twelve mothers were rated at the highest level of risk on this index. Data were collected from Early Head Start program records and birth certificates on the birth weight of children. A line graph illustrating the distribution of the mother’s risk status across their nutritional status during pregnancy is presented in Figure 3.
On the fourth risk index, the mother’s age was rated on a scale of 1 to 6. Ratings from 2 to 6 were assigned to teen mothers in the sample. The youngest of these teen mothers, who was 14 years old, was assigned a rating of 6. In the total sample, 32 of the 70 children (45.7%) were born to teenage mothers, who ranged in age from 14 to 20 (gave birth at age 20, conceived child at age 19). The median age of the teen mothers was 17 years of age. The distribution of the ratings on maternal age is presented in Figure 4.
Figure 4. Distribution of Children’s Ratings on the Mother’s Age during Pregnancy

The last index provided a rating on the mother’s substance abuse during pregnancy. Examples of substances utilized by the mothers included cocaine use, tobacco use, and alcohol use. Ten of the mothers were rated above the highest level of risk on this index. The distribution of the ratings of this index is presented in Figure 5 below.
A final risk index was calculated by summing the ratings across the five indexes. This rating indicated the overall degree of risk to the child based on these five factors that may have influenced their healthy development. The total risk index score across the sample is displayed in Figure 6.
A number of data points were collected on children and their families. Most of the data came from programmatic records kept on each child and family by the school system.

Demographic Information

Cumulative records that contained information from the child and family were gathered from both formal (e.g., birth records, social service records) and informal sources (e.g., interviews with the parents of children). Demographic information was collected for the purposes of this study from the child and family records. Specific data was collected on child demographic variables and included: (1) gender; (2) ethnicity; (3) date of birth; (4) birth weight; (5) birth status (i.e., prematurity); (6) general health status; (7) enrollment in special education;
(8) abuse and neglect referrals; and (9) attendance in the program. Data collected on families was collected only on mothers given the high rate of single-parent households for children in the study as well as a high rate of absence of children’s fathers. Data collected on mothers included: (1) age of mother at birth; (2) general and specific health status of mother during pregnancy; (3) substance use during pregnancy; (4) involvement in the program; (5) referrals for mental health including depression; (6) knowledge of child development; (7) number of referrals for community services; (8) number of visits from family service worker; (9) family crisis rating; and (10) ratings of parent-child interactions.

Bayley Scales of Infant Development-Second Edition (BSID-II)

Developed by Bayley (1969), the measure is an individually administered examination to assess developmental function of infants and children. One outcome of the measure is to diagnose developmental delay in young children. The measure is utilized with children aged 1 month to 42 months and is comprised of three subscales, Mental Index, Motor Index, and Behavior Rating. The mental index assesses the child’s level of cognitive, language, personal-social development with a specific focus on memory, habituation, problem solving, early number concepts, generalization, classification, vocalizations, language, and social skills. The motor index provides evidence of development on fine and gross motor tasks including movement associated with rolling, crawling and creeping, sitting, standing, walking, running, jumping, and fine motor manipulations involved in prehension, adaptive use of writing implements, and imitation of hand movements. The Behavior Rating assists in the interpretation of the mental and motor indices and includes information on attention/arousal (under 6 months of age), orientation/engagement toward the tasks, examiner and caregiver, emotion regulation, and quality of movement. The scale was renormed in 1991-1992. The BSID-II has moderate to high
average internal consistency (Mental, 0.88; Motor, 0.84; Behavior 0.88). Validity studies indicate that the measure correlates well with the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R) and the McCarthy Scales of Children’s Abilities (MSCA). Data also suggest that the BSID-II tends to classify children similarly to classification obtained by the Denver Developmental Screening Test-II, although the Bayley is a diagnostic test and the Denver is a screening tool.

For the purposes of this study, the highest Bayley scores were utilized in the analysis. Because children were tested at different ages and data points are not available for all children at all ages because of their date of entrance into the program, the highest mental index, motor index, and behavioral ratings were utilized in the analysis.

_Denver Developmental Screening Test-II (Frankenburg & Dodds, 1967)_

The Denver was first published in 1967 to assess developmental problems in young children from birth to six years of age. The screening tool assesses children for possible asymptomatic conditions and provides evidence for a mechanism of support for referral for future diagnostic testing over specific concerns. The screening tool has four sectors that include: personal-social, fine motor-adaptive, language, and gross motor tasks. Results are scored as typically developing or suspect (leading to referral). The authors of the revised instrument report an inter-rater reliability index of 99.7%.

**Procedures**

Permission was obtained for parents of Early Head Start children in the fall of 2004 and spring of 2005. Data were collected from child and parental cumulative records in the spring of 2005. Children were assessed with the Denver tool in the fall of 2004 per Head Start Performance Standards. Children were assessed by their classroom teachers on the Denver with
any concerns reported to the family service coordinator for Early Head Start. The quality of the Denver score is judged to be high, even when administered by teachers, because teachers were trained in the administration of the instrument routinely by the author of this study. Children were assessed with the Bayley scales on the schedule based on child age that included data points for respective children at 3, 6, 9, 12, 18, 24, and 36 months. These data were collected by the author who had the requisite skills to administer and interpret the Bayley scores. The qualitative summary for each of the three Bayley scales was provided to the Early Head Start program for informational and referral purposes. As stated earlier, the highest rating on the Bayley instrument was utilized in the analysis.

Once all data were collected, each child’s profile was examined for the risk factors and a risk index was calculated for each child. All children in the sample lived in poverty, therefore, the definition of early risk exposure means those risk variables for each child in addition to the poverty variable.

Data Analysis

Specific data analyses were performed on the group of children classified as at risk. Table 2 displays the specific dependent variables for child cognitive development, child physical development, child socio-emotional development, and parental outcomes. Data were analyzed via regression and correlation strategies (See Table 2).
### Table 2

**Area, Variable, Source, and Description**

<table>
<thead>
<tr>
<th>Area</th>
<th>Variable/Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child Cognitive Development</td>
<td>Mental development (Bayley)</td>
<td>Standardized mean score=100 (SD=15)</td>
</tr>
<tr>
<td></td>
<td>Child’s diagnosed disability (cumulative record, Denver)</td>
<td>Babies can’t wait referral/ Denver results (normal, suspect, and delayed development)</td>
</tr>
<tr>
<td></td>
<td>Parental knowledge of child development (ratings from EHS Staff)</td>
<td>Excellent, very good, good, fair, and poor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child Physical Development</td>
<td>Motor development (Bayley)</td>
<td>Standardized mean score=100 (SD=15)</td>
</tr>
<tr>
<td></td>
<td>Child’s general health status (rating from EHS staff)</td>
<td>Excellent, very good, good, fair, and poor</td>
</tr>
<tr>
<td></td>
<td>Child’s diagnosed disability (cumulative record, Denver)</td>
<td>Babies can’t wait referral/ Denver results (normal, suspect, and delayed development)</td>
</tr>
<tr>
<td></td>
<td>Child’s specific disease status (cumulative record)</td>
<td>Check any of the disease on the cumulative form (see Appendix A)</td>
</tr>
<tr>
<td></td>
<td>Parental knowledge of child development (ratings from EHS Staff)</td>
<td>Excellent, very good, good, fair, and poor</td>
</tr>
<tr>
<td>Child Socio-emotional Development</td>
<td>Parental Outcomes</td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Behavioral rating (Bayley)</strong></td>
<td><strong>Excellent, very good, good, fair, and poor</strong></td>
<td></td>
</tr>
<tr>
<td>Child’s diagnosed disability</td>
<td><strong>Parent’s depression and service receiving</strong></td>
<td></td>
</tr>
<tr>
<td>(cumulative record, Denver)</td>
<td>(see Appendix A)</td>
<td></td>
</tr>
<tr>
<td>Child Protective Service</td>
<td><strong>Number of visits during the academic year</strong></td>
<td></td>
</tr>
<tr>
<td>referrals (cumulative record)</td>
<td>(see Appendix A)</td>
<td></td>
</tr>
<tr>
<td>Parent-Child Interactions (rating</td>
<td><strong>None, 1-2, 3-5, 6-9, and more than 10</strong></td>
<td></td>
</tr>
<tr>
<td>from EHS Staff)</td>
<td>requests (see Appendix A)</td>
<td></td>
</tr>
<tr>
<td>Program attendance (cumulative</td>
<td><strong>Developing normally, minimal crisis but</strong></td>
<td></td>
</tr>
<tr>
<td>record)</td>
<td><strong>still developing, moderate crisis, and major</strong></td>
<td></td>
</tr>
<tr>
<td>Number of PACT meetings</td>
<td><strong>crisis impedes development (see Appendix</strong></td>
<td></td>
</tr>
<tr>
<td>(cumulative record)</td>
<td><strong>A)</strong></td>
<td></td>
</tr>
<tr>
<td>Parental knowledge of child</td>
<td><strong>Excellent, very good, good, fair, and poor</strong></td>
<td></td>
</tr>
<tr>
<td>development (ratings from EHS</td>
<td><strong>Number of visits during the academic year</strong></td>
<td></td>
</tr>
<tr>
<td>Staff)</td>
<td>(see Appendix A)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>None, 1-2, 3-5, 6-9, and more than 10</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>requests (see Appendix A)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Developing normally, minimal crisis but</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>still developing, moderate crisis, and major</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>crisis impedes development (see Appendix</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>A)</strong></td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER 4

RESULTS

Analyses of the four main hypotheses are presented in this chapter. Data analyses include both regression and correlational analysis where appropriate. Results are first presented for statistical tests concerning child cognitive outcomes, then physical outcomes, socio-emotional outcomes, and parental outcomes.

Child Cognitive Outcomes

A regression analysis was performed with both linear and quadratic methods under the assumption that the research literature would suggest a curvilinear distribution of risk where high risk status would result in lower outcomes on measures of cognitive development. Examination of the mental index from the Bayley measure indicated that the risk index was not predictive of later cognitive development (See Table 3). Scores for the sample on the Bayley mental index ranged from 54 to 111 with a mean score of 92.60 ($SD=10.67$).

Table 3

*Linear Regression of Bayley Mental Index on Overall Risk Index*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model</th>
<th>B</th>
<th>t</th>
<th>p</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayley Mental Index</td>
<td>Linear</td>
<td>-.45</td>
<td>-.82</td>
<td>.41</td>
<td>.01</td>
</tr>
<tr>
<td>Bayley Mental Index</td>
<td>Quadratic</td>
<td>3.37</td>
<td>1.02</td>
<td>.31</td>
<td>.03</td>
</tr>
</tbody>
</table>

The risk index variable was also correlated with the information from the Denver screening tool as well as the presence of a diagnosed disability for the child. Data from the
Denver screening tool indicated that the higher the rating on the risk index, the more likely the child was to being screened as suspect for a disability or categorized as delayed in his or her development ($r=.31, p=.01$). The Denver procedures screens for personal-social, fine motor-adaptive, language, and gross motor tasks, multiple areas in development. For each of the subsequent hypotheses, the results on this assessment will not be repeated. On the relationship between parental knowledge about child development and the level of early risk, no significant correlation was found ($r=-.03, p=.78$). Analyses for the other hypotheses as they relate to parental knowledge of child development, will not be repeated in the physical and socio-emotional development.

**Child Physical Outcomes**

A regression analysis was performed with both linear and quadratic methods under the assumption that the research literature would suggest a curvilinear distribution of risk where high risk status would result in drastically lower outcomes on measures of physical development. Examination of the motor index from the Bayley measure indicated that the risk index was not predictive of later physical development (See Table 4). Scores on the Bayley motor index ranged from 73 to 124 with a mean score of 99.08 ($SD=11.16$).

Table 4

*Linear Regression of Bayley Motor Index on Overall Risk Index*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model</th>
<th>B</th>
<th>t</th>
<th>p</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bayley Motor Index</td>
<td>Linear</td>
<td>-.78</td>
<td>-1.39</td>
<td>.17</td>
<td>.03</td>
</tr>
<tr>
<td>Bayley Motor Index</td>
<td>Quadratic</td>
<td>.87</td>
<td>.25</td>
<td>.80</td>
<td>.03</td>
</tr>
</tbody>
</table>
The relationship between child’s general health status and the level of early risk was statistically not significant ($r=-.12, p=.35$). The relationship between child’s specific disease status and the level of early risk was also not found ($r=.10, p=.42$). On the relationship between parental knowledge about child development and the level of early risk, no significant correlation was found ($r=-.03, p=.78$).

**Child Socio-Emotional Outcomes**

A number of statistical analyses were performed on variables related to socio-emotional outcomes. The correlations of the risk index with child socio-emotional developmental outcomes were shown in Table 5.

**Table 5**

*Correlations of Socio-Emotional Outcomes and Overall Risk Index*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall Risk Index</td>
<td>--</td>
<td>.01</td>
<td>.31*</td>
<td>-.02</td>
<td>-.02</td>
<td>.07</td>
<td>-.16</td>
<td>-.03</td>
</tr>
<tr>
<td>2. Bayley Behavior rating</td>
<td>--</td>
<td>-.08</td>
<td>-.10</td>
<td>.09</td>
<td>.20</td>
<td>-.07</td>
<td>-.20</td>
<td></td>
</tr>
<tr>
<td>3. Child’s diagnosed disability</td>
<td>--</td>
<td>-.13</td>
<td>-.08</td>
<td>-.08</td>
<td>-.08</td>
<td>.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CPS referrals</td>
<td>--</td>
<td>.21</td>
<td>-.03</td>
<td>.18</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Parent-child interactions</td>
<td>--</td>
<td>.41*</td>
<td>.38*</td>
<td>.62*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Program attendance</td>
<td>--</td>
<td>.31*</td>
<td>.49*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Number of PACT meetings</td>
<td>--</td>
<td>.25*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Parental knowledge of child development</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p<.05
As in the previous analysis, the relationship between a diagnosed disability or delayed in development and the level of early risk indicated that the risk index was predictive of the child’s diagnosed disability \( (r=.31, p=.01) \). Although the other variables were not correlated to the overall risk index, there were several significant correlations among the variables of child’s socio-emotional outcomes. The quality of parent-child interactions was correlated to the child’s program attendance \( (r=.41, p=.00) \), number of PACT meetings \( (r=.38, p=.01) \), and parental knowledge of child development \( (r=.62, p=.00) \). Program attendance pattern was also closely correlated to number of PACT meetings \( (r=.31, p=.01) \), parental knowledge of child development \( (r=.49, p=.00) \), and overall family crisis ratings \( (r=.28, p=.02) \). The more the parents attended PACT meetings, the better the parents understanding of child development \( (r=.25, p=.04) \).

**Parental Outcomes**

To examine the correlations between the risk index and parental outcomes, a number of statistical analyses were conducted. The correlations of the risk index with parental outcomes were shown in Table 6.

The correlation between the overall early risk index and family crisis rating indicated that the risk index was predictive of the degree of overall family crisis \( (r=-.25, p=.04) \). Among the parental outcome variables, several significant correlations were found that are not directly related to the risk index. Mother’s general health status was negatively correlated with the number of visits from the family service worker and the number of requests for assistance \( (r=-.45, p=.00, \text{ and } r=-.39, p=.00, \text{ respectively}) \) while positively correlated with family crisis rating \( (r=.28, p=.02) \). Number of requests that the parent has made for assistance was also correlated
with the mother’s mental health \( (r = .26, p = .04) \), number of visits from the family service worker \( (r = .43, p = .00) \), and family crisis rating \( (r = -.37, p = .00) \).

Table 6

_Correlations of Parental Outcomes and Overall Risk Index_

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall Risk Index</td>
<td>--</td>
<td>.01</td>
<td>.09</td>
<td>-.06</td>
<td>.07</td>
<td>-.25*</td>
</tr>
<tr>
<td>2. Mother’s general health</td>
<td>--</td>
<td>-.04</td>
<td>-.45*</td>
<td>-.39*</td>
<td>.28*</td>
<td></td>
</tr>
<tr>
<td>3. Mother’s mental health</td>
<td>--</td>
<td>.23</td>
<td>.26*</td>
<td>-.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Number of visits from the family service worker</td>
<td>--</td>
<td>.43*</td>
<td></td>
<td>.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number of requests of assistance</td>
<td>--</td>
<td>.37*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Family crisis rating</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\* \( p < .05 \)

Summary

The first hypothesis was that children who had higher level of early risk factors have lower developmental status in their cognitive, physical, and socio-emotional development. The hypothesis was partially supported by the analysis. The analyzed data did not show statistically significant differences in each developmental area of the children who had different levels of early risk. However, the children who were more exposed to early risk factors were more likely to be diagnosed as having disability.

Secondly, it was hypothesized that the parents of children who had higher level of early risk factors have poor parental outcomes including parents’ general and mental health, number of family service worker, number of requests of assistance, and family crisis rating. The analysis
results supported the relationship between level of early risk factors and family crisis rating but not other parental outcomes.

While the data analyses performed did not in large measure support the hypotheses, the data do suggest that the group of children, regardless of risk status, were performing well given their level of early risk. Analyses also suggested the buffering role of parents in child and family outcomes.
CHAPTER 5
DISCUSSION, CONCLUSIONS, AND IMPLICATIONS

Summary of the Study

To measure the degree of early risk factors of children in the high quality Early Head Start intervention, a risk index was constructed for this study. The risk index allowed for five different risk factors to be considered in a weighted fashion and also allowed for the measure of an accumulated amount of risk rather than merely categorizing risk by absence or presence of the attribute. Because all children in the sample lived in poverty, it was important to conceptualize the contribution of additional risk factors when thinking about the developmental outcomes of children. As a result, children’s early risk was defined in a continuous manner in the study. Therefore, it is possible to make conclusions as to the degree to which a child is placed at risk for poor developmental outcomes. This unique way of organizing the data provided for better understanding and control of the contributions of the risk variability. While this strategy is not one that has been typically employed in early intervention research, there appears to be some promise to the use of such method when accounting for developmental outcomes in high-risk samples of children and families. Previous research has generally used a categorical variable to describe risk in children. In addition, the use of a risk index seems more appropriate for a dynamic system of intervention where rapid development of children and families is taking place. Such an index can account for the unique attributes of children, while still maintaining sensitivity to the definition of risk.
As the literature suggested, resilience in this group of at risk children was enhanced by a high quality early intervention program that minimized the resultant effects of early exposure to risk by supporting sound development in cognitive, physical, socio-emotional, and parental development. This study contributes to the literature by examining the degree of risk on developmental outcomes for children who are enrolled in a high-quality early intervention. Very few studies have focused on such interventions for infants and toddlers and most often those studies have focused on children in intervention treatments and those in either matched or random control groups. This study adds to the literature by examining how children enrolled in high-quality early intervention fare when exposed to the same intervention by mediated by different early risk variables. While many researchers discuss the importance of the prenatal development period, few studies follow children into high-quality intervention settings. That is, intervention programs have mainly focused on risk factors at later stages of the human life span, that is, once children are born and most often during their preschool years. Many research results suggest the importance of prenatal development and this study begins that line of inquiry by evaluating early intervention programs that attend to the early risk factors.

In the Russell County Early Head Start program, children from diverse backgrounds were provided high-quality intervention. All of the participants were from low socioeconomic and minority families. In addition, the diversity is also highlighted by the one third of the sample who were non-English speakers. As such, all children and their families were exposed to some risk. Through the study, the data suggested that the participants’ risk factors were successfully accommodated by the services provided by the program. While not all families are out of crisis, the program provided continuous support and access to services to manage additional risks faced by the children and the families. It was hypothesized that the developmental outcomes of
children who were more exposed to risk were poorer than the developmental outcomes of those who had low numbers of risk factors. Surprisingly the significant differences were not evident among different levels of risk. This lack of differentiation, when the research literature would predict that differences should exist, may be a function of the restricted sample size or the limited variability in the overall risk index. Over time, with the inclusion of additional children and families in the sample, the levels of risk may be variable enough to more accurately differentiate among the children with different levels of early risk. Despite the lack of statistically significant difference, through this early intervention program, it was apparent that children with all levels of risk had relatively sound development. Their developmental outcomes were not far from the normative sample, as indicated on measures such as the Bayley where the group mean was within one standard deviation of the mean score on the mental index. Indeed, for the motor index, the group was at the normative mean. It may be that this sample of children, while still exposed to multiple risk factors, have some confounding influences associated with their outcomes. For example, perhaps the proactivity of the parents who sought services for their children along with the quality of the continuous intervention warded off negative outcomes. These outcomes are atypical for the research literature that suggests that short periods of intervention do not necessarily result in lasting gains.

Discussion of the Results

Cognitive and Physical Outcomes

For both the cognitive and physical outcomes for this sample of children at risk, a slight curvilinear relationship appeared where highest risk was associated with lower gains, but this result was not statistically significant. This may be the result of a sample of children whose scores were very close to the normative mean scores. If the sample size was increased, the
curvilinear path might be more definitive. Another reason of the insignificance may be that the very young children’s cognitive and motor development is difficult to be correctly assessed because their attention span is short, and they do not possess abstract thinking skills. If the children at this age were assessed later on, the relationship between early risk factors and cognitive development might be more evident. There was a tendency that the children who had the higher levels of risk were more likely to being screened as suspect for a disability or categorized as delayed in their development. The screening may enable earlier special needs intervention that would minimize negative outcomes for cognitive and physical development. That is, it could be reasoned that early screening and immediate intervention diminished the impact of the early risk factors. Because the data were limited to the age range of birth to age three, future research should follow these children into their preschool and primary school environments to see what the outcomes would be once the continuous high-quality early intervention is taken away. Specifically, for this sample of children, not all children transition into Head Start or other high-quality intervention programs at age three or prekindergarten at age four. In the absence of continuous monitoring it could be hypothesized that during this period of rapid development that the positive cognitive and physical outcomes could stagnate.

One other important aspect to cite is the education provided to the parents of the children in the study. It could also be a confounding variable in that parents who are more educated about cognitive stimulation and physical development opportunities for their children will engage in such practices, this minimizing negative outcomes.

Socio-Emotional Outcomes

The early risk index predicted children’s diagnosed disability. The children who had more early risk factors were more likely to be diagnosed as having disability than those who had
less risk. The disabilities found in the sample of children included motor skill or speech delay; however, these developmental areas are also closely related to the child’s socio-emotional development. For example, physical disabilities would restrict the child’s independent skills and speech delay would constrain the child’s social skills. Children with disabilities can also be more challenging to care for especially by the parents who have lack of resources. Such barriers could disturb healthy attachment between child and parent. The correlation of parent-child interaction quality and other outcomes was found in the study and maintained the explanation. Regardless of the difference in early risk index, children who had better interaction with their parents had better program attendance. Their parents more frequently attended parent involvement activities and had better understanding of child development regardless of early risk exposure. Consequently, it was concluded that the early risk index predicted diagnosed disabilities and the disabilities were harmful to a child’s socio-emotional development as well as cognitive and physical development. Fortunately, the Early Head Start program provided adequate early intervention and facilitated resilience of children who were exposed to early risk factors.

Parental Outcomes

The early risk index correlated with the overall family crisis rating provided by the program staff. Within this area of the study, the mother’s general and mental health seemed to be significantly related to the number of visits from the Early Head Start family service worker as well as the number of requests for community assistance. What these data suggest is either that the program is proactive in responding to mothers who are exhibiting signs of distress or crisis by program and/or community intervention services, and/or that the mothers of the sample children are more proactive than other mothers of children at risk in seeking appropriate help. In any case, such rapid response to such situations most likely facilitates the healthy development
of children, because the length of time in crisis is minimized. These data are supported by the correlation between the general and mental health of the mother and the family crisis rating.

**Summary**

Overall the hypotheses suggested at the beginning of this study were not supported. While the children and families are categorized as generally exposed to more risk because of their poverty status and additional early risk variables, the data do not generally support the hypothesized predictions about poor outcomes for children and families.

**Limitations to the Study**

There are a few limitations to this research study. One of the main limitations centers on the size of the sample. While many studies of infants and toddlers have relatively low sample sizes, a larger sample size may be needed to differentiate the children with regard to their levels of risk. The sensitivity of the risk index, although many of the sub-indices had respectable distributions, may suggest that a more varied sample may produce different results with regard to the developmental outcomes. For example, only one child was rated as extremely low birthweight. Additional children who meet the criteria may add variability to the data and one’s ability to differentiate among children the contribution of that risk index.

Another limitation of the study was the use of only one data point for the Bayley scores. Alternative analysis techniques such a growth curve modeling may more accurately represent the data. However, given the relatively small sample size and because not all children enroll in the Early Head Start program at the same age point, there were significant gaps in data cells for some children. One additional limitation is focused on the use of self-report data from the mother as well as ratings by the program staff. The study would have been strengthened by the inclusion of direct observation of children and families.
Suggestions for Future Research

While this study begins the line of inquiry concerning the differential contribution of risk to child and family development outcomes, it is important for future research to continue the longitudinal nature of such inquiries. By adding additional children and families to the sample and by tracking children and families as they enter public school, the strength of assertions made from the early risk indices may be more powerful.

This study focused on mothers and their children and ignored the important contribution of fathers to the development of their children. Future research that accounts for both parents perspectives is warranted.

Summary

This study investigated differences for children who attended a high-quality early intervention program but who had different degrees of risk. The results of the study support the call for early intervention program in warding off the negative outcomes of risk on later development. By focusing on the early risk factors, this study has contributed to the literature in ways that most intervention research has not. By documenting the contribution of risk in the prenatal and early days of life, this research provides a foundation for the development of future studies on such risk variables.
REFERENCES


APPENDIX A

Early Head Start Longitudinal Evaluation Cumulative Record Form

Date form completed: ____________________

Demographic Information

1. Name of EHS Child: ________________________________
2. Date of entry into the EHS Program: ________________
3. Gender of Child: MALE  FEMALE
   Ethnicity: _____ African-American
               _____ Latino
               _____ Caucasian
               _____ Asian
               _____ Native American
               _____ Other
4. Date of Birth of EHS Child: ______________ (Month/Day/Year)
   Was this child born prematurely?  YES   NO
   If so, how many weeks early? ______________
   What was the birth weight of this child? ____________
   What was the age of parent at the child’s birth? ___________
   During the pregnancy, rate the quality of prenatal care received:
   LOW  MEDIUM  HIGH
   During the pregnancy, rate the quality of the mother’s nutritional state:
   POOR  FAIR  GOOD  EXCELLENT
   Did the mother engage in any of the following during the pregnancy:
   _____ Alcohol use
   _____ Smoking
   _____ Other substance use
   _____ Prescription drug use
   During the first year of life, the child received (check all that apply):
   _____ Breast milk
   _____ Formula
   _____ Other: ___________ 
5. Service Option Enrollment: (Include dates of enrollment for home-based and center-based care)
Center-Based Care: __________________________
Home-Based Care: __________________________

Did the child switch between service options? YES NO
Reason for the switch: ______________________

Educational Levels of Center Based Teachers or Child Development Specialist:
Teacher One Teacher Two
_____ HS/GED _____ HS/GED
_____ CDA _____ CDA
_____ Associates _____ Associates
_____ Bachelors _____ Bachelors
_____ Masters _____ Masters

6. Is the child dually enrolled in Even Start? YES NO

7. EHS child lives with (Check all that apply):
   _____ Mother
   _____ Father
   _____ Stepparent
   _____ Sibling
   _____ Grandparents
   _____ Other Biological Relative
   _____ Other caregiver not related to child
   _____ Foster Care

   Is the child in routine contact with his or her father? YES NO
   If no, list reason for noncontact ______________________

   The general health of this EHS child is:
   _____ Excellent
   _____ Very good
   _____ Good
   _____ Fair
   _____ Poor

8. Was the EHS child born to a teen parent? YES NO
   If yes, what was the age of the mother at the time of the birth? ___________

9. What is the primary language spoken in the home?
   _____ English
   _____ Spanish
   _____ Other (please list) ___________

   Citizenship of the child:
   _____ US citizen
   _____ Permanent US resident
_____ Visitor on visa
_____ Immigrant
_____ Undocumented

10. How long has the child lived at his/her current address? ______________

11. What type of housing does the child live in?
   _____ Public housing
   _____ House or duplex (not public housing)
   _____ Apartment (not public housing)
   _____ Trailer
   _____ Community shelter
   _____ Homeless

12. Has this child been homeless at any point in the last year?  YES  NO
    How many people live in the child’s home? _________

13. Does this child have any siblings that have attended Early Head Start or Head Start?
    YES  NO

14. What type of child care does the child receive?
    _____ Center-based EHS
    _____ Private daycare (center-based, nursery school, preschool)
    _____ Care in a relative’s home
    _____ Care in a non-relative’s home
    _____ Family Child care
    _____ Care by babysitters (not one consistent person)
    _____ Even Start Center-based care
    _____ Drop-in, hourly child care
    _____ Other: __________
    _____ Care at home with parents (in own home)

This EHS child has a medical home:  YES  NO
This EHS child has a dental home:  YES  NO

Check any of the following that the child has been identified or has received services for:
    _____ Rheumatic fever or rheumatic heart disease
    _____ Epilepsy
    _____ Cerebral palsy
    _____ Muscle weakness
    _____ Asthma
    _____ Chronic bronchitis
    _____ Hayfever or other allergies
    _____ Hyperactivity
    _____ Recurrent ear infections
    _____ Mental health problems
___ HIV/AIDS
___ Sickle cell trait
___ Head injury
___ Down syndrome
___ Developmental delay
___ Prematurity
___ Speech
___ Motor development

Number of CPS referrals on this child since September of this year: ______________
Has this child been referred for SST?: YES  NO
Is this child receiving services from Babies Can’t Wait?: YES  NO
Does this child have a disability?: YES  NO
What type of insurance does this child have:
___ Medicaid/Peachcare
___ Private insurance
___ No insurance

This child’s attendance in Early Head Start is:
___ Excellent
___ Very good
___ Good
___ Fair
___ Poor

15. Parents:

Indicate the parent on which these data are being completed: ________________

Ethnicity of Parent:
___ African-American
___ Latino
___ Caucasian
___ Asian
___ Native American
___ Other

Age of parent: ______________________

Marital status of parent:
___ Unmarried
___ Married
___ Living together but not married
___ Divorced
___ One or both parents deceased
Highest Level of Education:
- _____ Grades 1-4
- _____ Grades 5-8
- _____ Grades 9-12 (no diploma)
- _____ High School graduate
- _____ GED (General Education Diploma)
- _____ Some college, but no degree
- _____ Associate Degree
- _____ Bachelor’s Degree
- _____ Advanced Degree

Is the parent currently enrolled in continuing education?  YES  NO
If so, check all that apply:
- _____ GED
- _____ ESL
- _____ Citizenship training
- _____ Tutoring
- _____ Job Skills/Computer Training
- _____ Other: _____

Has the parent received employment assistance? (Check all that apply)
- _____ No
- _____ Job training (including skills training, courses, on the job-training)
- _____ Job placement
- _____ Employment counseling
- _____ Other: ________________

What is the primary parent’s occupation? __________________
MOTHER  FATHER  OTHER

What is this family’s income level?
- _____ Under $1,000 per year
- _____ $1,001-$5,000 per year
- _____ $5,001-$10,000 per year
- _____ $10,001-$15,000 per year
- _____ $15,001-$20,000 per year
- _____ More than $20,001 per year

Check the community services that the family receives other than those provided by Early Head Start (Check all that apply):
- _____ None
- _____ WIC
- _____ Medicaid
- _____ Food stamps
- _____ TANF
- _____ SSI
Does the parent have a chronic health problem or disability that interferes with his/her ability to care for the EHS child? YES NO Which parent? ___________

The primary parent/caregiver for this EHS child’s general health is:

【】 Excellent
【】 Very good
【】 Good
【】 Fair
【】 Poor

Over the last 6 months, has the primary parent/caregiver expressed concerns of depression? YES NO
If yes, did the parent receive help? YES NO

If the child has siblings, do any of the siblings have chronic health problems or disabilities? YES NO

Has this parent ever had an issue with the law or authorities? YES NO

Family Goals
What are the three greatest strengths of this family?:
1. __________________________________________________________
2. __________________________________________________________
3. __________________________________________________________

What are the three greatest needs of this family?:
1. __________________________________________________________
2. __________________________________________________________
3. __________________________________________________________
Since September of the current year, number of visits made to the family by the family service worker: ____________

Since September, number of PACT meetings attended:
  _____ None
  _____ 1-3
  _____ 4-6
  _____ 7-10
  _____ More than 10

During PACT time, parent-child interactions:
1 = Parent & Child are uncomfortable in their interactions during PACT activities
2 = Parent & Child interactions are strained but improving (shows improvement)
3 = Parent & Child engage in PACT activities comfortably

Since September of this year, the number of requests that this parent has made for assistance from EHS:
  _____ None
  _____ 1-2 requests
  _____ 3-5 requests
  _____ 6-9 requests
  _____ More than 10 requests

Since September of this year, the overall rating of this family would be:
  _____ Family developing normally
  _____ Family in minimal crisis, but still developing
  _____ Family in moderate crisis, with concerns about developing
  _____ Family in major crisis, crisis impedes development

Overall, this parent's knowledge of child development is
  _____ Excellent
  _____ Very good
  _____ Good
  _____ Fair
  _____ Poor

Rate this parent’s involvement with parent committee?
  _____ Excellent
  _____ Very good
  _____ Good
  _____ Fair
  _____ Poor

Is this parent involved on any policy council committees?  YES  NO
Does this family use Early Head Start transportation?  YES  NO
Denver Score:    Suspect or    Normal
ATTACH A COPY OF DENVER PROTOCOL

Bayley:
Age at asmt: ____    Age at asmt: ____    Age at asmt: ____
Cognitive: ______    Cognitive: ______    Cognitive: ______
Motor: _______      Motor: _______      Motor: _______
Behavior: _______   Behavior: _______   Behavior: _______
ATTACH A COPY OF BAYLEY COVER PAGE

Vision:          PASSED    NOT PASSED
Hearing:        PASSED    NOT PASSED
Well Baby Checks:      Up to Date  Not up to date
Immunizations:        Up to Date  Not up to date
Completed EPSDT:    Up to Date  Not up to date
ATTACH COPIES OF EPSDT FOR THIS FIRST ROUND OF DATA COLLECTION

Growth assessments:
Age at asmt: ____    Age at asmt: ___    Age at asmt: ____
Height: _______      Height: _______      Height: _______
Weight: _______      Weight: _______      Weight: _______
Head Circ: _______  Head Circ: _______  Head Circ:_______
ATTACH A COPY OF NUTRITIONAL ASSESSMENT

ITERS SCORE: _________________________
Arnett Score: _______________________
Health & Safety Checklist: ______________
HOME SCORE: _________________________
EASI SCORE: _________________________