

Predicting Expressive Language Outcomes at 35 Months: The Influence of Home and Child
Care Quality on Rural, Low Income Children

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ABSTRACT

AMANDA HUFF ADKINS: Predicting Expressive Language Outcomes at 35 Months: The Influence of Home and Child Care Quality on Rural, Low Income Children
(Under the direction of Lynne Vernon-Feagans, Ph.D.)

Research has long demonstrated and established that the quality of the home and child care environment that young children experience before the age of three is related to their subsequent development. However, there is a distinct dearth of research of the influence of these environments on rural populations and rural children as much of the extant literature uses samples of more urban and suburban children and families. Data employed in this study was drawn from the Family Life Project. The Family Life Project is a longitudinal, representative study of families living in two rural, low-wealth areas in the United States. A sample of 268 children who attended child care at both 24 and 35 month time points was used for this study exploring the associations between home and child care quality and children's expressive language development at 35 months. Results suggested that the quality of the home environment was directly associated with expressive language skills. Further, after controlling for child and family demographics, and home quality, child care quality was also found to be directly associated with expressive language skills. Future research recommendations for the study of rural children's home and child care experiences and current study limitations are also discussed.

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Jonas Salk is quoted as stating "Good parents give their children roots and wings. Roots to know where home is and wings to fly away and exercise what's been taught them." I must first thank my parents for giving me both a strong foundation to build from and wings to go out and make a difference in this world. You gave me the gifts of your time, dedication, and understanding. You are models for my life for I could not ask for better confidants and heroes.

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CHAPTER ONE

Statement of the Problem

The share of children attending non-maternal child care has risen rapidly over the last 40 years in the United States. In 2010, a large majority of all four year olds (80%) attended some kind of non-maternal child care before entering Kindergarten, an increase of 43% from 1970 (U.S. Census Bureau, 2009). Furthermore, the average child spends 27 hours a week in non-maternal care over the first 4½ years of life (National Institute of Child Health and Human Development Study of Early Child Care and Youth Development [NICHD ECCRN], 2005). Child care is the setting in which most children first learn to interact with other children on a regular basis, establish bonds with adults other than their parents, receive important inputs for early language and learning developments, and experience their initial encounter with a school-like environment (Burchinal et al., 2008; Vandell et al, 2010). Unfortunately, most studies of child care quality have found that child care in America is of less than ideal quality (Blau, 1999; NICHD, 2005, 2002, 2000, 1999; Peisner-Feinburg & Burchinal, 1997), with high quality child care even less likely to be available in rural areas (Atkinson, 1994, 1996; Ispa, Thornburg, & Venter-Barkley, 1998; Maher, Frestedt, & Grace, 2008).

In America, 14 million children live in rural areas (Rural Families Data Center [RFDC], 2004). That is, 1 out of every 5 children in the US lives in a rural family (RFDC, 2004). Although rural citizens comprise a significant population in America, there is a

relative lack of research on rural populations as compared to urban/suburban populations (Beach, 1995; Burchinal et al., 2008; Vernon-Feagans et al., 2008). Compared to urban and suburban areas, less is known about the quality, availability, use, and cost of human services in rural areas, including child care, because suitable data are challenging to find (Beach, 1995; Burchinal et al., 2008).

In studies conducted with rural populations and samples compared to urban and suburban populations, rural children have been found to have lower school readiness and language skills at Kindergarten age than the urban and suburban children (Fish & Pinkerman, 2003; Lee & Burkham, 2002; Vernon-Feagans, 1996). Research evidence has suggested that differences in children's early childhood experiences play a formative role in shaping school readiness and help to explain the skill gaps at school entry (Belsky et al., 2007; Burchinal, et al., 2000; Dickinson & Tabors, 2001; Hirshberg, Huang, & Fuller, 2005; Lamb, 1998). This developmental period, therefore, is one in which the outcome I wish to evaluate is crucial for later school readiness skills.

Across a number of studies, differences in young children's language abilities have been linked to various measures of home and childcare quality. Most of the extant literature focuses on urban or suburban children, with almost no research on young, rural children's child care experiences. Thus, it is important to understand the characteristics of the home and child care environment that may lead to the reported differences in rural children's expressive language skills. Given the relative lack of research on such a significant rural population, this dissertation will add to the body of knowledge about rural early childhood expressive language development, specifically for children 35 months old and younger who

attended non-maternal child care at 24 and 35 month time points for at least ten hours per week.

One of the most important school readiness skills that children acquire in the first three years of life is language. Language acquisition in the early childhood years is a cumulative effect of child experiences, interaction, and development (Bloom, 1998; Dickenson & McCabe, 2001; Dickinson & Tabors, 2001; Hoff, 2003; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Early childhood language experiences are significantly important through the establishment of the fundamentals of language and cognitive functions in the first few years of a child's life. Research has established links between the home and classroom environments contributing significantly to kindergarten expressive and receptive vocabulary and literacy (Campbell & Ramey, 1984; Dickinson & McCabe, 2001; Hart & Risley, 1992, 1995; NICHD ECCRN, 2005; Sameroff & Fiese, 2000). Language is a complex system that develops rapidly after birth and provides the foundation for later language and literacy learning, making the first three years of a child's life imperative to study and understand (Dickinson & McCabe, 2001; McCartney, 2002; NICHD ECCRN, 2000, 2005).

The relationship between language input from caregivers and children's early vocabulary acquisition is well documented in the extant literature (Burchinal, et al., 2000; Hart & Risley, 1995; Heath, 1983; McCartney, 1984, 2002; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). Early childhood vocabulary growth has been related to the quality of the proximal developmental environments (i.e. the home and child care environments). For example, the quantity of language children hear (Hart & Risley, 1995; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002;), maternal sensitivity and

responsiveness (Lamb, 1998; NICHD ECCRN, 2005), and amount time children spend communicating with adults and peers (Hart & Risley, 1995; McCartney, 1984) have all been found to be related to child language development. However, these studies were primarily conducted with urban and suburban samples and are used as examples in this study because of a dearth of research using rural samples. Therefore, the significance of the current study is that it will add to the body of research connecting the quality of child care experiences between 24 and 35 months of age to child language development at 35 months for rural children.

Children living in rural areas may or may not have the same opportunities to experience high quality child care like their more urban and suburban counterparts. The distances rural families live from jobs, stores, public services, and schools vary widely. Children living in rural areas are also more likely to be poor than their urban and suburban counterparts (U.S. Census Bureau, 2009). Research has shown that high quality child care can serve as an effective intervention for children in at-risk environments (such as children living in poverty) and provide opportunities for better language development (Belsky, et al., 2007; Burchinal, Roberts, Nabors, & Bryant, 1996; McCartney, 1984; Phillips, McCartney, & Scarr, 1987; Peisner-Feinberg, & Burchinal, 1997; Vandell, & Wolfe, 2000). However, research suggests child care use and quality may be different in rural and non-rural areas (Atkinson, 1994, 1996; Ispa, Thornburg, & Venter-Barkley, 1998; Maher, Frestedt, & Grace, 2008). The quality of care a child receives is integral to their later development, and is especially important in the first three years of the child's life (Burchinal, et al., 2000; NICHD ECCRN, 2000; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). The caregiver's role in providing the children with appropriate language experiences is emphasized in the

language acquisition process (Gleason, 2001). Early language interactions and experiences are especially important to child development and language and rural children may be missing out on these types of experiences that benefit language development.

I propose to utilize an ecological approach to develop an analytical model that highlights the importance of the home and child care environments in predicting child language development in a study of a representative sample of families living in two rural, low income regions of the United States. According to the Ecological systems model, children living in different ecological niches tend to encounter specific actions, objects, events, and conditions in different amounts and patterns (Bronfenbrenner & Morris, 1998, p. 996), such as children living in a rural environment as opposed to a more urban or suburban environment. Ecological systems model is an approach to study the processes of development within changing environments and contexts across the life span (Bronfenbrenner & Morris, 1998, p. 998). Specific features of the early childhood environment have influence on children's competence and behavior across ecological niches. For example, the quality of care the child receives in the home or in the child care environment can influence a child's language development. Utilizing the ecological approach in this dissertation will allow for assessment and inclusion of features of the home and child care environments for this sample of rural children.

This dissertation explores the influence of quality of child care on child expressive language development for a sample of rural children who have attended child care for at least ten hours a week from 24 to 35 months of age. Hierarchical linear regression will be the approach used to model the relationship between child expressive language ability, home care quality and child care quality. Referencing studies on more urban and suburban

populations, both home and child care quality are expected to be positively and directly related to child language development. In this study, the moderational role that child care quality plays in linking home quality and child language outcomes in children less than 35 months from families in rural, low income areas is also examined. It is expected that high quality child care will buffer the children from the influence of a low quality home environment on their expressive language development at 35 months.

While an extensive amount of research has shown the importance of both the home and child care quality on child language development for children under the age of three, there is a distinct lack of research on children from rural areas. Much of the extant research in this area has focused on urban and suburban populations. It is integral to the body of literature to determine if the development of rural children is found to be influenced similarly by the quality of their child care environment as urban and suburban children. This dissertation will add to the literature by answering four research questions. Research Question 1 is: What is the contribution of Home care quality to the prediction of children's expressive language at 35 months for the sample of children who attended child care at 24 and 35 months, after controlling for child and family demographic variables? Research Question 2 is: Does child care quality add additional variance to the prediction of child language above the quality of the home environment and covariates? Research Question 3 is: Does child care moderate the relationship between the quality of the home environment in predicting child expressive language development? Research Question 4 is: Does the pattern of moderation evaluated in Research Question 3 differ for subpopulations of the sample, specifically by race and poverty status? Due to a limited amount of research has been conducted on representative samples of rural children and families, the influence of child

care quality on rural child expressive language development for children under the age of three remains to be discovered.

To date, very little attention has been given to understanding the ways in which child care quality in both the home and child care environments affect child expressive language development for rural, low income children. The purpose of the current study is to document the quality of home and child care experienced within a statistically representative sample of families with children under the age of 35 months in low-income rural communities in the two selected rural communities and determine the extent to which the quality of care received related to the child's expressive language development at 35 months.

CHAPTER TWO

Theoretical Foundation

Ecological Systems Model

The theoretical framework on which this study is based is Bronfenbrenner's ecological model of child development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p. 501). The constant interplay between systems that characterizes the ecological model helps explain the pathways through which environmental variables and processes influence children's language development, as well as how the child influences his or her environment. Bronfenbrenner's ecological theory states that environments are not independent of one another; processes operating in different environments interact and influence one another (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p. 491). Children are influenced by factors within their homes, child care, and other settings in which they spend a significant amount of time. Furthermore, children are affected not only by events occurring within such settings, but they are also influenced by the variables and processes operating within distal settings (e.g., parent's place of employment), and the larger sociocultural context (e.g., society's beliefs and values) (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p. 990). The ecological theory views the child as an active participant in their environment, proposing that a reciprocal relationship exists between the child and his or her environment, such that the child acts upon and influences the environment, which in turn influences the child (Garbarino & Ganzel, 2000; Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p.393).

Microsystems, defined as the immediate environments that surround young children, are the primary ecological contexts for human development. Settings such as the child's home and place of child care are microsystems in which children spend a considerable amount of time. Such settings are likely to be particularly influential to the development and psychological functioning for children under the age of three as these are likely to be sole environments such young children encounter. The quality of a microsystem has a significant effect on the transactions, or proximal processes, that occur between the child and his or her environment. Examples of proximal processes occurring within microsystems which promote positive language development include healthy, pro-social relationships with peers, interactions with supportive child care staff, and caring, responsive, parent-child relationships (Brody & Flor, 1997; Hart & Risley, 1995; Hoff, 2003; McCartney, 1984).

The ecological model suggests that a supportive and responsive environment promotes healthy development. Conversely, a disadvantaged or disorganized environment may place children at risk for poorer development (Bronfenbrenner & Morris, 1998; Raviv, Kessenich, & Morrison, 2004). For example, the quality of the home environment and the parent-child relationship may be compromised by impoverished, disadvantaged circumstances, thereby reducing the quality of proximal processes (Bradley, Corwyn, McAdoo, & Coll, 2001; Hoff, 2003; Khattri, Riley, & Kane, 1997). Interactions with caregivers and/or peers within the child care environment may encourage or discourage certain styles of learning or regulatory behaviors.

Mesosystems are relationships between microsystems, such as the interaction between the child's home and child care setting. The nature of the connections between settings is important, in part because of alignment of values and interactions across settings

helps to promote positive child language development (Hart & Risley, 1995; Heath, 1983; Hoff, 2003; McCartney, 1984; McLoyd, 1997). For example, facilitation and encouragement of language skills in both the home and child care center have been found to dramatically increase a child's language development at later ages (Hart & Risley, 1995; Heath, 1983; McCartney, 1984). Additionally, continuity of quality of care across different environmental contexts one may better ensure a child's success in a variety of domains (e.g. child care, home) (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p.402; Garbarino & Ganzel, 2000).

Distal ecological contexts consisting of exosystems and macrosystems also impact children through their effects on proximal processes (Bronfenbrenner & Morris, 1998, p. 411). Garbarino and Ganzel (2000) described the utility of using the ecological approach for conceptualizing child development, as this approach leads one to look beyond the child and family. The ecological approach emphasizes that individuals and settings with which the child has no direct contact greatly impact child development. For example, exosystems are distal environments that affect child development. These include settings such as the parents' workplace, neighborhood, and child development agencies (Garbino & Ganzel, 2000). Child development may either be enhanced or placed at greater risk depending upon the interactions that occur within these remote systems. For instance, poverty, rurality, and unemployment may negatively impact children through diminished resources, place greater stress on the parent-child relationship and increase incidences of reduced parental supervision (Bauer & Katras, 2007; Beeson & Strange, 2000; Brody & Flor, 1998; Burchinal et al, 2008; Dill, 1999; Khattri, Riley, & Kane, 1997).

Macrosystems, like exosystems, contain distal variables, processes, and values that indirectly influence children. Macrosystems encompass the cultural values, beliefs, and norms of society (Garbarino & Ganzel, 2000). Cultural beliefs towards social reform and welfare policies are examples of processes that are played out at the macrosystem level but which impact individual families and children (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998, p.911; Garbarino & Ganzel, 2000). For example, access to high quality child care for low income families has been an important national policy since 1965 with the creation of Head Start and other early childhood intervention programs (Shonkoff & Phillips, 2000, p.307). The cultural belief that all children have the right to an equal and high quality education is an example of a current macrosystem level process that directly impacts families and children.

In summary, using an ecological systems model to understand the interactions among and between systems allows for the assessment of the developmental characteristics of a person. Thus, in my investigation of the environmental supports for children's acquisition of language skills, I have sought to describe the children's home and child care settings in terms of quality of environment. An assumption of my work, based on Bronfenbrenner's theory, is that both the home and child care setting are vital to children's language development. Bronfenbrenner's (1979) ecological systems model provides a model for greater appreciation to the extent which all child development unfolds within this variety of environmental contexts. The ecological perspective provides a lens for examining outcomes across and among different groups, such as among rural children as opposed to urban and suburban children. The model used in this study assumes that the caregiving environments are the most

influential on child language development, with the home caregiving environment acting as the most influential proximal environment.

CHAPTER THREE

Literature Review

Understanding the influence of the quality of the home environment and child care on rural children's language development, particularly for children under the age of three, is an important contribution to the extant literature on child expressive language development. Child language development is a product of the cumulative interactions between the child and the kinds of learning opportunities different environments provide. Studies have suggested that the "rural experience" may be different than the urban or suburban contexts that are more commonly researched (Bauer & Katras, 2007; Monroe & Tiller, 2007; Thornburg, Mathews, Espinosa, & Ispa, 1997). Overall, rural families are typically poorer, experience more incidences of persistent poverty, have lower levels of education, and experience higher incidence of unemployment than their more urban counterparts (Beeson & Strange, 2000; O'Hare & Johnson, 2004; RFDC, 2004). In the context of rurality, proximal and distal processes may have a similar or different influence on child expressive language development as compared to the urban and suburban child.

The quality of the learning environment in both the home and in non-maternal child care settings are the primary focus of this study. Family income and child race (African American or non-African American) are also influential contexts that will be discussed because the impact rural child care may potentially have on child expressive language development may be attenuated by the geographic, social, and cultural contexts within which it is operating. Therefore, the following section will detail the specific rural context

employed in this study. The definition of what constitutes a rural environment and a rural population is discussed below.

Conceptualizing the Rural Environment

A primary and unique aspect of this dissertation is its sample of rural families. An Ecological systems model provides a framework for examining individual differences among populations due to differences in proximal and distal processes, such as living in a rural environment as opposed to a more suburban or urban environment. A place can be defined as a certain kind of geographic settlement with rules and boundaries of what comprises each kind of settlement, such as population density or proximity to other areas (RFDC, 2004). Contemporarily, city populations have dispersed into the countryside, and rural and urban lifestyles have converged under the effects of a mass society with its mass media and mass consumption, blurring conventional conceptions of rural, urban, and suburban areas (Beeson & Strange, 2000). “Rural” has traditionally been defined as non-metropolitan or non-urban, as in what it is without, what it is lacking or defined by process of exclusion (U.S. Census Bureau, 2000). Unfortunately, “rural” in and of itself is commonly conceptualized uniquely among and across research and as consequence, there is a lack of a clear, uniform definition of “rural” utilized in academic studies (Atkinson, 1994; Beeson & Strange, 2000; 1996; Brody & Flor, 1998; RFDC, 2004).

The potential usefulness of research conducted in rural areas is hampered by the lack of a single, uniform definition of “rural” across research. The difficulty in defining “rural” has primarily occurred because conceptual and empirical comparability is challenging (Atkinson, 1994; 1996; Brody & Flor, 1998; RFDC, 2004). It is important to understand the meaning and method of sampling procedures in order to compare samples and results across

studies (Blau, 1999). Without methodological comparability, inferences into causal and correlational mechanisms of variables in rural environments cannot be reliably and accurately posited across the literature. Therefore, common definitions of “rural” are discussed below, as well as the definition of “rural” that was employed for use in this dissertation.

The most common definition of rural encountered in the early childhood literature is from the U.S. Census Bureau definition. The U.S. Census Bureau defines rural as census blocks or blocks not classified as urban areas or urban clusters (U.S. Census Bureau, 2000; U.S. Census Bureau, 2009). Urban areas and clusters are defined based on a population density threshold per square mile. Under this definition, all persons living in urban areas and in places (cities, towns, villages, etc.) with a population of 2,500 or more outside of urban areas are considered an urban population (U.S. Census Bureau, 2000; U.S. Census Bureau, 2009). All others are considered rural.

Recent studies on rural populations have begun to adopt new measures of rurality using geo-coding of locales and their zip codes (Burchinal et al., 2008; Vernon-Feagans et al., 2008). This method of geo-coding provides a more precise measure of the degree of rurality of a certain place. This study sampled counties designated “non-metropolitan” according to the U.S. Census Bureau, meaning only counties without an urban core of 50,000 or more in population and the entire county population is less than 100,000 (U.S. Census Bureau, 2000). The sampled counties also were not located directly adjacent to any county considered “metropolitan” or “urban”. It is imperative to be clear about the definition of rural used for this paper because of concerns for methodological comparability and understanding of the meaning and context of the results of this study. Also important, is understanding the

developmental outcome of interest used in this study. The developmental outcome of interest, expressive language development at age three, is discussed in the following section.

Language Development for Children up to 35 Months of Age

The developmental outcome of interest for this study is child expressive language development at 35 months. Language development begins early in life and is amazingly complex by three years of age. For example, the density of short-range synaptic connections in the brain reaches its peak in the first three years of a child's life (Elman et al, 1996; Johnson, 2000). This period of rapid brain development is influenced by the environment around the child and the child themselves (Bronfenbrenner & Morris, 1998; Elman et al, 1996; Johnson, 2000). Early childhood language experiences provide the educational and developmental foundation for language development and school readiness skills (Bloom, 1998; Bradley & Corwyn, 2002; Dickenson & McCabe, 2001; Walker et. al, 1994). Early childhood language develops through multiple interrelated contexts and facilitative systems, such as within the home and child care environments. It is within these environments that the basis for early language learning is provided and possibly nurtured.

Children's early language development has been identified by research scholars as an integral component of the progression toward reading proficiency and school readiness skills (Snow, Burns, & Griffin, 1998). In fact, vocabulary and other early childhood language skills are good predictors of later reading skills (Belsky, et. al, 2007; Bloom, 1998; Bradley & Corwyn, 2002; Dickenson & McCabe, 2001; Walker et. al, 1994). However, many children enter kindergarten with language skills that differ from those that the emergent literacy research suggests are needed to support their literacy achievements. The influence of early language development goes beyond just ability to communicate and collaborate with

others by also including preparation for later literacy skills and development. Negative early experiences in the first three years of a child's life have been found to constrain later language development and reading achievement (Bloom, 1998; Bradley & Corwyn, 2002; Dickenson & McCabe, 2001; Walker et. al, 1994). These experiences could include lack of parent-child interaction, poverty, and poor child care quality (Duncan & Brooks-Gunn, 2000; Fish & Pinkerman, 2003; Hart & Risley, 1995). Children living in rural areas have been shown to arrive at school behind their peers in terms of language development, signifying a need for further research on rural early childhood language development (Beeson & Strange, 2000; Dill, 1999; Heath, 1983; RFDC, 2004).

During the first few years of life and across a wide range of environments, children master the intricate patterning of linguistic units that make up the grammar of their language and gradually become able to employ the language to express their thoughts and feelings (Dickinson & Tabors, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). The system of language and literacy capacities, beginning in early childhood, becomes increasingly well organized as children begin speaking and initiating communication with peers and adults. As children's language skills develop, the mutual facilitation between the systems that support language continue to grow and becoming increasingly integrated (Dickinson & McCabe, 2001; Bloom, 1998; Bradley & Corwyn, 2002; Walker et. al, 1994). The caregiver's role in both the home and child care environments in providing the child with appropriate language experiences is emphasized in the language acquisition process (Dickinson & McCabe, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Therefore, special attention will be paid to the quality of care caregivers provide to rural children in both the home and child care environments in this dissertation. Research

discussing the influence of the most proximal environment, the home, on child language development is discussed in the following section.

The Home Environment

The caregiving environment in the home has been identified in prior research as a primary influence on the expressive and receptive language abilities of children up to and beyond 35 months of age (Bloom, 1998; Bradley & Caldwell, 1984; Hart & Risley, 1992, 1995). The home environment has been identified by researchers as the primary environment where children learn, grow, and mature. As result of the geographic isolation of rural families, children may possibly be even more influenced by parenting behaviors and quality of the home environment than their more urban and suburban peers (Fish & Pinkerman, 2003; Khattri; Riley & Kane, 1997; Vernon-Feagans, et al, 2008). Therefore, a major focus of this dissertation will focused on the quality of the home environment.

Defining Home Care Quality

Aspects of the home environment have long been identified in the extant literature as influencing child expressive language development and other school readiness skills. Traditional measures of home care quality commonly assess both the parent-child relationship and the physical environment of the home (Belsky, et. al, 2007; Bloom, 1998; Bradley & Corwyn, 2002; Dickenson & McCabe, 2001; Walker et. al, 1994). Quality indicators of the parent – child relationship include parental responsivity, acceptance of the child, maternal language, and maternal engagement with the child. Indicators of the physical environment quality include learning materials located in the home (such as books, magazines, and newspapers) (McCartney, Dearing, Taylor, & Bub, 2007). Further exploration of these home care quality indicators are discussed below.

Home Quality and Child Language Development

Two indicators of the parent-child relationship that will be employed in this dissertation are measures of the parent's responsivity and acceptance of the child's behavior. The extent to which the parent responds to the child's behavior is represented as a measure of a parent's reponsivity. Examples include the reinforcement of desired behaviors and communication through words and actions. Mother and child interaction patterns in early childhood have been identified as significant, powerful predictors of verbal ability as well as subsequent academic achievement in elementary and middle school (Dickinson & McCabe, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). For example, in a study by Fish (2003), the quality of mother-child interactions over time accounted for significant variance in language skills for preschoolers. Mothers who were responsive and exhibited non-intrusive parenting behaviors with preschoolers in teaching and problem-solving tasks had children with higher language scores (Fish & Pinkerman, 2003).

Parent-child communication has been a cornerstone of the research on child language development (Hart & Risley, 1992, 1995; Hoff, 2003). The extant literature reveals that the diversity of maternal vocabulary may be particularly important in predicting children's later language development (Burchinal et al., 2008; Dickinson & McCabe, 2001; Hart & Risley, 1995; Hoff, 2003; McCartney, Dearing, Taylor & Bub, 2007; Vernon-Feagans et al., 2008). The time children spend participating in specific language and activities, such as book reading, telling narratives, and communicating with peers and adults are important contributors to subsequent expressive language development (Hoff, 2003; McCartney, 1984; Vernon-Feagans, 1996;). In a study by Hoff (2003) preschoolers who heard longer utterances built productive vocabularies at faster rates than children who heard shorter utterances. The

mothers who spoke in longer utterances also used a richer vocabulary, thus providing even more diverse language experiences for the children to build their vocabularies from (Hoff, 2003).

Parental acceptance of the child's behavior that is less than optimal and avoidance of undue restriction and punishment are common conceptual research measures of a parent's level of acceptance of their child. An example of this would be a parent that has a positive relationship with their child. The literature on early childhood home environments suggests that positive parent-child relationships give children a sense that they are worthy of others' affection (Bronfenbrenner & Morris, 1998, p.134; Hubbs-Tait, Culp, Culp, & Miller, 2002). This leads them to develop a positive sense of self, decreasing the likelihood that they will develop externalizing or internalizing problems (Burchinal et al., 2006). The relationship between maternal sensitivity and expressive language development for children has been well established in previous research (Bloom, 1998; Dickenson & McCabe, 2001; Dickenson & Tabors, 2001, p.101; Hoff, 2003; Raviv, Kessenich, & Morrison, 2004). For example, in a study by Burchinal and colleagues (2008), decreases in maternal harshness predicted child cognitive skills at 15 months even when statistically accounting for maternal harshness at 6 months.

The materials in the home that facilitate language development are also an important aspect to consider when assessing home quality and are a third indicator employed within the measure of home quality utilized in this study. The provision of appropriate play and learning materials capable of stimulating development that allow the child to touch, feel, manipulate, move, listen, and have fun have been shown to help facilitate early expressive language development. Measurement of the amount of language and literacy promoting materials in

the home environment has been a traditional indicator employed in many measures of home quality (Caldwell & Bradley, 1984; Khattri, Riley & Kane, 1997; Mashburn et. al, 2008; McCartney, 2002; Raviv, Kessenich, & Morrison, 2004). Together, indicators of the quality of the parent-child relationship and the learning materials available to the child provide a thorough assessment of the quality of the home environment. The measure assessing home caregiving quality accounts for both of these indicators and will be discussed further in the methods section of this dissertation.

Rural Home Quality and Child Language Development

The provision of a high quality home environment can be influenced by environmental factors many rural families encounter. Common experiences of rural families, such as higher levels of poverty, higher levels of unemployment, and lower levels of parental education have been shown to negatively influence child language development in urban and suburban samples (Brody & Flor, 1998; Burchinal et al., 2008; Duncan, 1992; Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Vernon-Feagans et al. 2008). The influence of these risk factors on the provision of the quality of care in the home environment will be discussed further in the following section.

Research has established that children from lower income families build their vocabularies at slower rates than children from higher income families (Duncan, 1992; Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Incidentally, the rural areas of the United States are far poorer than metropolitan areas as a whole, and nearly as poor as inner cities. Of the 250 poorest counties in America, 244 are rural (Beeson & Strange, 2000; RFDC, 2004). Almost one-half of all rural children (46%) live in families with income less than twice the poverty line, significantly higher than the

38% of urban children (U.S. Census Bureau, 2009). In all, 2.8 million rural children live in families with incomes between 100% and 200% of the poverty line. Differences in maternal language input in early infancy and early childhood, including less elaborated vocabulary and syntax, have been implicated as an explanatory factor for why children have lower cognitive and language skills in early and middle childhood (Hart & Risley, 1995; Hoff, 2003).

Poor parents have been found to spend less time reading to their children, less time talking with them, and less time visiting museums and libraries with them (Bradley et al., 2001; Hart & Risley, 1995; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; McCartney, Dearing, Taylor & Bub, 2007). High income mothers, as compared to low income mothers, talk more, provide more object labels, sustain conversational topics longer, respond more contingently to their children's speech and elicit more talk from their children (Hart & Risley, 1995; Hoff-Ginsburg, 1998). As previously reviewed, parent- child interactions and the provision of learning materials in the home are related to child expressive language development. Rural children, particularly low-income rural children, may not be experiencing the highest quality home environments and could be considered at risk for poorer expressive language development. Further discussion of the influence of rural poverty on child language development will continue later in this chapter.

In 2004, the percentages of school-age children in rural areas with a mother or father whose highest educational attainment was a high school diploma (33% and 35%, respectively) were higher than the comparable percentages for children in cities (26% and 24%, respectively) and suburbs (25% and 24%, respectively) (Provasnik et al., 2007). However, the percentage of adults with a bachelor's degree as their highest level of educational attainment was lower in rural areas (13%) than the national percentage (17%).

More years of formal education have been linked with more responsive and vigilant parenting and with more sensitive parent-child relationships (Rutter, 1979). Maternal education is posited in many studies as influencing the amount and richness of the language stimulation the mother provides for her child which, in turn, influences the child's developing language (Brody & Flor, 1998; Burchinal et al., 2008; Vernon-Feagans et al. 2008).

Parents with more years of formal education tend to be more familiar with the school context, increasing the likelihood that they will be invested in the education of their own children (Brody & Flor, 1998). In 2003, greater percentages of students in rural areas than students in cities had parents who attended a school event (74% versus 65%) or served as a volunteer or on a committee (42% versus 38%), which suggests that more than level of education of the parents is indicative of school involvement (Provasnik et al., 2007). Hoff-Ginsburg's (1998) research with mothers of 2-year-old children found that compared with high school-educated mothers, college-educated mothers talked more, asked more questions, and used fewer directives and more contingent responses, thus providing more opportunities for language exposure and development. Rural areas may have more high school graduates, but also have fewer adults with bachelor degrees and beyond. As discussed previously, maternal language, education, and vocabulary are all especially important to child expressive language development. However, rural children may be experiencing lower levels of these quality indicators than their urban and suburban counterparts.

The Child Care Environment

In addition to the immediate family environment, child care is a microsystemic context in which early development unfolds, starting in infancy and continuing through

school entry for the vast majority of young children in the United States. The numbers of children attending child care have steadily risen in the United States since the 1960's and this trend does not appear it will decline (U.S. Census Bureau, 2009). For example, in 2010, approximately 80% of children attended some form of non-maternal child care before Kindergarten, increasing by 40% from 1960 (U.S. Census Bureau, 2009). Child care is the setting in which most children first learn to interact with other children on a regular basis, establish bonds with adults other than their parents, receive or fail to receive important inputs for early language and learning development, and experience their initial encounter with a school-like environment.

As previously discussed, early childhood language experiences are important through the establishment of the fundamentals of language and cognitive functions in the early years of a child's life, and child care is a significant environment where these fundamentals of language can be established (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Howes, Phillips, & Whitebook, 1992; Peisner-Feinberg & Burchinal 1997; Vandell & Wolfe, 2000; NICHD ECCRN, 2005; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). Examining the processes through which child care quality operates would yield a fuller understanding of the nature and sources of expressive language development for this sample of rural children. Research conceptions of what exactly constitutes a high quality child care environment is discussed in the following section.

Defining Child Care Quality

Because child language development has been found to be shaped by the quality of child care the child attends, prior research has focused on specific aspects and conceptions of child care quality that may influence child expressive language development. The quality of

child care has been traditionally measured attending to the structural and process components of quality child care (Burchinal et al., 2000; Vandell & Wolfe, 2000). Quality indicators such as child: adult ratio, the size of each group of children, and the formal education and training of the caregivers are conceptualized as the structural quality components of the child care setting (NICHD ECCRN, 1999; Scarr, Eisenberg, & Deater-Deckard, 1994; Vandell & Wolfe, 2000). Process quality in classroom settings involves social, emotional, physical, and instructional elements of teacher-child interactions with young children. Further exploration of structural and process child care quality are discussed below.

Structural aspects of quality can be both direct causes of differences in quality (ratios and groups sizes) and indirect indices of quality (caregiver training) (Scarr, Eisenberg, & Deater-Deckard, 1994). The quality of the caregiver-child relationship has been related to group size, caregiver-child ratios, and caregiver training (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Howes, Phillips, & Whitebook, 1992; NICHD ECCRN, 1999; Peisner-Feinberg & Burchinal 1997; Vandell & Wolfe, 2000; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). The structural child care components provide the educational setting for high quality child care to be possible. The teacher who has more than the optimal number of children per adult in his/her class may not have enough time to provide the individual language models and responsive turn-taking interactions that enhance language development (Dickinson & Tabors, 2001; Lamb, 1998; Mashburn, et al., 2008). Both correlational and quasi-experimental research has found relations between structural child care quality and child expressive language development in urban and suburban samples of children (Howes, Phillips, & Whitebook, 1992; Vandell & Wolfe, 2000).

Three child care attributes have emerged as standard determinants of structural quality of care (Blau, 1999; NICHD ECCRN, 2005; Vandell, & Wolfe, 2000). These standards are often called the “iron triangle” of child care quality (Phillips, 1987). These standards are the number of children per adult (child-staff ratios), class sizes, and caregiver education. The name “iron triangle” resulted from the belief that these indicators represent the elements of the classroom that must be in place before the most basic standard of child care can be reached (Phillips, 1987).

Easily observed indicators such as group size, staff-child ratio, and the level of staff training have been found to be unlikely to be good substitutes for direct measures of quality of teacher-child interactions and relationships (Blau, 1999). Structural quality indicator variables, such as training, ratios, and group sizes can provide an environment conducive to high quality teacher-child interactions, but it is up to the teacher to capitalize on the structural environment. What actually happens in classrooms of small children with one or two caregivers is not adequately captured by most variables one can legislate and regulate (Blau, 1999; Howes, Phillips, & Whitebook, 1992; Lamb, 1998; Phillips, 1998; Scarr, Eisenburg, & Deater-Deckard, 1994). Children’s interactions with caregivers and other children, in particular activities such as language stimulation are the key elements influencing child language development (McCartney, 1984, 2002; NICHD ECCRN, 2005).

Process child care quality is also influenced by the structural child care quality environment. Evidence of this is from a study by Vernon-Feagans and colleagues (2007). Although no observations of the caregivers were conducted in the child care setting, it was determined that part of the reason for children performing better on tests of verbal and cognitive skills was teacher-child involvement. Researchers hypothesized that with the lower

teacher-child ratios of higher quality centers, teachers had more time and opportunity to interact with the children. The opportunities for sensitive and informational verbal interactions between caregivers and children appeared to accelerate verbal and cognitive skills of the children (Vernon-Feagans, Hurley, Yont, Wambolt, & Kolak, 2007).

Quality of child care has typically been measured by process features of adult-child interaction that represent good care giving. These features include sensitivity and responsiveness to the child's needs, positive affect, frequent verbal and social interaction, and cognitive stimulation (Blau, 1999; Hart & Risley, 1995; Howes, Phillips, & Whitebook, 1992; Mashburn, et al., 2008). Quality of child care is also defined by researchers as the developmental appropriateness of the interactions between the provider and the child, and the environment, curriculum, materials, and activities to which children are exposed. One of the features that distinguish higher-quality from lower-quality care with regard to early cognition and language is the amount of language stimulation that early care teachers provide (McCartney, 1984; NICHD ECCRN, 2000; Shonkoff & Phillips, 2000). Verbal skills of children are nurtured and accelerated in high quality child care environments.

The influences of both structural and process child care quality impact children's language and overall development. Neither context is alone in explaining the total differences in child language development. Even with the recognition of both process and structural child care quality, there is still much to be discovered about child care quality and its relation to child language and developmental outcomes. This study uses a measure of child care quality (*HOME*; Caldwell & Bradley, 1984) that employs both process and structural quality components in its measurement of child care quality. The same three subscales that comprise the total measure of child care quality (teacher acceptance, reponsivity, and learning

materials) used within the home will be used in the child care setting and will be discussed further in the methods section of this dissertation.

Child Care Quality and Child Language Development

Understanding the influence of child care on child development has been researched extensively on urban and suburban populations (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Howes, Phillips, & Whitebook, 1992; NICHD ECCRN, 2005; Peisner-Feinberg & Burchinal 1997; Vandell & Wolfe, 2000; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). High quality non-maternal care during the early childhood years is generally associated with the child performing better on tests of cognitive functioning, complex play, and language development (Belsky, et al., 2007; Burchinal, Roberts, Nabors, & Bryant, 1996; McCartney, 1984; Peisner-Feinberg, & Burchinal, 1997; Phillips, McCartney, & Scarr, 1987; Vandell, & Wolfe, 2000). High quality child care has also been found to facilitate child language development more efficiently than lower quality child care. One reason for this is because opportunities for high quality interaction and communication between teachers and children can occur more readily in high quality child care (McCartney, Dearing, Taylor, & Bub, 2007; NICHD ECCRN, 2002; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007).

The NICHD ECCRN study found that process quality during the first three years of a child's life is related to children's pre-academic skills of expressive and receptive language at 35 months, even after controlling for particular child and family characteristics (NICHD ECCRN, 2002). This study conducted observations of over 600 non-maternal child care settings (grandparents, in-home care, child care homes, and centers) in nine states (NICHD ECCRN, 2005). In this demographically and ethnically diverse sample of more than 1,000

children, the average child spent 27 hours a week in non-maternal care over the first 54 months of a child's life. During the children's first 24 months of a child's life, most child care took place in family homes with relatives or in child care homes. As children got older, more were in center-based child care. Relatively low rates of positive child-caregiver interactions in center-based care were observed across all time points compared to child care homes (NICHD ECCRN, 2002; 2005). This study also identified a specific feature of the child care environment (language stimulation), that appears to facilitate language and cognitive development. However, the longer the children were in centers, beginning at 6 months, the better they performed on cognitive and language measures. Responsive, sensitive care giving was related to cognitive and language outcomes throughout the first 35 months of a child's life (NICHD ECCRN, 2002; 2005).

Additionally, in high quality child care, teachers are sensitive and responsive to children's needs, offer a language-rich environment and language stimulation, organize activities that promote development, and encourage children to behave in pro-social ways (McCartney, Dearing, Taylor, & Bub, 2007; NICHD ECCRN, 2002; Vernon-Feagans, Hurley, Yont, Wambolt, & Kolak, 2007). These elements of high quality child care classroom practices encourage early childhood language and cognitive development. Researchers have proposed that caregiver-child interaction during the language learning process is important partly because adults scaffold and extend the early utterances of children (Dickinson & Tabors, 2001; Lamb, 1998; NICHD ECCRN, 2002). Studies have found that caregiver scaffolding talk, sensitivity to the child's interest and promotion of dialogic reading were related to child performance on language measures (Belsky et al., 2007; Burchinal, et al.,

2000; McCartney, 1984; McCartney, 2002; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007).

Early childhood adult-child language interactions facilitate early language because of the scaffolding that adults use during one to one interactions and because of the extended dialogue on a topic that can occur during lengthy interactions (Dickinson & Tabors, 2001; Lamb, 1998; Mashburn, et al., 2008). A seminal study on teacher-child interactions in child care was conducted by McCartney (1984). In a study of 166 preschool aged children from 9 daycare centers, the importance of teacher-child verbal interaction with caregivers was underscored. Results revealed verbal interaction of preschool children with caregivers in a daycare environment was critical for child language development. Children from centers with extensive caregiver speech performed better on tests of language development than children from centers where peers dominated the conversation (McCartney, 1984). Scaffolded conversations with teachers advanced child vocabulary more than interactions with peers.

In a study by Vernon-Feagans and colleagues (2007), 60 children were followed longitudinally from childcare entry in infancy until three years of age. All of the children's families in this study were dual earner families. Half the children were in higher quality childcare and half in lower quality childcare. The higher quality centers the teacher-child ratio was 1 to 2 or 1 to 3 whereas the teacher-child ratio in the lower quality center was 1 to 8. Group size was also significantly smaller in the high quality child care settings than in the low quality setting. This study found large and consistent differences between children in lower quality and higher quality childcare on measures of expressive language at 6, 12, 24, and 35 months, but with especially strong differences at 24 and 35 months of age (Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). Children in higher quality care had larger

vocabularies and more indicators of advanced syntactic and morphological development in comparison to the children in lower quality care.

Cumulative language effects resulting from the quality of childcare differences over time were found in this sample (Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). These results are particularly significant given the fact that these families in this study had similar background characteristics. This study is especially important for this dissertation due to the effects being found to be stronger at 24 and 36 months of age because the target age of the children in this sample is 35 months.

The quality of child care has become of particular concern to researchers, especially since large studies of child care quality in America has found child care to be typically of low quality (Blau, 1999; NICHD ECCRN, 2005, 2002, 2000, 1999; Peisner-Feinberg & Burchinal, 1997). An example of available quality of care comes from a study by the NICHD ECCRN Study of Early Child Care (NICHD ECCRN, 2005). Quality of child care in the NICHD ECCRN sample, measured by the Observational Record of the Caregiving Environment (*ORCE*; NICHD ECCRN, 1999) and *HOME* Child Care Inventory (Caldwell & Bradley, 1984), revealed that 56% of child care settings were observed to be of poor quality (NICHD ECCRN, 2005). Only 11% of the child care settings were considered excellent (NICHD ECCRN, 2005). Furthermore, the Cost, Quality and Child Outcomes (CQO; Peisner-Feinberg & Burchinal, 1997) found that only 24% of centers serving preschool-aged children provided good or developmentally appropriate care, while 10% were rated as being of poor quality (Peisner-Feinberg & Burchinal, 1997). Positive child-caregiver interactions were observed in fewer than half of the child care facilities (Peisner-Feinberg & Burchinal,

1997). These results represent a grim reality of the probable quality of child care interactions occurring within child care settings across America.

Structural and process qualities of child care are both integrally related to child language development, especially at 35 months. It has been well established that higher quality care for urban and suburban children is related to better language abilities for children at 36 months of age. What remains to be determined is if the association of child care quality and child language development is the same for rural children as it is for more urban and suburban children. The purpose of this dissertation is to help define this association for rural children at 35 months of age that have attended non-maternal child care. Does the quality of child care matter for rural children's language development at 35 months like it does for suburban and urban children? In the following section, rural child care quality as it relates to child language development is discussed.

Rural Child Care Quality and Child Language Development

The diversity of child care and child care quality children attend before Kindergarten raises concerns about the potential collective consequences across classrooms, schools, communities, and society at large. Research suggests child care use and quality may be different in rural and non-rural areas (Atkinson, 1994, 1996; Bauer & Katras, 2007; Beeson & Strange, 2000; Ispa, Thornburg, & Venter-Barkley, 1998; Maher, Frestedt, & Grace, 2008). However, there is little research on rural child care, particularly on rural child care quality. Studies of rural child care limited in that they often are based only on rural samples, include families living in only one area of the country, or are limited to descriptions of parental concerns (Atkinson, 1994, 1996; Ispa, Thornburg, & Venter-Barkley, 1998).

Child care selection in urban, suburban, and rural areas may also be different according to cultural, social, and economic priorities and needs. The variety of care that is provided in these rural areas is an area that challenges researchers. Due to geographic isolation and population dispersion, options for child care may be limited. In rural areas, families may have less access to licensed center-based child care; child care providers may have fewer opportunities for job-related training, and providers typically charge lower fees than in urban areas (Atkinson, 1994; Beach, 1995). Research suggests child care use and quality may be influenced by family geographic isolation (Atkinson, 1994, 1996; Ispa, Thornburg, & Venter-Barkley, 1998; Maher, Frestedt, & Grace, 2008).

Availability of higher quality child care may be less due to a shortage of caregivers and more due to family preference/access to care (Atkinson, 1994; 1996; Beach, 1995). In Atkinson's study (1994; 1996) rural mothers were significantly more likely than urban mothers to use child care by relatives (45% vs. 36%, respectively) than nonrelatives including baby-sitters (42% vs. 46%, respectively) or day care centers and preschools (12% vs. 16%, respectively), particularly when children were below 36 months of age. Rural families also used fewer caregivers for longer hours and had a longer history of use of caregivers than urban mothers. These results indicate a possible lack of access to a variety of non-maternal child care settings for rural families.

Lack of access to center and school-based programs potentially places rural children at greater risk for performing worse than their urban and suburban counterparts in tests of language skills. In a study of four urban communities, each with a population of over 15,000, and 13 rural communities, each with populations of 1,500 to 12,000, Ispa and colleagues (1998) compared the child care selection criteria valued by urban and rural mothers and

fathers and the relations between these selection criteria and the quality of the child care in which their children were enrolled (Ispa, Thornburg, & Venter-Barkley, 1998). Urban families gave more weight to daily programming and less weight to friends' recommendations than did rural families. Significant correlations between child care selection criteria and the observed quality of the programs indicated that valuing of daily programming was associated with higher quality and valuing of friends' recommendations was associated with lower quality of care (Ispa, Thornburg, & Venter-Barkley, 1998). The context of families living in rural areas may influence the type and quality of care chosen, thus influencing child language development. This study is unique in that it adds to the limited extant research sampling rural families and the influence of child care quality on child expressive language development at 35 months.

The Buffering Effect of Child Care and Child Language Development

Recent studies have found that high quality child care can buffer children against poorer developmental outcomes, especially if children experience home environments that are not of high quality (Burchinal et al., 2000; Dearing, McCartney, & Taylor, 2009; Magnuson, Meyers, Ruhm, & Waldfogel, 2004; McCartney, Dearing, Taylor, & Bub, 2007; NICHD ECCRN, 2000). However, these studies sampled urban and suburban populations. The primary focus of this study is to determine if higher quality child care can serve as a buffer for expressive language development in a sample of rural children, akin to the results reported from studies of more urban and suburban samples of children.

While acknowledging that the child care environment may be particularly important for children from at risk populations, the home environment has still been found to be a stronger and more consistent predictor of children's early language development (Belsky, 2007;

NICHD ECCRN, 2005). Therefore, this study is particularly interested in the interaction of the home and child care environments on child expressive language development. Studies have shown that, after adjusting for the quality of the family and home environment, that children's cognitive and language development tended to be markedly higher if they attended a high-quality child-care than if they attended a low-quality child care (Belsky, 2007; NICHD ECCRN, 2005; McCartney, 2007; McCartney, Dearing, & Taylor, 2003). These results have long provided the basis for advocacy of regulation and provision of high quality child care to all children, and particularly for children who come from low quality home environments.

Researchers have hypothesized that high quality child care experiences will be more strongly related to children's development for children experiencing lower quality family environments or other social risk factors (Lamb, 1998; McCartney, 2007; McCartney, Dearing, & Taylor, 2003), thereby buffering the child from some of the negative impact of these risk factors. For example, in a study by Magnuson, Meyers, Ruhm, & Waldfogel, (2004), high quality child care was found to have larger effects on child language and reading development for children from disadvantaged backgrounds as opposed to children from non-disadvantaged backgrounds. Attending a high quality child care program that provides a cognitively stimulating environment and opportunities for interactions with a responsive caregiver may compensate for a less stimulating home environment and promote child language development (Bradley, Burchinal, & Casey, 2001; Caughy, DiPietro, & Strobino, 1994; Hubbs-Tait et al., 2002; NICHD, 2000; McCartney, Dearing, & Taylor, 2003).

Furthermore, in a study by McCartney, Dearing, Taylor, and Bub, (2007), there was evidence that higher quality child care buffered children from the negative impact of lower

family economic resources. The results indicated both a direct and indirect relationship between higher quality childcare and children's outcomes for cognitive and language development, with higher quality childcare acting as a buffer for children from the negative impact of lower family economic resources. After controlling for nine child and family covariates, an interaction between family income-to-needs ratio (family income divided by the state poverty threshold for family size) and childcare quality was found to predict school readiness, receptive language, and expressive language, as well as improvements in the home environment. Children from low-income families benefited from observed learning supports such as sensitive care and stimulation of cognitive development, and their parents profited from unobserved informal and formal parent supports.

However, not all studies have found such protective effects on language and reading skills. Social risk factors in early childhood have often been associated with later academic difficulties for children. In a study by Burchinal (2006), six risk factors (i.e., poverty, father absent in household, large household size, low maternal education, high maternal depression, and high life stress) were indexed into one multiple risk variable (averaged over several collection points during early childhood). The results suggested that childcare quality (measured by the *ITERS* and *ECERS*) emerged as a protective factor over time in the area of mathematics skills, though not for reading scores or social skills. For children who attended higher quality childcare, exposure to risk was negatively related to mathematics skills in first grade much more strongly than in third grade, showing that the effect of risk decreased with time for these children. In contrast, risk became a stronger negative predictor over time for children who attended lower quality childcare centers. In summary, although the direct effects of child care quality in both the home and child care environments are important in

understanding children's expressive language development, it is also important to understand if child care quality might buffer children against poorer language when they receive low quality care at home.

Poverty

Family poverty and related social risk factors often have been linked to a variety of poor outcomes for young children, especially if poverty is experienced during infancy and early childhood (Burchinal et al., 2008; Duncan & Brooks-Gunn, 2000; Huston, McLoyd, & Garcia-Coll, 1994; McLoyd, 1997). The relatively high poverty rate for children in rural America today is not a new phenomenon. In 1970, the poverty rate was 12% for urban children and 20% for children in rural areas. Although the gap between rural and urban child poverty narrowed in the 1970s and 1980s, it has widened from 3 percentage points in 1990 to 5 percentage points in 2007 (U.S. Census Bureau, 2009). Rural poverty encompasses places as diverse as they are distant (Dill, 1999), from the black south, central Appalachia, the Mississippi delta, to the northern plains. Because rural poverty is so diverse and prevalent, it is important that this dissertation accounts for family income-to- needs ratio in the analytical model.

Rural poverty has been found to have a significant impact on early childhood language development and skills. Studies have found that children from low income homes receive fewer encouragements to talk and less overall exposure to vocabulary (Hart & Risley, 1992; Heath, 1983; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; Vernon-Feagans, 1996). Research has established that children from lower income families build their vocabularies at slower rates than children from higher income families (Duncan, 1992; Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Poor

parents have been found to spend less time reading to their children, less time talking with them, and less time visiting museums and libraries with them (Bradley, Burchinal, & Casey, 2001; Hart & Risley, 1995; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002; McCartney, Dearing, Taylor & Bub, 2007). Particularly for poor rural children, the lower exposure to vocabulary in the home may be exacerbated by the geographic isolation of families living in rural areas.

Poor children living in high-poverty communities, as compared with their counterparts residing in communities with lower rates of poverty, are disadvantaged by reduced accessibility to jobs, high-quality public and private services (child care, schools, parks, community centers), and informal social supports (Burchinal et al., 2008; McLoyd, 1997; Vernon-Feagans, 1996; Vernon-Feagans et al. 2008). The task of developing and maintaining supportive, involved parenting practices and family relationships may be uniquely difficult for poor rural families because of the lack of certain types of support systems and amenities that are more commonly available in urban and suburban settings (Brody & Flor, 1998.) Examples of these support systems include social service agencies, parent education centers, public transportation, and close proximity to neighbors. Further, child care costs for rural, low income families have been found to commonly exceed 35% of their budgets (Atkinson, 1994; Beach, 1997; Walker & Reschke, 2004). Given that, on average, rural child poverty rates are higher than those in urban/suburban areas, these detrimental consequences on child language development are likely to fall disproportionately on children in rural areas.

Rural children are not only more likely to be poor, they are more likely to be living in deep poverty, with family incomes less than 50% of the poverty threshold than

urban/suburban children (O'Hare & Johnson, 2004). Deep poverty is important because for most of these rural families, poverty is entrenched and their needs are more desperate than their urban/suburban counterparts. The rural poor tend to be poor for longer spells than their urban/suburban counterparts. The median length of poverty in rural areas is 15% longer than in urban areas (U.S. Census Bureau, 2008). Persistent poverty is consistently found to have more adverse effects than transitory poverty on language development of preschool children, with children experiencing both types of poverty scoring lower on language assessments than never poor children (Duncan, 1992; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Persistent poverty can have an impact at the personal and community level. People who are persistently poor are disadvantaged, but so are people who live in communities that are persistently poor. Persistently poor families who live in persistently poor communities are doubly burdened (O'Hare & Johnson, 2004). Although urban poverty is typically concentrated in a small number of neighborhoods, rural poverty is much more widespread and diverse.

The effect of poverty on child language is especially important and significant in the preschool years. In a longitudinal study, Duncan and Brooks-Gunn, (2000) found that the effects of poverty were greatest during the preschool years. The study used whole-childhood data from the Panel Study of Income Dynamics (PSID). Income poverty had a strong association with a low level of preschool ability, which was associated with low test scores later in childhood, even after controlling for family characteristics (Duncan, & Brooks-Gunn, 2000). Children living in poverty are also at higher risk for poorer social, health, cognitive, and educational outcomes than those children from higher income families (O'Hare &

Johnson, 2004). The experience of poverty in the first three years of a child's life may have lasting negative consequences on that child's later language development.

Verbal and cognitive stimulation by caregivers, both maternal and non-maternal, have been found to have a significant impact on child later language skills (Dickinson & Tabors, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). However, the available time for sensitive parent-child interactions and the impact of other distal stressors on parents may also be related to family income (Hoff, 2003; McLoyd, 1997). High income mothers, as compared to low income mothers, talk more, provide more object labels, sustain conversational topics longer, respond more to their children's speech and provoke more talk from their children (Hart & Risley, 1995; Shonkoff & Phillips, 2000, p. 268). An example of this comes from Hart and Risley's (1995) work tracking 42 families for 9 years and showing that one of the strongest predictors of children's vocabulary was adult talk. Their observational evidence indicates that both the quantity and quality of parents' verbal interactions vary by income, with young children in professional families hearing, on average, three times as many words, with five times as much affirmative feedback and half as many prohibitions as children in welfare families (Hart & Risley, 1995). When quantified, these differences are staggering: in a typical hour-long observation period, the average low income parent addressed 616 words to their child, while the average high income parent uttered 2153 (Hart & Risley, 1995). Income accounted for 42 percent of the variance in children's rate of vocabulary growth at age three. This is consistent with research demonstrating that stresses related to economic strain may lead to less sensitive parenting which is in turn associated with less favorable academic outcomes (McLoyd, 1997).

Previous research has found that mothers from lower income backgrounds may use a less diverse vocabulary when interacting with their children than mothers from higher income backgrounds (Hoff, 2003; Vernon-Feagans et. al, 2008). In another study by Hoff, (2003) children whose families differed in income levels also differed in their rates of productive vocabulary development due to different language-learning experiences. Naturalistic interactions between 33 high-income and 30 mid-income mothers and their 2-year-olds were analyzed and were recorded at 2 time points 10 weeks apart. The high-income children grew more than the mid-income children in the size of their productive vocabularies (Hoff, 2003). In this study, properties of maternal speech that differed as a function of income fully accounted for this difference. Children in this sample who heard longer utterances built productive vocabularies at faster rates than children who heard shorter utterances (Hoff, 2003). Higher income mothers tend to sustain conversation with children for longer periods of time, elicit more talk from their children, and respond to their children in a more contingent manner (Duncan, 1992; Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002).

Hypothetically, for rural children living in poverty, the experience and exposure to high quality child care may provide more encouragements to talk and higher overall exposure to vocabulary than they would ordinarily receive in their home environments. By attenuating the risk of poverty and low quality home environments, child care may potentially serve as a buffer for child expressive language development.

Race

Many African Americans live in rural areas. In fact, African Americans comprise 6.5% of the United States' rural population (U. S. Census Bureau, 2009). Almost 90% of all

African Americans living in rural communities live in the southern United States (U. S. census Bureau, 2008). Further, nearly all (95%) of poor rural black children live in the South (O'Hare, 2004). Because there appears to be a strong racial overlay to regional rural child poverty, rural African American children may have different early childhood language experiences than their Caucasian counterparts due to different cultural scripts and social experiences.

The development of language abilities are linked to a child's everyday experiences which are embedded in the cultural practices or "scripts" of his or her family and society (Schonkoff & Phillips, 2000, p.240) Patterns of interdependency between language and literacy pass through a filter of culture. The cultural significance that children, parents, and teachers assign to different approaches to using language directly impact the practice of using language and related skills (Dickinson & McCabe, 2001; Heath, 1983; Vernon-Feagans, 1996). Parents from different social strata may hold different beliefs about the value and appropriateness of talking to children or about the desirability of having a talkative child, and they may behave differently as a result (Heath, 1983; McLoyd, 1997; Vernon-Feagans, 1996).The relationship between narrative skills and home experiences are complex because narrative skills are a significant way cultures convey meaning (Dickinson & McCabe, 2001).The ways parents talk to and with children have been portrayed as one of culture's most powerful ways of communicating values (Heath, 1983; Shonkoff & Phillips, 2000, p.248; Vernon Feagans, 1996).

Relationships are established and sustained in cultural contexts and the ways children and adults regard each other are influenced by the beliefs, values, and expectations of the wider social community. A central function of early care giving relationships is the child's

socialization into a specific cultural niche within society. It is because of these socialization values that early childhood relationships are diverse among different cultures and multifaceted and have different effects on young children (Heath, 1983; Garcia Coll et al., 1996; Shonkoff & Phillips, 2000, p.241; Vernon-Feagans, 1996). The socialization process that is embedded in the development of early relationships is influenced by the transmission of values and behaviors by the contemporary social context and individual differences among caregivers (Burchinal et al., 2008; Garcia-Coll & Magnuson, 2000; McCartney, Dearing, Taylor & Bub, 2007; Vernon Feagans et al., 2008) Parents and other important caregivers introduce children to both informal routines and formal institutions that reinforce their cultural values and goals. Parent belief systems and parent-child interactions provide some of the most important ways in which culture is integrated in the process of child rearing during early childhood (Heath, 1983; Vernon-Feagans, 1996).

Ways of storytelling are a significant indicator of socialization of values in different cultures (Heath, 1983; Vernon-Feagans, 1996). In her book, “Ways with Words”, Heath (1983), highlights the differences in uses of language in two different communities geographically only a few miles apart. The communities were comprised of white, low income families (Roadville) and of African American, low income families (Trackton). The way children told stories and their narrative opportunities were very different in both communities. Heath (1983) describes how parents from different social strata encouraged some forms of storytelling and not others, sometimes to the point of labeling “imaginative” stories from school as telling “lies” (Heath, 1983). In Roadville, parents coached their children in telling narratives factually and exactly the way that the adult has already conceptualized the story (Heath, 1983, p. 187). In Trackton, children were encouraged to tell

narratives that entertain and to relate the story to larger events beyond just the factual happenings the story is based upon (Heath, 1983, p. 188). These differences in language experience could have varied effects. It might make it hard for children to understand the ways they are being asked to use language in mainstream society and, especially, the classroom (Heath, 1983).

This lack of familiarity with classroom uses of language may cause children to adopt a nonstandard way of answering questions and, in turn, teachers have trouble understanding and interpreting the response (Dickinson & McCabe, 2001; Heath, 1983). As a result, teachers may find it hard to communicate with these children in ways that help them learn (Heath, 1983; Dickinson & McCabe, 2001; Vernon-Feagans, 1996). In her book, Vernon-Feagans (1996) highlighted the mismatch between mainstream school teachers' expectations of language and that of the Abecedarian project subsample of semi-rural African American children. In analyses of a book task where questions were read by the teacher and answered by the student, Vernon-Feagans analyzed the strategies teachers used to help children understand the story and answer the question correctly. The teachers responded to different types of response errors with certain strategies designed to help the child. However, teachers used the least effective strategies when the child answered in an irrelevant manner (Vernon-Feagans, 1996, p.190). The children who made most of the irrelevant comments were the Abecedarian children. In many instances, the children may have been embellishing the story, as is common in their culture, rather than responding verbatim as the teacher expected (Vernon-Feagans, 1996, p.188). The cultural difference in ways of answering questions about language was evident in this example.

The socialization process that is embedded in the development of early relationships is influenced by the transmission of values and behaviors through individual differences among caregivers (Garcia-Coll & Magnuson, 2000; Harkness & Super, 1992, 1996; Super & Harkness, 1997). Parents and other significant caregivers introduce children to both informal routines and formal institutions that reinforce their cultural values and goals. When confronted by outside influences that they perceive to be undermining these efforts, caregivers may become highly threatened. Parent belief systems and modes of parent-child interaction provide some of the most important ways in which culture is embedded in the process of child rearing during the early years of life (Levine, 1989; Super & Harkness, 1986). Maternal behavior is influenced by cultural values and beliefs. Brody & Flor (1998) sought to identify those family processes that were linked with academic and psychosocial competence among rural African American children living in two-parent households. This study found that that the provision of instrumental and emotional care giving support, along with harmonious, engaged family interactions with low levels of parental conflict were associated with greater linguistic competence among school-aged children (Brody & Flor, 1998).

Ethnicity likely plays a crucial role in the provision of quality of care in the black south and could moderate the association between child care quality and home quality and child language development due to a long history of racism in the south (McLoyd, 1998). Further, the recommendations of fellow African American community members may be more important to the development of parenting style than are parameters such as adequacy of income or maternal education (Brody & Flor, 1998). For rural African American parents, social relationships may influence parenting more than level of income or education. Cultural

practices related to early childrearing are highly variable and lead to different developmental outcomes (Hoff, 2003). Therefore, the model guiding this paper will analyze if the model is as effective in predicting child language development for African American children as it is for Caucasian children.

The African American population residing in rural America is heavily concentrated in the south. There is a strong racial and ethnic overlay to the distribution of high-poverty communities that blurs the face of rural poverty. By acknowledging that race may also influence the buffering effect child care quality may have on child expressive language development, a richer analytical model will be employed in this study.

Contextual Influences

Throughout development, the child is physically changing, as is the child's perception of the environment. Living and interacting within microsystems brings about change (Bronfenbrenner & Morris, 1998). Children participate in and shape their current realities. Children help to influence their own child care settings, relationships, and learning and social opportunities.

Child Characteristics

Person characteristics, such as age and gender most immediately affect a child's development within the microsystem. Child age is important to account for because the target time span of this dissertation (24 – 35 months) is a time of rapid development. Older children may have more well-developed language skills than younger children. In order to account for differences in age produced developmental gains, age will be controlled for in this dissertation. Gender may also influence child language development because children may elicit different responses from their caregivers according to their gender. For example,

teachers have been found to rate their relationships with boys as less close than their relationships with girls (Hamre & Pianta, 2001). This difference in the teacher-child relationship may negatively impact boys' later outcomes, especially since quality of teacher-child relationships have been shown to predict child expressive language development.

Child temperament, as measured by child negative temperament rating, was also important to control for in this analyses. Research has shown that whenever a child's developmental experiences involve the interaction with others, a child's own behavior is likely to influence their experiences (Dickenson & McCabe, 2001; Duncan & Brooks-Gunn, 2000; Hart & Risley, 1992; 1995). Children's ability to interact with others in socially positive ways is in part based on individual characteristics that they bring to their relationships with peers and caregivers in child care settings (Mendez, McDermott, & Fantuzzo, 2002). For example, children with an easier rather than difficult temperament (De Schipper et al., 2003), who are female rather than male (Youngblade, 2003), and older rather than younger (Cryer et al., 2005) have tended to have more positive relationships with their caregivers and elicit more positive and longer responses from their caregivers. The child with a higher rating on negative temperament will be more less likely attempt to elicit positive responses and communication with their caregiver, possibly leading to less advanced language development.

Family Characteristics

Some of the associations between child expressive language development and quality of the home environment may be accounted for by contextual characteristics of the child's family. As previously reviewed, the caregiver's role in providing the child with appropriate language experiences is emphasized in the language acquisition process (Dickinson &

McCabe, 2001; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). Maternal characteristics such as maternal education are significantly important in predicting child expressive language development. Therefore, maternal education will be controlled for in the model analyses.

Beyond maternal education, family income-to-needs ratio also provides a significant familial context that must be accounted for in the analytical model. Higher-income families are more likely to have access to higher-quality care and center-based care (Dowsett, Huston, Imes, & Gennetian, 2008). Since higher quality care is more commonly associated with better child language outcomes (Vandell et al., 2010), family income-to-needs ratio will be controlled for as well.

Child Care Characteristics

The unique contexts of child care type and quantity are also associated with child language development. Children who attend center based care have been found to be more likely to receive high quality child care than children in other types of care. However, some studies have found that rural families prefer placing their children in non-center based child care arrangements. To account for these differences in placement, child care type will be controlled for. Child care type is frequently measured as either formal care, such as center-based care (including public programs such as Head Start or state-funded prekindergarten), or informal care, such as relative-based care. More experience in center-based child care has been associated with higher ratings of language development at 36 months (NICHD ECCRN, 2005), however care provided by relatives was found to be more positive at 36 months. This may mean that younger children, including children in the target age range of this study, may benefit from the familiarity of caregivers. The number of hours the child is in child care will

also be addressed in this study. The amount of time and exposure in the child care environment may be different for each child. In order to account for these differences, hours in child care will be controlled for.

Research Questions

Research Question 1: What is the contribution of Home care quality to the prediction of children's expressive language at 35 months for the sample of children who attended child care at 24 and 35 months, after controlling for child and family demographic variables?

The home is the primary proximal environment the child encounters during early childhood. Research has shown that the quality of the home environment is a consistent and reliable predictor of child language outcomes (Bradley, Caldwell, & Rock, 1988; Hart & Risley, 1992, 1995). For children receiving high quality care in the home environment typically have higher language skills than children receiving low quality care in the home environment (Bradley, Caldwell, & Rock, 1988; Caldwell & Bradley, 1984; Hart & Risley, 1992, 1995). A modified version of the *HOME* (Caldwell & Bradley, 1984) was used to assess home and child care quality at 24 and 35 months. For research question one, I have hypothesized that after accounting for child and family demographic variables, children who experience high quality home care will exhibit higher levels of expressive language development than will those children who have experienced low quality home care. Conversely, children who experience low quality home care are predicted exhibit lower levels of language development than children who received high quality home care. This is the main effect of the home environment on child expressive language development. These predictions are aligned with previous research on more urban and suburban samples of

children that have shown that children with higher quality home environments also show higher levels of language development than their peers who have experienced lower levels of home care (Hoff, 2003; McCartney, 1984; McLoyd, 1997).

Research Question 2: Does child care quality add additional variance to the prediction of child language above the quality of the home environment and covariates?

The quality of both the home and child care environments has been found to influence child language development before the age of three (Burchinal et. al, 2000; Lee & Burkham, 2002; NICHD, 2002). Child care is assessed as another important proximal developmental environment the child encounters during early childhood. Child care quality from 24 and 35 months was measured using a modified version of the *HOME* (Caldwell & Bradley, 1984). I have hypothesized that after controlling for child and family demographic variables and the home quality environment, children who experience high quality child care will exhibit higher levels of language development than will those children who have experienced low quality child care.

Research Question 3: Does child care moderate the relationship between the quality of the home environment in predicting child expressive language development?

High quality child care has been found to buffer young children from the negative effects of low quality home environments for school readiness outcomes as well as for language development before the age of three (McCartney, Dearing, Taylor, & Bub, 2007; McCartney, 2008). The interaction of the quality of the home and child care environments will be assessed as they predict to child language outcomes. I hypothesize that when the quality of the home environment is low, high quality child care will buffer children against poorer language development. When the quality of the home environment is high, the quality

of the child care will not have as significant buffering influence on child language development.

Research Question 4: Does the pattern of moderation evaluated in Research Question 3 differ for subpopulations of the sample, specifically by race and poverty status?

It is important to this study to re-estimate the model in research question three separately for the two subpopulations of interest (e.g. African American vs. non-African American; High income-to-needs ratio vs. Low income-to-needs ratio) and investigating whether the same conclusions can be made for these subpopulations as for the whole sample. Studies have found that higher family income levels may buffer children at risk from poorer language outcomes (Burchinal et al., 2008, 2006; Duncan & Brooks-Gunn, 2000; McCartney et al., 2007; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007). That is, high quality child care may matter more for children from low income backgrounds than for children from high income families. Research has also shown that race may influence child language development (Heath, 1983; McLoyd, 1997; Vernon-Feagans, 1996). Rural African American children may have different early childhood language experiences than their Caucasian counterparts due to different cultural scripts and social experiences. High quality child care may matter more for children from an African American background than for children of non-African American backgrounds.

In summary, the overall purpose of the current study is to document the levels of home and child care quality experienced within a statistically representative sample of families with young children in rural communities in the two selected low-income rural regions and to determine the extent to which child care quality was related to child expressive language development at 35 months.

CHAPTER FOUR

Methods

Sample and Design

The data were for this study was acquired from the Family Life Project (FLP). The FLP is a research study that sampled families who resided in two of the four major geographical areas of high rural poverty (Dill, 1999). These two sampled regions are in Eastern North Carolina and Central Pennsylvania. Using a developmental epidemiological design, a sample of 1,292 families was initially recruited at the time a new child was born into the family. A two-stage randomized representative sample was drawn. Three of seven hospitals within each county in Pennsylvania were sampled due to the fact that the hospitals located in this areas were too numerous to recruit from all of them. The North Carolina sampled in all of the hospitals in the given counties. The second stage of the sampling included the recruitment of two groups of families in Pennsylvania and four groups of families in North Carolina.

Racial and economic minority families were over-sampled in order to acquire ample representation of these populations in these geographic areas. Specifically, low income families and African American families (only in North Carolina) were over-sampled. Due to target communities in Pennsylvania being over 95% European American, African American families were not oversampled in Pennsylvania. In order to guide recruitment for the FLP study, family incomes were dichotomized (low and not low) in order to obtain family data at

the initial hospital screening. If reported household income was less than 200% of the federal poverty threshold for a given household size, social services were utilized (food stamps, WIC, Medicaid), or if the head of households had less than a high school education then families were classified as low income.

Two methods of recruitment were employed in North Carolina. Families were recruited in person and by phone. Recruitment at the three hospitals that delivered babies whose families resided in the target counties occurred in person. For families whose babies were delivered in other counties but resided in the target counties, phone recruitment was employed. A systematic search of the birth records in the county courthouses was used to locate these families. Between September 15, 2003 and September 14, 2004 recruitment occurred seven days per week over this 12 month recruitment period. Standardized scripts and screening protocols were used with the families.

FLP recruiters identified 5,471 (57% NC, 43% PA) women who gave birth to a child during the recruitment period, 72% of which were eligible for the study. In order to be eligible for the study, families must reside in the target counties, use English as the primary language in the home, and have no intention of moving from the area within the next three years. Of the eligible population, 68% were willing to participate in the study. Of these, 58% were asked to formally participate. After the completion of the first home visit, 82% ($n = 1,292$) were enrolled in the study.

Procedures

Data presented here were collected through two methods: home visits and child care visits. Home visits consisted of two research assistants who conducted interviews, administered questionnaires, videotaped mother-child interactions, and videotaped child-

based tasks. Secondary caregivers (including fathers and grandparents, among others) who lived in the home were also interviewed and videotaped interacting with the target child. At each home visit, primary and secondary caregivers completed the *KFAST* literacy screener (Kaufman & Kaufman, 1994). Caregivers reading at an eighth grade or higher level were given the opportunity to complete questionnaires by themselves. For caregivers who read below an eighth grade reading level, research assistants read questionnaires to them and entered their verbal responses into laptop computers. Research assistants completed the *HOME* assessment at 24 and 35 month visits in the home.

At child care visits, two research assistants conducted interviews and administered questionnaires with the target child's child care provider. The child care site was observed to assess various aspects of child care quality at 24 and 35 months. Additionally, each classroom was observed to assess several aspects of the classroom climate. All interviews, questionnaires, assessments, and observations were computerized at the time of collection. Research assistants and respondents entered all responses into laptop computers, thereby expediting the transfer of data from the remote data collection sites to a centrally-located data processing center.

Analysis Sample

The current analyses are based on a subsample of Family Life Project target children who met the following inclusion criteria: (1) they were in child care at least 10 hours per week at 24 and 35 month time points, and (2) a *HOME* evaluation was conducted in the home and child care at 24 and 35 months, and (3) assessment of the child using the *PLS-4* was conducted at the 35 month time point. Using these criteria, this led to a sample size of 268. The sample was chosen in order to ensure that consistent measures of child care quality

both in the home and child care were available at each time point, as well as available outcome data. Further, by sampling at 24 and 35 month time points, sufficient range of the outcome and predictor variables was obtained for analyses.

Table 1 presents descriptive information from the whole sample of the Family Life Project versus the subsample used in this study. The characteristics of this subsample differed from the rest of the children included in the Family Life Project who did not meet the above criteria ($n = 970$). In the subsample of 268 children, independent-samples t-tests comparing control variables, variables of interest, and outcomes revealed several significant differences. Children who were not included in the subsample had mothers with a lower number of years of education ($M = 14.22$, $SD = 2.86$), $t(936) = -5.02$, $p = 0.01$; came from families with lower income-to-needs ratios ($M = 1.71$, $SD = 1.53$), $t(822) = 1.06$, $p = 0.058$; were more likely to be from Pennsylvania (57%), $t(970) = 1.17$, $p = 0.01$; were less likely to be African American (43%), $t(855) = -2.80$, $p < 0.001$; and scored lower on the *PLS* measure of expressive language development at 35 months ($M = 97.27$, $SD = 15.97$), $t(813) = 1.08$, $p = 0.05$.

There were no significant differences between groups among the following variables: child age, gender, and temperament, home quality, hours in child care, and child care quality. Overall, the children that were in child care at both 24 and 35 month time points and included in the sample were less likely to experience family contextual environments that negatively influenced their expressive language development (i.e. lower maternal education and lower income-to-needs ratio).

Measures

Child Characteristics

Child demographic variable data was obtained through the home visit questionnaires completed by the mother. The variables obtained through these questionnaires and utilized in this study were child age, gender, race, and negative temperament rating. The measure of child gender and race was taken for each child from a questionnaire completed by the parent at the 6 month interview. The parent either answered yes if the child was female or no if the child was male. This was coded as a dichotomous variable as a 0 (male) or 1 (female). Similarly, child race was also coded as a dichotomous variable where the parent either answered yes if the child was black (1) or no if the child was not (0). Child age was obtained using the 35 month questionnaire and calculating the child's age in months.

Child negative temperament was calculated by creating a composite of two measures of the child's temperament. One measure, the Infant Behavior Record (Bayley, 1969), was conducted at the 24 month home visit. The home visitor evaluated the child's behavior across the visit and completed the 11 item scale measure. Scores on each item were either on a 5 or 9 point scale. A subscale, child irritability, was chosen for the negative temperament composite. Examples of items from this scale include ranging from a score of 1 if the child "Accepts the entire home visit with no evidence of fear, caution, or inhibition of action" to a score of 9 if the child "Strong indication of fear of the home visit, to the extent that he/she cannot be brought to participate in many of the tasks." This score was standardized and then added and averaged with the negative temperament measurement acquired at 35 months. The negative temperament measurement at 35 months was obtained from the Observation of Child Temperament Scale which is also an adaptation of the Bayley Scales of Mental Development (Bayley, 1969). This measure was also an observational measure completed by the home visitors. Children were also scored on either a 5 or 9 point scale. The subscale of

child shyness/fearfulness was chosen for the composite measure of child negative temperament. Examples of items from this scale include ranging from a score of 1 if the child showed “no irritability; infant passively responds to all stimulation” to a score of 9 if the child was “irritable to all degrees of stimulation encountered throughout the home visit.” The scores at 35 months were standardized, added, and then averaged with the negative temperament score obtained at 24 months to create the negative temperament composite score.

Family Characteristics

Family demographic variable data was also obtained through the home visit questionnaires completed by the mother. Family variables included state, maternal education, and family income-to-needs ratio. At the 35 month home visit, mothers were asked to identify which state they lived in (either North Carolina or Pennsylvania). This data was then recoded as either a 0 (for North Carolina) or 1 (for Pennsylvania,). Mothers were asked at this same home visit to identify their highest level of education categorically. This variable was recoded as a continuous variable by changing the previous categorical education levels into the years of education attained by the mothers at the time of each home interview.

The measure of income-to-needs ratio was calculated for each household by summing the following: primary caregiver’s annual income; secondary caregiver’s annual income; annualized contributions to the household for all of the other people in the households; and all other sources of income. Examples of other sources of income would include unemployment insurance, worker’s compensation, social security retirement, supplemental security income, etc. This annual household total income figure was divided by the federal poverty threshold for a family matching size and composition to create the

income-to needs ratio. Income to needs ratio from 24 and 35 months will be included to control for the influence of the income on children's developmental skills. Income to needs ratio was then measured by taking the average reported income at each time point and dividing that by the number of family members in the household at each time point. These numbers were then averaged over time and standardized to be included in the analytical model.

Child Care Characteristics

Two child care characteristics were employed to account for differences in child experiences in child care: hours in child care and child care type. Data for these variables was gathered from a caregiver report measure completed at 24 and 35 months. The child care provider reported the average number of hours target children were in child care at each time point (24 and 35 months). The hours were then averaged across time to produce a measure of hours in child care. Child care type was computed as a dichotomous variable of either informal care (0) or formal care (1). If the target child was reported to be cared for in a home environment other than the child's home, including a family child care home, then the target child was considered to be in informal care. Informal care would include care from a relative in their home or care in a family child care home. If the target child was reported to be cared for in a non-home, center-based environment, then the target child was considered to be in formal care.

Quality of the home and child care environments

Home and child care quality from 24 and 35 months was measured using a modified version of the *HOME*. The Home Observation for Measurement of the Environment (*HOME*; Caldwell & Bradley, 1984) is a home and child care quality inventory that was used at 24 and

35 months. The *HOME* uses an interview and observation format to assess the quality and quantity of stimulation and support available to the child at home. The Family Life Project used three *HOME* subscales: 1) Responsivity, 2) Acceptance of the child, and 3) Learning materials. Each of these was scored in a yes/no fashion by trained research assistants with scores ranging from 0 to 28 for the 24 month version, and 0 to 22 for the 35-month version. Higher scores indicate higher quality environments. Examples of items in the responsivity subscale include “Caregiver’s voice conveys positive feelings toward the child” and “Caregiver converses with child 2 or more times during visits”. The acceptance subscale was reverse coded when scoring and included items such as “Caregiver scolds or criticizes child during visit” and “Caregiver shouts at child.” Lastly, the learning materials subscale included items scoring if “Toys for literature and music” and “ten or more children’s books” are present in the caregiving environment.

For these analyses, the measure of home and child care quality was created as an across-time composite. The *HOME* scores were computed as the mean of the proportion of items passed at 24 and 35 months. The *HOME* scores were then standardized in order to be included in the model. Each of the three subscales will also be separately analyzed as predictor variables in the models.

Expressive Language Development using the Preschool Language Scale

The outcome variable of interest is the child’s expressive language development as measured by the expressive communication subscale of the *PLS-4* at 35 months. The *PLS-4* targets receptive and expressive language skills in the areas of attention, play, gesture, vocal development, social communication, vocabulary, concepts, language structure, integrative language skills, and phonological awareness (Raviv, Kessenich, & Morrison, 2004). The test

was individually administered and includes tasks that assess skills in the areas of preverbal behaviors, as well as linguistic skills in the areas of semantics, morphology, syntax, integrative language skills, and pre-literacy skills. Examples of items included in the expressive communication subscale include “combines three or four words in spontaneous speech” and that the child “can answer what and where questions”. The *PLS-4* is a standardized instrument with a mean of 100 and a standard deviation of 15.

Analytic Plan

Using SAS 9.2, descriptive and correlational analyses as well as hierarchical linear regression models were conducted to investigate the four research questions this dissertation addresses. Data analyses focused on testing the associations between home and child care experiences during 24 and 35 months and children’s expressive language development. Child and family demographic characteristics were examined descriptively and the relations between the quality of the home environment, child care, and child expressive language development were examined using hierarchical linear regression. By using a hierarchical linear regression model, tests of both direct and moderated relationships of home quality with child expressive language ability by child care quality were conducted. Further analyses of the influence of race and income on the regression model were also conducted. Covariates were mean-centered for use in the regression analyses.

To investigate the direct and interactive influences of child characteristics, family context, and child care experiences, hierarchical multiple regression was used with predictor variables entered in a stepwise fashion. Child characteristics were entered in the first block. Family demographic contextual factors were entered in the second block. In the third block, child care characteristics were included. In the fourth block, home quality was added. The

fifth block added child care quality while the sixth block included all of the two-way interactions for the specific model. The seventh block examined the three way interaction between home and child care quality interactions and either income-to-needs ratio or child race. Using Hedges g , effect sizes were calculated for significant main effects and interactions (Cooper & Hedges, 1994). Effect sizes are interpreted as $d = 0.10$ indicating a small effect, $d = 0.30$ a moderate effect, and $d = 0.50$ as a large effect (Cohen, 1988).

CHAPTER FIVE

Results

Descriptive Results

Table 1 presents the means and standard deviations for all model variables. For the outcome variable of expressive language skills, target children scored an average of 100 ($SD = 15.39$). This implies that children in this sample scored the average score one would expect from any typical sample of children of this same age.

Table 2 presents the correlations for all model variables. For the outcome variable of expressive language skills, significant negative correlations with variables included child gender ($-0.15, p = 0.02$), child race ($-0.12, p = 0.05$) and child negative temperament ($-0.16, p = 0.01$). These correlations mean that being male or African American was negatively correlated to expressive language skills at 35 months.

Significant positive correlations with expressive language skills occurred with variables including maternal education ($0.34, p < 0.0001$), income-to-needs ratio ($0.33, p < 0.0001$), home (*HOME*) quality ($0.32, p < 0.0001$) child care (*HOME*) quality ($0.24, p < 0.0001$) all of the subscales of the home quality measure [*HOME* - responsivity subscale ($0.20, p = 0.001$), *HOME* - learning materials subscale ($0.26, p < 0.0001$), *HOME* - acceptance subscale ($0.25, p = 0.002$)] and two of the three child care quality subscales [child care (*HOME*) quality- responsivity subscale ($0.16, p = 0.009$) child care (*HOME*) quality- learning materials subscale ($0.19, p = 0.002$).

Regression Results

The trimmed results for the regression analyses can be found in Table 3. Child characteristics employed as control variables in the first block of the model included child age, child gender, child race, and child temperament. The child characteristics control variables (Step 1) accounted for 6% of the variance in 35 month expressive language. Family characteristics were added to the model in the second block and included state, mother's education, and family income-to-needs ratio. The addition of family characteristic variables (Step 2) accounted for an additional 12% of the variance for a total of 18% of the variance in child expressive language development being explained by child and family characteristics. In block 3, two child care control variables were added (Step 3). These variables were hours per week in child care and child care type. The addition of the two child care variables did not account for any additional variance in the model.

Research question one asked: "What is the contribution of Home care quality to the prediction of children's expressive language at 35 months for the sample of children who attended child care at 24 and 35 months, after controlling for child and family demographic variables?" In order to answer this question, the predictor variable, average home quality at 24 and 35 months, was added to the model in block 4 (Step 4). Home quality was found to be significantly related to children's expressive language ($R^2 = .21$, $B = 3.29$, $p = 0.003$) and accounted for an additional 3% of the variance [$F(1, 256) = 10.80$, $p = 0.001$]. The effect size was small for the main effect of home quality ($d = 0.22$).

For research question two I asked "Does child care quality add additional variance to the prediction of child language above the quality of the home environment and covariates?" In order to answer this question, average child care quality at 24 and 35 months was added to the model in block 5 (Step 5). Results showed that average child care quality (Step 5) from

24 and 35 months had a direct effect on child expressive language development at 35 months. For the children's expressive language development, 1% variability was explained when child care quality was included ($R^2 = .22$, $B = 1.95$, $p = 0.03$); [$F(1, 255) = 4.51$, $p = 0.03$]. The effect size was small for the main effect of child care quality ($d = 0.13$).

In research question three I asked "Does child care moderate the relationship between the quality of the home environment in predicting child expressive language development?" In order to answer this question, the interaction term of average home quality by average child care quality at 24 and 35 months was added to the model in block 6 (Step 6). Adding an interaction term in block 6 of home quality by child care quality was not significant.

Research question four probed research question three further by asking "Does the pattern of moderation evaluated in Research Question 3 differ for subpopulations of the sample, specifically by race and poverty status?" In order to answer this question, all two-way interaction terms for both child race and income to needs level were entered in separate models. Step 6 in the "race" model included all two way interactions of the predictor variables by race (average home quality by average child care quality, average home quality by child race and average child care quality by child race). Then, in Step 7, the three way interaction of average home quality by average child care quality by child race was entered into the model. In the "income-to-needs" model all two way interactions were entered in Step 6 and included interactions between average home quality by average child care quality, average home quality by family income-to-needs ratio and average child care quality by family income-to-needs ratio. Then, in Step 7, the three way interaction of average home quality by average child care quality by family income-to-needs ratio was entered into the model. The proposed model moderators of family income to needs and child race were not

found to be significant. Step 6 and the model moderators are not shown on Table 3 as Table 3 shows the trimmed results only.

CHAPTER SIX

Discussion

This dissertation examined the influence of home and child care quality on child language development for children under the age of three. This study adds new information about the predictors of child language development in a diverse and large representative sample of rural families in two rural, low income areas of the United States. Although one in five children in the United States lives in a rural area, there is still a lack of research relative to the more urban and suburban populations (Beach, 1995; Burchinal et al., 2008; Vernon-Feagans et al., 2008). The findings from this study underscore the importance of the quality of the home environment and the quality of child care for children who live in rural communities, specifically in the area of expressive language development for children under the age of three.

Using a sample of rural families living in North Carolina and Pennsylvania, this study drew upon data assessing the quality of both the home and the child care environments. The results of this study extend previous work on the quality of the home and the quality of child care predicting to child language development (Burchinal et al., 2000; 2006; NICHD ECCRN, 2000, 2001). Studies have reported that the quality and/or the consistency of the quality of the multiple settings which young children encounter are strongly associated with children's early and later development, especially with regard to skills that are important for school readiness such as language (Burchinal et al., 2008; Dickinson & McCabe, 2001; Hart & Risley, 1995; Hoff, 2003; McCartney, Dearing, Taylor & Bub, 2007; NICHD ECCRN,

2005; Vernon-Feagans et al., 2008). The primary environments for the children in the current study and for most young children in the United States are the home setting and the child care setting. A large amount of previous research has tried to capture the quality of these two settings through ratings of their quality, using measures like the HOME (Bradley et al., 2002, 2003). The current study builds on previous studies by using the HOME (Bradley et al., 2002, 2003) in both the home environment and the child care environment while measuring the influence and possible interaction of both environments on children's expressive language development at 35 months.

Aligned with previous research on more urban and suburban samples of children (Bloom, 1998; Bradley & Caldwell, 1984; Hart & Risley, 1992, 1995), the quality of the home environment was found to directly influence child expressive language skills at 35 months. These results contribute to the larger literature that has long documented the importance and influence of the home quality on child language development. Further, even after controlling for the influence of the home environment, and child, family and child care characteristics, results showed that the quality of child care still influenced child expressive language at 35 months. These results, along with interpretation of the descriptive data in this study, will be discussed in detail in the following section.

Child and Family Context

First, it is important to place this study in context by discussing the background of the study children who lived in two low wealth rural areas of the United States and were part of a representative sample of children who were being raised in this rural environment. These families have been traditionally understudied so it is important to describe how findings in this study might generalize or not generalize to other rural children. Only 268 children out of

1292 children in the Family Life Project attended child care at both 24 and 35 months for at least 10 hours per week. Geographic proximity to relatives may be associated with where and if families place their children in child care. In Shoffner's (1986) study examining child care in the rural South (where two-thirds of participants were European American and one-thirds were African American), she found that over 30% lived near one to five relatives while over 20% lived near more than five relatives.

Rural communities are traditionally conceptualized as having higher levels of social capital, than urban and suburban communities (Hofferth & Iceland, 1998). Social capital includes strength of family, proximity kith and kin, and community support (Hobbs, 1994; Hofferth & Iceland, 1998; Khattri, Riley, & Kane, 1997). The lower population density encourages connections between residents, and that isolation and lower levels of public services in rural areas, compared to urban and suburban areas, facilitates community cooperation and exchange and voluntary activity. In Hofferth and Iceland's (1998) study of rural and urban households from the 1988 wave of the Panel of Income Dynamics, differences in resource exchange patterns between rural and urban areas existed. The researchers also found that families in rural areas more often exchange exclusively with kin than do urban families (Hofferth & Iceland, 1998). Compared to urban communities, rural communities are more cohesive, closely knitted, and have stronger family ties and connection to their family networks (Hofferth and Iceland, 1998; Hobbs, 1994; Khattri, Riley, & Kane, 1997). Rural residents are more likely to exchange resources with kin than non-kin, and those rural residents who grew up in the same community were more likely to give and receive money to and from each other (Hofferth & Iceland, 1998).

Other studies have found that social support (including child care) within families may include relatives (mainly grandmothers) residing with young mothers (Hogan, Hao, & Parish, 1990; McDonald & Armstrong, 2001). Children were counted as being in informal child care in this study if they were cared for by a relative outside of the child's home or if the child was cared for by a grandparent inside of the home. However, this grandparent could not be the primary or secondary caregiver of the child in order for the child to be identified as being in child care. The presence of the father or kin member within the home, as well as supportive friends or kin outside the home, often suppress the probability that mothers select a center or other market form of care and may help explain the low rate of child care used by families in this study (Leibowitz, Waite, & Witsberger, 1988; Hofferth & Wissoker, 1992).

Of the families who used child care in the Family Life Project for more than 10 hours per week at 24 and 35 month time points, almost 60% were African American, slightly more than in the larger sample. Average income/needs ratios at 35 months of age were around 2 (or 200% of the Federal Poverty Level), suggesting that the families, on average, had incomes just above the levels that would make them eligible for many poverty intervention programs. The findings in the study may best generalize to other children from low income families living in other rural areas in the United States. For instance, this sample is poorer than the NICHD ECCRN (2000, 2005) sample whose income-to-needs ratios were over 3.5 (or 350% of the federal poverty level). Mothers in this sample also had education levels that averaged at least one year of educational attainment beyond high school. Incidentally, given the income levels and relatively low level of maternal education of the families, the children's language scores at three years of age were near the national norms for children three years of age.

Children in the Family Life Project who used child care at 24 and 35 month time points were from mostly working class families who used child care for many hours a week. Akin to children in more urban settings who are poor or considered near poor, children in this study spent a considerable amount of time in their child care settings during early childhood (NICHD ECCRN, 2005; Vernon-Feagans, et. al, 2008). On average the children in this study who were in child care spent 36 hours a week in child care at 24 and 35 months of age. A little more than half of the children in this sample attended formal child care settings, such as a child care center. Families were more likely to use formal child care at 35 months than at 24 months (59% vs. 53%). The results on child care type (formal versus informal) are aligned with previous research on rural families preferences for child care. In Atkinson's study (1994; 1996) rural mothers were significantly more likely than urban mothers to use child care by relatives (45% vs. 36%, respectively) than nonrelatives including baby-sitters (42% vs. 46%, respectively) or day care centers and preschools (12% vs. 16%, respectively), particularly when children were below 36 months of age. The incidence of use of more formal child care settings increased as the children aged.

In the current study, consistent with NICHD ECCRN study, the child and family demographic variables contributed the most variance to the model in understanding children's language (18%). This study controlled for most of the demographic variables often used to predict children's early language development; child variables including age, gender, race and temperament and family variables including state, income-to-needs ratios, and maternal education level. Child care characteristics such as hours in care and type of care did not contribute a significant amount of variance to the model. The child care characteristics were important to control for due to the possible dosage effect the child care environment.

Home Quality

The overall quality of both the home and child care settings was measured by the *HOME* (Bradley et al., 2002, 2003). The quality of the home was found to be only slightly higher quality than the quality of the child care setting at 24 and 35 months. The association between the quality of the home environment and child language development is a consistent finding in most of the early childhood language literature (Burchinal et al., 2008; Dickinson & McCabe, 2001; Hart & Risley, 1995; Hoff, 2003; McCartney, Dearing, Taylor & Bub, 2007; Vernon-Feagans et al., 2008).

The findings in this study of Family Life Project families are generally consistent with an extensive literature on the positive impact high quality care has on child language development, and this study extends these findings to rural children below 35 months of age. The overall quality of home environment did add additional significant variance (3%) when predicting language development using the *HOME* at 35 months. When combined with the child and family contextual variables, the model accounted for (21%) of the variance in children's language development. This is a lower result than what has been found in other research. For example, The NICHD ECCRN study (2000) found that the context variables during the first three years of life that were associated with the home, such as the quality of the home environment, income and maternal education, accounted for up to 40% of the variance in children's language development. This study found a small effect size of only $d = 0.22$ when measuring the direct effect of home quality. However, effect sizes in naturalistic studies are typically small because they are measured in the context of many other influences (Cohen, 1988).

Child Care Quality

Findings from studies that examined both the quality of the home environment and the quality of the child care setting have separately or when taken together suggested that both settings have contributed to children's development, but that the home setting was the most consistent predictor of child language outcomes (Belsky, 2007; NICHD ECCRN, 2005). Rarely, if ever, have these studies used the same measure of quality of home and child care in their study. A great strength of this study was the use of the same quality measure in both the home and child care environments. Comparisons across both the home and child care environments were able to be conducted using the same quality measure in this study.

Results in this study are consistent with prior research on the influence of child care quality on child language development (McCartney, 1984; McCartney, 2002; NICHD ECCRN, 2005). Even after accounting for child, family, and home quality variables, child care was found to contribute another 1% of the variance to the model. The effect size, however, was small ($d = 0.13$) and much smaller than the effect size found for home quality ($d = 0.22$). These results are similar to other studies that have found that the home environment is the primary and most influential environment on child language outcomes after accounting for the developmental influences of child and family demographic characteristics on child language development (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Howes, Phillips, & Whitebook, 1992; NICHD ECCRN, 2005; Peisner-Feinberg & Burchinal 1997; Vandell & Wolfe, 2000; Vernon-Feagans, Hurley, Yont, Wamboldt, & Kolak, 2007).

Moderator Effects

What I expected to find in this study was that child care quality moderated the relationship between home environment quality and expressive language development for

children under the age of three. However, the current study examined the influence of home and child care quality on child language development using a fairly homogenous sample of rural, low income families. The small number of children and families involved in this study may limit power to detect associations between independent variables and child language development when child and family demographic variables were also considered. Although previous research has identified child care quality as a moderator of the influence of home quality on child language development (Bradley, Burchinal, & Casey, 2001; Caughy, DiPietro, & Strobino, 1994; Hubbs-Tait et al., 2002; NICHD, 2000; McCartney, Dearing, & Taylor, 2003), the relatively homogenous sample of home, child care quality, income-to-needs ratios, and race in this sample may have weakened the ability to detect a moderator effect. This study did not find that child care moderated the relationship between home environment quality and expressive language development for children under the age of three. Without a full range of values for the independent variables, an interaction effect may be difficult to detect.

Limitations and Future Directions

Certain limitations should be considered when interpreting these results. The study restricted recruitment to families which English was spoken. This restriction limits my ability to generalize to non-English speaking families and children. These findings, in conjunction with the growing child care literature, suggest more studies are now needed that focus on a representative sample of diverse families with respect to rurality, income-to-needs ratio, and ethnicity so that researchers can examine the individual differences in quality of home and child care that might be important for very young children. Additional study of other rural areas of the United States with other varieties of ethnic groups (e.g. Hispanic, Native

American) with culturally appropriate contextual and interactional variables are needed to determine if the main findings from this study of rural low-income children from two rural areas of the United States apply to other groups.

Specific aspects of the rural environment may also have an influence on child language development. For instance, social capital in rural areas may have a protective impact on child language development, especially when the child is in a high risk family because of exposure to other proximal contexts besides the family environment. However, some studies (Fish & Pinkerman, 2003; Burchinal et al., 2008; Vernon-Feagans et al., 2008), have not found the theorized protective influences of social capital on rural child language development and outcomes. Future research must address the influence of social capital along with the influence of home and child care quality on child language development.

These results are limited by sample size and may not be generalizable to other low income children in different contexts. Although this is a commonly used measure, there are no norms or common methods of scoring the HOME. Therefore, it is difficult to identify a threshold of “good” or “poor” quality child care for this sample. The range of measures of the home and child care quality tended to be limited and clustered near the higher end of the quality scale. Future studies should replicate these results within samples with a wider array of home and child care quality environments to determine whether child care quality remains as an important contributor of child language development outcomes independent of home quality.

The quality of the home and child care environments were rated on a global quality scale. For example, some items indicating high quality include “There is a pet” and “Caregiver reads newspaper daily”. Taken individually, these items from the HOME do not

seem to be directly related to the facilitation of language of children under the age of 35 months. More proximal and specific environmental factors (such as parent/child and caregiver/child interactions) may be better predictors of child language outcomes at 35 months. In many ways, children from rural, poor backgrounds do not participate in the types of experiences that foster language use like language is being used in the public schools (Heath, 1983; Vernon-Feagans, 1996). Researchers have suggested that the failure of many children from minority and lower socioeconomic groups' results from a mismatch between home and community patterns of language use and the uses of language typically expected in school (Vernon-Feagans, 1996; Dickinson & McCabe, 2001; Heath, 1983). Cultural practices related to early childrearing are highly variable and lead to different developmental outcomes (Hoff, 2003). Sensitive parenting, maternal responsiveness, and the feedback children receive in their interactions with adults have been shown to predict early language skills (Burchinal et al., 2008; Dickinson & McCabe, 2001; Hart & Risley, 1995; Hoff, 2003; McCartney, Dearing, Taylor & Bub, 2007; Vernon-Feagans et al., 2008). The cultural practices of rural families must be directly measured in terms of the quality of the interactions between parents and children in order to more clearly assess the contribution of the home quality to child expressive language development at 35 months.

In addition, the quality of teacher-child interactions in the caregiving context has also been related to child language skills (Blau, 1999; Hart & Risley, 1995; Howes, Phillips, & Whitebook, 1992; Mashburn, et al., 2008). While child care quality remains an important contextual factor, it seems more pragmatic for future research to examine specific parent and child interactions that are associated with home and child care quality and exert direct influence on the language abilities of young children. Future research is needed to determine

whether these associations between expressive language development of children under the age three and quality of home and child care will be maintained in the preschool years.

Relationships among the home and child care environments are bidirectional from an early point in children's acquisition of language (Dickinson & McCabe, 2001; McCartney, Dearing, Taylor & Bub, 2007). In McCartney's (2007) study of low income children found bidirectional effects between quality of child care and quality of parent child relationships. As quality of child care increased, so did quality of parent child interactions. This interaction predicted the child's school readiness, receptive language, and expressive language, as well as improvements in the home environment. Future study of the connection and interaction of the home and child care environments is imperative to the further understanding of the influence of the quality of these environments on child developmental outcomes.

Possible mediation was detected in the model between the direct effect of child race, state, maternal education and average home quality. The quality of the home environment may mediate the influence of child race, state, and maternal education on child expressive language development at 35 months. These possible findings are aligned with previous research showing mediation by the home environment. For example, in a study by Burchinal, (2008), severity of exposure to social risk related to parenting and cognitive development in the first 15 months of an infant's life was studied in a representative diverse sample of families in two rural poor regions in the United States. For the first 15 months of the infant's life, 1292 families were followed. Proximal learning and literacy activities mediated the negative pathway from cumulative risk to cognitive development (Burchinal et. al, 2008). However, cumulative risk exposure became a weaker predictor of harsh parenting between 6 and 15 months. There was evidence of a meditational pathway from risk severity through

three proximal variables (maternal sensitivity and warmth, parental learning and literacy activities, and maternal language to child outcomes) (Burchinal et. al, 2008). These results suggested that the real causal mechanism in child language outcomes, in this rural sample, was the proximal parenting environment. Although not explored in this dissertation, future study will address the possible findings of mediation by the home environment on the strength of influence child race, state, and maternal education have on child expressive language development at 35 months.

Causal linkages cannot be inferred because of the correlational nature of the study. Caution must be exercised in drawing causal or directional inferences, especially with the measure of child language. For example, it is possible that children with stronger language skills elicit more sensitive and stimulating parenting and caregiving

The findings have several important implications for shaping early education and intervention programs. The current findings demonstrate the importance of considering models of development that include both the home and child care environments and allow examination of the complex interaction between the two. The influence exerted by both the home and child care environments on basic language skills at these early ages reemphasizes the importance of aiming education and intervention efforts toward parents and educators of young children, before the age of three. A high quality child care program that provides a cognitively stimulating environment and opportunities for interactions with a responsive caregiver may compensate for a less stimulating home environment and promote child language development (Bradley, Burchinal, & Casey, 2001; Caughy, DiPietro, & Strobino, 1994; Hubbs-Tait et al., 2002; McCartney, Dearing, & Taylor, 2003; NICHD, 2000).

As non-maternal child care becomes even more common for children in America, it is imperative to understand the underpinnings behind the influence of the quality of child care both inside the home and in the child care environment on child development. There are many barriers for children to go through in order to receive high quality child care, including family income, culture, values, geographic isolation, parental education, availability of care, and societal values. The benefits of high quality child care both inside the home and in the child care setting have been established, and yet children are still likely to experience low to mediocre child care quality. Researchers may need to address the barriers to the provision of high quality child care for children in rural areas in order to understand the contributors to child development outcomes.

Conclusion

This study replicated the findings that the quality of both the home and child care environments influence child language development at 35 months. This underscores the importance of these environments on child development outcomes. The results are consistent with the findings of previous studies that quality of both the home and child care environment are important predictors of child language development (Belsky, 2007; McCartney, 2007; McCartney, Dearing, & Taylor, 2003; NICHD ECCRN, 2005). This study provides evidence that the quality of the home and child care environment is positively related to child language development at 35 months. The need for high quality child care programs is evidenced in this study since it was found that child care was still related to child language development even after accounting for child and family characteristics. As the concept of “rural” is continually changing and families and societies become more

connected, it is important to understand how the home and child care environments influence child development in all populations in the United States.

Table 1: Means, and Standard Deviations for all variables: FLP and Children who were in Child Care at each time point (24 and 35 months)

Variable	FLP				Study Sub-Sample			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Outcome Variable								
Language Development (PLS)	813	97.27*	15.97	50-150	268	100.09*	15.39	50-144
Child Characteristics								
Age (months)	855	37.10	1.82	50-47.31	268	36.89	1.49	34.50-45
Gender (% female)	855	49%			268	51%		
Child Race (% Black)	855	43%*			268	57%*		
Child Temperament (Negative)	812	0.03	0.74	1-8	268	2.81	0.92	1.25-5.88
Family Characteristics								
State (% North Carolina)	970	57%*			268	70%*	0.46	
Maternal education	936	14.22*	2.86	6-22	268	15.19*	2.52	8-21
Income-to-needs ratio	822	1.71*	1.53	0-14.39	268	2.20*	1.49	0-7.38
Home Quality								
Home environment quality (HOME)	870	0.83	0.13	0.21-1	268	0.85	0.11	0.31-1
Home-Responsivity Subscale	765	0.89*	0.15	0.05-1	268	0.92*	0.11	0.36-1
Home-Materials Subscale	746	0.81	0.16	0.11-1	268	0.82	0.16	0.09-1
Home-Acceptance Subscale	763	0.80	0.19	0.19-1	268	0.82	0.17	0.13-1
Child Care Characteristics								
Number of hours in care/week	855	4.21	9.41		268	36.76	12.27	12.50-104.00
Child care type (% formal)					268	56%		
Quality of child care (HOME)					268	0.83	0.09	0.50-1
Child care- Responsivity Subscale					268	0.80	0.13	0.32-1
Child care- Materials subscale					266	0.83	0.14	0.20-1
Child care- Acceptance subscale					267	0.92	0.07	0.56-1

Note: † $p < .10$, * $p < .05$. for t-Test of group

Table 2

Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Expressive Language Development	-									
2. Age (months)	0.08	-								
3. Gender (% female)	-0.15*	-0.03	-							
4. Race (% black)	-0.12*	-0.03	-0.08	-						
5. Temperament	-0.16*	-0.12*	0.09	-0.16*	-					
6. State (% North Carolina)	-0.04	0.07	-0.23*	0.48*	-0.33*	-				
7. Maternal education	0.34*	-0.03	-0.05	-0.20*	0.16 [†]	-0.25*	-			
8. Income-to-needs ratio	0.33*	0.11 [†]	0.03 [†]	-0.37*	0.11 [†]	-0.33*	0.64*	-		
9. Home environment quality	0.32*	-0.11 [†]	-0.09	-0.26*	0.15*	-0.21*	0.43*	0.45*	-	
10. Home- Responsivity subscale	0.20*	-0.16*	-0.07	-0.09	0.09	-0.03	0.24*	0.22*	0.18*	-
11. Home- Materials subscale	0.26*	-0.11 [†]	-0.01	-0.27*	0.13*	-0.29*	0.40*	0.45*	0.84*	0.40*
12. Home- Acceptance subscale	0.25*	0.07	-0.15*	-0.17*	0.11 [†]	-0.06	0.29*	0.25*	0.64*	0.34*
13. Number of hours in care/week	-0.09	0.17*	-0.06	0.09	-0.13*	0.36*	-0.25*	-0.10	0.15*	0.01
14. Child care type	0.07	-0.07	-0.03	0.27*	-0.17*	0.33*	-0.08	-0.20*	0.17*	0.08
15. Child care quality	0.28*	0.01	-0.14 [†]	-0.15 [†]	0.09	-0.29*	0.38*	0.29*	0.11	-0.07
16. Child care- Responsivity subscale	0.16*	0.03	-0.12*	-0.12*	0.15	-0.25*	0.18*	0.22*	0.05	-0.02
17. Child care- Materials subscale	0.19*	-0.02	-0.06	-0.07	0.04	-0.05	0.21*	0.18*	0.25*	0.20*
18. Child care- Acceptance subscale	0.10	0.02	-0.16*	0.01	-0.05	0.11 [†]	0.05	0.09	0.18*	0.19*

Note: [†] $p < .10$, * $p < .05$.

Table 2, cont'd

Correlation Matrix

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1. Expressive Language Development								
2. Age (months)								
3. Gender (% female)								
4. Race (% black)								
5. Temperament								
6. State (% North Carolina)								
7. Maternal education								
8. Income- to -needs ratio								
9. Home environment quality								
10. Home- Responsivity subscale								
11. Home- Materials subscale	-							
12. Home- Acceptance subscale	0.18*	-						
13. Number of hours in care/week	-0.04	-0.02	-					
14. Child care type	-0.16*	-0.10	-0.14*	-				
15. Child care quality	0.37*	0.16*	0.31*	0.11 [†]	-			
16. Child care- Responsivity subscale	0.18*	0.07	-0.05	-0.33*	0.62*	-		
17. Child care- Materials subscale	0.23*	0.13*	-0.10 [†]	0.34*	0.81 [†]	0.10 [†]	-	
18. Child care- Acceptance subscale	0.10	0.18*	-0.10 [†]	0.23*	0.50*	0.09	0.34*	-

Note: [†] $p < .10$, * $p < .05$.

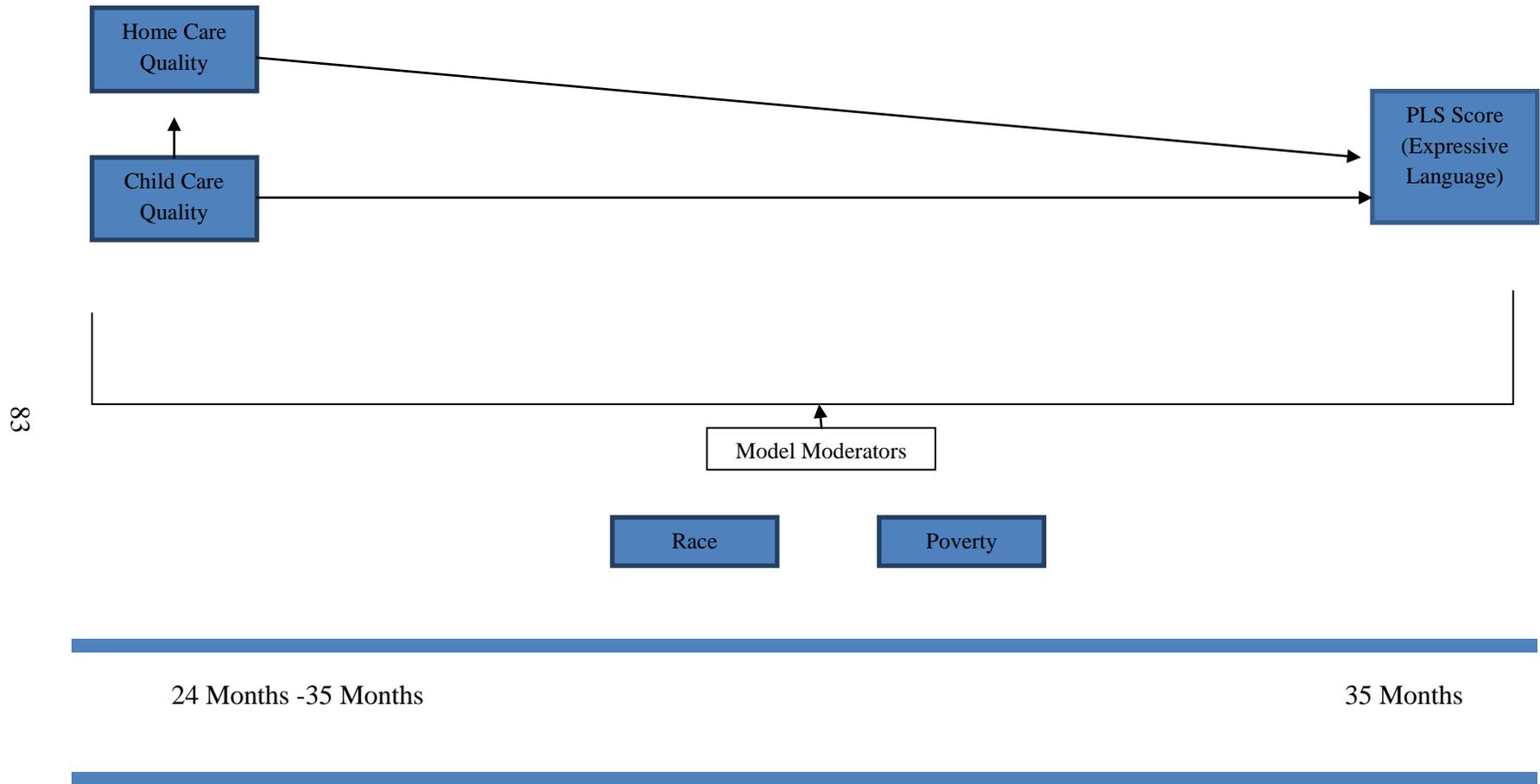
Table 3

Hierarchical Regression Analysis: Home Quality, Child Care Quality and Expressive Language- Trimmed

Predictor Variables	Step #									
	1		2		3		4		5	
	Child Characteristics		Family Characteristics		Child Care Controls		Home Quality		Child Care Quality	
	<i>B</i>	SE	<i>B</i>	SE	<i>B</i>	SE	<i>B</i>	SE	<i>B</i>	SE
Child Variables										
Child age	0.86	0.93	0.57	0.88	0.61	0.89	1.10	0.89	1.00	0.88
Child gender	-2.19*	0.93	-1.94*	0.89	-1.83*	0.89	-1.44	0.88	-1.17	0.89
Child race	-2.42*	0.93	-0.66	1.01	-0.63	1.02	-0.26	1.01	-0.29	1.00
Child Temperament	-3.40**	1.27	-4.37***	1.24	-4.49**	1.24	-4.72***	1.22	-4.83***	1.21
Family Context										
State			0.03	1.06	0.76	1.18	0.96	1.16	1.22	1.16
Maternal education			3.22**	1.14	3.01*	1.17	2.21 [†]	1.17	2.09 [†]	1.17
Income- to- needs ratio			3.35**	1.21	3.42**	1.22	2.54*	1.22	2.31 [†]	1.22
Child care characteristics										
Number of hours in care/week					-0.09	0.08	-0.13	0.08	-0.13	0.08
Child care type					-2.52	2.13	-2.64	2.09	-3.46	2.11
Home context										
Home quality (HOME)							3.29**	1.00	2.86**	1.01
Child care context										
Child care quality (HOME)									1.95*	0.92
<i>Intercept</i>	100.09	0.92	100.07	0.85	104.95	3.61	106.36	3.57	106.81	3.55
<i>R</i> ²	0.06		0.18		0.18		0.21		0.22	
<i>F</i> for Δ			14.22***		1.08		10.80**		4.51*	

Note: [†] $p < .10$, * $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 1. Predicting Expressive Language Outcomes at 35 Months: The Influence of Home and Child Care Quality



REFERENCES

- Atkinson, A.M. (1994). Rural and urban families' use of child care. *Family Relations*, 43, 16-22.
- Atkinson, A.M. (1996). Rural mothers' evaluation of the strong and weak points of child care. *Journal of Research in Rural Education*, 12(2), 83-91.
- Bauer, J., and Katras, M.J., (2007). *Rural Prosperity: A Longitudinal Study of Rural Communities and Rural Low-income Families*. Retrieved from: <http://fsos.cehd.umn.edu/img/assets/16501/NRICGP%20Final%20Report.pdf>
- Bayley, N. (1969). *Bayley Scales of Infant Development*. San Antonio, TX: Psychological Corporation.
- Beach, B. A. (1995). What do we know about rural child care? An overview of issues. *Journal of Research in Rural Education*, 11(2), 114-120.
- Beeson, E., & Strange, M. (2000). Why rural matters: The need for every state to take action on rural education. *Journal of Research in Rural Education*, 16, 63-140.
- Belsky, J., Burchinal, M., McCartney, K., Vandell, D. L., Clarke-Stewart, K.A., & Owen, M. T. (2007). Are there long-term effects of early child care? *Child Development* 78(2), 681-701.
- Blau, D. M. (1999). The production of quality in child care centers: Another look. *Applied Developmental Sciences*. 4: 116–135
- Bloom, L. (1998). *Language acquisition in its developmental context*. In D. Kuhn & R. Siegler (Eds.), *Handbook of Child Psychology*. Volume 2: Cognition, Perception and Language (5 ed., pp. 309-370). New York: Wiley.
- Bradley, R. H., Caldwell, B. C., & Rock, S. L. (1988). Home Environment and School Performance: A Ten-Year Follow-Up and Examination of Three Models of Environmental Action *Child Development* , Vol. 59, No. 4 (Aug., 1988), pp. 852-867
- Bradley, R. H., Corwyn, R. F., Caldwell, B. M., Whiteside-Mansell, L., Wasserman, C. A., & Mink, I. T. (2000). Measuring the home environments of children in early adolescence. *journal of Research on Adolescence*, 10, 247-288
- Bradley, R.H., & Corwyn, R.F. (2002). Socioeconomic status and child development. *Annual Review of Psychology*, 53, 371-399.
- Bradley, R. H., Burchinal, M. R. & Casey, P. H. (2001). Early intervention: The moderating role of the home environment, *Applied Developmental Science*, 5(1), 2-8.

- Brody, G. H., & Flor, D. L. (1998). Maternal psychological functioning, family processes, and child adjustment in rural, single-parent, African-American families. *Developmental Psychology*, *33*, 1000–1010.
- Bronfenbrenner, U. (1979). *The Ecology of Human Development*, Harvard University Press.
- Bronfenbrenner, U. & Morris, P. A. (1998). *The ecology of developmental processes*. In Lerner, R. M. (Ed.), *Handbook of Child Psychology* (5th edition volume 1): (series editor: W. Damon) Pp. 993-1028. New York: Wiley.
- Burchinal, M. R., Roberts, J. E., Nabors, L. A., & Bryant, D. M. (1996). Quality of center child care and infant cognitive and language development. *Child Development*, *67*, 606–620.
- Burchinal, M. R., Roberts, J. E., Riggins, R., Zeisel, S. A., Neebe, E., & D. Bryant. (2000). Relating quality of center child care to early cognitive and language development longitudinally. *Child Development* *71*, 339-357
- Burchinal, M. R., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (2006). Social risk and protective child, parenting, and child care factors in early elementary school years. *Parenting*, *6*(1), 79-113.
- Burchinal, M., Vernon-Feagans, L., Cox, M. & Key Family Life Project Investigators (2008). Cumulative social risk, parenting, and infant development in rural low-income communities. *Parenting: Science and Practice*, *8*, 41-69.
- Caldwell, B., & Bradley (1984). *Home observation for measurement of the environment*. Little Rock: University of Arkansas at Little Rock
- Campbell, F. A., Helms, R., Sparling, J. J. & Ramey, C. T. (1998). Early-childhood programs and success in school: The Abecedarian study In W.S. Barnett, S.S. Boocook (Eds.), *Early care and education for children in poverty: Promises, programs, and long-term results*, State University of New York Press, Albany, NY, pp. 145–166
- Campbell, F. A., Ramey, C. T., Pungello, E. P., Sparling, J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science* *6*, 42–57.
- Caughy, M., Di Pietro, A., & Strobino, D. M. (1994). Day-care participation as a protective factor in the cognitive development of low-income children. *Child Development*. *65*, 457-471.
- Cohen, J. (1988), *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates

- Cryer, D., Wagner-Moore, L., Burchinal, M., Yazejian, N., Hurwitz, S., & Wolery, M. (2005). Effects of transitions to new child care classes on infant/toddler distress and behavior, *Early Childhood Research Quarterly*, 20(1) 37-56, ISSN 0885-2006
- De Schipper, J. C., Tavecchio, L. W. C., Van IJzendoorn, M. H. (2003). Children's Attachment Relationships with Day Care Caregivers: Associations with Positive Caregiving and the Child's Temperament. *Social Development*, 17(3), 454-470
- Dickinson, D. K., & McCabe, A. (2001). Bringing it all together: The multiple origins, skills, and environmental supports of early literacy. *Learning Disabilities Research and Practice*, 16, 186–202.
- Dickinson, D.K., & Tabors, P. O. (Eds). (2001). *Beginning literacy with language: Young children learning at home and school*. Baltimore, MD: Brookes Publishing
- Dill, B. T. (1999). *Poverty in the rural U.S.: Implications for children, families, and communities*. New York: Annie E. Casey Foundation.
- Dowsett, C. J., Huston, A. C., Imes, A. E., & Gennetian, L. (2008). Structural and process features in three types of child care for children from high and low income families. *Early Childhood Research Quarterly*, 23(1), 69–93
- Duncan, C. M. (1992), *Rural Poverty in America*. New York: Auburn House;
- Duncan, C. (1992). Parental support in schools and the changing family structure. *NASSP Bulletin*, 76(543), 10-14.
- Duncan, G., & Brooks-Gunn, J. (2000). Family poverty, welfare reform and child development. *Child Development*, 71(1), 188–196.
- Elman, J.L., Bates, E.A., Johnson, M.H., Karmiloff-Smith, A., Parisi, D., Plunkett, K. (1996). *Rethinking Innateness: A Connectionist Perspective on Development*. Cambridge, MA: MIT Press.
- Fish, M., & Pinkerman, B. (2003). Language skills in low-SES rural Appalachian children: Normative development and individual differences, infancy to preschool. *Applied Developmental Psychology*, 23, 539–565.
- Garbarino J, Ganzel B. (2000). *The human ecology of early risk*. In: Shonkoff JP, Meisels SJ, editors. *Handbook of early intervention*, 2nd ed. Cambridge: Cambridge University Press.
- García Coll, C.T., & Magnuson, K. (2000). *Cultural differences as sources of developmental vulnerabilities and resources: a view from developmental research*. In S.J. Meisels & J.P. Shonkoff (Eds.), *Handbook of Early Childhood Intervention* (pp. 94-111). Cambridge: Cambridge University Press.

Hamre, B. K., & Pianta, R. C. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development, 72*, 625–638

Harkness, S., & Super, C. M. (1992). The developmental niche: A theoretical framework for analyzing the household production of health. *Social Science and Medicine, 38*(2), 217-226

Harkness, S., & Super, C. M. (1996). Introduction. In S. Harkness & C. M. Super (Eds.), *Parents' cultural belief systems: Their origins, expressions, and consequences* (pp. 1-23). New York: Guilford.

Hart, B., & Risley, T. R. (1992). American parenting of language-learning children: Persisting differences in family-child interactions observed in natural home environments. *Developmental Psychology, 28*, 1096-1105.

Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore, MD: Paul H. Brookes Heath

Heath, S. B. (1983). *Ways with words: Language, life, and work in communities and classrooms*. New York: Cambridge University Press.

Hirshberg, D., Huang, D.S., & Fuller, B. (2005) Which low-income parents select child-care? Family demand and neighborhood organizations. *Children and Youth Services Review, 27*, 1119-1148.

Hobbs, D. (1994). Demographic trends in nonmetropolitan areas. *Journal of Research in Rural Education, 10*(3), 149-160.

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary via maternal speech. *Child Development, 74*(5), 1368-1378.

Hogan, D.P., Hao, L.X., & Parish, W.L. (1990). Race, kin networks, and assistance to motherheaded families. *Social Forces, 68*, 797-812.

Hoff-Ginsberg, E. (1998). The relation of birth order and socioeconomic status to children's language experience and language development. *Applied Psycholinguistics, 19*, 603–629.

Hofferth, S. L., & Iceland, J. (1998). Social Capital in Rural and Urban Communities. *Rural Sociology 63*: 574-597.

Hofferth, S.L. & Wissoker, D.A. (1992) Price, quality and income in child care choice. *Journal of Human Resources, 28*, 70-111.

Howes, C., Phillips, D.A., & Whitebook, M. (1992). Thresholds of quality: Implications for the social development of children in center-based child care. *Child Development, 63*(2), 449-460

Hubbs-Tait, L., Culp, A.M., Culp, R.E., & Miller, C.E. (2002) Relation of maternal cognitive stimulation emotional support, and intrusive behavior during Head Start to children's kindergarten cognitive abilities. *Child Development, 73*, pp. 110–131.

Huston, A., McLoyd, V. C., & Garcia-Coll, C. (1994). Children and poverty: Issues in contemporary research. *Child Development, 65*, 275-282.

Huttenlocher, J., Vasilyeva, M., Cymerman, E., & Levine, S. (2002). *Language input and child syntax. Cognitive Psychology, 45(3)*, 337-3374.

Ispa, J.M., Thornburg, K.R., & Venter-Barkley (1998). Parental child care selection criteria and program quality in metropolitan and nonmetropolitan communities. *Journal of Research in Rural Education, 14(1)*, 3-14.

Johnson, M. H. (2000). Functional brain development in infants; Elements of an interactive specialization framework. *Child Development, 71(1)*, 75-81.

Khattri, N., Riley, K.W., & Kane, M.B. (1997). Students at risk in poor, rural areas: A review of the research. *Journal of Research in Rural Education, 13(2)*, 79-100.

Lamb, M. E. (1998). *Nonparental child care: Context, quality, correlates, and consequences*. In Handbook of Child Psychology, Vol. 4: Child Psychology in Practice, ed. W. Damon, I. E. Sigel, and K. A. Renninger. New York: John Wiley.

Lee, V. E. & Burkam, D. T. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, D.C.: Economic Policy Institute.

Leibowitz, A., Waite, L., & Witsberger, C. (1988). Child Care for Preschoolers: Differences by Child's Age. *Demography* 205-20.

Magnuson, K. A., Meyers, M., Ruhm, C. J., & Waldfogel, J. (2004). Inequality in preschool education and school readiness. *American Educational Research Journal, 41*, 115–157.

Maher, E.J., Frestedt, B., Grace, C. (2008). Differences in child care quality in rural and non-rural areas. *Journal of Research in Rural Education, 23(4)*, 1-13.

Mashburn, A.J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., Burchinal, M. , Early, D.M , & Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development, 79(3)*. 732-749

McCartney, K. (1984). Effect of Quality of Day-Care Environment on Children's Language Development. *Developmental Psychology, 20*, 244-260.

McCartney, K. (2002). *Language environments and language outcomes: Results from the NICHD Study of Early Child Care and Youth Development*. In L. Girolametto & E. Weitzman, Enhancing caregiver language facilitation in child care settings_(3.1-3.10). Toronto: The Hanen Centre.

McCartney, K., Dearing, E., Taylor, B. A., & Bub, K. L. (2007). Quality child care support the achievement of low-income children: Direct and indirect pathways through caregiving and the home environment. *Journal of Applied Developmental Psychology, 28*(5-6), 411-426.

McLoyd, V. C. (1997). The impact of poverty and low socioeconomic status on the socioemotional functioning of African-American children and adolescents: Mediating effects. In R. D. Taylor & M. C. Wang (Eds.), *Social and emotional adjustment and family relations in ethnic minority families* (pp. 7–34). Hillsdale, NJ: Lawrence Erlbaum Associates.

Mendez, J. L., McDermott, P., & Fantuzzo, J. (2002). Identifying and promoting social competence with African American preschool children: Developmental and contextual considerations. *Psychology in the Schools, 39*(1), 111-123.

Monroe, P. A., & Tiller, V. V. (2001). Commitment to work among welfare-reliant women. *Journal of Marriage & Family, 63*, 816-829.

National Institute of Child Health and Human Development, Early Child Care Research Network. (1999). Child outcomes when child care center classes meet recommended standards for quality. *American Journal of Public Health, 89*, 1072 – 1077.

National Institute of Child Health and Human Development Early Child Care Research Network. (2000). The relation of child care to cognitive and language development. *Child Development, 71*, 960-980.

National Institute of Child Health and Human Development, Early Child Care Research Network. (2002). Child-care structure-process-outcome: Direct and indirect effects of child-care quality on young children's development. *American Psychological Society, 13*, 199 – 206.

National Institute of Child Health and Human Development, Early Child Care Research Network. (2005). *Child care and child development: Results from the NICHD study of Early Child Care and Youth Development*. New York: Guilford Press

O'Hare, W. P., & Johnson, K. M. (2004). Child poverty in rural America. *Reports on America, 4*(1). Population Reference Bureau.

- Peisner-Feinberg, E., & Burchinal, M. (1997). Relations between preschool children's child-care experiences and concurrent development: The cost, quality, and outcomes study. *Merrill-Palmer Quarterly*, 43, 451 – 477.
- Phillips, D., McCartney, K., & Scarr, S. (1987). Child-care quality and children's social development. *Developmental Psychology*, 23(4), 537-543.
- Phillips, D. A. (1987). *Quality in childcare: What does research tell us?* Washington, DC: National Association for the Education of Young Children.
- Provasnik, S., KewalRamani, A., Coleman, M.M., Gilbertson, L., Herring, W., and Xie, Q. (2007). *Status of Education in Rural America* (NCES 2007-040). Washington, D.C.: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.
- Reynolds, A. J., & Temple, J. A. (1998). Extended early childhood intervention and school achievement: Age thirteen findings from the Chicago Longitudinal Study. *Child Development*, 69, 231 – 246.
- Raviv, T., Kessenich, M., & Morrison, F. (2004). A meditational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly*, 19, 528 – 547.
- Rural Families Data Center. (2004). *Strengthening rural families: America's rural children*. Washington, DC: Population Reference Bureau.
- Rutter, M., Tizard, J., Yule, W., Graham, P., & Whitmore, K. (1976). Research report: Isle of Wight Studies: 1964-1974. *Psychosomatic Medicine*, 6:313-332.
- Sameroff, A. J., & Fiese, B. H. (2000). Transactional regulation: The developmental ecology of early intervention. In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 135–159). New York: Cambridge University Press.
- Scarr, S., Eisenberg, M. & Deater-Deckard, M. (1994). Measurement of quality in child care centers. *Early Childhood Research Quarterly*, 9, 131-151.
- Shoffner, S. M. (1986). Child care in rural areas: Needs, attitudes, and preferences. *American Journal of Community Psychology*, 14(5), 521-538.
- Shonkoff, J. P. & Phillips, D.A. (2000). *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academy Press. Pp. 307–20.
- Snow, C., Burns, S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

- Super, C. M. & Harkness, S. (1997). Modernization, family life, and child development in Kokwet in the early 1970s. In T. Weisner, C. Bradley, & P. Kilbride (Eds.), *African families and the crisis of social change* (pp.341-353). Westport, Connecticut: Bergin & Garvey.
- Thornburg, K. R., Mathews, M. C., Espinosa, L., & Ispa, J. (1997). Perceptions of child care in rural America. *Journal of Research in Rural Education*, 13, 117-130.
- U.S. Census Bureau. (2000). Profiles of general demographic characteristics: 2000 census of population and housing. Retrieved August 8, 2011 from www.census.gov/prod/cen2000/dp1/2kh00.pdf
- U.S. Census Bureau. (2009). United States Census 2000. Washington, DC. Retrieved August 2, 2011, from <http://www.census.gov/main/www/cen2000.htm>
- Vandell, D.L., Burchinal, M., Vandergrift, N., Belsky, J., & Steinberg, L. (2010). Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, 81, 737-756.
- Vandell, D. L., & Wolfe, B. (2000). Child care quality: Does it matter and does it need to be improved? Institute for Research on Child Poverty, University of Wisconsin – Madison.
- Vernon-Feagans, L. (1996). *Children's talk in communities and classrooms*. Cambridge, MA: Blackwell Publishers.
- Vernon-Feagans, L., Hurley, M. M., Yont, K. M., Wamboldt, P.M., & Kolak, A. (2007). Quality of childcare and otitis media: Relationship to children's language during naturalistic interactions at 18, 24, and 36 months. *Journal of Applied Developmental Psychology*, 28, 115-133.
- Vernon-Feagans, L. Pancsofar, N. Willoughby, M., Odom, E., Quade, A. Cox, M., & The Family Life Project Key Investigators (2008). Predictors of maternal language to infants during a picture book task in the home: Family SES, child characteristics, and the parenting environment. *Journal of Applied Developmental Psychology*, 29(3), 213-226.
- Walker, S. K., & Reschke, K. L. (2004). Child care use by low-income families in rural areas: A contemporary look at the influence of women's work and partner availability. *Journal of Children & Poverty*, 10, 149-167.
- Youngblade, L. M. (2003). Peer and teacher ratings of third- and fourth-grade children's social behavior as a function of early maternal employment. *Journal of Child Psychology and Psychiatry*, 44: 477–488. doi: 10.1111/1469-7610.00138