Contributions of biological resident fathers to early language development in two-parent families from low-income rural communities

Nadya Leotia Pancsofar

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Approved by:

Lynne Vernon-Feagans

Kathleen Gallagher

Harriet Boone

Vonnie McLoyd

Mike Willoughby

ABSTRACT

Contributions of biological resident fathers to early language development in two-parent
families from low-income rural communities
(Under the direction of Lynne Vernon-Feagans)

This dissertation developed and empirically tested a multidimensional model of
biological resident fathers' distal and proximal contributions during infancy to children's later
language development using the Family Life Project dataset. The Family Life Project dataset
included a large sample of 521 two-parent middle-income and low-income African-American
and non-African-American families. The results of this study suggest fathers made
contributions to children's communication and language development via characteristics of
family SES, father work experience, the mother-father relationship, and father-child proximal
processes. Specifically, higher family SES, positive father reasoning skills in the mother-father
relationship, and highly engaging and stimulating father-child interactions when children are 6
months were significantly associated with more advance child communication at 15 months
and expressive language development at 24 months. Father job insecurity when children were 6
months was negatively associated with child language development at 24 months.

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CHAPTER ONE

Statement of the Problem

Recent decades have brought increasing research on fathers' roles in families and their possible contributions to their children's development. Such research moved away from unidimensional characterizations of fathers that focused on father presence or absence to a broader consideration of the many roles fathers play in the lives of children and families (Lamb & Tamis-LeMonda, 2004). However, the majority of research on fathers has been conducted with White, middle-class samples (Coley, 2001). Less is known about the experiences of low-income and minority fathers and their impact on child development (Coley, 2001; Roopnarine, 2004), yet, there has been considerable interest in low-income fathers in the policy arena, with attention focused on establishing paternity and financial support for low-income families (Cabrera & Evans, 2000; Coley, 2001). In both research and policy realms, emphasis traditionally has been placed on the financial contributions of fathers to their families and children (Marsiglio, Amato, Day, & Lamb, 2000). This focus is problematic, especially when considering low-income and minority fathers, who are more often restricted in their opportunities to fulfill the traditional role of married financial provider. There is a need for clarification of the range of normative roles for fathers in these underrepresented populations. This dissertation develops and empirically analyzes a multileveled, multidimensional model of the direct and indirect contributions of biological resident fathers to children's early language

development, with a particular focus on two types of underrepresented fathers: fathers from low-income families and African American fathers.

Conceptions of fatherhood have been shaped by broad social changes over the last 30 years. Changing economic bases, the increase of women in the workforce and the increase of cultural and linguistic diversity in the United States have contributed to a growing awareness of the variability in father behavior (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Parke, 1995; Gottman, 1998; Roopnarine, 2004). However, the limited research on fathers, and low-income and minority fathers in particular, has focused on more traditional roles of fathers as financial providers and father presence or absence. Little research has considered involved biological resident fathers from low-income or minority samples (Coley, 2001) and their impact on early child development (Nelson, 2004).

Early oral language development is an important component of emergent literacy, with links to school readiness and early reading (Vernon-Feagans, Head, & Kainz, 2004; NICHD Early Child Care Research Network, 2005a; Walker, Greenwood, Hart, & Carta, 1994). The first 2 years of children's lives are characterized by rapid changes in children's language development, particularly in language production. Typically developing children begin to babble between 3 and 6 months, and by 24 months, they often produce approximately 250-300 words and can speak intelligibly in two- and three-word phases (Mowder, 1997). Researchers have argued that children learn language in a social context and that caregivers play an important role in the development of early expressive communication (Bruner, 1981; Tomasello, 1992). Environmental stimulation in the form of adult-child interactions is an important way through which children acquire

early communication and expressive language skills. Like mothers, fathers may play an important role in children's expressive language development. In their early language development, children may benefit from interacting with multiple caregivers, providing them with a diversity of stimulation (Lamb & Tamis-LeMonda, 2004). However, because empirical research on parent contributions to early language development has focused primarily on mothers, there is a need for research that considers the complex direct and indirect contributions of fathers to early language development, particularly in samples of 2-parent families that include underrepresented low-income and African American fathers.

In general, father involvement has been linked to better cognitive and school functioning for children, although there are few studies in this area (Coley, 2001; Marsiglio, et al., 2000). Literature suggests that father presence in the home is associated with better cognitive development, school achievement, and supportive home environments (Parke, 1996; Roopnarine, 2004; Yogman, Kindlon, & Earls, 1995). Fathers' financial contributions have been positively associated with children's receptive language skills (Black, Dubowitz, & Star, 1999). However, research has not yet elucidated the mechanism through which father's presence or financial contributions may positively impact child development. Research is needed into the processes through which fathers contribute to children's language development.

Very few studies have considered the impact of fathers in proximal child ecologies, but in general, these few studies suggest that supportive, sensitive father-child interactions are related to early cognitive and language development in samples of ethnically diverse low-income families (Roopnarine, 2004; Tamis-LeMonda, Shannon,

Cabrera, & Lamb, 2004). Parent language input and supportive parenting may positively impact early language development through father-child interactions in families of young children across income and ethnic groups, however, research is needed that simultaneously considers direct and indirect contributions of fathers to early language development across proximal and distal child ecologies using more diverse samples of families.

This dissertation integrates ecological systems theory and family systems theory to develop a multidimensional conceptual framework of the contributions of biological resident fathers to children's early language development via children's distal and proximal ecologies. This study uses a large representative sample of families from 2 nonurban areas of high-poverty in the United States (Appalachia and the Black South) to empirically test the hypothesized father contributions to child communication and expressive language development put forth in the conceptual framework. This dissertation will also consider whether processes of father contributions are moderated by father race and whether the contributions of distal child ecologies, such as family socioeconomic status, father work experiences and the mother-father relationship, are mediated by father-child interactions.

CHAPTER TWO

Theoretical Foundation

The conceptual model proposed in Figure 1 offers a framework for understanding the direct and indirect influences of biological resident fathers on children's early language development. This model assumes that from birth, children's development of communication and language skills occurs within broader social contexts. For young children, one of the most salient of these contexts is the family. This model posits that biological resident fathers make direct and indirect contributions through distal and proximal processes during a child's infancy to that child's later language development. In presenting the conceptual model supporting this dissertation research, it is important to first consider perspectives on the acquisition of language skills during early childhood.

Early language development

The acquisition of language skills occurs within social contexts (Bates, 1976; Bruner, 1981; Tomasello, 1992). Children learn much of their earliest language in the context of social interactional routines, such as feeding, diaper changing, book activities, and social games (Tomasello, 1992). The people in a young child's environment support that child's language learning in several ways. At a very basic level, the child needs a partner to learn how to converse. Caregivers of very young children often focus their attention and feedback on how, when and where to make appropriate utterances, not

necessarily on correcting syntax or meaning (Bruner, 1981). Bruner argues that language acquisition involves a transaction between a novice with a high readiness to learn and an expert adult well-tuned to the needs of the novice. This system of finely tuned responding comprises the Language Assistance System (LAS), which brings the child's efforts to communicate into an appropriate contextualization.

Stimulating caregiver language that is attuned to the child's developmental level has been thought to be integral to early language development (Bruner, 1981; Snow, 1977). Caregivers also support early language learning through scaffolding and joint attention, in which children imitate and incorporate adult model utterances or phrases in to their own lexicon in interactions in which caregivers and children attend to the same thing (Ninio & Bruner, 1976; Snow, Perlman, & Nathan, 1987; Warren, Yoder, & Leew, 2001). Scaffolded utterances are less demanding to produce than spontaneous utterances. When caregivers follow a child's attentional lead, they sustain a child's interest in activities and social interaction (Warren, et al., 2001). Further, the way that parents respond to their children's early communication efforts is thought to be important in language development. Parents' appropriate and timely contingent responses to children's communicative bids can act as reinforcement to maintain or evoke further communication from the child (Dunst, Lowe, & Bartholomew, 1989).

The relational function of speech is central to understanding language development (Locke, 2001). Locke argues from an evolutionary standpoint that language serves to develop and maintain inter-personal links from the infant's social environment. Infant vocalizations help the infant to maintain continual contact with the people in their social environment who know more about the world and can protect them, and they allow

for the transmission of information relevant to the infant's health and well-being (Locke, 2001). Locke posits that infants' "precursors of language" are symptoms of a parental relationship that promotes language independently, or does so through the behavior that expresses that relationship. Therefore, children's very early communication development cannot be separated from the social relationships within their family. In this way, children's language learning can be understood as a consequence of more fundamental social processes (Bruner, 1981; Locke, 2001).

In the area of children's early language development, literature links parents' interactional behaviors to their infants' later development. Historically, research in this area has focused primarily on mother-child dyads from White middle-class families, although current research has broadened the scope of analysis to include fathers, grandparents, and other caregivers. In particular, the language use and sensitivity of child care providers have been linked to early language development (McCartney, 1984; NICHD Early Child Care Research Network, 2000a). Additionally, there has been a trend in current research to consider more complex models of early language development that incorporate factors across multiple family subsystems, and that are tested with larger sample sizes (Pan, Rowe, Singer, & Snow, 2005; Pancsofar & Vernon-Feagans, 2006; Pancsofar, Vernon-Feagans, Odom & Roe, under review; Raviv, Kessenich, & Morrison, 2004; Tamis-LeMonda, et al., 2004). This dissertation will employ a conceptual model of the role of biological resident fathers in the language development of their young children in low-income families. This conceptual model seeks to explain the impact of these under-researched caregivers, drawing support from ecological systems theory and family systems theory.

Theoretical perspectives

Two theoretical frameworks are integrated as the basis for the conceptual model presented in Figure 1. Each framework supports a specific aspect of the model. Ecological systems theory offers insight into proximal processes producing child development, as well as the contributions of contexts outside of the family. Family systems theory highlights the importance of mother-father relationships in understanding parent-child interactions and child development. This paper will now consider each of these theoretical frameworks as they relate to the conceptual model in greater detail.

Ecological Systems Theory. The ecological systems theory (Bronfenbrenner, 1979) provides a framework for the ways in which children's early language development occurs within and is affected by a variety of contexts. According to ecological systems theory these influential contexts are organized as nested systems that include, from most proximal to most distal, the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1986; Bronfenbrenner & Morris, 1998). The microsystem includes the settings within which children behave at given moments in their lives. The family is one important microsystem in understanding children's early development. The mesosystem includes the interactions and influences between the principal settings (microsystems) in which child development occurs. The exosystem includes contexts that, though not directly involving the developing child, influence the child's development. Lastly, the macrosystem includes broader social mechanisms and

institutions. The macrosystem influences the nature of interactions within all other levels of the ecology of early development.

The ecological systems perspective highlights proximal processes as the primary mechanisms producing child development (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998). Proximal processes can be understood as progressively more complex reciprocal interactions between children and the people, objects and symbols in their immediate environment (Bronfenbrenner & Morris, 1998). Examples of such proximal processes include a father reading a book or playing with his child. When designing research on the contributions of fathers to children's early language development, the ecological systems theory supports a focus on more proximal process-oriented factors, such as father-child interactions, as a way of better understanding the contributions of more distal factors.

Ecological systems theory suggests that the social interactions between fathers and children influence children's development. These proximal processes are, in turn, influenced by external systems, such as the father's work environment. Parents' work experiences are included as part of the child's exosystem, which encompasses settings outside of the family in which parents live their lives (Bronfenbrenner, 1986). Bronfenbrenner argued that parents' work schedules and conditions impact child development through their influence on family processes.

Family SES has long been considered an important distal context in the study of child development and family processes. Bronfenbrenner and colleagues argue that family SES marks a child's environmental label or "social address." The role of family SES in children's language development can be better understood through the

investigation of intervening structures or processes through which the environment might impact children's early communication (Bronfenbrenner & Crouter, 1983). For example, Bronfenbrenner and colleagues argue that poverty creates chaotic systems for children through unpredictability in everyday activities (Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 1998). Environmental conditions associated with poverty may be major sources of interruption to proximal processes. That is, chaotic systems can interrupt proximal processes that promote competence or produce proximal processes that lead to dysfunction (Bronfenbrenner & Evans, 2000). Ecological systems theory begins to highlight the possible pathways through which poverty and low family SES may negatively impact early language development via effects on proximal processes.

Ecological systems theory provides insight into the possible contributions of fathers to children's language development through proximal processes with their infants. Further, this theoretical perspective illuminates how more distal contexts such as father work environments and family SES may impact children's language development via more proximal interactions between fathers and children. To gain a deeper understanding of the inter-relatedness of familial social relationships and their impact on early language development, this paper now turns to a consideration of family systems theory.

Family Systems Theory. According to family systems theory, the family is an organized whole comprised of smaller subsystems, such as the mother-child, father-child, mother-father-child, mother-father and sibling-sibling (Minuchin, 1985). Members of the parent-child subsystem are simultaneously members of other dyads that support or stress them (Minuchin, 1985). In this way, the quality of the adult-adult subsystem can support

or stress the functioning of the parent-child subsystem. Minuchin (1985) argues that patterns of interactions associated with marital conflict can either provide complementary and cooperative resources for parenting or they can be a source of parenting difficulties. For example, a mother-father relationship characterized by high levels of aggression may contribute to a father being distracted and less responsive in his interactions with his children. Alternatively, positive mother-father conflict resolution strategies might contribute to supportive parenting strategies (Lamb & Tamis-LeMonda, 2004; Wilson & Gottman, 2002).

According to family systems theory, each subsystem is different and uniquely important, as are the processes by which interactional patterns are established and changed in each major subsystem (Cox & Paley, 1997; Minuchin, 1985). As such, the father-child subsystem, for example, may operate differently than the mother-child subsystem (Minuchin, 1985). Fathers may impact their children directly through father-child interactions, as well as indirectly through the impact of fathers on the mother-father relationship.

Family systems theory can be seen as nested within ecological systems theory in that within the microsystem of the family, there are often multiple important subsystems. These subsystems are interrelated and exert direct and indirect influences on one another. Therefore, research on the contributions of fathers to children's language development should extend the analysis beyond the consideration of direct effects to child outcomes to also include indirect effects of fathers through other familial subsystems, such as the mother-father subsystem (Pancsofar, et al, under review).

Integrating perspectives. Ecological systems theory and family systems theory can be integrated to support the conceptual model presented in Figure 1. In early interactions, fathers and infants engage in proximal processes that may be related to early language development. Through proximal processes, children access information about how to use symbol systems, such as language and gestures, to communicate. Children are embedded in larger family systems and often engage in meaningful proximal processes with multiple caregivers. Mother-father relationships influence proximal processes between parents and children. More distal processes occurring in the child's exosystem and macrosystem also influence the proximal processes occurring within the child's microsystem. That is, distal factors, such as father work experiences and economic hardship may influence early language development via their impact on proximal processes between parents and children.

Applying the conceptual model to African American families. In applying the conceptual model in Figure 1 to research on racially diverse families and children, it is important to acknowledge the role of social mechanisms of racism, discrimination and segregation as a part of the child's macrosystem. García Coll and colleagues (1996) have suggested that these macrosystem forces create unique conditions faced by African American families and children and influence developmental processes. That is, these nonshared experiences with other populations may define unique pathways of development for African American children and families (García Coll, Crnic, Lamberty, Wasik, Jenkins, García, & Pipes McAddo, 1996). Such social mechanisms may also differentially impact other elements in the child's exosystem and microsystem. For

example, employment discrimination may uniquely shape the contributions of the father's workplace to father-child proximal processes and child development in African American families. Racism, discrimination and oppression place strain on African American families that may impact familial social relationships, through, for example, mother-father or father-child interactions (McLoyd, 1990).

While racism and discrimination are not directly measured in this study, the conceptual model holds that these macrosystem factors may create unique pathways of father contributions to early communication and language development that may be different for African American fathers than for non-African American fathers. Specifically, father race, which may represent differential experiences of racism, discrimination and segregation, may moderate the impact of more distal forces such as family SES, parent work experiences and mother-father relationships on father-child interactions and children's language development.

Summary

The model contained in Figure 1 holds that for low-income families with young children, fathers may contribute to their children's later language development through family SES, work experiences, relationships with partners and interactions with their children during infancy. The contributions of fathers through more distal contexts (family SES, work experiences, mother-father relationship) on children's communication and language development may be explained by their impact on the more proximal context of father-child interactions. While not directly measured in this study, elements of the macrosystem, such as racism and discrimination, may influence patterns of family

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interactions and child development, such that processes of father influence on early language development may be different in African-American and non-African American families.

This paper will now turn to a consideration of previous research investigating the role of fathers in children's early language development. Specifically, this paper will address family SES, father work experiences, quality of the mother-father relationship, affective quality of the father-child relationship, and father language input. This review of the literature will focus on research on underrepresented biological resident fathers from low-income families and from African American families.

CHAPTER THREE

Literature Review

Introduction

There is limited research on the influence of fathers on children's early language development, particularly in two-parent low-income or African American families. However, this limited body of research supports the conceptual model posited in Figure 1 and allows for some hypotheses to be drawn when testing such a model empirically. This review of the literature considers contributions of biological resident fathers to children's language development via distal and proximal child ecologies. These father contributions include family SES, work experiences, relationships with partners, affective quality of father-infant interactions, and father language input.

Impact of poverty and family SES on fathering and early language development

Over past decades, income inequality has steadily increased (Seccombe, 2002) due, in part, to sluggish economic growth, loss of low-skill, high-wage jobs from declining manufacturing industries, and erosion of government transfers (McLoyd, 1998). Low family SES, including lower levels of parental education and family income, has been associated with many negative outcomes for children, including chronic health problems, behavioral problems and poor academic achievement (Evans, 2004). A substantial body of research has documented that children living in poverty are at risk for developmental delays across cognitive domains (McLoyd, 1998). In particular, research

indicates that young children of families living in poverty have below average scores on standardized measures of language development during preschool years (Fish & Pinkerman, 2003; Raviv, et al., 2004). Performance on such standardized language measures is linked to early school achievement (Walker, et al., 1994), suggesting that young children born into poverty are at risk for developmental delays in language and, in turn, early school failure.

One distal pathway through which fathers may influence early language development is family SES (Black, et al., 1999). Because women on average earn less money than men and are less likely to be employed full-time, children's economic status, even in low-income families, is often largely determined by their fathers (Marsiglio, et al., 2000). Increases in children's income-to-needs ratio during the first 3 years of life have been found to have a positive impact for poor children in their home learning environment, school readiness and language development (Dearing, McCartney, & Taylor, 2001; Garret, Ng'andu, & Ferron, 1994). Conversely, chronicity, or persistence of poverty, during childhood has detrimental effects on language and cognitive development (Korenman, Miller, & Sjaastad, 1995; McLoyd, 1998; NICHD Early Child Care Research Network, 2005b). However, it remains unclear by what mechanisms such aspects of family SES influence early language development. That is, research has not yet fully elucidated why father contributions to family SES might matter for early language development.

While there may be several pathways through which family SES impacts early language development, including the quality of the home environment and access to health care and child care resources (Magnuson & Duncan, 2002; McLoyd, 1998),

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literature suggests that one important pathway through which family SES may impact early language development is via parent-child interactions. Families living in poverty experience a greater frequency and intensity of stressful live events and daily hassles (Evans, 2004; McLoyd, 1990; McLoyd, 1998). Psychological distress due to this excess of negative life events may diminish the capacity of supportive, consistent, and involved parenting (Magnuson & Duncan, 2002; McLoyd, 1990). Hammer and Weis (1999) have posited that level of education may also influence parenting in that parents with higher levels of education may use more behaviors that are valued in school, such as play that incorporates more language goals.

The hypothesized role of parent-child proximal processes in mediating the relationship between family SES and early language development has been supported by previous research looking at mother-child interactions. Research shows that the longer the duration of poverty, the stronger the link between poverty and harsher, less responsive parenting (Evans, 2004). Raviv et al. (2004) found that parenting factors, specifically, maternal sensitivity and cognitive stimulation were partial mediators of the impact of SES factors at 1 month of age to children's later language outcomes. Previous research by Hoff suggests that maternal language input may also mediate the relationship between family SES and early language development (Hoff, 2003; Hoff-Ginsburg, 1998). Examining a sample of mother-child dyads from middle-class and upper-class backgrounds, Hoff-Ginsburg (1998) found that high-SES mothers had a higher rate of speech, used a richer vocabulary, continued child topics more frequently, produced fewer directives and asked more questions. In a later study of the same sample, Hoff (2003) found that SES was significantly associated with children's vocabulary development

during toddler years. Hoff found that mothers' mean length utterance (MLU) fully mediated this relationship.

This research focusing on mother-child interactions supports the conceptual model presented in Figure 1, with findings that the links between distal factors of family SES and early language development may be mediated by parent-child interactions (Hoff, 2003; Raviv et al., 2004). However, very few studies have considered the influence of father education or the potential mediating influence of father-child interactions in understanding the role of family SES on early language development in two-parent families.

Because fathers traditionally are considered the primary breadwinners of families (Cabrera et al., 2000; Coley & Chase-Lansdale, 1999; Marsiglio, et al., 2000), financial hardship may exert a more negative impact on fathering than on mothering. That is, the quality of father-child interactions may be more sensitive to changes in family SES than are mother-child interactions (Doherty, Kouneski, & Erickson, 1998). In studies of families during the Great Depression, Elder and colleagues found that father behavior, rather than mother behavior, was the critical causal link between family hardship and children's well-being (Elder, Caspi, & van Nguyen, 1986). Of the limited research considering the effects of income and education on father interactions with young children, findings are similar to those from studies with mothers. Woodworth, Belsky, and Crnic (1996) found that fathers of lower SES families engaged in less harmonious parenting interactions with their toddler sons than did fathers of higher SES families. There is a need for research investigating the unique way in which proximal processes of

father-child interactions may mediate the influence of distal SES variables, such as parent level of education and family income-to-needs ratio, on early language development.

Ahmeduzzaman and Roopnarine (1992) argue that issues of income and education may have greater meaning for the interpretation of the father's role in African American families when one considers the disproportionately large number of African American families and children living in poverty or near the poverty line. The negative impact of financial hardship on early language development may be particularly salient for African American families. Research suggests that African American men with higher incomes and higher levels of education are more likely to be involved in the socialization and basic care of their infants and preschoolers (Ahmeduzzaman & Roopnarine, 1992; Coley & Chase-Lansdale, 1999; Gavin, Black, Minor, Abel, Papas, & Bentley, 2002; Yogman, et al., 1995). Minority families are more apt to experience economic segregation and more extreme and longer-lasting poverty than are White families, suggesting that socioeconomic factors may have stronger negative influences on the development of competences in children of color (García Coll, et al., 1996).

A review of the literature allows for certain hypotheses to be drawn in testing the model presenting in Figure 1. Family income-to-needs ratio and mother and father level of education may positively impact later communication and expressive language development. One pathway through which family SES may influence later language development may be via father-child proximal processes during infancy. Lastly, father's race may moderate the relationship between family SES and language development, such that family SES variables may be more strongly associated with the quality of father-

child interactions in families with African American fathers than families with non-African American fathers.

Father work experiences

There is a growing body of research investigating the work-family interface. The conceptual model posited in Figure 1 suggests that fathers' work experiences exert influence on early language development through father-child proximal processes. Research on the impact of work experiences on parenting and early child development has typically focused on mothers. However, several studies suggest that aspects of fathers' work experiences are important in understanding fathers' involvement. For fathers, and in particular those fathers from low-income families, employment, job hours, job shifts, job satisfaction and job insecurity may be particularly salient in understanding fathers' impact on early language development.

Father employment may facilitate engagement with families and children. Research suggests that fathers who are unemployed or underemployed are more likely to limit their involvement with their families (Halle & Le Menestrel, 1999; Menaghan, 1991), perhaps due to the pervasive societal emphasis of fathers as economic providers (Cabrera et al., 2000; Coley & Chase-Lansdale, 1999; Marsiglio, et al., 2000). Research has found that unemployed fathers are often more hostile and punitive to their children and irritated by their increased interaction with them than are employed fathers (Menaghan, 1991). Unemployed men are also more likely to be depressed, anxious and hostile and have elevated levels of dissatisfaction with themselves and their lives than are

employed men (McLoyd, 1989), and the negative effects of unemployment seem particularly severe for men with limited economic resources (Menaghan, 1991).

While few studies have examined the impact of father job insecurity to the quality of father-child interactions and child outcomes, existing research suggests that like unemployment, job insecurity may negatively impact fathers' capacities to engage with their children. Barling and MacEwen (1992) found that among men and women, increased job insecurity was linked with cognitive difficulties, such as concentration, mental alertness and ability to attend to everyday activities. Job insecurity may contribute to overall job-related tension among fathers that negatively impacts their interactions with their young children (Stewart & Barling, 1996).

Among employed fathers, job hours have been found to be negatively associated with the amount of time fathers participate in childcare (Aldous, Mulligan, & Bjarnason, 1998; Marsiglio, 1991; Yeung, Sandberg, Davis-Kean, & Hofferth, 2001). Several studies with samples of primarily White, middle class families, have found that among two-parent families with children under the age of 5, greater father work hours are associated with less father participation in childcare activities (Aldous et al., 1998; NICHD Early Child Care Research Network, 2000b) and reading activities with their children (Marsiglio, 1991). Father "overwork," or very long work hours, have been related to less positive father-child relationships among fathers of adolescents (Crouter, Bumpus, Head, & McHale, 2001).

These findings suggest that in middle-class families, fathers who work more hours may have less access to their children to engage them in meaningful proximal processes. However, research is needed that specifically considers the impact of father work hours

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among low-income and minority fathers. Different trends may hold for low-income or minority parents who are more likely to experience job insecurity and underemployment (McLoyd, 1989). For fathers from low-income communities who are able to maintain meaningful employment, fathers' job hours may be positively related to their investment in the fathering role and in turn, to their likelihood to engage in frequent and meaningful proximal processes with their child (Halle & Le Menestrel, 1999). Therefore, the impact of father work hours on early child development in low-income families warrants further investigation.

The shifts that fathers work may also be important when considering the experiences of low-income families. "Shift work" is used to describe work hours that fall outside of the traditional "9-to-5" workday (e.g. working evenings, nights, or rotating shifts), and is commonly associated with occupations that provide services that are needed at all hours, such as food service and retail (Beers, 2000). Men are more likely than women to engage in shift work, and African Americans are more likely than Whites or Latinos to work alternative shifts (Beers, 2000).

Research suggests that parental participation in shift work may strain family relationships and negatively influence early language development. Shift work by either spouse has also been found to have a modest, but negative impact on marital quality and increase the probability of divorce over 3-to-5-year periods for couples with children (Perry-Jenkins, Goldberg, Pierce, & Sayer, 2007; Presser, 2000; White & Keith, 1990). Han (2005) considered the impact of maternal nonstandard work schedules on early cognitive and language development. Using data from the NICHD Study of Early Child Care, Han found that maternal nonstandard work schedules in the first 3 years of

children's lives were negatively associated with cognitive outcomes, including children's expressive language at 36 months of age. This negative association was stronger if mothers started working nonstandard hours in the first year of the child's life, particularly for child expressive language. The findings of this recent study highlight the potential importance of including nonstandard work schedules in research concerning the impact of fathers' work experiences on children's early language development.

The quality of father-child interactions may also be impacted by the way fathers feel about their jobs (Stewart & Barling, 1996). Stewart and Barling (1996) examined job satisfaction as a measure of fathers' job-related affect. They found that when fathers reported higher levels of job satisfaction, they engaged in more positive parenting with their elementary school-aged children. Grossman, Pollack, and Golding (1988) found that while fathers who expressed greater job satisfaction spent less time with their 5-year-old children than did less satisfied fathers, fathers with greater job satisfaction were more supportive and sensitive towards their children. The results of these few studies suggest that higher levels of job satisfaction may contribute child outcomes through more positive father-child interactions during early childhood.

The work experiences of African American men may be particularly salient for father-child interactions and early language development due to discrimination in employment and the workplace (García Coll, et al., 1996). African American men have the lowest labor force participation rates among men from other racial groups in the United States (McLoyd & Enchautegui-de-Jesus, 2005). African American men are also overrepresented in lower wage jobs and tend to be employed in occupations in which hourly wages decline over time (McLoyd & Enchautegui-de-Jesus, 2005). Research

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suggests that perceived discrimination is highly salient in African American workers'

evaluation of their workplace experiences (McLoyd & Enchautegui-de-Jesus, 2005).

Employment and work hours may have a stronger positive influence on African

American fathers, who experience greater challenges in procuring gainful employment

due to employment discrimination, than may be found for White fathers. Conversely,

discrimination in the work place may negatively impact African American fathers such

that stressful work conditions, such as shift work, long work hours, low job satisfaction,

and high job insecurity, may have a stronger negative impact on father-child interactions

in African American families.

Because fathers traditionally have been considered the primary breadwinners of

the family, work experiences may have a differential impact on fathering than on

mothering (Doherty, et al., 1998). Research suggests that fathers' work experiences may

influence early language development via father-child proximal processes. For low-

income fathers who are more apt to be unemployed or underemployed, it can be

hypothesized that employment, fathers' job hours, and father job satisfaction may be

positively associated with child language development, in that fathers experiencing

meaningful employment and who are satisfied with their job will be more invested in the

fathering role and, in turn, engage in more positive proximal processes with their infants.

However, when fathers participate in shift work or perceive high levels of job insecurity,

their work experiences may restrict opportunities to engage in proximal processes with

their infants. Therefore, father participation in shift work and job insecurity may be

negatively associated with early language development via less optimal parent-child

proximal processes. Macrosystem forces, such as employment discrimination, may cause

fathers' race to act as a moderator of the association between father work experiences and later child language development, with effects being stronger for African American families than non-African American families.

Mother-father relationships

Fathers may influence their children's lives through the mother-father relationship (Cummings, Goeke-Morey, & Raymond, 2004). The conceptual model posited in Figure 1 holds that characteristics of the mother-father relationship may influence young children's early language development through their impact on parent-child proximal processes (Amato, 1998; Grych, 2002; Minuchin, 1985). Patterns of interactions associated with marital conflict can either provide complementary and cooperative resources for parenting or they can be a source of parenting difficulties (Minuchin, 1985). When parents are engaged in negative adult-adult relationships, they may have difficulties attending to the signs used by their infants to communicate their needs. In such situations, infants may learn that caregivers are unreliable sources of information or assistance (Wilson & Gottman, 2002) or that their own communicative cues are ineffectual. High levels of negative interpersonal conflict may draw familial caregivers' social resources away from the child and restrict the child's opportunities to engage in regular proximal processes with that caregiver. Because fathers are traditionally less socialized than mothers to the caregiving role, father-child interactions may be more vulnerable to disruptions in the family system (Belsky, Youngblade, Rovine, & Volling, 1991; Doherty, et al., 1998; Goldberg & Easterbrooks, 1984).

Among those studies looking at middle and upper-middle-class White families with young children, fathers in more harmonious, satisfied, and low-conflict marriages have more positive attitudes towards their infants, participate in more caregiving activities, report greater satisfaction in fathering, and demonstrate more engagement, sensitivity, warmth and support in father-child interactions (Cox, Owen, Lewis, & Henderson, 1989; Feldman, Nash, & Aschenbrenner, 1983; Goldberg & Easterbrooks, 1984; Grych, 2002; Kitzmann, 2000; NICHD Early Child Care Research Network, 2000a).

A great deal of attention has been paid in the literature to the quality of the mother-father relationship in minority and low-income families. The multiple risk factors and negative life conditions associated with poverty place strain on familial social relationships, including the mother-father relationship (McLoyd, 1990). Job loss and economic strain may decrease warmth and increase hostility in mother-father relationships (Magnuson & Duncan, 2002). However, fewer studies have considered the impact of the quality of the mother-father relationship to the quality of father-child interactions in low-income or minority families that include biological resident fathers. The results of these studies are generally congruent with the findings from studies with samples of middle and upper-middle-class White families in that high-quality mother-father relationships are associated with more father involvement and more positive and responsive father-child interactions (Belsky, et al., 1991; Coley & Hernandez, 2006; Shannon, Tamis-LeMonda, & Cabrera, 2006).

Belsky and colleagues have considered the impact of marital quality on parent-child behavior in a sample of White middle- and working-class families in the

Pennsylvania Infant and Family Development Project (Belsky, et al., 1991; Volling & Belsky, 1991), finding that marital conflict and ambivalence during a mother's pregnancy were associated with less responsive and stimulating father behavior in interactions with infants a year later (Volling & Belsky, 1991). Data from the Fragile Families and Child Well-Being Study, one of the few large studies to consider the quality of the mother-father relationship and parenting among low-income and unmarried families, suggests levels of supportiveness and conflict in the mother-father relationship at a child's birth were related to mother and father parenting a year later. Specifically, fathers in more supportive and less conflictual relationships showed more positive parenting (Carlson & McLanahan, 2004).

Far fewer studies have considered links between marital quality and parental language input, and these existing studies have looked at primarily middle-class White families. Pratt, Kerig, Cowan and Cowan (1992) measured marital satisfaction and mother and father language input during dyadic play sessions with children at 3.5 years of age. Pratt et al. found that mother and father conversational styles were similar, but that more satisfied parents spoke in longer utterances. Brody, Pillegrini, and Sigel (1986) also considered the relationship between parent language input and marital quality. Brody et al. looked at marital stress and dyadic teaching interactions with mothers and fathers with children 5.5-7.5 years of age. The authors found that fathers in distressed families gave less positive feedback and were more intrusive in father-child interactions than were fathers in nondistressed families. A recent study of two-parent, dual-earner middle-class families found that when marital relationships were high in love and broader family relationships were low in conflict when children were 12 months old, fathers later used a

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more diverse vocabulary in triadic play interactions with mothers, fathers and children when children were 2 years old (Pancsofar, et al., under review). This growing body of research suggests that the quality of the mother father-relationship is related to language used by fathers in interactions with their young children, however, this research has not yet included low-income or minority families.

Even among studies of middle-class families, very few have considered direct or indirect contributions of the mother-father relationship to children's early language development. In one of the only studies to consider child communicative outcomes, Dickstein and Parke (1988) looked at associations between the mother-father relationship and one early aspect of infant social communication, social referencing. They found that fathers' marital satisfaction significantly predicted infant referencing to both mothers and fathers. Specifically, infants who had more satisfied fathers referenced both fathers and mothers more frequently. This study did not consider the possible mediating role of parenting or parental language input in explaining the associations between marital satisfaction and child communicative behavior.

Previous research has consistently identified the quality of the mother-father relationship as an important factor in understanding the quality of father-child interactions across samples of varying income levels. In particular, high levels of negative conflict in the mother-father relationship have been linked to lower-quality father-child interactions (Brody, et al., 1986; Carlson & McLanahan, 2004; Volling & Belsky, 1991) while high levels of relationship satisfaction have been linked to higher-quality father-child interactions (Pancsofar, et al., under review; Pratt, et al., 1992). However, very few studies have specifically considered how fathers contribute to the

quality of the mother-father relationship, and how these contributions might relate to parenting and child outcomes. Cox, Paley, Burchinal, and Payne (1999) found that father's problem solving behavior was an important predictor of marital satisfaction across the transition to parenthood. When fathers demonstrated positive problem-solving communication in the marital context before the child was born, couples reported higher levels of marital satisfaction after the child's birth. Lindahl, Clements and Markman (1997) found that father marital conflict-related communication was an important factor in understanding father-child and family interactions during early childhood years. Lindhal et al. found that for fathers in particular, early negative marital affect before the child was born was predictive of negative tone and affect when later discussing their marriage in the presence of their young child. These few studies with middle-class White families suggest that fathers make important contributions to the quality of the mother-father relationship through conflict management and communication. More research is needed to determine if these father contributions to the mother-father relationship are meaningfully associated with child outcomes.

While the impact of the quality of the mother-father relationship on fathering in low-income families is becoming a primary concern in the literature, very few studies have considered the specific ways that fathers contribute to the mother-father relationship and how those contributions may impact father-child interactions and early language development of young children (Cox, et al., 1999; Lindhal et al., 1997). Few, if any, studies have considered these issues in low-income families that include biological resident fathers.

When considering adult relationships in diverse samples of families, it is important to consider that the psychological strain of racism and discrimination may negatively impact mother-father relationships in African American families (McLoyd, 1990). Closely linked to patterns of job availability and economic hardship, there have been declines in the rates of marriages among African American families over past decades (McLoyd, Cauce, Takeuchi, & Wilson, 2000). Specifically, among African American families, marital unions are more common in upper and middle-SES than in lower-SES families (Roopnarine, Fouts, Lamb, & Lewis-Elligan, 2005). Due to these unique conditions often experienced by African American couples, the contributions of the mother-father relationship to language development may be particularly salient for African American fathers.

Father's contributions to the mother-father relationship may indirectly influence children's early communication and expressive language development via the quality of father-child interactions (Cox, et al., 1989; Grych, 2002). Drawing upon previous research and the theoretical model in Figure 1, fathers who utilize more positive conflict communication and resolution strategies in relationships with mothers during a child's infancy may engage in more positive proximal processes with their child, facilitating more advanced communication and language skills. These associations may be particularly strong for African American families, for whom social mechanisms of racism and discrimination may place greater strain on mother-father relationships.

Quality of father-infant interactions

There has been considerable research investigating the links between mothers' affective behavior, particularly sensitivity and responsivity, and children's early language development. Parental sensitivity can be understood as an awareness of the child's verbal and nonverbal cues (Wallace, Roberts, & Ladder, 1998). Parental responsivity refers to how parents respond to their children's cues during parent-child interactions (Wallace, et al., 1998). Parents' appropriate and timely contingent responsivity can act as a reinforcer to maintain or evoke further communication from the child (Dunst, et al., 1989). When children's communication bids produce the same effect across repeated productions, there is a high probability that children will develop contingency awareness and expectations about the behavior of their interactive partners (Dunst, et al., 1989).

Maternal sensitivity and responsivity are positively linked to young children's achievement of communication and language milestones during infant and toddler years (Baumwell, Tamis-LeMonda, & Bornstein, 1997; Dunst, et al., 1989; Fish & Pinkerman, 2003; Nicely, Tamis-LeMonda, & Bornstein, 1999; Tamis-LeMonda, Bornstein, & Baumwell, 2001). However, very few studies have considered impact of father-child interactions on children's early language development, and still fewer have included low-income or minority fathers.

Some research with middle-class families suggests that fathers are less responsive in interactions with their infants than are mothers, although infants have been found to be equally responsive to both mothers and fathers (Kochanska & Aksan, 2004; Power, 1985; Power & Parke, 1983; Yogman, Cooley, & Kindlon, 1988). In middle-class White

families, fathers' stimulation and sensitivity has been linked to mastery motivation and linguistic and cognitive capacities of children during infancy (Magill-Evans & Harrison, 1999; Yarrow, MacTurk, Vietze, McCarthey, Klein, & McQuiston, 1984).

Of the few previous studies to consider the impact of father-child relationships on early development in low-income or minority families, most have had methodological limitations. Radin (1973) found that in a small sample of 30 White boys, paternal nurturance during preschool was positively correlated with children's verbal IQ scores one year later for middle-SES families, but not for low-SES families. However, the small sample size and low power of this study makes interpretation and generalization of these findings difficult. Kelly, Smith, Green, Berndt, and Rogers (1998) conducted a cross-sectional study with a sample that included low- to working-income African American mothers, biological fathers, and children, ages 1-3 years. They found that fathers who were more sensitive during free play interactions with children had children with better socialization and motor skills. However, the cross-sectional design of this study and lack of controls for child age makes it difficult to determine directionality of effects.

In one of the few studies to consider the quality of father-child interactions on children's language development in large longitudinal sample of low-income families, Tamis-LeMonda et al. (2004) examined father-child and mother-child engagements in a racially/ethnically diverse sample of low-income families participating in Early Head Start programs. Tamis-LeMonda et al. found that mothers' and fathers' supportive parenting at 24 months, as defined through sensitivity, positive regard and cognitive stimulation, predicted children's language development at 36 months of age, even after controlling for demographic factors.

The affective quality of parent-child interactions may be central to the reciprocity of proximal processes and to the degree to which children gain access to knowledge about language structure and use. The work of Tamis-Lemonda et al. (2004) suggests that in low-income and minority families, supportive and engaging parenting positively impacts early language development through both mother-child and father-child proximal processes. However, it is necessary to extend this limited existing research on father parenting to include father-child interactions during infancy in low-income and minority families. From this body of evidence and the theoretical model in Figure 1, it can be hypothesized that fathers who demonstrate more supportive and engaging parenting during proximal processes with their infants, may have children who later develop better communication and language skills.

Father language input

Parental language input provides young children with the tools of language structure and use. Often, parental language input to language-learning children occurs within the context of proximal processes. The proximal processes most often considered in studies of parental language input include parent-child free play interactions, storybook activities and mealtime interactions.

Parents modify their speech to their young children in ways that support their early language learning through, for example, simplified language that is less complex grammatically, more redundant, and with a higher pitch and exaggerated intonation pattern (Fernald, 1989; Kavanaugh & Jirkovsky, 1982; Kitamura & Burnham, 2003; McRoberts & Best, 1997; Rondal, 1980; Snow, 1977). Previous research on the influence of parental language input on children's language development has focused primarily on

mothers. Research into maternal language input has indicated that the amount of talk mothers direct to their children is associated with their children's gains in linguistic abilities (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991). The diversity of maternal vocabulary has been a strong predictor of children's later language development and literacy in middle- and low-income families (Bornstein, Haynes & Painter, 1998; Hart & Risley, 1995; Hoff-Ginsberg, 1991; Pan, et al., 2005; Weizman & Snow, 2001).

Few studies have considered paternal language input, particularly in low-income and minority families. Rowe, Coker, and Pan (2004) compared fathers and mothers' language input in a sample of rural low-income White families with 2 year-old children. They found a great deal of variability in language input, indicating the importance of considering individual differences even within low-income samples. Rowe et al. found that fathers used significantly more wh- questions and more requests for clarifications than did mothers. Roopnarine, Fouts, Lamb, and Lewis-Elligan (2005) considered a sample of African American families from lower, middle and upper SES backgrounds, and found that while mothers spent more time overall vocalizing to their young infant, fathers spent a greater proportion of their time with their young infant vocalizing than did mothers. These findings of studies comparing mother and father language input in low-income and minority families are consistent with other studies of mother and father language input in middle-class White families (Leaper, Anderson, & Sanders, 1998; Pancsofar & Vernon-Feagans, 2006; Rondal, 1980).

To date, only one study has considered the contributions of father language input to early child language development. Pancsofar and Vernon-Feagans (2006) investigated the contributions of mother and father language input to children's language development

in a sample of White, middle income, dual-earner two-parent families. They found that fathers' language input made a significant and unique contribution to their children's later expressive language development. Specifically, fathers who used more different words in their interactions with their children at 24 months had children with better expressive language skills at 36 months of age. Father contributions to children's language development held even after controlling for parental level of education, quality of childcare, and the same aspects of maternal language input to these young children.

While the impact of father language input on early child language development is an under-researched area, the limited literature and the theoretical model in Figure 1 suggest that across SES and racial groups, father language input may positively impact early language development in the context of father-child proximal processes. Specifically, fathers who talk more and use a more diverse vocabulary with their infants may have children with more advanced communication and expressive language skills.

Synthesis of the research

A review of the literature on fathers' contributions to early child language development supports the empirical examination of the conceptual model presented in Figure 1. Literature suggests that during infancy fathers make direct and indirect contributions to children's later expressive language development. Stimulating parent language input and engaging parenting positively impact early communication and language development through father-child proximal processes. Fathers' supportive and engaging parenting positively impacts children's language development during early childhood years (Tamis-LeMonda, et al. 2004) and father's language input is predictive

of children's later expressive language skills (Pancsofar & Vernon-Feagans, 2006). However, because fathering traditionally has been defined socially through financial, rather than caregiving, responsibilities (Cabrera et al., 2000; Coley & Chase-Lansdale, 1999; Marsiglio, et al., 2000), father language input and positive parenting may be especially vulnerable to the influences of other family subsystems and more distal child ecologies, such as the mother-father relationship, father work experiences and family SES.

At the level of the child's macrosystem, previous research suggests that poverty and low family SES have a negative impact on children's early language development (Fish & Pinkerman, 2003; Garret, et al., 1994; Krishnakumar & Black, 2002; Korenman, et al., 1995; McLoyd, 1998; NICHD Early Child Care Research Network, 2005b; Raviv, et al., 2004) and that this relationship may be partially mediated by parenting and parental language input (Hoff, 2003; Raviv, et al., 2004). At the level of the child's exosystem, father employment, job hours, and job satisfaction may be associated with greater engagement with their child, particularly in low-income families (Grossman, et al., 1988; Halle & Le Menestrel, 1999; Menaghan, 1991; Stewart & Barling, 1996). Father participation in shift work and father job insecurity may negatively impact early father-child interactions and child language development (Barling & MacEwen, 1992; Han, 2005; Stewart & Barling, 1996). The influence of father work experiences on child language development may be mediated by parenting and parental language input. When considering familial subsystems, research suggests that more positive mother-father relationships are associated with more positive parenting (Cox, et al., 1989; Grych, 2002), more sophisticated parental language input (Brody, et al., 1986; Pancsofar, et al.,

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under review; Pratt, et al., 1992) and more advanced early social communication skills (Dickstein & Parke, 1988). Fathers contribute to the quality of the mother-father relationship in various ways, including conflict communication and resolution (Cox, et al., 1999; Lindahl, et al., 1997).

Pervasive social forces of racism, employment discrimination and economic segregation may create disproportionate hardships for fathers in the realms of family SES, father work experiences and the mother-father relationship for African Americans. Because of the cumulative effects of these macrosystem forces on distal child ecologies, the impact of family SES, father work experiences, and the mother-father relationship on father-child proximal processes and child language development may be particularly strong in African American families (Ahmeduzzaman & Roopnarine, 1992; García Coll, et al., 1996; McLoyd, 1990; McLoyd & Enchautegui-de-Jesus, 2005).

While literature supports each component of the theoretical model in Figure 1, previous research on father's contributions to early development has considered these elements in isolation, rather than in a multidimensional framework that considers possible mediating pathways. Further, research in this area has failed to consider whether these processes of father contributions are different for African American fathers, who more often experience discrimination and oppression. This dissertation is the first study to consider multiple processes of father influence during infancy on children's early communication and expressive language development using a large sample that includes low-income and minority fathers. This dissertation addresses the following 5 research questions:

(1) What are the contributions of family SES during infancy on children's

communicative development at 15 months and expressive language development at

24 months? Are these contributions moderated by father's race?

It can be hypothesized that family income-to-needs ratio, father education and

mother education during infancy will positively contribute to children's communicative

development at 15 months and expressive language development at 24 months of age.

Children in families with higher income-to-needs ratios and higher levels of mother and

father education will have more advanced communication skills at 15 months and more

advanced expressive language skills at 24 months of age. Father's race is expected to

moderate the contributions of family SES to early communication and expressive

language development, with family SES exerting a stronger positive influence on child

development for families with African American fathers than for families with non-

African American fathers.

(2) What are the additional contributions of fathers' work experiences during infancy on

children's communicative development at 15 months and expressive language

development at 24 months? Are these contributions moderated by father's race?

The proposed study hypothesizes that after controlling for family SES, father

employment, work hours, and perceived job satisfaction during infancy will positively

contribute to children's communicative development at 15 months and expressive

language development at 24 months of age, while father shift work and perceived job

insecurity will negatively contribute to children's communicative development at 15 months and language development at 24 months of age. That is, when fathers are employed, work standard shifts, work more hours per week, and perceive high levels of job satisfaction and low levels of job insecurity during children's infancy, their children will have more advanced communicative development at 15 months and expressive language development at 24 months. It can be further hypothesized that father's race will be a moderator of the contributions of father work experiences to communication and expressive language development, with stronger associations in the hypothesized directions found for families with African American fathers than for families with non-African American fathers.

(3) What are the additional contributions of fathers through the mother-father relationship during infancy to children's communicative development at 15 months and expressive language development at 24 months? Are these contributions moderated by father's race?

The proposed study hypothesizes that after controlling for family SES and fathers' work experiences, fathers' use of reasoning skills in the mother-father relationship during infancy will positively impact children's communicative development at 15 months and expressive language development at 24 months. Fathers' use of verbal aggression in the mother-father relationship during infancy will negatively impact children's communicative development at 15 months and expressive language development at 24 months. That is, fathers who use more reasoning and less verbal

aggression in their relationships with mothers during a child's infancy will have children

with more advanced communication skills at 15 months and language skills at 24 months

of age. It can be further hypothesized that father's race will be a moderator of the

contributions of the mother-father relationship to communication and expressive

language development, with stronger associations in the hypothesized directions found

for families with African American fathers than for families with non-African American

fathers.

(4) Are the contributions of fathers through family SES, work experiences or the mother-

father relationship during infancy to children's communicative development at 15

months and expressive language development at 24 months mediated by father-child

proximal processes?

The proposed study hypothesizes that the contributions of fathers through family

SES, work experiences, and the mother-father relationship during infancy on children's

communicative development at 15 months and expressive language development at 24

months will be at least partially mediated by father-child proximal processes. That is,

family income-to-needs ratio, parent level of education, father employment, father work

hours, father job satisfaction, and father reasoning in the mother-father relationship will

contribute to more positive father-child proximal processes during infancy, which in turn,

will positively impact children's communicative development at 15 months and

expressive language development at 24 months of age. Father shift work, father job

insecurity, and father verbal aggression in the mother-father relationship will contribute

to less positive father-child proximal processes during infancy, which in turn, will negatively impact children's communicative development at 15 months and expressive language development at 24 months of age.

(5) Are indirect pathways of father contributions (family SES, fathers' work experiences, the mother-father relationship) during infancy to children's communicative development at 15 months and expressive language development at 24 months via father-child proximal processes moderated by father's race (moderated mediation)?

Moderated mediation occurs when the mediating processes that explain the relationship between predictor and outcome variables are different for people at different values of a moderator variable (Miller, Judd, & Yzerbyt, 2005). In the case of this study, moderated mediation would occur if the indirect pathways between distal factors (family SES, fathers' work experiences, and the mother-father relationship) on child communication and language development via father-child proximal processes were different for African American and non-African American fathers. The proposed study hypothesizes that the mediated pathways investigated in Question 4 will have stronger indirect effects on children's communicative development at 15 months and expressive language development at 24 months for families with African American fathers than for families with non-African American fathers. Specifically, it is hypothesized that distal factors will have stronger associations with father-child proximal processes for African American fathers than for non-African American fathers.

CHAPTER FOUR

Methods

Sample and design

The Family Life Project (FLP) was designed to study families who lived in two of the four major geographical areas of high child rural poverty (Dill, 1999). Specifically, three counties in Eastern North Carolina and three counties in Central Pennsylvania were selected to be indicative of the Black South and Appalachia, respectively. The FLP adopted a developmental epidemiological design. Complex sampling procedures were used to recruit a representative sample of 1,292 families at the time that they gave birth to a child, with low-income families in both states, and African American families in NC, being over-sampled. African American families were not over-sampled in PA, as the target communities were at least 95% White. Given logistical constraints related to obtaining family income data in the context of hospital screening, family income was dichotomized (low vs. not low) solely for purposes of recruitment. Families were designated as low income if they reported household income as less than or equal to 200% of the federal poverty threshold for a given household size, use of social services requiring a similar income requirement (e.g., food stamps, WIC, Medicaid), or if the head(s) of the household had less than a high school education.

In PA, families were recruited in person from three hospitals. These three hospitals represented a weighted probability sample (hospitals were sampled proportional

to size within county) of seven total hospitals that delivered babies in the three target PA counties and provided 89% coverage of all babies born to residents of target counties. PA hospitals were sampled because the number of babies born in all seven target hospitals far exceeded the number needed for purposes of the design. In NC, families were recruited in person and by phone. In-person recruitment occurred in all three of the hospitals that delivered babies in the target counties. Phone recruitment occurred for families who resided in target counties but delivered in non-target county hospitals. These families were located through systematic searches of the birth records located in the county courthouses of nearby counties. At both sites, recruitment occurred seven days per week over the 12-month recruitment period spanning September 15, 2003 through September 14, 2004 using a standardized script and screening protocol.

In total, 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. Eligibility criteria included residency in target counties, English as the primary language spoken in the home, and no intent to move from the area in the next three years. Of those eligible, 68% were willing to be considered for the study. Of those willing to be considered, 58% were invited to participate. Invitations for participation were based on screening information related to income and, in NC, race. Of those invited to participate, 82% ($N = 1,292$) of families completed their first home visit, at which point they were considered enrolled in the study. The overall sample in the Family Life Project included 1,204 families when children were 6 months and 1,100 families when children were 24 months of age.

All biological mothers were the primary caregivers at the child's birth, and at each visit to the child's home the biological mother was designated as the primary caregiver if she lived with her child. If the biological mother did not live with the child, then the person who had legal custody of the child or who lived with and cared for the child on a regular basis was designated the primary caregiver. Biological fathers were designated as the secondary caregiver if they resided in the household or if they cohabitated in the household at least 3 nights per week.

The current study was based on 521 respondents who met the following inclusion criteria: (1) The biological mother was the primary caregiver at 6-, 15- and 24-month visits, (2) The biological father was identified as the secondary caregiver at 6-, 15- and 24-month visits, (3) The biological father participated in the 6-month visit. Of the 1,204 families participating in the larger study at the 6-month visit, 822 families reported a secondary caregiver in the home. In 83% of these families (683/822), the secondary caregiver was the biological father. Other secondary caregivers at 6 months who were excluded from this sample were mostly maternal grandparents ($n = 127$), as well as 1 foster parent, 1 married step-parent, 5 unmarried partners of the primary caregiver, 2 paternal grandparents, and 4 unrelated adults.

In 613 families, the biological mother was consistently the primary caregiver through the 24-month visits and the biological father was consistently the secondary caregiver through 24-month visits. Fathers participated in the 6-month visit in 85% (521/613) of these families. Among African American families with fathers in the home for the first 2 years of life, 73% (98/134) of fathers participated at the 6 month visit.

Among non-African American families with fathers in the home for the first 2 years of life, 88% (423/479) of fathers participated at the 6 month visit.

The African American subgroup was comprised of 98 fathers who identified their primary race as African American. The non African American subgroup was mostly comprised of fathers who self-identified their primary race as White (419/423). The non-African American subgroup also included two fathers who identified as American Indian or Alaska Native, one father who identified as Korean and one father who identified as Samoan.

Table 1 illustrates the mean values on key demographic variables for families in the full Family Life Project sample, families with biological resident fathers through the first 2 years of children's lives, and families in which biological resident fathers participated in the 6-month home visit. Families in which fathers participated in the 6-month visits on average had higher levels of education and family income-to-needs ratios than did the families in the full sample and than families in which fathers did not participate in the 6-month visits. Families with non-participating fathers were equivalent on measures of marital instability, but slightly less likely to be married on average than families with participating fathers.

Procedure

Data presented here were collected during 2 ½ hour home visits, when children were 6, 15, and 24 months of age. Two separate visits were conducted within 2 weeks of each other when children were 6 and 24 months of age. Only 1 home visit was conducted at 15 months. Secondary caregivers were not asked to participate during the 15-month

visit. Home visits were conducted by 2 home visitors who simultaneously collected a variety of data from the families, including interviews, questionnaires, primary and secondary caregiver-child interactions, and child-based tasks.

All interviews and questionnaires in the FLP were computerized. Thus, interviewers and respondents entered all interview and questionnaire responses into laptop computers, thereby expediting the transfer of data from remote data collection sites to a centrally located data processing center. At each assessment, new caregivers completed the KFAST literacy screener (Kaufman & Kaufman, 1994). Parents reading at an 8th grade reading level (or beyond) were given the opportunity to complete questionnaires on their own, whereas those who read below an 8th grade reading level had questionnaires read to them.

The specific task from which father parenting variables were obtained was a free play task in the home. Mothers and fathers were separately asked to spend time interacting with their child using a set of Fisher Price toys. Home visitors gave parents the following instructions for this task: "We would like for you to play with [infant's name] as you normally would if you had a little free time during the day. There are some toys here if you choose to use them. They are cleaned and sanitized after each visit, so they are safe for [infant's name] to use. Please do not use your own toys because we try to be consistent for all families. Likewise, please do not use any pacifiers. Try to ignore us as best you can. Try not to talk to the camera or to us during the interaction unless you have a question. The session will go for 10 minutes, and we will let you know when that is over. Do you have any questions?"

Mother-child and father-child dyads used the same set of toys during these interactions. At the 6-month visit, toys included a lights and levers lab activity center, blocks, and stackers. Each interaction lasted for 10 minutes and was recorded with a DVD camera to be coded later by trained graduate students.

The specific task from which father language input variables were obtained was a picture book task in the home. Parents were asked to sit in a comfortable chair or couch with the child and were given the book. Home visitors provided the following instructions to parents: "This is a wordless picture book activity for you and [infant's name]. Please 'go through' the book with your child as you normally would. So we can hear what you are saying try not to whisper if possible. When you and [infant's name] are through, just let me know. "

At the 6-month visit the book *Baby Faces* (DK Publishing, 1998) was used for both mothers and fathers. The book was modified so that it contained no words. This wordless picture book contained a picture of a baby face on each page, with each baby showing a different emotion. Parents were given time to go through the book and familiarize themselves with the pictures before beginning the activity. The home visitors were told to end the session after 10 minutes if the parent had not signaled he/she had finished before that point. Parents wore high quality wireless microphones. All sessions were recorded with a DVD camera to be used for transcription.

Measures.

Demographic control variables. In these analyses, efforts were made to control for demographic factors that have been linked to child language development, such as

parental age, birth order of the child, and hours per week spent in child care. Research suggests that children of adolescent parents may be at greater risk for developmental delays and early school failure (Burgess, 2005; Furstenberg, Brooks-Gunn, & Chase-Landsdale, 1989). Child birth order has also been linked with children's early vocabulary competence, with first-born children demonstrating some advantages over later born children in language development (Bornstein, Leach, & Haynes, 2004). The amount of hours per week children spend in nonfamilial childcare has also been linked in the literature to children's early social and communicative development (Hubbs-Tait, Culp, Huey, Culp, Starost, & Hare, 2002; NICHD Early Child Care Research Network, 2002; 2003; Vortruba-Drzal, Coley, & Chase-Lansdale, 2004). Lastly, region of residence was an important aspect of the sampling design of this study and has been linked to parental language use in other published research using Family Life Project data (Vernon-Feagans, Pancsofar, Willoughby, Odom, Quade, and The Family Life Project Investigators, 2007).

Demographic data on the families were initially collected at the time of the child's birth and updated at each home interview if information had changed. At each home interview, detailed information was gathered on household composition, including all people who presently lived in the home, household income that included income from anyone who lived in the household of the family, as well as other information on education, jobs, and child care arrangements of household members. From these home interviews, the following control variables were derived: *state* (PA=1, NC=0), *first born status* (first born=1, not first born=0), *hours/week in childcare*, *father age*, and *mother age*.

Family SES. **Mother education** and **father education** in years were derived from the home interviews conducted independently by mothers and fathers at 6-month visits. At each home visit, primary caregivers also provided information about the household income. The FLP adopted the approach taken by Hanson, McLanahan, and Thomson (1997) of basing household income on anyone who resides in the household, not simply those people related by blood, marriage, or adoption. People were considered to be co-residents if they spend three or more nights per week in the child's household. At each visit, the mother completed a household grid that contained information about each person residing in the household. Household annual income was comprised as a sum of the mothers' reported annual income, the fathers' reported annual income, annualized contributions of all of other the people included in the household grid, and all other sources of income, including unemployment insurance, worker's compensation, social security retirement, other pension, cash income from welfare, child support, interest/dividend income, rental income, alimony, regular help from relatives, and regular help from friends. This annual household total income figure was then divided by the federal poverty threshold for a family of that particular size and composition (thresholds vary based on number of adults and children) to create the income-to-needs ratio. For this data, the **income-to-needs ratio** was calculated using the family income information collected at the 6-month visits and the 2004 poverty threshold values.

Father work experiences. At 6-month visits, fathers were asked to complete a jobs grid, in which they provided information about their work hours, environment, and

conditions. ***Employment*** is a binary variable in which 1 = employed and 0 = not employed. ***Total job hours*** is the total hours the father worked per week. ***Job shift*** is a binary variable in which 1 = nonstandard work shifts (including fixed evening shift, fixed night shift, rotating shift, irregular or other) and 0 = fixed day shift (Most hours between 8am and 4pm). Information on nonstandard work hours was collected for fathers' primary job only.

At 6-month visits, fathers were also asked to answer questions regarding their ***job satisfaction*** and ***job instability***. This 4-item measure was constructed from a collection of questions related to job satisfaction and quality administered to individuals in the 1997 National Study of the Changing Workforce (Bond, Galinsky, & Swanberg, 1998). Fathers rated their job satisfaction and job instability on a 4-point Likert Scale. Fathers' job satisfaction was assessed with the following question: "In general, how satisfied are you with your (main) job?" (1 = "Not at all satisfied," 4 = "Very satisfied"). Fathers' job instability was assessed with the following question: "How likely are you to lose your current (main) job in the next couple of years?" (1 = "Not at all likely," 4 = "Very likely").

Conflict Tactics Scale. The Conflict Tactic Scales (CTS: Straus, 1990) assesses the strategies that couples use to manage conflict in their relationship. Respondents were asked to report if their partner or themselves had ever used particular strategies in the past 12 months and how often that occurred. Frequency of that behavior was rated on a 7-point Likert Scale (0 = Never, 7 = More than 20 times). The CTS yields 6 subscales: respondent reasoning, respondent report of spouse/partner reasoning, respondent verbal

aggression, respondent report of spouse/partner verbal aggression, respondent violence, and respondent report of spouse/partner violence. Measures of father violence were not included in this study, as they were measures of more abusive behavior, which could be related to child trauma and was not the focus of this study. Therefore, this study used the following measures of father contributions to mother-father relationship: *father rating of father reasoning*, *father rating of father verbal aggression, mother rating of father reasoning*, and *mother rating of father verbal aggression*.

The reasoning subscales were the mean of 3 items in which the respondent reported on father use of positive conflict resolution strategies (e.g. discussed an issue calmly, got information to back up your side of things, brought in or tried to bring in someone to help you settle things). The verbal aggression subscale was the mean of 6 items in which the respondent reported on father use of negative or aggressive conflict resolution strategies (e.g. sulked or refused to talk about an issue, threw or smashed or hit or kicked something, stomped out of the room or house or yard). Reliability coefficients for the CTS have been reported in the literature to range from 0.42 to 0.76 for the reasoning subscales and from 0.62 to 0.88 for the verbal aggression subscales (Straus, 1990). Internal consistency estimates for these subscales in the FLP full sample were lower than those reported in the literature. Alphas for the FLP sample on these scales were 0.28 for mother rating of father reasoning, 0.30 for father rating of father reasoning, 0.52 for mother report of father verbal aggression and 0.52 for father report of father verbal aggression.

Parent language input. The software, Systematic Analysis of Language Transcripts (SALT: Miller & Chapman, 1985) was used to transcribe all of the DVDs of the picture book activities. The picture book activity commenced when the parent was given the book and the instructions for the task had ended. The activity ended when the parent signaled the coder that the activity was completed. Highly trained research assistants, including the author, transcribed the language directed to the child during the session. Transcribers were trained by the author, who spent 1 year learning SALT conventions and developing a training manual. Transcribers used the training manual to learn the specific conventions of SALT, and transcribed 20 training transcripts that were reviewed by the author. As an ongoing check, transcripts were regularly reviewed by the author and discussed at weekly research group meetings to ensure consistency in transcription.

From the SALT variables that were created from the transcripts when children were 6 months old, 2 variables were selected that were cardinal variables in the literature on parental language input. **Number of different word roots** was a measure of the parent's vocabulary during the task. This was determined on the basis of unique free morphemes. Omitted and unintelligible words were not included. Variations in the words were not counted as separate root words. For instance, *talk* and *talked* would be considered the same root word. Because fathers varied extensively on the amount of time they spent engaging with children in the book activity (total time ranged from 0.73 minutes to 11.33 minutes), it was important to include a measure of father talk that accounted for this variation. **Words per minute** was derived by dividing the total words used by fathers by the total time fathers spent in the book activity (in minutes).

Parent-child interaction codes. Parent-child interaction variables were derived for fathers when children were 6 months old. Free play interactions were videotaped and coders rated the interaction on elements such as parent sensitivity/responsiveness, animation, stimulation of development, positive regard, negative regard, detachment and intrusiveness. Coders rated each of these areas on a 5-point Likert scale (1 = Not at all characteristic, 5 = Highly characteristic). Approximately 30% of the parent codes were double-coded, which means that the final scores were reached by consensus between 2 coders. Each coding pair maintained an inter-rater reliability rating of 0.80 or above.

While specific information about the race of the coders for each interaction was not recorded in this study, efforts were made to match White and African American coders in teams for interactions that were double-coded. The coding system used in this study has been used in previous research with low-income samples that included African American parents (Mills-Koonce, Gariepy, Propper, Sutton, Calkins, Moore, G., & Cox, 2007; Mills-Koonce, Propper, Gariepy, Blair, Garrett-Peters, & Cox, 2007; Whiteside-Mansell, Bradley, Owen, Randolph, & Cauce, 2003). Reliability and validity information for this coding system with families of young African American children were conducted as part of the NICHD Study of Early Child Care (Whiteside-Mansell, et al., 2003). Using partial invariance methods, Whiteside-Mansell and colleagues found that these measures of parenting were comparable across African American and White parents in a sample of 1,076 families.

Previously conducted factor analysis of the FLP parent-child interaction data yielded 2 factors, labeled as parent sensitivity and parent engagement. Parent sensitivity

was the mean of the following subscales: sensitivity, intrusiveness (reverse scored) and

negative regard (reverse scored). Parent engagement was the mean of the following

subscales: stimulation, animation, detachment (reverse scored), and positive regard.

Reliabilities for the sensitivity subscales for secondary caregivers in the Family Life

Project at 6 months ranged from 0.48 to 0.55. Reliabilities for the engagement subscales

for secondary caregivers in the Family Life Project at 6 months were higher, ranging

from 0.57 to 0.64. Preliminary statistics indicated that father sensitivity was not strongly

associated with father engagement ($r = 0.24$), measures of father vocabulary ($r = 0.01$) or

father words per minute ($r = -0.01$). Further, father sensitivity was not significantly

associated with either outcome variable in this study ($p < 0.05$). Therefore, the decision

was made to use only the ***father engagement*** variable from the father-child free play.

Communication and Symbolic Behavior Scales. Child communication skills at 15

months were measured using Infant-Toddler Checklist from the *Communication and*

Symbolic Behavior Scales Developmental Profile (CSBS: Wetherby & Prizant, 2002), a

screening and assessment tool. The Infant-Toddler Checklist was designed to be used

with children ages 6 to 24 months and can be utilized independently of the other

components of the CSBS. Mothers completed the Infant-Toddler Checklist, rating their

children in seven areas: Emotion and Eye Gaze, Communication, Gestures, Sounds,

Words, Understanding, and Object Use. Results were summarized by adding raw scores

for each area and creating three composite scores and a Total score. The Total raw score

was summed from all seven raw scores. Normative data for the Infant-Toddler Checklist

is presented in 1 month intervals and is based on 1,891 children from culturally diverse

groups. Total Standard scores were based on a mean of 100 and a standard deviation of 15. The Total Standard Score for each child at 15 months was used in this study.

Wetherby, Allen, Cleary, Kublin, & Goldstein (2002) report the reliability of the CSBS Infant-Toddler Checklist as the stability of results over time. The research examined how the performance of the components of the CSBS Infant-Toddler Checklist changed over an interval of approximately 4 months when testing the same children. Using paired t-tests, Wetherby, et al. found that there were no significant differences in the standard scores obtained at each time point. Additionally, a measure of effect size (d) was calculated for each composite, including the total score. The reported d values were at or below 0.1, which indicates that standard scores were not different between test and retest.

Preschool Language Scale. The Preschool Language Scale Fourth Edition (PLS-4; Zimmerman, Steiner, & Pond, 2002) was administered by home visitors in the child's home at 24 months. The PLS-4 is a norm-based measure of children's language skills, from birth to age 6. The PLS-4 yields 2 subscale measures: auditory comprehension and expressive communication. Only the ***expressive communication*** subscale of this test was administered in this project. This subscale measured how well the child communicated with others. Expressive communication tasks varied by child age. Infant and toddler tasks initially assessed rudimentary aspects of expressive language, such as the ability to make sounds of pleasure, and later involved tasks that required the child to demonstrate verbally an understanding of language concepts, such as plural tense. Test-retest reliability for this age group has been found to be .82 for expressive communication, and

internal consistency estimates have been found to be .91 for expressive communication

(Zimmerman, et al., 2002).

CHAPTER FIVE

Results

Data analysis plan.

This study addresses 5 research questions. Path analysis and structural equation modeling techniques were used to address these questions using the Amos v. 6.0 software (Arbuckle, 1995). Amos addresses missing data through full information maximum likelihood estimation, which does not delete a case if it is missing a variable, avoiding problems such as biased parameter estimates that are more likely to occur when using listwise deletion procedures to compensate for missing data (Arbuckle, 1996; Wothke, 2000).

Each analysis controlled for the possible effects of *state*, *first born status*, *hours/week in childcare, father age*, and *mother age*. The first 3 research questions are concerned with testing the direct effects of father contributions through distal family factors, such as family SES (Question 1), father work experiences (Question 2), and the mother-father relationship (Question 3) during infancy on child *communication* at 15 months and child *expressive language development* at 24 months, and whether these direct effects are moderated by *father race* (African American vs. non-African American). Figures 2, 3, and 4 display the models tested using path analysis for each of these research questions.

Question 4 was concerned with testing the indirect contributions of family SES, father work, and the mother-father relationship to child *communication* and *expressive language development* via the following possible mediating latent construct: *father-child proximal processes*. Indirect effects were assessed using the product of coefficients approach (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004). Figure 5 displays the model tested using structural equation modeling.

To address whether the direct effects of distal factors (family SES, father work experiences, mother-father relationship) on child communication and expressive language development (Questions 1-3) or indirect effects via father-child proximal processes (Question 4) were moderated by *father race*, each model was re-estimated using a multiple groups approach, in which groups were designated by father race. The multiple groups approach involves applying cross-group equality constraints to the path analyses. Using this approach, models were run twice, once in which a predictive relationship was freely estimated separately for African American and non-African American fathers, and a second time in which an equality constraint was imposed on the previously freely estimated predictive relationship. Because the latter model is nested within the former model, a chi-square difference test can provide a formal test of moderation. The chi-square difference statistic indicates whether the model in which the path is constrained to be equal is significantly different from the models in which that path is allowed to be freely estimated in each group. A nonsignificant chi-square difference test suggests that the constrained model and unconstrained models are not significantly different from one another, and essentially equivalent. A significant chi-square difference statistic suggests that the unconstrained models are a better fit to the

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data than the constrained model and that there may be some measurable difference between groups on the direction and strength of that association. However, it is important to note that a significant chi-square statistic does not mean that the path of interest is significant in either model. That is, it is possible for a path to differ in meaningful ways across groups in direction or strength, but not to reach significance in either model for either group.

Preliminary descriptive statistics

Descriptive statistics were run on each variable using SAS v. 8.02, and prior to estimating each model, outliers and influential cases were identified. Those cases that had extreme Cook's D values or extreme studentized residual values were examined in detail. In investigating these cases, it was determined that 2 cases had values for income-to-needs ratio that were extremely high and likely an error in data collection. These cases were deleted from the analysis sample, yielding a total sample size of 519 families.

Table 2 presents the means and standard deviations for all variables for the full sample, the African American subsample and the non-African American subsample. In general, African American families in this study were less advantaged than non-African American families in terms of income-to-needs ratio. African American fathers were also more likely to be unemployed and to work nonstandard shifts than were non African American fathers in this sample. Table 3 presents the correlation matrix for the full sample on all variables. Table 4 presents the correlation matrices for the African American and non-African American subsamples on all variables.

Results for Research Question 1

Research Question 1 was concerned with whether family SES at 6 months predicted child communication at 15 months and child expressive language at 24 months, and whether these predictive relationships were moderated by father race. Question 1 was addressed using path analysis of the model presented in Figure 2. Predictor variables for research question 1 included ***income-to-needs ratio***, ***mother education***, and ***father education***, as well as control variables of ***state***, ***first born status***, ***hours/week in childcare, father age***, and ***mother age.*** All predictor variables were allowed to freely intercorrelate.

The results of this analysis are presented in Table 5. The model containing control and family SES variables accounted for 6% of the variance in child communication scores at 15 months and 16% of the variance in child expressive language scores at 24 months. Of the control variables, there was 1 significant relationship: Older mothers scored their children's communication skills lower on the CSBS ($\beta = -.16$, $p = 0.02$).

There were some predictive relationships between family SES and the outcome variables. Family income-to-needs ratio had a positive relationship with children's communication development, in that when families had higher income-to-needs ratios when children were 6-months of age, children had more advanced communication skills at 15 months ($\beta = .14$, $p = 0.01$). Family income-to-needs ratio at 6 months had a significant indirect impact on children's expressive language development at 24 months via children's communication development at 15 months ($z = 2.32$, $p = 0.02$). That is, family income-to-needs ratio had a positive impact on children's communication

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development, which in turn, positively impacted children's expressive language development.

Mothers' level of education was a significant predictor of children's expressive language development. Mothers with higher levels of education had children with higher expressive language scores at 24 months ($\beta = .14$, $p = 0.02$). Father education was not found to make significant direct contributions to child outcomes in the full sample.

The model in Figure 2 was re-estimated using multiple groups comparisons to assess whether the predictive relationships between family SES and child outcomes were moderated by father race. Multiple groups comparisons were conducted for each predictor variable separately, as well as a whole set of SES variables. When SES predictor variables were considered as a set, no differences were found across African American and non-African American samples for effects of SES variables (income-to-needs ratio, mother education, and father education) on child communication ($\chi^2 = 3.9$, $df = 3$, $p = 0.27$) or child expressive language development ($\chi^2 = 7.4$, $df = 3$, $p = 0.06$).

When each path was considered individually, there were no differences across groups on income-to-needs ratio ($\chi^2 = 1.7$, $df = 1$, $p = 0.20$), mother education ($\chi^2 = 0.5$, $df = 1$, $p = 0.50$), or father education ($\chi^2 = 1.3$, $df = 1$, $p = 0.25$) when predicting child communication. Likewise, there were no differences across groups on income-to-needs ratio ($\chi^2 = 0.2$, $df = 1$, $p = 0.67$) and mother education ($\chi^2 = 0.9$, $df = 1$, $p = 0.35$) when predicting child expressive language development. However, groups were found to differ significantly on the effect of father education to expressive language development ($\chi^2 = 6.4$, $df = 1$, $p = 0.01$). This significant finding suggests that the unconstrained model, in which the path between father education and child expressive language was freely

estimated in the African American and non-African American subsamples, was a better fit to the data than the model in which this path was constrained to be equal across groups. In the unconstrained model, father education significantly predicted child expressive language development in African American families ($\beta = .34$, $p < 0.001$). In the unconstrained model for non-African American families, this path was not significant ($\beta = .05$, $p = 0.40$).

Results for Research Question 2

      Research Question 2 was concerned with whether the addition of father work experience variables at 6 months to the model with family SES and control variables predicted child communication at 15 months and child expressive language at 24 months, and whether these predictive relationships were moderated by father race. Question 2 was addressed using path analysis of the model presented in Figure 3. Additional predictor variables for research question 2 included **father employment**, **father shift work, father work hours, father job satisfaction**, and **father job insecurity**. The model also included family SES variables (**income-to-needs ratio, father education, mother education**) as well as control variables (**state**, **first born status**, **hours/week in childcare, father age**, **mother age**). All predictor variables were allowed to freely intercorrelate. To account for a possible nonlinear relationship between parent job hours and outcomes, **total job hours squared** was also considered in all analyses. However, it did not significantly impact child outcomes ($p < 0.05$), and was therefore dropped from the final analyses.

      The results of this analysis are presented in Table 6. The model containing control, family SES, and father work variables accounted for 7% of the variance in child

communication scores at 15 months and 18% of the variance in child expressive language

scores at 24 months. The inclusion of father work variables to the model with control and

family SES variables accounted for an additional 1% of variance in child communication

score ($\chi^2 = 4.37$, $df = 5$, $p = 0.50$) and an additional 2% of the variance in child

expressive language scores ($\chi^2 = 10.04$, $df = 5$, $p = 0.07$). The only father work variable

to make a significant contribution to child outcomes above and beyond the effects of

control variables and family SES, was father job insecurity. When fathers reported more

job insecurity at 6 months, their children had less advanced expressive language skills at

24 months ($\beta = -.09$, $p = 0.05$). Father employment, father shift, father work hours, and

father job satisfaction did not significantly impact child communication development or

expressive language development, above and beyond the effects of family SES and

control variables.

The model in Figure 3 was re-estimated using multiple groups comparison to

assess whether the predictive relationships between father work experiences and child

outcomes were moderated by father race. As was done with family SES variables,

multiple groups comparisons were conducted for each work predictor variable

individually as well as a set. The effects of father work variables (employment, shift, job

hours, job satisfaction, job insecurity), when considered as a set, were not found to differ

significantly across African American and non-African American fathers on child

communication ($\chi^2 = 1.5$, $df = 5$, $p = 0.92$) or child expressive language ($\chi^2 = 1.9$, $df = 5$,

$p = 0.86$). When each path was considered individually, there were no differences across

groups for father employment ($\chi^2 = 0.0$, $df = 1$, $p = 1.0$), father shift ($\chi^2 = 0.5$, $df = 1$, $p =$

0.48), father job hours ($\chi^2 = 0.2$, $df = 1$, $p = 0.67$), father job satisfaction ($\chi^2 = 0.9$, $df = 1$,

$p = 0.34$), or father job insecurity ($\chi^2 = 0.0$, $df = 1$, $p = 0.93$) when predicting child

communication. Likewise, there were no differences across groups for father

employment ($\chi^2 = 0.0$, $df = 1$, $p = 1.00$), father shift ($\chi^2 = 0.5$, $df = 1$, $p = 0.50$), father job

hours ($\chi^2 = 0.9$, $df = 1$, $p = 0.36$), father job satisfaction ($\chi^2 = 0.5$, $df = 1$, $p = 0.48$), or

father job insecurity ($\chi^2 = 0.1$, $df = 1$, $p = 0.72$) when predicting child expressive

language development.

Results for Research Question 3

Research Question 3 was concerned with whether the addition of mother-father

relationship variables at 6 months to the model with family SES and father work

variables predicted child communication at 15 months and child expressive language at

24 months, and whether these predictive relationships were moderated by father race.

Question 3 was addressed using path analysis of the model presented in Figure 4.

Additional predictor variables for research question 3 included *father rating of father*

reasoning, *father rating of father verbal aggression, mother rating of father reasoning*,

and *mother rating of father verbal aggression*. The model also included family SES

variables (*income-to-needs ratio, father education, mother education*) father work

variables (*father employment*, *father shift work*, *father job hours*, *father job*

satisfaction, and *father job insecurity*), as well as control variables (*state*, *first born*

status, *hours/week in childcare, father age*, *mother age*). All predictor variables were

allowed to freely intercorrelate.

The results of this analysis are presented in Table 7. The model containing

control, family SES, father work, and mother-father relationship variables accounted for

9% of the variance in child communication scores at 15 months and 18% of the variance in child expressive language scores at 24 months. The inclusion of mother-father relationship variables to the model with control, family SES and father work variables accounted for an additional 2% of variance in child communication score ($\chi^2 = 10.54$, $df = 4$, $p = 0.03$). The addition of mother-father variables to the model did not account for any additional variance in child expressive language scores.

Mother ratings of fathers' use of reasoning tactics in the mother-father relationship significantly predicted children's later communication skills. When mothers rated fathers as using more reasoning tactics in their romantic relationship at 6 months, children had more advance communication skills at 15 months ($\beta = .12$, $p = 0.006$). Mother ratings of fathers' use of reasoning tactics in the mother-father relationship at 6 months had a significant indirect relationship with children's expressive language development at 24 months via children's communication development at 15 months ($z = 2.56$, $p = 0.010$). That is, father reasoning, as rated by mothers, positively contributed to children's communication development, which in turn, positively contributed to children's expressive language development.

Father ratings of his own use of reasoning tactics and mother and father ratings of fathers' verbal aggression skills did not significantly predict child communication skills. There were no significant direct predictive relationships between father contributions to the mother-father relationship and children's expressive language development.

The model in Figure 4 was re-estimated using multiple groups comparisons to assess whether the predictive relationships between the quality of the mother-father relationship and child outcomes were moderated by father race. As was done with family

SES and father work variables, multiple groups comparisons were conducted for each mother-father relationship predictor variable individually as well as a set. When mother-father relationship predictor variables were considered as a set, no differences were found across African American and non-African American samples for effects of mother-father variables (father rating of father reasoning, father rating of father verbal aggression, mother rating of father reasoning, mother rating of father verbal aggression) on child communication ($\chi^2 = 6.3$, $df = 4$, $p = 0.18$) or child expressive language development ($\chi^2 = 5.6$, $df = 4$, $p = 0.23$). When each path was considered individually, there were no differences across groups on measures of father rating of father reasoning ($\chi^2 = 0.0$, $df = 1$, $p = 0.97$), father rating of father verbal aggression ($\chi^2 = 2.2$, $df = 1$, $p = 0.14$), mother rating of father reasoning ($\chi^2 = 3.0$, $df = 1$, $p = 0.08$), or mother ratings of father verbal aggression ($\chi^2 = 2.8$, $df = 1$, $p = 0.09$) when predicting child communication. There were no differences across groups on measures of father rating of father reasoning ($\chi^2 = 0.3$, $df = 1$, $p = 0.60$), father rating of father verbal aggression ($\chi^2 = 0.0$, $df = 1$, $p = 0.92$), or mother rating of father reasoning ($\chi^2 = 0.0$, $df = 1$, $p = 1.0$) when predicting child expressive language development.

When the path from mother ratings of father verbal aggression predicting child expressive language was constrained, multiple groups analyses indicated that the unconstrained model was a significantly better fit to the data ($\chi^2 = 3.9$, $df = 1$, $p = 0.048$). While the unconstrained models yielded different standardized regression coefficients for mother report of father verbal aggression in the non-African American ($\beta = -.11$, p = 0.07) than the African American ($\beta = .11$, $p = 0.27$) subsample, this path did not reach significance ($p < 0.05$) in either model.

Results for Research Question 4

Research Question 4 was concerned with whether father contributions to early communication and language development via distal pathways of family SES, father work experiences, and the mother-father relationship at 6 months were mediated by the more proximal construct of father-child interactions. Figures 1 and 5 depict the model tested in this analysis. Question 4 was addressed using structural equation modeling, using Amos, v. 6.0. Maximum likelihood estimation methods were employed and a good fit was determined by a nonsignificant chi-square value, a root mean square error of approximation (RMSEA) value of less than .05 and an incremental fit index (IFI) and comparative fit index (CFI) between .90 and 1.00 (Hoyle & Panter, 1995).

The model was estimated based on covariance matrices, which can be recreated with the information provided in Tables 2, 3, and 4. Distal predictive variables included family SES (***income-to-needs ratio, father education, mother education***), father work experiences (***father employment***, ***father shift***, ***father job hours***, ***father job satisfaction***, and ***father job insecurity***), and father contributions via the mother-father relationship (***father rating of father reasoning***, ***father rating of father verbal aggression, mother rating of father reasoning***, ***mother rating of father verbal aggression***). The model also included control variables (***state***, ***first born status***, ***hours/week in childcare, father age***, ***mother age***).

The latent construct ***father-child proximal processes*** was comprised of 3 indicators: ***father number of different word roots, father words per minute***, and ***father engagement***. As illustrated in Table 3, these variables demonstrated good correlations with one another. This model, presented in Figure 5, demonstrated very good fit to the

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data. The model yielded a nonsignificant chi-square value ($\chi^2 = 49.40$, $df = 38$, $p = 0.10$), a RMSEA value of 0.024, an IFI value of 0.995, and a CFI value of 0.995. Father number of different words (.80), father words per minute (.84), and father engagement (.64) all loaded significantly onto the latent construct of father-child proximal processes ($p < 0.001$). The full model including control, family SES, father work experiences, mother-father relationship and father-child proximal processes variables accounted for 11% of the variance in child communication scores at 15 months and 18% of the variance in child expressive language scores at 24 months. The inclusion of father-child proximal processes variables to the model with control, family SES, father work experiences, and mother-father relationship variables accounted for an additional 2% of variance in child communication score ($\chi^2 = 10.55$, $df = 1$, $p = 0.001$). The addition of father-child proximal processes to the model did not account for any additional variance in child expressive language scores. Fifteen percent of the variance in the father-child proximal processes latent construct variable was explained by the distal predictors.

As Table 8 illustrates, father-child proximal processes at 6 months were significantly related to early child communication development at 15 months. Higher quality father-child proximal processes were predictive of more advanced later child communication skills ($\beta = .30$, $p < 0.001$). Father-child proximal processes at 6 months had a significant indirect effect on later child expressive language development at 24 months via children's communication development at 15 months ($z = 2.68$, $p = 0.007$). That is, when fathers engaged in higher quality proximal processes with their children at 6 months, their children developed better communication skills at 15 months, which in turn, contributed to more advanced expressive language development at 24 months.

Few of the distal factors (family SES, father work experiences, mother-father relationship) were significantly associated with father-child proximal processes in the full sample. Father education was positively associated with father-child proximal processes in that fathers with more education at 6 months engaged in higher quality interactions with their children at 6 months ($\beta = .30$, $p < 0.001$). Father job insecurity was negatively associated with father-child proximal processes in that fathers who perceived more job insecurity at 6 months engaged in lower-quality interactions with their children at 6 months ($\beta = -.10$, $p = 0.047$). There were no further significant associations between distal factors (family SES, father work experiences, mother-father relationship) and father-child proximal processes at 6 months.

Formal tests of mediation were conducted using the product of coefficients approach (MacKinnon, et al., 2002; Preacher & Hayes, 2004) and are presented in Table 9. These analyses indicated that there was a significant indirect relationship between father education and child communication via father-child proximal processes ($z = 2.46$, $p = 0.014$). That is, fathers with higher levels of education engaged in higher-quality proximal processes with their children at 6 months, which in turn, contributed to more advanced child communication skills at 15 months. No other significant indirect associations were found ($p < 0.05$).

Results for Research Question 5

Research Question 5 was concerned with whether the indirect pathways between distal variables (family SES, father work experiences, mother-father relationship) via father-child proximal processes were moderated by race. Although previous analyses

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suggested there were few significant indirect pathways in the full sample, each possible

mediated pathway was analyzed using multiple groups comparisons. All multiple groups

comparisons of indirect paths from income-to-needs ratio ($\chi^2 = 2.11$, $df = 2$, $p = 0.35$),

father education ($\chi^2 = 0.91$, $df = 2$, $p = 0.64$), mother education ($\chi^2 = 0.75$, $df = 2$, $p =$

0.69), father employment ($\chi^2 = 0.74$, $df = 2$, $p = 0.69$), father shift work ($\chi^2 = 2.83$, $df = 2$,

$p = 0.24$), father work hours ($\chi^2 = 1.30$, $df = 2$, $p = 0.52$), father job satisfaction ($\chi^2 =$

0.82, $df = 2$, $p = 0.66$), father job insecurity ($\chi^2 = 4.02$, $df = 2$, $p = 0.13$), father report of

father reasoning ($\chi^2 = 0.95$, $df = 2$, $p = 0.62$), father report of father verbal aggression (χ^2

$= 0.75$, $df = 2$, $p = 0.69$), mother report of father reasoning ($\chi^2 = 2.21$, $df = 2$, $p = 0.33$),

and mother report of father verbal aggression ($\chi^2 = 1.82$, $df = 2$, $p = 0.40$), to child

communication via father-child proximal processes yielded nonsignificant χ^2 values,

indicating that models were equivalent across racial groups with regards to these indirect

associations.

Similarly, all other multiple groups comparisons of indirect paths from income-to-

needs ratio ($\chi^2 = 3.12$, $df = 2$, $p = 0.21$), father education ($\chi^2 = 1.96$, $df = 2$, $p = 0.38$),

mother education ($\chi^2 = 1.82$, $df = 2$, $p = 0.40$), father employment ($\chi^2 = 1.80$, $df = 2$, $p =$

0.41), father shift work ($\chi^2 = 4.00$, $df = 2$, $p = 0.14$), father work hours ($\chi^2 = 2.36$, $df = 2$,

$p = 0.31$), father job satisfaction ($\chi^2 = 1.88$, $df = 2$, $p = 0.39$), father job insecurity ($\chi^2 =$

4.48, $df = 2$, $p = 0.07$), father report of father reasoning ($\chi^2 = 1.93$, $df = 2$, $p = 0.38$),

father report of father verbal aggression ($\chi^2 = 1.82$, $df = 2$, $p = 0.40$), mother report of

father reasoning ($\chi^2 = 3.31$, $df = 2$, $p = 0.19$), and mother report of father verbal

aggression ($\chi^2 = 2.66$, $df = 2$, $p = 0.27$) to child expressive language via father-child

proximal processes yielded nonsignificant χ^2 values, indicating that models were

equivalent across racial groups with regards to these indirect associations.

CHAPTER SIX

Discussion

This study identified several important distal and proximal pathways through which fathers contributed to their children's early communication and language development. The results of this study, using a large sample of 519 families that included low-income and African American biological resident fathers, suggest that elements of family SES, father work experiences and the mother-father relationship when children were 6 months of age were associated with their subsequent communication development at 15 months and later expressive language development at 24 months of age. Proximal characteristics of father-child interactions during infancy also were linked to children's later communication development, above and beyond the contributions of the more distal forces. These proximal father-child interactions rarely mediated the effects of the more distal child ecologies. The models tested in this study were largely equivalent across African American and non-African American fathers.

This study is unique in that it considered multidimensional models of early contributions to children's communication and language development across several distal and proximal domains. This study utilized measures of father and mother report, as well as observational data of fathers interacting with their children in different activities in the home environment. This study measured child outcomes using 2 different standardized measures of early communication and language development. Lastly, this

study was based on a large sample of biological resident fathers that was diverse across SES and racial groups. This discussion will now consider the specific findings from the study in greater detail, highlighting limitations of the study and areas of future research.

Research Question 1: Effects of family SES on early communication and expressive language development

Results from this study suggest that fathers made contributions to their children's early communication development and language development via their family SES. Specifically, children from families with higher income-to needs ratios during infancy had more advanced communication scores at 15 months, and in turn, more advanced expressive language development at 24 months of age. Multiple-groups analyses found that the positive effects of income-to-needs ratio on early communication and language development were equivalent in African American and non-African American families. This evidence of the negative relationship between financial hardship and communication and language development during even the first few months of children's lives adds to the growing body of research documenting the ways in which poverty and financial hardships during early childhood place children at risk for developmental delays and academic failure (Evans, 2004; Fish & Pinkerman, 2003; McLoyd, 1998; Raviv, et al, 2004) by negatively impacting even their earliest communicative efforts.

Analyses of the full sample suggested that mother education was positively associated with children's expressive language development at 24 months. In this study, children of more highly educated mothers had more advanced expressive language skills, which is consistent with literature in this area (Hammer & Weis, 1999; Hoff, 2003; Hoff-

Ginsberg, 1998). Analyses of the full sample did not suggest a significant relationship between father education and children's early communication and language development. However, multiple groups analyses suggested that the pathways between father education and children's expressive language development were significantly different in African American and non-African American families. Specifically, in African American families, father education had positive relationship with children's expressive language development, similar to the effects of mother education. Father education was not significantly related to children's communication and language development for non-African American fathers.

This finding lends empirical support to the argument that issues of education may be particularly salient in the lives of African American fathers and their children (Ahmeduzzaman & Roopnarine, 1992; Coley & Chase-Lansdale, 1999). Institutional racism and segregation may place roadblocks to the educational attainment of African American men (García Coll, et al., 1996), which may have negative implications for future generations of African American children. High school drop-out rates remain higher among African American youth than White youth (U.S. Department of Education, National Center for Education Statistics, 2001), and African American men have lower rates of participation in postsecondary education than do White men, White women and African American women (U.S. Department of Education, National Center for Education Statistics, 2005). The findings of this dissertation support programs and policies that facilitate African American men and fathers obtaining higher levels of education. Such efforts may positively impact the early language development and ensuing school readiness of African American children living in two-parent households.

Research Question 2: Effects of father work experiences on early communication and expressive language development

This study found that fathers' perceived job insecurity when children were infants was negatively associated with children's later expressive language development. When fathers perceived their jobs as being more insecure when children were 6 months of age, their children had less advanced expressive language skills at 24 months of age. Few, if any, studies have considered the direct impact of father job insecurity on children's language development, particularly during infancy. The results of this study suggest that father job insecurity may be a salient factor in children's early language development, particularly in families from low-income communities, who may be more apt to experience periods of unemployment and chronic underemployment (McLoyd, 1998).

It is important to consider that in the context of this study, father perceived job insecurity could have operated as a proxy for other unmeasured factors, such as subsequent job loss, loss of income, or sporadic or unpredictable employment patterns over the first 2 years of life. This is, it remains unclear whether fathers' perceptions of job insecurity negatively impacted children's language development or if it is rather the actual experience of job loss and associated economic strain that negatively impacts children's language development. Future studies in the area of father work experiences should consider measures of job insecurity in conjunction with measures of stability and change in father job experiences over the first 2 years of children's lives.

While this study did not find evidence of the hypothesized contributions of other father work variables, such as employment status, job shift, job hours, and job

satisfaction, these results should be interpreted with the consideration of father job insecurity. In communities with high levels of unemployment, underemployment and job insecurity, the impact of fathers' work experiences during infancy may not be as salient to child language development at 24 months, as more recent or even concurrent work experiences. Future research on father contributions to early development via the work experience should consider employment status, job shift, job hours and job satisfaction at multiple timepoints over the first 2 years of life.

Lastly, there is some indication from previous research that father employment status and work hours may impact father participation in childcare tasks (Aldous, et al., 1998; NICHD Early Child Care Research Network, 2000b; Yeung, et al., 2001), but not necessarily their participation in play activities with their children (Marsiglio, 1991). In their interactions with children, fathers may prioritize the sort of play activities that promote development and learning. When fathers' time and emotional resources are taxed by stressful work experiences, they still may be able to maintain comparable play activities as fathers who are less constrained by work experiences.

This study found that the contributions of father work experiences to child communication and language development were equivalent for African American and non-African American fathers. However, because there were no direct measures of employment discrimination used in this study, it is unknown to what degree African American fathers experienced or were affected by such social conditions. Future studies should include direct measures of employment discrimination and racism to gain a better understanding how father contributions to early development might be influenced by such macrolevel social forces.

Research Question 3: Contributions of fathers via the mother-father relationship on early communication and expressive language development

Results from this study suggest that when mothers reported fathers using more verbal reasoning tactics in the mother-father relationship when children were 6 months of age, mothers later rated children as having more advanced communication skills at 15 months. This finding extends previous research by considering the relationship between positive mother-father interactions and children's early communication and language outcomes (Cox, et al., 1999; Dickstein & Parke, 1988; Lindahl, et al., 1997). However, it should be noted that the significant predictor and outcome variables in this analysis were both derived from maternal report. It is possible that this finding reflects same-source bias in that some mothers may simply perceive their lives more positively or negatively including their relationships with their partners and the development of their children. However, it may also be the case that mothers in this sample were more comfortable answering personal questions related to relationship functioning and were therefore better able accurately report on father behavior in the context of interpersonal conflict.

It is surprising that there were no significant findings regarding father use of verbal aggression and child outcomes. However, very few previous studies have considered father contributions to the mother-father relationship during infancy as they relate to child communication and language development. In one of the few studies to look at families with young children, Lindahl et al. (1997) found that negative father affect in the mother-father relationship was not predictive of father interactions with children longitudinally, but was associated with parenting concurrently when children

were 5 years old. Fathers' use of verbal aggression in the mother-father relationship may be a more important predictor of child language development as children move beyond the infant stage and become more aware of the surrounding interpersonal interactions and affective quality of their environment.

This study found that the contributions of the mother-father relationship to child communication and language development were largely equivalent for African American and non-African American fathers. Multiple groups comparisons suggested that African American and non-African American fathers differed significantly in their contributions to children's expressive language development via their verbal aggression, as reported by mothers. However, this relationship did not reach significance in for either group of fathers. While the relationship between mother reports of father verbal aggression and subsequent child language development may not have been equivalent across groups in magnitude or direction of association, mother report of father verbal aggression did not make a significant impact on expressive language development for children of either African American or non-African American fathers.

Because there were no direct measures of racism or discrimination used in this study, it is unknown to what degree African American fathers experienced or were affected by such social conditions. Future studies should include direct measures of discrimination and racism in such analyses to gain a better understanding how such macrolevel forces might influence the mother-father relationship and child language development.

The interpretation of these findings regarding the contributions of fathers via the mother-father relationship is limited by the low reliability of the *Conflict Tactic Scales*

(Straus, 1990) when used in this sample. The low reliability values suggests that perhaps the tactics included in this measure did not truly capture the reasoning and verbal aggression skills used by fathers from these more low-income, rural communities. Reliabilities for father reported subscales on this measure were particularly low. These measurement limitations suggest that future research needs to more carefully investigate fathers' perceptions of their relationships with mothers, their own contributions to these relationships, and their comfort in discussing these qualities of their interpersonal relationships with researchers, in low-income, rural, and racially diverse communities.

Research Question 4: Father-child proximal processes as direct predictors of early communication and expressive language development and as mediators of more distal factors

This study found that father-child proximal processes at 6 months significantly predicted child communication skills at 15 months. When fathers engaged in high quality interactions with their children, as characterized by high levels of engagement, diverse vocabulary, and numerous words per minute, during infancy, children later had more advanced communication skills. The positive contributions of father-child proximal processes extended to children's expressive language development at 24 months, in that children who engaged in higher quality father-child proximal processes at 6 months later developed more advanced communication skills at 15 months and which, in turn, contributed to more advanced expressive language development at 24 months.

This study builds upon a growing body of research examining the impact of father-child interactions on early development (Kelly, et al., 1998; Magill-Evans &

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Harrison, 1999; Yarrow, et al., 1984). Few previous studies with sound methodological designs have considered the contributions of father-child interactions on children's language development (Tamis-LeMonda, et al., 2004; Pancsofar & Vernon-Feagans, 2006). These studies have found that across diverse groups of fathers, high-quality father interactions with children during toddler years contributed to more advanced child language development at 3 years of age. This study extends the findings of these previous works to consider father-child interactions during infancy as they relate to very early communication and language development during the first 2 years of life. Further, this study controlled for the possible impact of a variety of important distal factors, finding that the quality of father-child proximal processes contributed to children's early communication development above and beyond the effects of family SES, father work experiences, and the quality of the mother-father relationship.

While it was hypothesized that father-child proximal processes would mediate the effects of more distal factors, evidence of such indirect effects of distal family ecologies via father-child proximal processes were found in only a single instance. This study found a significant indirect effect of father education on child communication development via father-child proximal processes. More highly educated fathers engaged in higher-quality father-child interactions at 6 months, which in turn, contributed to more advanced child communication skills at 15 months. This finding is consistent with several existing studies of family SES and mother-child interactions, which found that the quality of mother-child interactions at least partially mediated the effects of SES on child language development (Hoff, 2003; Hoff-Ginsberg, 1998; Raviv, et al., 2004). This

dissertation is one of the only studies to empirically test for possible indirect effects of family SES on child language development via father-child interactions.

Overall, father-child proximal processes in this study were largely unaffected by other aspects of distal child ecologies. Significant associations were found between father education and father-child proximal processes and between father job insecurity and father-child proximal processes. Fathers who reported higher levels of job insecurity at 6 months also engaged in lower quality proximal processes with their children at 6 months. Because measures of father job insecurity and father-child proximal processes are concurrent, the direction of this effect is unclear. However, this finding is consistent with the very limited existing research in these areas that has found that father job insecurity negatively impacts fathers' capacities to engage with their children (Barling & MacEwan, 1992; Stewart & Barling, 1996). Future research should carefully consider the possible effects of father job insecurity on the way fathers interact with their children over time during early childhood.

It is possible that the effects of distal factors on children's language development may be mediated through aspects of children's lives other than father-child proximal processes. Other possible mediators could include mother-child proximal processes, the quality of the home environment, or access to high-quality childcare experiences. Future studies may also consider whether the quality of father-child proximal processes acts as a moderator, or protective factor, in the experiences young children. Children who engage in high-quality proximal processes with fathers during infancy may be buffered from detrimental effects of poverty, parental job insecurity or highly conflictual mother-father relationships.

Research Question 5: Father-child proximal processes as a mediator of more distal factors in African American and non-African American subgroups

This study found that the indirect paths between distal factors and child communication and language development via father-child proximal processes were equivalent for African American and non-African American fathers. While it was hypothesized that macrolevel forces of racism, discrimination, and segregation might make father-child interactions more vulnerable to disruptions in distal child ecologies for African American fathers, these social forces were not measured directly in this study. While the indirect pathways between distal factors and child language outcomes via father-child proximal processes appeared equivalent across racial groups, it remains unknown to what degree African American fathers experienced racism and discrimination or how these social forces may have impacted father-child proximal processes. Future studies should include direct measures of racism and discrimination to gain a better understanding how father contributions to early development might be influenced by such macrolevel social forces.

Control variables

It should be noted that very few of the control variables in this study were significantly related to father-child proximal processes or child outcomes. However, it was found that older mothers in this sample rated their children as having less advanced communication development. This finding is inconsistent with previous work in this area, which has found that children of adolescent mothers may be at risk for developmental

delay and early school failure (Burgess, 2005; Furstenberg, et al., 1989). In this study, the variable mother age may have been acting as a proxy for some other meaningful indicator of household size or chaos. Future research using similar samples may need to control for effects of number of children in the home or level of chaos in the home environment.

Limitations of the sample and methodology

When interpreting the findings of this study, it is important to note that the sample of children and families used in this study is not representative of all families living in low-income rural communities. Families were included in this study if both the biological mother and biological father were a part of the household through child's first 2 years of life. Such a family composition characterized 56 % of the families in the larger Family Life Project sample, with 67% of the non-African American families and only 25% of the African American families eligible to be included in this study. On average, this restricted sample was more economically advantaged and had parents with higher levels of education than families in the larger Family Life Project. The restricted sample used in this study limits the generalizability of these findings.

The prevalence of divorce, separation and single-mother households in low-income communities has been well-documented in the literature, particularly when considering African American families with young children (Cabrera, et al., 2000; McLoyd, et al., 2000). Considerable previous research has explored the roles of nonresidential fathers in the lives of children (Anderson, Kohler, & Letiecq, 2005; Amato & Gilbreth, 1999; Roy & Burton, 2007). However, biological resident fathers do reside in the households of young children in many low-income families, and these fathers have

been largely ignored in the existing literature. The findings of this study suggest that in these families, the experiences and characteristics of fathers may account for some of the variability in children's very early communication and language development during early childhood. This research contributes to a growing body of literature investigating the roles of fathers in the lives of children and families across different family compositions, SES and racial groups.

While this dissertation considered the contributions of biological resident fathers from low-income communities, there are certainly other important ways that researchers could approach the study of low-income and minority fathers. Future research on father contributions to children's language development in low-income communities needs to consider a broader conceptualization of fatherhood that includes residential and nonresident fathers and father-figures. Broadening the scope of research to include all fathers may better encapsulate the diversity of experiences for low-income and minority fathers. Such research should also investigate the roles of step-fathers, mother's boyfriends and social fathers who may contribute to the early development of children in many families in low-income communities. There is a need for a larger body of research on father contributions to children's early communication and language development that includes multiple studies that reflect the breath and diversity of family lives.

Summary and conclusions

Previous research on father contributions to families and children in low-income communities has focused on father presence and absence in the home, with little consideration of the distal and proximal pathways through which biological resident

fathers contribute to their children in these families (Coley, 2001; Nelson, 2004). In this study of biological resident fathers from low-income communities, fathers made significant contributions to children's communication and language development through family SES, work experiences, the mother-father relationship, and father-child proximal processes. The results of this study consistently showed that in for families with African American and non-African American fathers, biological resident fathers make positive contributions to their children's development through distal and proximal child ecologies. When examining children's distal ecologies, it was found that higher income to need-ratios, higher levels of mother education, lower levels of father job insecurity, and greater father use of reasoning skills in the mother-father relationship contributed to more advanced child communication and language development. High quality father-child proximal processes contributed to more advanced child communication and language development above and beyond the effects of these more distal factors.

Very few group differences were found between African American fathers and non-African American fathers. This may be in part due to the fact that this study included a representative sample in which every baby born within 6 counties in a 1-year period was systematically recruited for participation. In this design, income and race may have been disentangled more effectively than in previous research, contributing to largely equivalent models across racial groups. It is also possible that African American fathers in this sample perceived low levels of racism and discrimination or alternatively, that fathers were adept in buffering their children from negative effects of these social forces.

While this study is unique in methodology and makes important contributions to research on father contributions to early development, there are important limitations.

While it was hypothesized that contributions to early communication and language development for African American fathers might be influenced by racism and discrimination, these broader social forces were not directly measured, thereby limiting the conclusions that can be drawn in these analyses. Further, it was not possible in these analyses to consider possible coder effects in the measurement of father-child interactions. It is therefore unknown if individual coders were accurate in coding father behavior for African American and non-African American fathers, or whether the race of coder played any significant role in these analyses.

This research is further limited by a lack of information about father experiences between 6 months and 24 months of age. Such information may be particularly important in interpreting the role family SES and father work variables in low-income families who may be more apt to experience economic and employment instability.

In interpreting the results of this study, it should be noted that the addition of some distal and proximal father contributions (father work experiences, mother-father relationship, father-child proximal processes) explained very little of the variance in child language outcomes, above and beyond the effects of demographic and SES variables. These findings suggest that while fathers may make significant contributions to children's language development, there are many other important contributing factors influencing the development of young children living in low-income rural communities. Other important factors not considered in this study might include mother contributions, neighborhood contexts, and biological or health conditions. Future research on child language development should incorporate father contributions in conjunction with these other elements of child ecologies.

The multidimensional model developed in this dissertation allowed for a careful assessment of the direct and indirect contributions of racially and economically diverse resident fathers to children's early communication and language development through distal and proximal child ecologies. Such an approach informs the understanding of unique pathways of influence for biological resident fathers via family SES, work experiences, the mother-father relationship and father-child interactions. The results of this study should be applied to future work that considers broader family systems, including the contributions of fathers, mothers, and other caregivers to child communication and language development across these important domains.

Implications for the field of early childhood education and early intervention

Children's early communication skills and oral language development are an important focus of early intervention and early childhood education programs aimed at supporting school readiness (Bredekamp & Copple, 1997; Dickinson & Tabors, 2001; Wasik, Bond, & Hindman, 2006). Perhaps because so much is known about the ways in which mothers contribute to children's early communication and oral language development, early childhood programs and intervention services generally focus their family involvement efforts on mothers (Brookes-Gunn, Berlin, & Fuligni, 2000; Turbiville & Marquis, 2001). In recent years, there have been increased efforts to understand father participation in early childhood and intervention programs (Elder, Valcante, Yarandi, White, & Elder, 2005; Roggman, Boyce, Cookie, & Cook, 2002). This dissertation supports such research with evidence that fathers are important figures in the ecology of young children living in two-parent households, across SES and racial

groups. Education and intervention efforts to improve child language development should expand their focus to include fathers of young children.

In several previous qualitative and quantitative studies of families from diverse SES groups, fathers reported needing information and educational resources on parenting, such as advice and information on child development, and guidance on discipline (Summers, Boller, & Raikes, 2004; Turbirville & Marquis, 2001). The results of this study suggest children may benefit from practitioners providing fathers with such parenting support, which might also include information on characteristics of father-child interactions that support positive early communication and language development. Such efforts should be individualized to the unique needs of families and responsive to the cultural values and traditions held by these fathers and families.

Personnel preparation programs need to directly include fathers in training efforts to develop family collaboration skills among early childhood and early intervention professionals. Such programs may need to develop new approaches to include low-income fathers, such as inviting fathers from the community to coordinate father participation in training efforts. Practitioners may also need to be aware of the ways that father-child interactions and child language development may be influenced by broader familial and nonfamilial contexts, such as father education, father job insecurity and the ways that fathers interact with mothers.

Future research is needed to better understand the factors that support and inhibit fathers' involvement in early childhood programs and early intervention services, as well as the utility of addressing broader familial and nonfamilial contexts within the scope of early intervention services. For example, future studies should consider broadening early

intervention efforts to include employment counseling for fathers, or couples or co-parenting counseling, and evaluating the impact of such efforts on the development of children at-risk for developmental delay and early school failure. The findings of this study also highlight the need for future research to consider father contributions to children's development in families of children with diagnosed disabilities, particularly in the language domain.

Figure 1*: Conceptual model of father contributions to early language development*
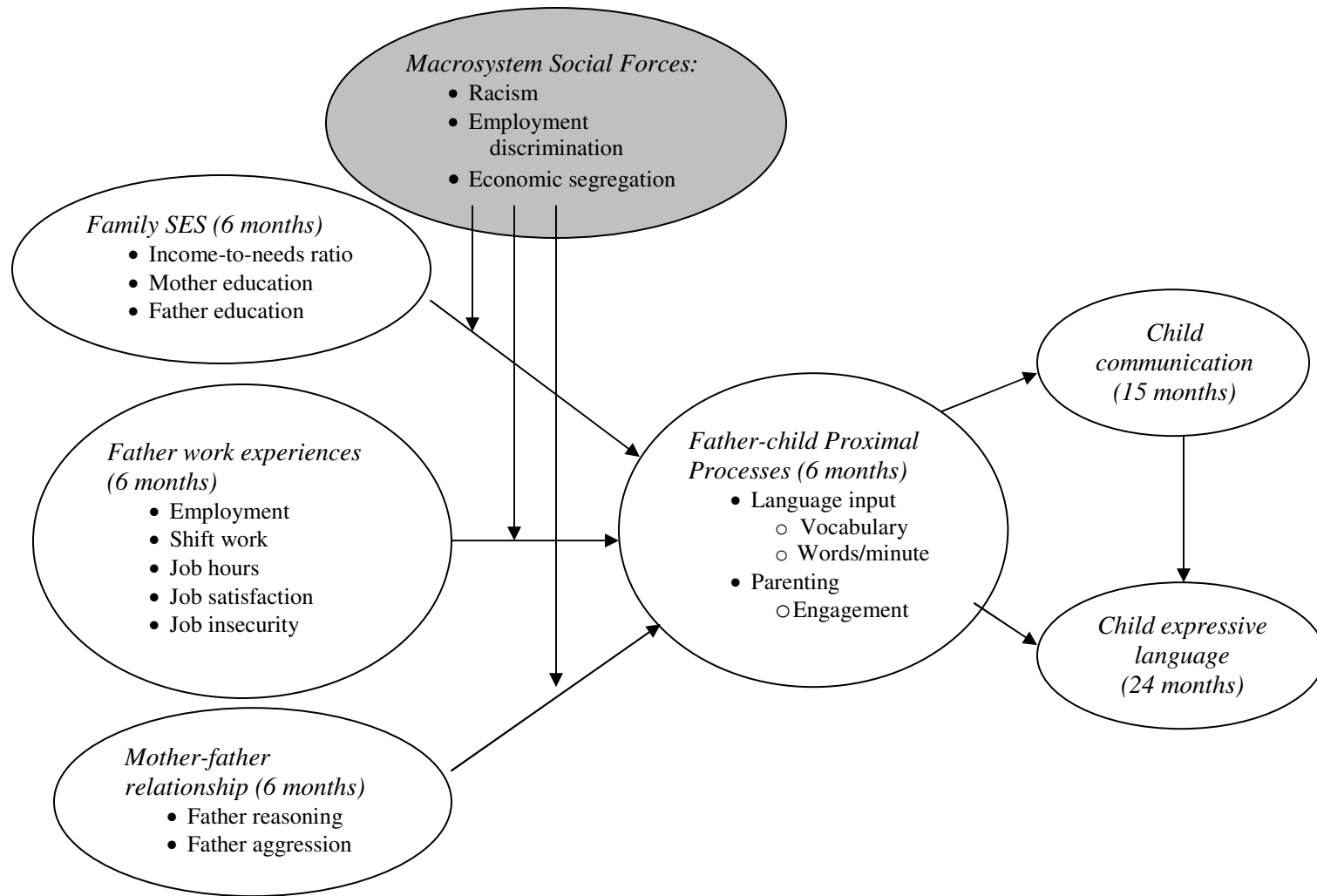
Figure 2: *Path diagram for Research Question 1*
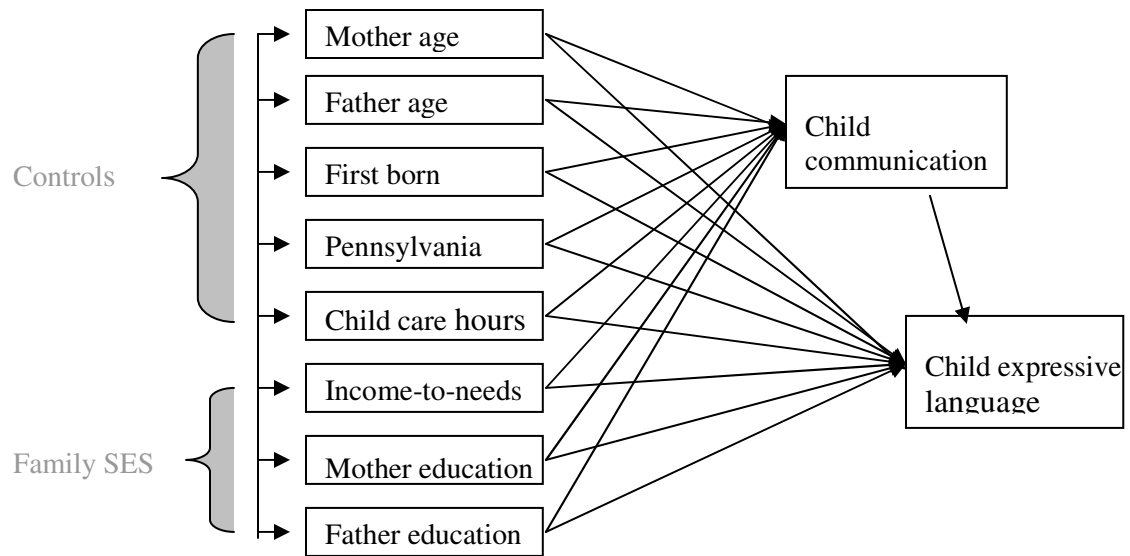
Figure 3: *Path diagram for Research Question 2*
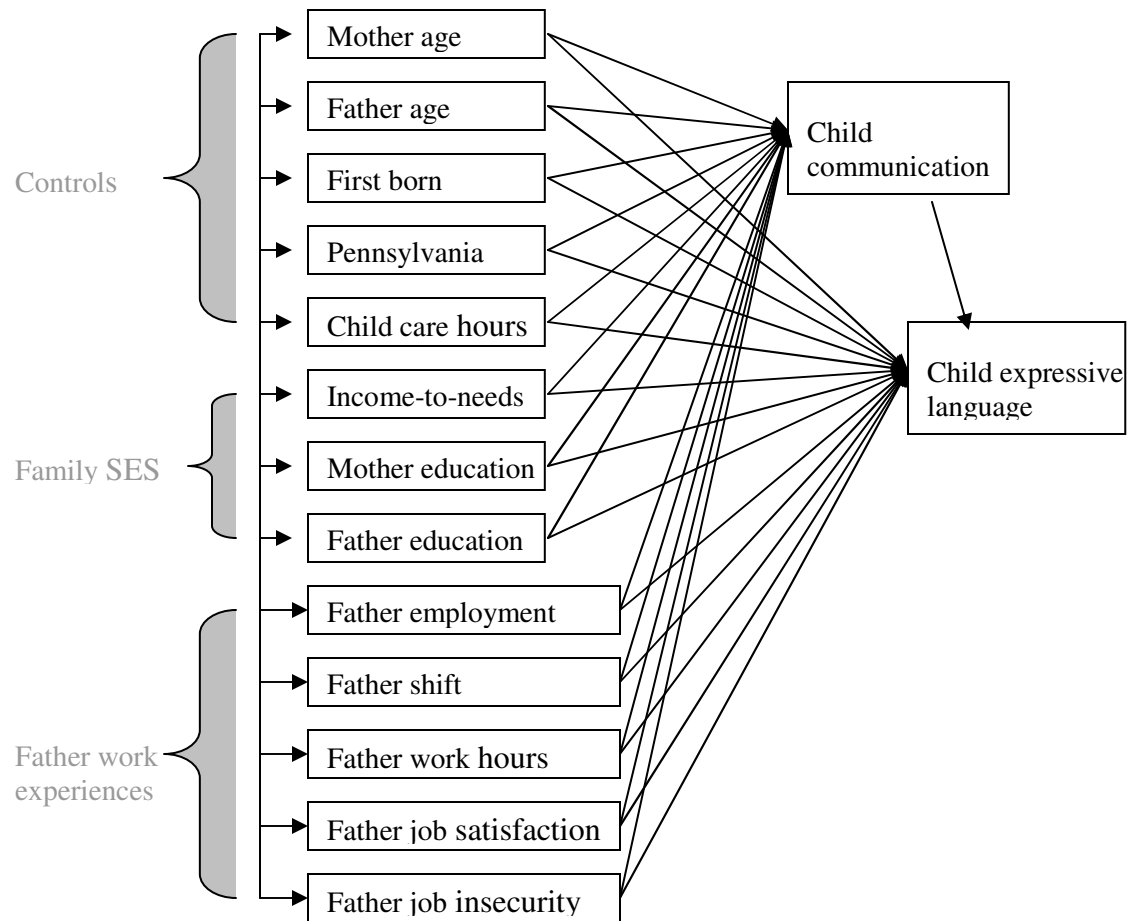
Figure 4: *Path diagram for Research Question 3*
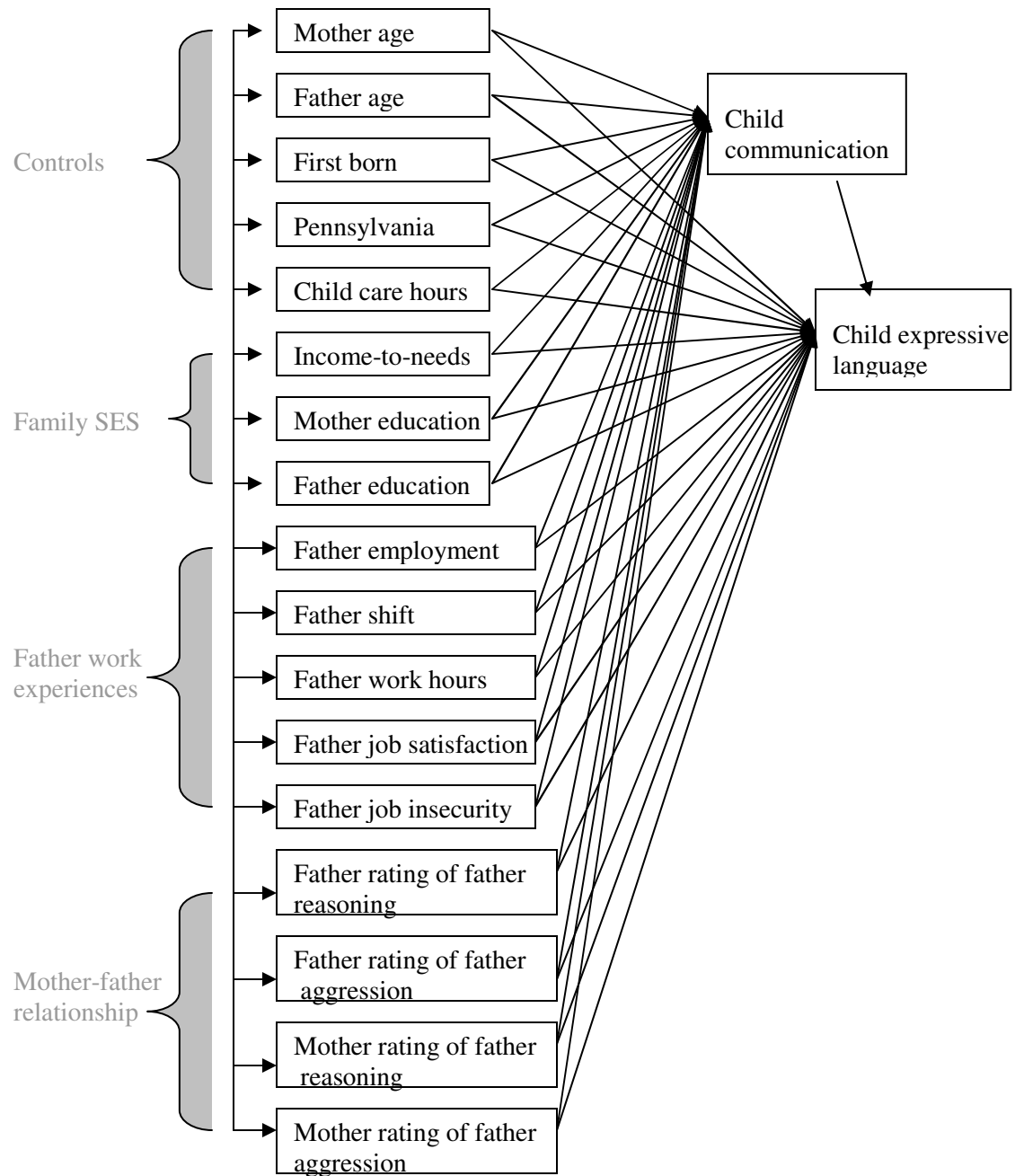
Figure 5: *Path diagram for Research Question 4*
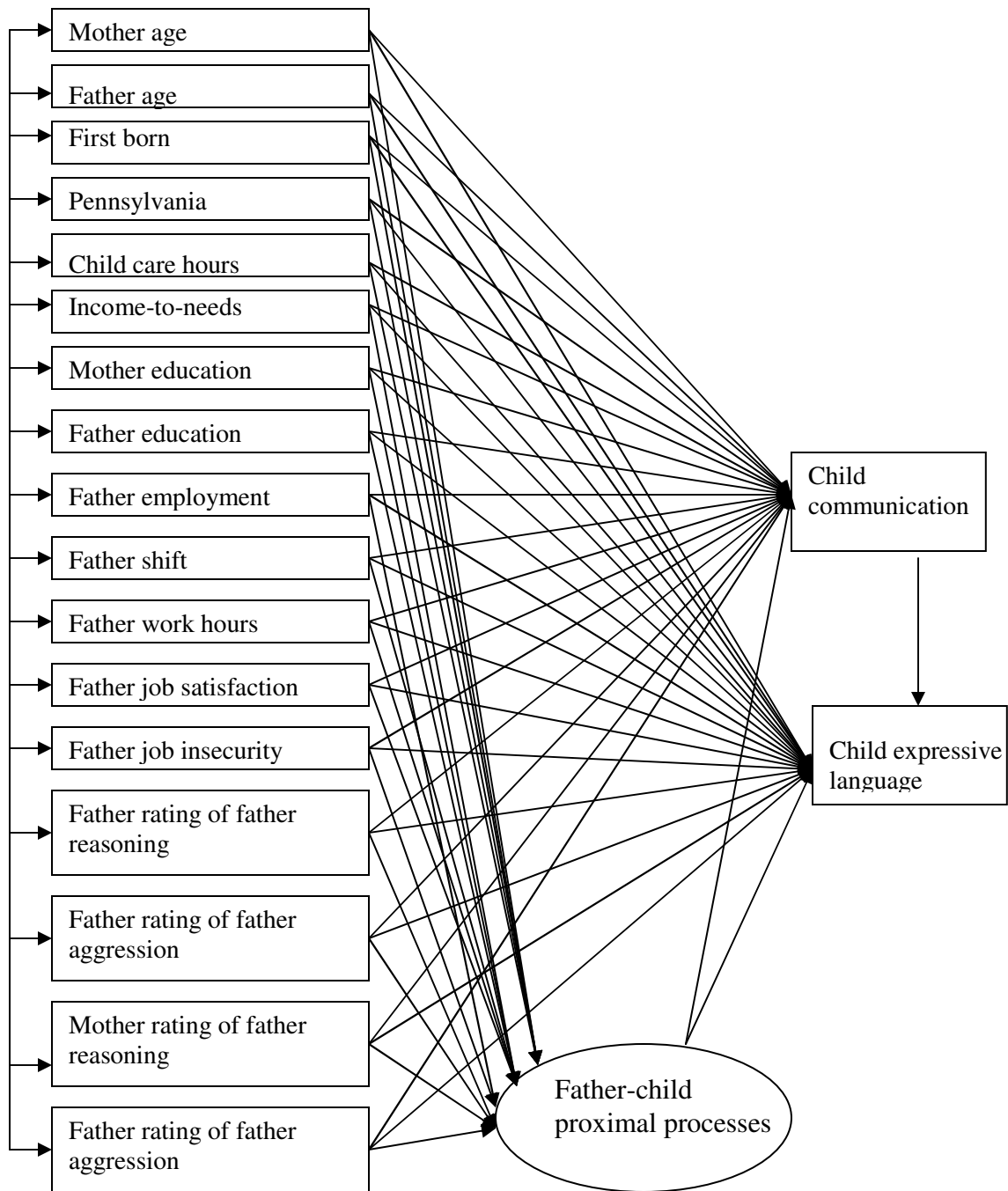
Table 1: *Univariate statistics on key demographic variables for the full Family Life Project sample, the subsample of families with biological resident fathers, and the subsample of families with participating biological resident fathers.*

	Full Family Life Project sample			Biological resident father subsample			Participating biological resident father subsample		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Expressive Language – 24 mos.	1130	100.25	15.08	580	102.41	15.43	496	102.71	15.28
Communication – 15 mos.	1199	100.99	15.97	610	102.51	14.99	518	102.77	14.86
State (PA) – 6 mos.	1333	0.38	0.48	611	0.55	0.50	519	0.59	0.49
Birth order (First born) – 6 mos.	1333	0.39	0.49	611	0.33	0.47	519	0.34	0.48
Child care hours – 6 mos.	1232	20.16	20.90	610	16.47	17.78	519	16.40	17.71
Secondary caregiver age in years – 6 mos.	1008	33.94	9.64	611	30.86	6.36	519	30.90	6.29
Primary caregiver age in years– 6 mos.	1240	26.50	6.18	611	28.38	5.47	519	28.41	5.49
Income-to-needs ratio – 6 mos.	1240	1.77	1.57	611	2.49	1.71	519	2.64	1.73
Secondary caregiver education in years – 6 mos.	994	12.75	2.21	610	13.16	2.25	519	13.28	2.13
Primary caregiver education in years – 6 mos.	1240	12.62	2.06	611	13.46	2.13	519	13.53	2.14

Table 2: *Univariate statistics for all independent and dependent variables*

	Full sample			African American subsample			Non-African American subsample		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
Expressive Language – 24 mos.	496	102.71	15.28	92	97.24	11.95	404	103.96	15.69
Communication – 15 mos.	518	102.77	14.86	98	98.5	16.16	420	103.76	14.38
State (PA) – 6 mos.	519	0.59	0.49	98	0.07	0.26	421	0.71	0.46
Birth order (First born) – 6 mos.	519	0.34	0.48	98	0.22	0.42	421	0.37	0.48
Child care hours – 6 mos.	519	16.40	17.71	98	20.33	19.78	421	15.48	17.09
Father age in years – 6 mos.	519	30.90	6.29	98	30.35	5.65	421	31.03	6.43
Mother age in years– 6 mos.	519	28.41	5.49	98	27.45	5.36	421	28.64	5.50
Income-to-needs ratio – 6 mos.	519	2.64	1.73	98	1.80	1.13	421	2.84	1.78
Father education in years – 6 mos.	519	13.28	2.13	98	12.13	1.49	421	13.55	2.17
Mother education in years – 6 mos.	519	13.53	2.14	98	12.53	1.79	421	13.77	2.15
Father employment – 6 mos.	519	0.89	0.31	98	0.81	0.40	421	0.91	0.28
Father shift – 6 mos.	460	0.30	0.46	79	0.37	0.49	381	0.29	0.45
Father work hours – 6 mos.	460	47.10	11.81	79	45.67	11.09	381	47.40	11.94
Father job satisfaction – 6 mos.	460	3.30	0.77	79	3.19	0.74	381	3.32	0.77
Father job insecurity – 6 mos.	459	1.57	0.75	78	1.68	0.89	381	1.55	0.71
Father rating of father reasoning – 6 mos.	518	2.70	1.12	97	2.65	1.25	421	2.71	1.09
Father rating of father verbal aggression – 6 mos.	518	1.41	1.11	97	1.44	1.22	421	1.40	1.08
Mother rating of father reasoning – 6 mos.	519	2.51	1.01	98	2.35	1.26	421	2.54	0.94
Mother rating of father verbal aggression – 6 mos.	519	1.60	1.18	98	1.76	1.31	421	1.56	1.15
Father engagement – 6 mos.	475	2.87	0.80	83	2.54	0.82	392	2.94	0.78
Father vocabulary – 6 mos.	481	73.33	31.91	85	60.33	31.29	396	76.12	31.38
Father words/minute – 6 mos.	481	68.04	29.89	85	66.24	32.27	396	68.43	29.38

Table 3: *Correlation matrix for full sample*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. PLS	1.00	.32	.12	.06	.06	.09	.13	.16	.20	.25	-.01	-.06	.11	.06	-.09	.00	.01	.00	-.06	.14	.19	.10
2. CSBS		1.00	.08	.14	.03	-.07	-.08	.16	.07	.12	.05	.04	.06	-.05	.01	-.00	.05	.15	.07	.15	.11	.10
3. PA			1.00	.09	-.20	.02	.07	.10	.20	.15	-.04	-.03	.05	.04	-.09	-.03	-.03	.09	.01	.12	.06	-.01
4. BIR				1.00	.16	-.21	-.24	.25	-.02	.05	.02	-.04	-.08	-.02	-.03	-.06	-.00	-.01	.08	.04	.02	
5. CCHR					1.00	.01	.06	.35	.03	.15	.11	-.18	.03	-.01	.06	.01	-.02	-.04	.03	-.00	.03	.03
6. F_AGE						1.00	.70	.26	.30	.30	.06	-.03	.12	.14	.04	-.09	-.11	-.13	-.11	.11	.08	.13
7. M_AGE							1.00	.34	.40	.46	.13	-.05	.12	.17	.03	.01	-.10	-.13	-.16	.13	.12	.14
8. INR								1.00	.44	.56	.24	-.04	.18	.13	-.04	.01	-.05	.00	-.09	.13	.16	.15
9. F_ED									1.00	.60	.16	-.09	.10	.08	.02	.11	-.07	-.01	-.16	.28	.20	.26
10. M_ED										1.00	.11	-.05	.08	.12	-.02	.06	-.13	.01	-.15	.17	.21	.14
11. EMPL											1.00	.	.	.	.	-.07	-.01	-.07	-.09	.08	.01	.03
12. SHFT												1.00	.11	-.08	.03	.04	.02	-.08	.04	.03	.05	.05
13. WKHR													1.00	.13	-.03	.01	.03	-.03	-.04	.05	.08	.06
14. JSAT														1.00	-.17	-.05	-.15	-.07	-.12	.02	.04	.07
15. JINS															1.00	.02	.05	-.02	-.01	-.08	-.10	-.03
16. F_FRES																1.00	.27	.11	.07	.07	.09	.10
17. F_FVA																	1.00	.09	.52	-.04	-.05	-.01
18. M_FRES																		1.00	.21	.01	.04	.02
19. M_FVA																			1.00	-.03	-.04	-.05
20. NDW																				1.00	.49	.67
21. ENG																					1.00	.55
22. WDMN																						1.00

1. PLS = PLS expressive language subscale
2. CSBS = CSBS total communication composite standard score
3. PA = State (PA = 1, NC = 0)
4. BIR = Birth Order (1 = First born, 0 = Not first born)
5. CCHR = Hours per week in nonparental childcare
6. F_AGE = Father age
7. M_AGE = Mother age
8. INR = Income-to-needs ratio
9. F_ED = Father level of education in years
10. M_ED = Mother level of education in years
11. EMPL = Father employment status (1 = Employed, 0 = Not employed)
12. SHFT = Father shift work (1 = Nonstandard work hours, 2 = Standard work hours)
13. WKHR = Father work hours per week
14. JSAT = Father job satisfaction
15. JINS = Father job insecurity
16. F_FRES = Father rating of father reasoning skills
17. F_FVA = Father rating of father verbal aggression
18. M_FRES = Mother rating of father reasoning skills
19. M_FVA = Mother rating of father verbal aggression

20. NDW = Father number of different word roots
21. ENG = Father engagement
22. WDMN = Father words per minute

Table 4: *Correlation matrices for race subgroups*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1. PLS	1.00	.37	.03	.06	-.00	.11	.22	.16	.34	.26	-.06	.09	.16	-.01	-.17	.11	.07	.12	.07	.06	.16	.03
2. CSBS	.29	1.00	-.15	.07	.10	-.11	-.02	.00	-.08	.07	.05	.07	.05	-.15	.01	.01	.08	.24	-.03	.18	.16	.13
3. PA	.04	.04	1.00	-.05	.13	-.06	-.12	-.11	-.05	-.10	-.16	-.06	.07	.10	.07	.16	.10	-.00	.11	-.08	.05	-.09
4. BIR	.04	.14	.04	1.00	-.05	-.08	-.19	.18	.03	-.09	-.11	.01	.12	.04	-.21	-.10	-.11	.13	-.03	.02	.08	-.06
5. CCHR	.09	.04	-.18	.22	1.00	.03	.09	.35	.16	.20	.10	-.27	.16	.01	.09	.09	-.11	.06	.04	-.05	-.20	-.13
6. F_AGE	.08	-.07	.01	-.24	.02	1.00	.58	.19	.16	.21	.03	-.07	.16	.05	.01	-.07	-.11	.16	.01	.15	.14	.23
7. M_AGE	.10	-.11	.06	-.27	.06	.73	1.00	.25	.23	.48	.14	-.06	.16	.04	-.01	.04	-.15	.12	.04	.17	.05	.07
8. INR	.12	.15	-.01	.24	.41	.26	.34	1.00	.42	.49	.38	.03	.41	.26	.01	-.15	-.23	.07	-.30	.03	.07	.07
9. F_ED	.14	.06	.09	-.07	.05	.31	.42	.40	1.00	.45	.08	.01	.32	.17	-.05	.17	-12	-.05	-.18	.18	.05	.13
10. M_ED	.21	.10	.07	.04	.18	.31	.45	.55	.60	1.00	.23	.01	.35	.02	.03	.05	-.35	.16	-.25	.13	.11	.08
11. EMPL	-.03	.02	-.13	-.09	.13	.06	.12	.20	.15	.04	1.00	.	.	.	.	-.23	-.14	-.04	-.21	.09	.01	.06
12. SHFT	-.07	.05	.01	.03	-.17	-.02	-.05	-.04	-.09	-.05	.	1.00	.14	.16	-.18	-.00	-.13	-.09	-.09	.20	.05	.12
13. WKHR	.09	.06	.02	-.07	.01	.10	.11	.15	.05	.03	.	.10	1.00	.28	-.06	.02	-.14	-.14	-.21	.13	.06	.09
14. JSAT	.06	-.04	.00	-.11	-.01	.16	.20	.10	.06	.12	.	-.13	.10	1.00	-.13	.03	-.14	-.10	-.04	.13	.00	.02
15. JINS	-.06	.02	-.09	.03	.05	.04	.04	-.04	.06	-.02	.	.08	-.02	-.18	1.00	.02	.25	-.10	.02	.00	-.00	.16
16. F_FRES	-.02	-.01	-.08	.06	-.02	-.10	-.00	.03	.10	.05	-.01	.06	.00	-.07	.02	1.00	.19	.12	.03	.06	.07	.06
17. F_FVA	-.00	.04	-.05	-.05	.00	-.12	-.09	-.02	-.06	-.08	.04	.06	.07	-.15	-.00	.30	1.00	.03	.38	-.07	-.13	.02
18. M_FRES	-.04	.10	.07	-.05	-.06	-.21	-.22	-.03	-.02	-.05	-.10	-.08	-.01	-.06	.01	.11	.11	1.00	.19	.02	.17	.09
19. M_FVA	-.07	.11	.04	.00	.02	-.14	-.20	-.04	-.15	-.12	-.03	.07	.00	-.14	-.03	.08	.56	.22	1.00	-.08	-.04	-.08
20. NDW	.12	.12	.04	.06	.04	.10	.11	.10	.26	.13	.04	.01	.02	-.01	-.09	.08	-.03	-.01	-.01	1.00	.46	.65
21. ENG	.17	.07	-.06	.00	.13	.07	.11	.13	.18	.19	-.02	.06	.07	.04	-.11	.09	-.03	-.01	-.03	.47	1.00	.43
22. WDMN	.10	.08	-.01	.04	.08	.10	.15	.17	.28	.15	.01	.04	.05	.08	-.07	.10	-.02	-.00	-.04	.68	.58	1.00

Note. Values for families with African-American fathers are emboldened in the top triangle and values for families with non-African-American fathers are in bottom triangle.

1. PLS = PLS expressive language subscale
2. CSBS = CSBS total communication composite standard score
3. PA = State (PA = 1, NC = 0)
4. BIR = Birth Order (1 = First born, 0 = Not first born)
5. CCHR = Hours per week in nonparental childcare
6. F_AGE = Father age
7. M_AGE = Mother age
8. INR = Income-to-needs ratio
9. F_ED = Father level of education in years
10. M_ED = Mother level of education in years
11. EMPL = Father employment status (1 = Employed, 0 = Not employed)
12. SHFT = Father shift work (1 = Nonstandard work hours, 2 = Standard work hours)
13. WKHR = Father work hours per week
14. JSAT = Father job satisfaction
15. JINS = Father job insecurity

16. F_FRES = Father rating of father reasoning skills
17. F_FVA = Father rating of father verbal aggression
18. M_FRES = Mother rating of father reasoning skills
19. M_FVA = Mother rating of father verbal aggression
20. NDW = Father number of different word roots
21. ENG = Father engagement
22. WDMN = Father words per minute

Table 5: *Unstandardized and standardized regression weights for path model using family SES to predict child communication and expressive language skills.*

	Communication (15 months)			Expressive Language (24 months)		
	B	SEB	β	B	SEB	β
State (PA)	1.58	1.36	.05	2.02	1.35	.07
Birth order (First born)	1.66	1.50	.05	.86	1.49	.03
Child care hours	-.02	.04	-.02	.05	.04	.06
Father age	-.06	.14	-.02	.06	.14	.02
Mother age	**-.42***	.18	-.16	.14	.18	.05
Income-to-needs ratio	**1.24***	.50	.14	-.58	.50	-.07
Father education	-.06	.40	-.01	.70	.40	.10
Mother education	.80	.42	.12	**.97***	.42	.14
Communication → Expressive language	---	**---**		**.31***	.04	.30
R^2		.06				.16

Notes: Effects above/below dashed line are direct and indirect effects, respectively; * p < .05, ** p < .01; *** p < .001.

Table 6: *Unstandardized and standardized regression weights for path model using father work experiences to predict child communication and expressive language skills.*

	Communication (15 months)			Expressive Language (24 months)		
	B	SEB	β	B	SEB	β
State (PA)	1.70	1.36	.06	1.53	1.35	.05
Birth order (First born)	1.77	1.51	.06	.88	1.50	.03
Child care hours	-.02	.04	-.02	.04	.04	.05
Father age	-.06	.14	-.02	.05	.14	.02
Mother age	**-.42***	.18	-.16	.14	.18	.05
Income-to-needs ratio	**1.08***	.53	.13	-.62	.52	-.07
Father education	.03	.39	.00	.56	.39	.08
Mother education	.81	.42	.12	**1.04***	.42	.15
Father employment	.81	2.32	.02	-1.00	2.30	-.02
Father shift	1.13	1.52	.04	-1.62	1.50	-.05
Father work hours	.07	.06	.05	.09	.06	.07
Father job satisfaction	-1.01	.92	-.06	.34	.91	.02
Father job insecurity	.48	.92	.02	**-1.78***	.91	-.09
Communication → Expressive language	---	**---**		**.31***	.04	.31
R^2			.07			.18

Notes: Effects above/below dashed line are direct and indirect effects, respectively; * p < .05, ** p < .01; *** p < .001.

Table 7: *Unstandardized and standardized regression weights for path model using father contributions to mother-father relationship to predict child communication and expressive language skills.*

	Communication (15 months)			Expressive Language (24 months)		
	B	SEB	β	B	SEB	β
State (PA)	1.27	1.36	.04	1.75	1.35	.06
Birth order (First born)	2.34	1.51	.08	.86	1.51	.03
Child care hours	-.01	.04	-.01	.05	.04	.06
Father age	-.05	.14	-.02	.05	.14	.02
Mother age	-.35	.18	-.13	.13	.18	.05
Income-to-needs ratio	.92	.52	.11	-.65	.52	-.07
Father education	.10	.40	.01	.54	.40	.08
Mother education	.80	.42	.12	**1.08***	.42	.15
Father employment	1.84	2.32	.04	-1.71	2.31	-.04
Father shift	1.47	1.51	.05	-1.49	1.51	-.05
Father work hours	.07	.06	.05	.08	.06	.07
Father job satisfaction	-.71	.92	-.04	.27	.91	.01
Father job insecurity	.44	.91	.02	**-1.92***	.91	-.09
Father rating of father reasoning	-.54	.60	-.04	-.34	.60	-.03
Father rating of verbal aggression	.45	.71	.03	1.10	.70	.08
Mother rating of father reasoning	**1.79****	.65	.12	-.51	.65	-.03
Mother rating of father verbal aggression	.42	.65	.03	-.95	.65	-.07
Communication → Expressive language	---	**---**		**.32*****	.04	.31
R^2			.09			.18

Notes: Effects above/below dashed line are direct and indirect effects, respectively; * p < .05, ** p < .01; *** p < .001.

Table 8: *Unstandardized and standardized regression weights for path model including distal factors and father-child proximal processes to predict child communication and expressive language skills.*

	Father-child proximal processes (6 months)			Child communication (15 months)			Child expressive language (24 months)		
	B	SEB	β	B	SEB	β	B	SEB	β
State (PA)	-.62	2.60	-.01	1.33	1.35	.04	1.78	1.35	.06
Birth order (First born)	4.83	2.90	.09	1.90	1.51	.06	.71	1.51	.02
Child care hours	.07	.08	.05	-.02	.04	-.02	.05	.04	.06
Father age	.29	.27	.07	-.07	.14	-.03	.04	.14	.02
Mother age	.20	.34	.04	**-.36***	.18	-.14	.12	.18	.04
Income-to-needs ratio	-.22	1.00	-.02	.95	.52	.11	-.63	.52	-.07
Father education	**3.55***	.76	.30	-.22	.40	-.03	.42	.40	.06
Mother education	-.22	.81	-.02	**.82***	.42	.12	**1.10***	.42	.15
Father employment	-1.66	4.30	-.02	2.12	2.23	.04	-3.00	2.24	-.06
Father shift	5.47	2.89	.10	.93	1.51	.03	-1.58	1.51	-.05
Father work hours	.08	.11	.04	.06	.06	.05	.08	.06	.06
Father job satisfaction	1.44	1.75	.04	-.85	.91	-.04	.24	.91	.01
Father job insecurity	**-3.46***	1.74	-.10	.78	.91	.04	**-1.84***	.91	-.09
Father rating of father reasoning	1.82	1.16	.08	-.70	.60	-.05	-.40	.60	-.03
Father rating of father verbal aggression	-.28	1.35	-.01	.48	.70	.04	1.12	.70	.08
Mother rating of father reasoning	1.56	1.25	.06	**1.65***	.65	.11	-.54	.65	-.04
Mother rating of father verbal aggression	-.18	1.25	-.01	.44	.65	.04	-.94	.65	-.07
Father-child proximal processes → Communication	--	--		**.09***	.03	.16		**--**	--
Father-child proximal processes → Expressive language	--	--			--	**--**	.03	.03	.06
Communication → Expressive language	--	--			---	**---**	**.31***	.04	.30
R^2		.15			.11				.18

Notes: Effects above/below dashed line are direct and indirect effects, respectively;
* p < .05, ** p < .01; *** p < .001.

Table 9: *Formal tests for mediation*

	z
Income-to-needs ratio → Father-child proximal processes → Communication	-.22
Father education → Father-child proximal processes → Communication	**2.46***
Mother education → Father-child proximal processes → Communication	-.27
Father employment → Father-child proximal processes → Communication	-.38
Father shift → Father-child proximal processes → Communication	1.58
Father work hours → Father-child proximal processes → Communication	.69
Father job satisfaction → Father-child proximal processes → Communication	.79
Father job insecurity → Father-child proximal processes → Communication	-1.64
Father rating/father reasoning → Father-child proximal processes → Communication	1.39
Father rating/father verbal aggression → Father-child proximal processes → Communication	-.21
Mother rating/father reasoning → Father-child proximal processes → Communication	1.14
Mother rating/father verbal aggression → Father-child proximal processes → Communication	.66
Income-to-needs ratio → Father-child proximal processes → Expressive Language	.92
Father education → Father-child proximal processes → Expressive Language	-.49
Mother education → Father-child proximal processes → Expressive Language	.94
Father employment → Father-child proximal processes → Expressive Language	.71
Father shift → Father-child proximal processes → Expressive Language	.53
Father work hours → Father-child proximal processes → Expressive Language	.72
Father job satisfaction → Father-child proximal processes → Expressive Language	.65
Father job insecurity → Father-child proximal processes → Expressive Language	-.94
Father rating/father reasoning → Father-child proximal processes → Expressive Language	-.79
Father rating/father verbal aggression → Father-child proximal processes → Expressive Language	.57
Mother rating/father reasoning → Father-child proximal processes → Expressive Language	.98
Mother rating/father verbal aggression → Father-child proximal processes → Expressive Language	.57

* p < .05

REFERENCES

Ahmeduzzaman, M., & Roopnarine, J. L. (1992). Sociodemographic factors, functioning style, social support, and fathers' involvement with preschoolers in African-American families. *Journal of Marriage and the Family, 54*, 699-707.

Aldous, J., Mulligan, G. M., & Bjarnason, T. (1998). Fathering over time: What makes the difference? *Journal of Marriage and the Family, 60*, 809-820.

Amato, P. R. (1998). More than money? Men's contributions to their children's lives. In A. Booth & A. C. Crouter (Eds.), *Men in families: When do they get involved? What difference does it make?* (pp. 241-278). Mahwah, NJ: Lawrence Erlbaum Associates.

Amato, P. R., & Gilbreth (1999). Nonresident fathers and children's well-being: A Meta-Analysis. *Journal of Marriage and the Family, 61*, 557-573.

Anderson, E. A., Kohler, J. K., & Letiecq, B. L. (2005). Predictors of depression among low-income nonresidential fathers. *Journal of Family Issues, 26*, 547-567.

Arbuckle, J. L. (1995). *Amos™ 6.0 User's Guide*. Spring House, PA: Amos Development Corporation.

Arbuckle, J. L. (1996). Full information estimation in the presence of incomplete data. In G. A. Marcoulides & R. E. Schumaker (Eds.), *Advanced structural equation modeling: Issues and Techniques* (pp. 243-277). Mahwah, NJ: Lawrence Erlbaum Associates.

Barling, J. & MacEwen, K. E. (1992). Linking work experiences to facets of marital functioning. *Journal of Organizational Behavior, 13*, 573-583.

Bates, E. (1976). *Language and context: The acquisition of pragmatics*. New York: Academic Press.

Baumwell, L., Tamis-LeMonda, C. S., & Bornstein, M. H. (1997). Maternal verbal sensitivity and child language comprehension. *Infant Behavior and Development, 20 (2)*, 247-258.

Beers, T. M. (2000). Flexible schedules and shift work: Replacing the '9-to-5' workday. *Monthly Labor Review, 123 (6)*, 33-40.

Belsky, J., Youngblade, L, Rovine, M., & Volling, B. (1991). Patterns of marital change and parent-child interaction. *Journal of Marriage and the Family, 53 (2)*, 487-498.

Black, M. M., Dubowitz, H., & Starr, R. H. (1999). African American fathers in low income, urban families: Development, behavior, and home environment of their three-year-old children. *Child Development, 70*, 967-978.

Bond, J. T., Galinsky, E., & Swanberg, J. E. (1998). *The 1997 National Study of the Changing Workforce.* New York: Families and Work Institute.

Bornstein, M. H., Haynes, M. O., & Painter, K. M. (1998). Sources of child vocabulary competence: a multivariate model. *Journal of Child Language, 25*, 367-393.

Bornstein, M. H., Leach, D. B., Haynes, O. M. (2004). Vocabulary competence in first- and secondborn siblings of the same chronological age. *Journal of Child Language, 31*, 855-873.

Bredekamp, S. & Copple, C. (Eds.). (1997). *Developmentally Appropriate Practice in Early Childhood Programs, Revised Edition*. Washington D.C.: National Association for the Education of Young Children.

Brody, G. H., Pillegrini, A. D., & Sigel, I. E. (1986). Marital quality and mother-child and father-child interactions with school-aged children. *Developmental Psychology, 22*, 291-296

Bronfenbrenner, U. (1979). Contexts of child rearing. *American Psychologist, 34*, 844-858.

Bronfenbrenner, U. (1986). The ecology of the family as a context for human development: Research perspectives. *Developmental Psychology, 22*, 723-742.

Bronfenbrenner, U., & Crouter, A. C. (1983). The evolution of environmental models in developmental research. In W. Kessen (Ed.), *History, theory, and method*s, Volume 1 of P. H. Mussen (Ed.), *Handbook of child psychology* (4th ed., pp. 357-414). New York: Wiley.

Bronfenbrenner, U., & Evans, G. W. (2000). Developmental science in the 21st century: Emerging theoretical models, research designs, and empirical findings. *Social Development, 9*, 115-125.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon (Ed. in chief) and R. M. (Vol. Ed.), *Handbook of child psychology* (pp. 993-1028). New York: Wiley.

Brooks-Gunn, J., Berlin, L., & Fuligni, A. (2000). Early childhood intervention programs: What about the family? In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd ed., pp. 549-588). Cambridge, MA: Cambridge University Press.

Bruner, J. (1981). The social context of language acquisition. *Language and Communication, 1*, 155-178.

Burgess, S. (2005). The preschool home literacy environment provided by teenage mothers. *Early Child Development, 175*, 249-258.

Cabrera, N., & Evans, V. J. (2000). Wither fathers in welfare reform. *Poverty Research News, 4*. Retrieved March 3, 2006 from http://www.jcpr.org/newsletters/vol4_no2/index.html.

Cabrera, N. J., Tamis-LeMonda, C. S., Bradley, R. H., Hofferth, S., & Lamb, M. E. (2000). Fatherhood in the Twenty-first Century. *Child Development, 71*, 127-136.

Carlson, M., & McLanahan, S. (2004). Do good partners make good parents? Relationship quality and parenting in married and unmarried families. *Fragile Families Research Brief, 29*. Retrieved March 3, 2006 from http://www.fragilefamilies.princeton.edu/briefs/ResearchBrief29.pdf.

Coley, R. L. (2001). (In)visible men: Emerging research on low-income, unmarried, and minority fathers. *American Psychologist, 56*, 743-753.

Coley, R. L., & Chase-Lansdale, P. L. (1999). Stability and change in paternal involvement among urban African American fathers. *Journal of Family Psychology, 13*, 416-435.

Coley, R. L., & Hernandez, D. C. (2006). Predictors of paternal involvement for resident and nonresident low-income fathers. *Developmental Psychology, 42*, 1041-1056.

Cox, M. J., Owen, M. T., Lewis, J. M., & Henderson, V. K. (1989). Marriage, adult adjustment, and early parenting. *Child Development, 60*, 1015-1024.

Cox, M. J., & Paley, B. (1997). Families as systems. *Annual Review of Psychology, 48*, 243-267.

Cox, M. J., Paley, B., Burchinal, M., & Payne, C. C. (1999). Marital perceptions and interactions across the transition to parenthood. *Journal of Marriage and the Family, 61*, 611-625.

Crouter, A. C., Bumpus, M. F., Head, M. R., & McHale, S. M. (2001). Implications of overwork and overload for the quality of men's family relationships. *Journal of Marriage and the Family, 63*, 404-416.

Cummings, E. M., Goeke-Morey, M. C., & Raymond, J. (2004). Fathers in family context: Effects of marital quality and marital conflict. In M. E. Lamb (Ed.), *The role of the father in child development* (4th ed., pp. 196-221). Hoboken, NJ: John Wiley & Sons, Inc.

Dearing, E., McCartney, K, & Taylor, B. A. (2001). Change in family income-to-needs matters more for children with less. *Child Development, 72*, 1779-1793.

Dickinson, D. K. & Tabors, P. O. (Eds.). (2001) *Beginning Literacy with Language*. Baltimore, MD: Paul H. Brookes.

Dickstein, S., & Parke, R. D. (1988). Social referencing in infancy: A glance at fathers and marriage. *Child Development, 59*, 506-511.

Dill, B. T. (1999). *Poverty in the rural U.S.: Implications for children, families, and communities*. Literature review prepared for The Annie E. Casey Foundation.

DK Publishing (1998). *Baby Faces*.

Doherty, W. J., Kouneski, E. F., & Erickson, M. F. (1998). Responsible fathering: An overview and conceptual framework. *Journal of Marriage and the Family, 60*, 277-292.

Dunst, C. J., Lowe, L. W., & Bartholomew, P. C. (1989). Contingent social responsiveness and infant communicative competence. *National Student Speech Language Hearing Association Journal, 17*, 39-49.

Elder, G. H., Caspi, A., & van Nguyen, T. (1986). Resourceful and vulnerable children: Family influence in hard times. In R. K. Silbereisen, K. Eyferth, & G. Rudinger (Eds.), *Development as action in context: Problem behavior and normal youth development* (pp. 167-185). New York: Springer.

Elder, J. H., Valcante, G., Yarandi, H., White, D., & Elder, T. H. (2005). Evaluating in-home training for fathers of children with autism using single-subject experimentation and group analysis methods. *Nursing Research, 54*, 22-32.

Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist, 59*, 77-92.

Feldman, S. S., Nash, S. C., & Aschenbrenner, B. G. (1983). Antecedents of fathering. *Child Development, 54*, 1628-1636.

Fernald, A. (1989). Intonation and communicative intent in mothers' speech to infants: Is the melody the message? *Child Development, 60*, 1497-1510.

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.

Furstenberg, F. F., Brooks-Gunn, J., & Chase-Lansdale, L. (1989). Teenaged pregnancy and child bearing. *American Psychologist, 44*, 313-320.

García Coll, C., Crnic, K., Lamberty, G., Wasik, B. H., Jenkins, R., García, H. V., & Pipes McAddo, H. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development, 67*, 1891-1914.

Garrett, P., Ng'andu, N., & Ferron, J. (1994). Poverty experiences of young children and the quality of their home environments. *Child Development, 65*, 331-345.

Gavin, L. E., Black, M. M., Minor, S., Abel, Y., Papas, M. A., & Bentley, M. E. (2002). Young, disadvantaged fathers' involvement with their infants; An ecological perspective. *Journal of Adolescent Health, 31*, 266-276.

Goldberg, W. A., & Easterbrooks, M. A. (1984). Role of marital quality in toddler development. *Developmental Psychology, 20*, 504-514.

Gottman, J. M. (1998). Toward a process model of men in marriages and families. In A. Booth & A. C. Crouter (Eds.), *Men in families: When do they get involved? What difference does it make?* (pp. 149-193). Mahwah, NJ: Lawrence Erlbaum Associates.

Grossman, F. K., Pollack, W. S., & Golding, E. (1988). Fathers and children: Predicting the quality and quantity of fathering. *Developmental Psychology, 24*, 82-91.

Grych, J. H. (2002). Marital relationships and parenting. In M. Bornstein (Ed.), *Handbook of Parenting. Vol. 4: Social conditions and applied parenting*. (pp. 203-225). Mahwah, N.J.: Erlbaum.

Halle, T., & Le Menestrel, S. (1999, May). How do social, economic, and cultural factors influence fathers' involvement with their children? *Child Trends Research Brief*. Retrieved March 3, 2006 from http://www.childtrends.org/Files/dadinfluence.pdf.

Hammer, C. S., & Weiss, A. L. (1999). Guiding language development: How African American mothers and their infants structure play interactions. *Journal of Speech, Language, and Hearing Research, 42*, 1219-1233.

Han, W. (2005). Maternal nonstandard work schedules and child cognitive outcomes. *Child Development, 76,* 137-154.

Hanson, T. L., McLanahan, S., & Thomson, E. (1997). Economic resources, parental practices, and children's well-being. In G. Duncan & J. Brooks-Gunn (Eds.), *Consequences of Growing Up Poor* (pp. 190-221). New York: Russell Sage Foundation.

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

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

Hoff-Ginsberg, E. (1991). Mother-child conversation in different social classes and communicative settings. *Child Development, 62*, 782-796.

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

Hoyle, R. H., & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (Ed.), *Structural Equation Modeling* (pp. 158-176). Thousand Oaks, CA: Sage Publications.

Hubbs-Tait, L., Culp, A. M., Huey, E., Culp, R., Starost, H. & Hare, C. (2002). Relation of Head Start attendance to children's cognitive and social outcomes: Moderation by family risk. *Early Childhood Research Quarterly, 17*, 539-558.

Huttenlocher, J., Haight, W., Bryk, A., Seltzer, M., & Lyons, T. (1991). Early vocabulary growth: Relation to language input and gender. *Developmental Psychology, 27,* 236-248.

Kaufman, A. S., & Kaufman, N. L. (1994). *Kaufman Functional Academic Skills Test (K-FAST)*. Circle Pines, MN: American Guidance Service.

Kavanaugh, R. D., & Jirkovsky, A. M. (1982). Parental speech to young children: A longitudinal analysis. *Merrill-Palmer Quarterly, 28*, 297-311.

Kelley, M. L., Smith, T. S., Green, A. P., Berndt, A. E., & Rogers, M. C. (1998). Importance of fathers' parenting to African-American toddler's social and cognitive development. *Infant Behavior and Development, 21*, 733-744.

Kitamura, C., & Burnham, D. (2003). Pitch and communicative intent in mother's speech: Adjustments for age and sex in the first year. *Infancy, 4*, 85-110.

Kitzmann, K. M. (2000). Effects of marital conflict on subsequent triadic family interactions and parenting. *Developmental Psychology, 36*, 3-13.

Kochanska, G., & Aksan, N. (2004). Development of mutual responsiveness between parents and their young children. *Child Development, 75*, 1657-1676.

Korenman, S., Miller, J., & Sjaastad, J. (1995). Long-term poverty and child development in the United States: Results from the NLSY. *Children and Youth Services Review, 17*, 127-155.

Krishnakumar, A., & Black, M. M. (2002). Longitudinal predictors of competence among African American children: The role of distal and proximal risk factors. *Applied Developmental Psychology, 23*, 237-266.

Lamb, M. E., & Tamis-LeMonda, C. S. (2004). The role of the father: An introduction. In M. E. Lamb (Ed.), *The role of the father in child development* (4th ed., pp. 1-31). Hoboken, NJ: John Wiley & Sons, Inc.

Leaper, C., Anderson, K. J., & Sanders, P. (1998). Moderators of gender effects on parents' talk to their children: A meta-analysis. *Developmental Psychology, 34*, 3-27.

Lindahl, K. M., Clements, M., & Markman, H. (1997). Predicting marital and parent functioning in dyads and triads: A longitudinal investigation of marital processes. *Journal of Family Psychology, 11*, 139-151.

Locke, J. L. (2001). First Communion: The emergence of vocal relationships. *Social Development, 10*, 294-308.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83-104.

Magill-Evans, J., & Harrison, M. J. (1999). Parent-child interactions and development of toddlers born preterm. *Western Journal of Nursing Research, 21*, 292-307.

Magnuson, K. A., & Duncan, G. J. (2002). Parents in Poverty. In M. H. Bornstein (Ed.), *Handbook of Parenting: Social conditions and Applied Parenting, Vol. 4.* (pp. 95-121). Mahwah, NJ: Lawrence Erlbaum Associates.

Marsiglio, W. (1991). Paternal engagement activities with minor children. *Journal of Marriage and the Family, 53*, 973-986.

Marsiglio, W., Amato, P., Day, R. D., & Lamb, M. (2000). Scholarship on fatherhood in the 1990s and beyond. *Journal of Marriage and the Family, 62*, 1173-1191.

McCartney, K. (1984). Effect of quality of day care environment on children's language development. *Developmental Psychology, 20*, 244-260.

McLoyd, V. C. (1989). Socialization and development in a changing economy: The effects of paternal job and income loss on children. *American Psychologist, 44*, 293-302.

McLoyd, V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61*, 311-346.

McLoyd, V.C. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53*, 185-204.

McLoyd, V. C., Cauce, A. M., Takeuchi, D., & Wilson, L. (2000). Marital processes and parental socialization in families of color: A decade review of research. *Journal of Marriage and the Family, 62*, 1070-1093.

McLoyd, V. C., & Enchautegui-de-Jesus, N. (2005). Work and African American family life. In V. C. McLoyd, N. E. Hill, & K. A. Dodge (Eds.), *African American family life: Ecological and cultural diversity* (pp. 135-165). New York: The Guilford Press.

McRoberts, G. W., & Best, C. T. (1997). Accommodation in mean fo during mother-infant and father infant vocal interactions: a longitudinal case study. *Journal of Child Language, 24*, 719-736.

Menaghan, E. G. (1991). Work experiences and family interaction processes: The long reach of the job. *Annual Review of Sociology, 17*, 419-444.

Miller, D., Judd, C. M., Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology, 89*, 852-863.

Miller, J. F., & Chapman, R. S. (1985). *Systematic Analysis of Language Transcripts*. Language Analysis Laboratory, Waisman Center on Mental Retardation and Human Development, University of Wisconsin-Madison: Madison, WI.

Mills-Koonce, W. R., Gariepy, J. L., Propper, C. B., Sutton, K., Calkins, S., Moore, G., & Cox, M. J. (2007). Infant and parent factors associated with early maternal sensitivity: A caregiver-attachment systems approach. *Infant Behavior and Development, 30*, 114-136.

Mills-Koonce, W. R., Propper, C. B., Gariepy, J. L., Blair, C., Garrett-Peters, P., & Cox, M. J. (2007). Bidirectional genetic and environmental influences on mother and child behavior: The family system as the unit of analyses. *Development and Psychopathology, 19*, 1073-1087.

Minuchin, P. (1985). Families and individual development: Provocations from the field of family therapy. *Child Development, 56*, 289-302.

Mowder, B. A. (1997). Typical infant development. In A. Widerstrom, B. Mowder, & S. Sandall (Eds.), *Infant development and risk* (2nd ed., pp. 25-60). Baltimore, MD: Paul Brookes.

Nelson, T. J. (2004). Low-income fathers. *Annual Review of Sociology, 30*, 427-451.

Nicely, P., Tamis-LeMonda, C. S., & Bornstein, M. H. (1999). Mothers' attuned responses to infant affect expressivity promote earlier achievement of language milestones. *Infant Behavior and Development, 22*, 557-568.

NICHD Early Child Care Research Network (2000a). The relation of child care to cognitive and language development. *Child Development, 71*, 958-978.

NICHD Early Child Care Research Network (2000b). Factors associated with fathers' caregiving activities and sensitivity with young children. *Journal of Family Psychology, 14*, 200-219.

NICHD Early Child Care Research Network (2002). Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Educational Research Journal, 39*, 133-164.

NICHD Early Child Care Research Network (2003). Does the amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development, 74*, 976-1005.

NICHD Early Child Care Research Network (2005a). Pathways to reading: The role of oral language in the transition to reading. *Developmental Psychology, 41*, 428-442.

NICHD Early Child Care Research Network. (2005b). Duration and developmental timing of poverty and children's cognitive and social development from birth through third grade. *Child Development, 76*, 795-810.

Ninio, A., & Bruner, J. (1976). The achievement and antecedents of labeling. *Journal of Child Language, 5*, 1-15.

Pan, B. A., Rowe, M. L., Singer, J. D., & Snow, C. E. (2005). Maternal correlates of growth in toddler vocabulary production in low-income families. *Child Development, 76*, 763-782.

Pancsofar, N., & Vernon-Feagans, L. (2006). Mother and father language input to young children: Contributions to later language development. *Journal of Applied Developmental Psychology, 27,* 571-587.

Pancsofar, N., Vernon-Feagans, L., Odom, E., & Roe, J. (under review). Family relationships during infancy and later mother and father vocabulary use with

young children. *Early Childhood Research Quarterly*. Manuscript submitted for publication, revise and resubmit.

Parke, R. (1995). Fathers and families. In M. Bornstein (Ed.), *Handbook of parenting, Vol. 3: Status and social conditions of parenting* (pp. 27-64). Mahwah, MJ: Lawrence Erlbaum Associates.

Parke, R. (1996). *Fatherhood*. Cambridge MA: Harvard University Press.

Perry-Jenkins, M., Goldberg, A. E., Pierce, C. P., & Sayer, A. G. (2007). Shift work, role overload, and the transition to parenthood. *Journal of Marriage and the Family, 69*, 123-138.

Power, T. G. (1985). Mother- and father-infant play: A developmental analysis. *Child Development, 56*, 1524-2524.

Power, T. G., & Parke, R. D. (1983). Patterns of mother and father play with their 8-month-old infant: A multiple analyses approach. *Infant Behavior and Development, 6*, 453-459.

Pratt, M. W., Kerig, P. K., Cowan, P. A., & Cowan, C. P. (1992). Family worlds: Couple satisfaction, parenting style, and mothers' and fathers' speech to young children. *Merrill-Palmer Quarterly, 38,* 245-262.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, 36*, 717-731.

Presser, H. B. (2000). Nonstandard work schedules and marital instability. *Journal of Marriage and the Family, 62*, 93-110.

Radin, N. (1973). Observed paternal behaviors as antecedents of intellectual functioning in young boys. *Developmental Psychology, 8*, 369-376.

Raviv, T., Kessenich, M., & Morrison, F. J. (2004). A mediational model of the association between socioeconomic status and three-year-old language abilities: The role of parenting factors. *Early Childhood Research Quarterly, 19*, 538-547.

Roggman, L. A., Boyce, L. K., Cookie, G. A., & Cook, J. (2002). Getting dads involved: Predictors of father involvement in Early Head Start and with their children. *Infant Mental Health Journal, 23*, 62-78.

Rondal, J. A. (1980). Fathers' and mothers' speech in early language development. *Journal of Child Language, 7,* 353-369.

Roopnarine, J. L. (2004). African American and African Caribbean Fathers: Level, quality and meaning of involvement. In M. E. Lamb (Ed.), *The role of the father in child development* (4th ed., pp. 58-97). Hoboken, NJ: John Wiley & Sons, Inc.

Roopnarine, J. L., Fouts, H. N., Lamb, M. E., & Lewis-Elligan, T. Y. (2005). Mothers' and fathers' behaviors toward their 3- to 4- month old infants in lower, middle, and upper socioeconomic African American families. *Developmental Psychology, 41,* 723-732.

Rowe, M. L., Coker, D., & Pan, B.A. (2004). A comparison of fathers' and mothers' talk to toddlers in low-income families. *Social Development, 13*, 278-291.

Roy, K., & Burton, L. (2007). Mothering through recruitment: Kinscription of nonresidential fathers and father figures in low-income families. *Family Relations, 56*, 24-39.

Seccombe, K. (2002). "Beating the odds" versus "changing the odds:" Poverty, resilience, and family policy. *Journal of Marriage and the Family, 64*, 384-394.

Shannon, J. D., Tamis-LeMonda, C. S., & Cabrera, N. J. (2006). Fathering in infancy: Multuality and stability between 8 and 16 months. *Parenting: Science and Practice*, 6, 167-188

Snow, C. E. (1977). Mothers' speech research: From input to interaction. In C. E. Snow & C. A. Ferguson (Eds.), *Talk to children: Language input and acquisition* (pp. 31-49). Cambridge: Cambridge University Press.

Snow, C. E., Perlman, R., & Nathan, D. (1987). Why routines are different: Toward a multiple-factors model of the relation between input and language acquisition. In K. E. Nelson & A. Van Kleek (Eds.), *Children's language* (Vol. 6, pp. 65-98). Hillsdale, NJ: Lawrence Erlbaum Associates.

Stewart, W. & Barling, J. (1996). Fathers' work experiences effect children's behaviors via job-related affect and parenting behaviors. *Journal of Organizational Behavior, 17*, 221-232.

Straus, M. A. (1990). The Conflict Tactics Scale and its critics: An evaluation and new data on validity and reliability. In M. A. Straus & R. J. Gelles (Eds.), *Physical violence in American families: Risk factors and adaptations to violence in 8,145 families* (pp. 49-73). New Brunswick, NJ: Transaction Publishing.

Summers, J. A., Boller, K., & Raikes, H. (2004). Preferences and perceptions about getting support expressed by low-income fathers. *Fathering, 2*, 5-30.

Tamis-LeMonda, C. S., Bornstein, M. H., & Baumwell, L. (2001). Maternal responsiveness and children's achievement of language milestones. *Child Development, 72*, 748-767.

Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2- and 3-year-olds: Contributions to language and cognitive development. *Child Development, 75*, 1806-1820.

Tomasello, M. (1992). The social bases of language acquisition. *Social Development, 1*, 67-87.

Turbiville, V. P., & Marquis, J. G. (2001). Father participation in early education programs. *Topics in Early Childhood Special Education, 21*, 223-231.

U.S. Department of Education, National Center for Education Statistics. (2001). *Dropout Rates in the United States: 2000*, NCES 2002-114. Washington DC: P. Kaufman, M.N. Alt, & C.D. Retrieved January 2, 2008, from http://nces.ed.gov/pubs2002/droppub_2001/

U.S. Department of Education, National Center for Education Statistics. (2005). *Postsecondary participation rates by sex and race/ethnicity: 1974-2003*. NCES 2005-028. Washington DC: P. Kaufman, M.N. Alt, & C.D. Retrieved January 2, 2008, from http://nces.ed.gov/pubs2005/2005028.pdf

Vernon-Feagans, L., Head, D., & Kainz, K. (2004). An eco-cultural perspective on early literacy: Avoiding the perils of school for non-mainstream children. In B. Wasik (Ed.), *Handbook of Family Literacy* (pp.427-448). Mahwah, NJ: Lawrence Earlbaum.

Vernon-Feagans, L., Pancsofar, N., Willoughby, M., Odom, E., Quade, A., & The Family Life Project Investigators. (2007*).* 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.* Manuscript in press.

Volling, B. L., & Belsky, J. (1991). Multiple determinants of father involvement during infancy in dual-earner and single-earner families. *Journal of Marriage and the Family, 53*, 461-474.

Votruba-Drzal, E., Coley, R. L., Chase-Lansdale, P. L. (2004). Child care and low-income children's development: Direct and moderate effects. *Child Development, 75*, 296-312.

Walker, D., Greenwood, C., Hart, B, & Carta, J. (1994). Prediction of school outcomes based on early language production and socioeconomic factors. *Child Development, 65*, 606-621.

Wallace, I. F., Roberts, J. E., & Ladder, D. E. (1998). Interactions of African American infants and their mothers: Relations with development at 1 year of age. *Journal of Speech, Language, and Hearing Research, 41*, 900-912.

Warren, S. F., Yoder, P. J., & Leew, S. V. (2001). Promoting social-communicative development in infants and toddlers. In H. Goldstein, L. A. Kaczmarek, & K. M. English (Eds.), *Promoting social communication: Children with developmental disabilities from birth to adolescence* (pp. 121-149). Baltimore, MD: Paul Brookes.

Wasik, B. A., Bond, M. A., & Hindman, A. (2006). The effects of a language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology, 98*, 63-74.

Weizman, Z. O., & Snow, C. E. (2001). Lexical input as related to children's vocabulary acquisition: Effects of sophisticated exposure and support for meaning. *Developmental Psychology, 37*, 265-279.

Wetherby, A. M., Allen, L., Cleary, J., Kublin, K., & Goldstein, H. (2002). Validity and reliability of the Communication and Symbolic Behavior Scales Developmental Profile with very young children. *Journal of Speech, Language, and Hearing Research, 45,* 1202-1218.

Wetherby, A., & Prizant, B. (2002). *Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP)*. Baltimore: Paul. H. Brookes.

White, L., & Keith, B. (1990). The effect of shift work on the quality and stability of marital relations. *Journal of Marriage and the Family, 52*, 453-462.

Whiteside-Mansell, L., Bradley, R. H., Owen, M. R., Randolph, S. M., & Cauce, A. M. (2003). Parenting and children's behavior at 36 months: Equivalence between African American and European American Mother-Child Dyads. *Parenting: Science and Practice, 3*, 197-234.

Wilson, B. J., & Gottman, J. M. (2002). Marital conflict, repair and parenting. In M. Bornstein (Ed.), *Handbook of Parenting, Vol. 4, Social conditions and applied parenting*, (pp. 227-258). Mahwah, N.J.: Erlbaum.

Woodworth, S., Belsky, J., & Crnic, K. (1996). The determinants of fathering during the child's second and third years of life: A developmental analysis. *Journal of Marriage and the Family, 58,* 679-692.

Wothke, W. (2000). Longitudinal and multigroup modeling with missing data. In T. D. Little, K. U. Schnabel, & J. Baumert (Eds.), *Modeling longitudinal and multilevel*

data: Practical issues, applied approaches, and specific examples (pp. 219-240). Mahwah, NJ: Earlbaum.

Yarrow, L. J., MacTurk, R., H., Vietze, P. M., McCarthy, M. E., Klein, R. P., & McQuiston, S. (1984). Developmental course of parental stimulation and its relationship to mastery motivation during infancy. *Developmental Psychology, 20*, 492-503

Yeung, W. J., Sandberg, J. F., Davis-Kean, P. E., & Hofferth, S. L. (2001). Children's time with fathers in intact families. *Journal of Marriage and the Family, 63*, 136-154.

Yogman, M. W., Cooley, J., & Kindlon, D. (1988). Fathers, infants and toddlers: A developing relationship. In P. Bronstein & C. P. Cowan (Eds.), *Fatherhood Today: Men's changing role in the family* (pp. 53-65). New York: John Wiley & Sons.

Yogman, M. W., Kindlon, D., & Earls, F. (1995). Father involvement and cognitive/behavioral outcomes of preterm infants. *Journal of American Academy of Child and Adolescent Psychiatry, 34*, 58-66.

Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2002). *Preschool Language Scale Fourth Edition: Examiner's Manual*. San Antonio, TX: The Psychological Corporation.