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FATHER INVOLVEMENT IN LOW-INCOME FAMILIES: EVIDENCE ON PREDICTORS OF INVOLVEMENT FROM TWO LARGE SCALE MATERNAL-CHILD HEALTH DATASETS

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Abstract

The literature on father involvement in low-income, racially diverse families has grown in recent years, but is far from complete. Continued research is needed to better understand those factors that support father involvement, which has been identified to be a key contributor to maternal and child wellbeing. This dissertation examines the utility of using existing, large-scale maternal-child health datasets to generate insights into the processes that contribute to father involvement. Two large scale maternal-child health data sets on low-income families were examined to improve our understanding of the nature of father involvement at birth and in infancy/early childhood. Multinomial logistic and logistic regression models were developed to examine predictors of father involvement at the time of birth and at 36 months after birth. Significant predictors of low levels of father involvement included: 1) a non-marital birth/unmarried parents, 2) mothers without a high school education, 3) teen pregnancy, 4) maternal poverty, 5) race (a proxy for other social risk factors) for both Black and White mothers, compared to Latino mothers, but with Black mothers having the greatest likelihood of low father involvement, 6) maternal risky lifestyle/health behaviors and maternal prenatal health risks, 7) maternal depression/antidepressant use, and 8) unintended pregnancy. These findings expand the boundaries of both the child and family studies and maternal-child health/public health literature by validating theoretical frameworks that have been proposed for the study of father involvement and by identifying maternal characteristics and behaviors that increase the risk for low father involvement. This study identifies opportunities for earlier intervention focused on risk reduction and identifies additional areas for future research. The results of this study enhance the literature on low-income,
minority fathers—an area that has been identified as neglected and in need of significant attention.
FATHER INVOLVEMENT IN LOW-INCOME FAMILIES: EVIDENCE ON PREDICTORS OF INVOLVEMENT FROM TWO LARGE SCALE MATERNAL-CHILD HEALTH DATASETS

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Dissertation
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Introduction: Purpose and Significance of the Topic

While fathers and the contributions they make to their children’s development have been examined by child and family scholars for decades, this examination has been marked by a slow evolution and is far from complete. The gaps in this knowledge base are significant and there are numerous opportunities to further advance our understanding of fatherhood and how paternal involvement or the lack thereof, impacts both children and mothers (Hawkins & Dollahite, 1997; Tamis-LeMonda & Cabrera, 2002; Lamb, 2010). Much of father scholarship and the resulting knowledge base have predominantly focused on the study of white, middle-income fathers. And, while there is a growing body of research focused on the experiences of minority and low-income fathers, there continues to be much more we need to learn (Coley, 2001; Jarret, Roy, & Burton, 2002; Tamis-LeMonda & McFadden, 2010; Lu et al., 2010; Carlson & Magnuson, 2011).

This dissertation makes a contribution toward advancing our understanding of father involvement in low-income families, by identifying factors that predict its occurrence. While the study of father involvement has not been traditionally studied within the context of maternal-child health it is increasingly thought to be of great significance and requires further examination (Kotelchuck, 2003; Alio et al., 2009; Lu et al., 2010). While the relationships and dynamics within the maternal, paternal and child triad have typically been the province of child and family scholars, public health researchers have increasingly identified these relationships as key variables in birth outcomes and maternal health. However, the evolution of academic disciplines and the way they are organized within universities has resulted in intellectual silos, marked by hyper specialization within disciplines and little cross-disciplinary collaboration (Christensen, 2008). As such, minimal collaboration between child and family scholars
and public health/medical researchers has occurred (Kotelchuck, 2003). In this regard, this dissertation expands the boundaries of child and family research, forging a perspective that incorporates both public health and child and family scholarship into an analysis and discussion of father involvement within a maternal-child health context. Further, the use of a multidisciplinary approach to understand the nature and predictors of father involvement is a key focus of this investigation.

This study extends beyond the boundaries of the existing literature, by being the first to conjointly examine two large scale maternal-child health data sets on low-income families (described in further detail in the Methods section that follows), and to do so in an investigation of father involvement at the time of birth and in early childhood. This dissertation also provides new insights into the nature of father involvement at birth and in infancy/early childhood by identifying maternal, relational, socioeconomic, and demographic predictors of father involvement that have not been examined thoroughly, or at all, in previous studies. In particular, this is the first known study to identify certain maternal characteristics, such as educational attainment, health status, health behaviors and lifestyle risks that predict low levels of father involvement. Previous research on maternal predictors of father involvement has largely been restricted to maternal attitudes and beliefs about father involvement and how they support or impede involvement—ignoring other maternal attributes that might also influence involvement. Lastly, this is also one of very few studies that examines large-scale maternal-child health datasets to generate insights into the child and family processes/outcomes that influence father involvement, and the only study to undertake this line of inquiry with these particular datasets (Alio et al., 2011; Alio et al., 2009; Kotelchuck, 2003).
These findings expand the boundaries of both the child and family studies and maternal-child health/public health literature by not only validating theoretical frameworks that have been proposed for the study of father involvement (using new sources of data and additional variables that have not been analyzed before), but by identifying early risks for low father involvement, providing greater opportunity for intervention and identifying additional areas for future research. This study also adds to the literature on low-income, minority fathers—an area that has been identified as neglected and in need of significant attention.
Literature Review

In the tradition of Doherty, Kouneski, and Erickson (1998), this review of literature is intended to be “selective rather than comprehensive… [where the] goal is one of synthesis…rather than comprehensive documentation” of a vast body of literature that covers many decades (p. 278). It is also limited to “heterosexual, biological fathers, and not gay fathers, stepfathers, adoptive fathers or father surrogates—groups deserving more research and programmatic attention” (p. 279).

**Conceptualization of Father Involvement**

While contemplating how father involvement has been conceptualized, it is important to note that the definition of fathering and the lenses used by researchers to examine it, have evolved over time—an evolution that continues today (Lamb, 2010). Marsiglio’s (1993) review of the early decades of father involvement research highlights the ambiguity and conflicting perspectives associated with efforts to examine what it means to be and to become a father. This review identified key themes that emerged from this early body of research that include: a) the meaning and changing nature of cultural/subcultural fatherhood images and ideologies, b) conceptualization and study of the nature and consequences of men’s perceptions about their identities and roles as fathers, and c) inquiry into the ways and extent to which fathers (both resident and non-resident) interact with their children and demonstrate a sense of responsibility toward them.

Another prominent theme in the fathering literature is the conceptualization of fathering as a social role (LaRossa, 1988; LaRossa, Gordon, Wilson, Barian, & Jaret, 1991; Gerson, 1997). The study of the “social role of father” as it has evolved through the 20th century is useful as it views the role of the father in light of both contemporary
and historical expectations of what it means to father. However, framing fatherhood within this evolving social role conceptualization has generated conflicting perspectives on whether contemporary fathers are succeeding or failing to live up to cultural expectations of their role (Marsiglio, 1993).

Feminist perspectives on fatherhood have examined parental behaviors within the historical themes of power and male privilege and cite patriarchy, gender roles, and gender socialization of men as issues of concern as men become fathers (Silverstein, 1996; Walters, Carter, Papp, & Silverstein, 1988). Some feminist scholarship has challenged the modern notion and meaning of fatherhood altogether, casting traditional male gender roles in a negative light and challenged the construct of fathering and the need for fathers generally, positing that what is necessary, is a “good-enough father of whatever sex” rather than a traditional male figurehead (Samuels, 1995, p. 512). Feminist informed perspectives can be helpful in understanding how gender socialization has the potential to be harmful to both men and women as they define their roles as fathers and mothers.

However, in early fathering research, the result was often a deconstruction of fatherhood that cast fathers from a pedestal and into the mud (Doherty, 1991). This resulted in fathering research that was grounded in a role-inadequacy perspective that “emphasizes fathers’ lack of adaptation to sociocultural change, their lack of involvement in caring for children, and their lack of interest in changing the status quo” (Hawkins and Dollahite, 1997, p.15). An example of research influenced by the role inadequacy perspective is found in Belsky and Volling (1987) where they ask, “Do wives essentially interest their husbands in fathering by talking about the baby, or are fathers imitating and
modeling the behavior of mothers over time?” (p. 60). Implicit in this question is the assumption that fathers do not have the same intrinsic interest in their children that mothers are presumed to innately possess. Fortunately, this role inadequacy/deficit-based perspective to the study of fathering began to give way in the 1990’s as researchers realized that simply adapting methods and theories from maternal research and applying them to fathers resulted in incomplete and inaccurate perspectives on fathering. Researchers began to more clearly identify that most fathers were indeed interested in their children and desired to be involved in their lives. However, fathers’ own perspectives on what involved fathering consists of was often imperceptible through the research methods that had traditionally been employed—ones that had originally been developed to study mothers and simply reapplied to the study of fathers (Hawkins & Dollahite, 1997; Tamis-LeMonda & Cabrera, 2002; Lamb, 2010).

Building upon decades of research, including his own pioneering work with Michael Lamb and others (Lamb, Pleck, Charnov, & Levine, 1985), Pleck (2010) presented an updated conceptualization of the construct of father involvement that is comprised of “three primary components: (a) positive engagement activities, (b) warmth and responsiveness, and (c) control. It also includes two auxiliary domains: (d) direct care and (e) process responsibility” (p. 58). Positive engagement activities refer to “interaction[s] with the child of the more intensive kind likely to promote development…[Where warmth and responsiveness, and control represent] the qualitative dimensions underlying authoritative parental style” (p. 67). “Indirect care refers to activities undertaken for the child, but not involving interaction with the child, with the exception of providing economic support” (p. 65). Process responsibility refers to the father
“taking initiative and monitoring what is needed” in the family, rather than waiting for others to identify needs and requesting that the fathers respond to them (p. 66). While Pleck’s conceptualization of father involvement is grounded in extensive research on fathers, many have noted that the vast majority of fathering research has focused on white, middle-income fathers. As a result, conceptualizations such as Pleck’s may be limited in their ability to reflect the nuances of father involvement in racially, ethnically, and economically diverse groups (Jarrett, Roy, & Burton, 2002; Townsend, 2002; Tamis-LeMonda, Kahana-Kalman, & Yoshikawa, 2009; Summers et al, 1999; Roopnarine & Hossain, 2013).

In an effort to transcend the limitations associated with conceptualizations of father involvement that are grounded in the experiences of white, middle-income fathers, Snarey (1993) and Dollahite, Hawkins, and Brotherson (1997) have developed the concept of generative fathering that is grounded in developmental theory and is intended to be relevant across culture, race, and socioeconomics. Generative fathering is that which contributes to the well-being of future generations through care as birth fathers, child rearing fathers, and cultural fathers. In contrast to much of the early fathering literature that was rooted in the “role inadequacy perspective,” the generative perspective sees fathering as crucial to the individual development of men (Hawkins & Dollahite, 1998).

Rather than defining fathering as a social role, the ethic of generative fathering divides fathering up into seven dimensions of “fatherwork,” or areas in which fathers work to benefit their children. These areas are: 1) stewardship work, 2) ethical work, 3) development work, 4) recreation work, 5) spiritual work, 6) relational work, and 8)
mentoring work. From a generative perspective, “fathers’ internal desire to care for the next generation can be a starting point for improvement rather than an end point when cultural forces have done their job” (Dollahite & Hawkins, 1998, p. 11). Philosophically, generative fathering is not only a lens for researchers, but is intended to be a challenge to fathers to create and maintain an ethical relationship with their children.

Congruent with, and grounded in, this developmental/generative approach to fathering, Palkovitz (1997) created a conceptualization of father involvement that is comprised of (a) behavioral, (b) cognitive, and (c) affective domains. The “behavioral [domain] include[es] overtly observable manifestations of involvement, such as feeding, talking to, teaching and so forth; [the] affective [domain] consist[s] of emotions, feelings, and affection; and [the] cognitive [domain] encompass[es] reasoning, planning, evaluating, and monitoring. Each domain is well articulated with numerous types of acts [that can be identified as evidence of each domain]” (Toth & Xu, 1999, p. 76). Using national-level data on Black, Latino, and White fathers, Toth and Xu (1999) were able to confirm that Palkovitz’s conceptualization of father involvement did have cross-cultural relevance. Similarly, other research with Latino fathers, including Mexican fathers who immigrated to the United States and lived apart from their children, has further validated that a developmental/generative fathering conceptualization of father involvement is relevant to the experiences of fathers from many diverse populations (Cabrera & Garcia-Coll, 2004; Taylor & Behnke, 2005).

Within the realm of child and family scholarship, most father involvement research had focused on its conceptualization, operationalization, and child/adolescent outcomes of involvement (Pleck, 2010). However, an equally important segment of the
father involvement research has focused on increasing our understanding of what factors support involved fathering and on how to effectively engage uninvolved fathers (Doherty, Kouneski, & Erickson, 1998; Cabrera, 2010). Doherty, Kouneski, and Erickson’s (1998) development of a responsible fathering conceptual framework is a seminal effort to synthesize the multiple determinants of father involvement in a manner that supports theory refinement and is relevant to both child and family and public health researchers (see Figure 1). This framework is also grounded in a developmental/generative fathering perspective and was developed to be inclusive of fathers from diverse racial, ethnic, and socioeconomic backgrounds, who may or may not reside with their children. This conceptual framework specifically focuses on those factors that create and strengthen the father-child bond, but attempts to “transcend the dyadic focus of much traditional child development theory by emphasizing first the child-father-mother triad and then the larger systems’ influences” (p. 285). The framework identifies the importance of intrafamilial relationships (between father, mother and child), but recognizes that these relationships are impacted by the following factors/influences: 1) contextual, 2) father, 2) mother, 3) child, and 4) co-parental relationship. “The center of the model is the interacting unit of child, father, and mother, each formulating meanings and enacting behaviors that influence the other. The three are embedded in a broader social context that affects them as individuals and affects the quality of their relationships” (p. 285). However, it is important to note that these intrafamilial relationships, and the social context in which they occur, are shaped and influenced by a larger ecological context that includes economic, social, psychological and other forces, which can either support or diminish their vitality (Coley, 2001).
Similar to early stages of child development scholarship when fathers were largely excluded from examination, the field of maternal-child health research (evidenced by its very name) has often ignored the contributions of fathers to the health of children and their mothers.

Figure 1: Influences on Responsible Fathering: A Conceptual Model

(Doherty, Kouneski, & Erickson, 1998)

Due to the mounting evidence of fathers’ impact on birth outcomes and the need to consider fathers, mothers, and children collectively in birth outcome research, Lu et al. (2010) have developed an ecosystemic framework to organize those factors that support or impede father involvement. It is noteworthy that these public health/medical researchers have drawn heavily from child and family research, to frame the issue of father involvement. In so doing, these researchers have inherently extended Doherty, Kouneski, and Erickson’s (1998) framework beyond its initial intention of framing the mutually influential relationships between mothers, fathers, children, and their environment to help public health/medical researchers understand that these relationships are key contributors to health behaviors and outcomes.
**Determinants of Father Involvement**

Lu et al.’s (2010) ecosystemic framework organizes the barriers to, and supports of, father involvement into the following categories: 1) intrapersonal, 2) interpersonal, 3) neighborhood and community, 4) cultural and societal, 4) policy and 5) life course (Lu et al., 2010). These categories provide some coherence to what the literature suggests are barriers to, and supports of, father involvement and frames father involvement as a multivariate phenomenon.

*Intrapersonal factors* include a father’s human capital and his attitudes and beliefs toward fathering. A father’s human capital is typically thought to include his ability to provide for his child, both economically and emotionally in a way that supports their achievement and success in society and has frequently been operationalized as the father’s level of educational attainment and employment status. While attitudes and beliefs about fathering are influenced by “familial, moral, religious, and cultural influences…Fathers with a stronger commitment to parenting and who see their role as a father as integral to their image are, not surprisingly, more involved fathers, regardless of their marital or residential status” (p. 747, Coley, 2001). Fathers with gender-equitable attitudes about parental involvement and those with a positive self-concept and self-esteem were also more likely to be involved with their children (Lu et al., 2010). In a study of minority teen parenthood in an urban community, a father’s financial insecurity or confusion on how to care for children was the strongest predictor of a stated lack of interest in fathering. In turn, stated disinterest predicted lack of involvement. Both mothers and fathers agreed that employment would help to increase father involvement (Rhein et al., 1997). Some unemployed fathers cited their inability to provide
economically for their children resulted in their loss of access to their children due to the actions of the mother or other family members. Some fathers also indicated that the shame of being unable to provide economic support had caused them to withdraw from being involved with their children. Conversely, low-income, non-residential, and minority fathers with employment and education were more likely to be involved with their children (Coley, 2001). Among non-residential fathers with child support orders; those fathers with joint custody or visitation with their children were more likely to pay child support, than those fathers who lacked such access to their children (Doherty, Kouneski, & Erickson, 1998).

Interpersonal factors are comprised of both family environments and the relationships men develop. For example, “the quality of the mother-father relationship and the fathers’ current marital and parental roles are important factors predicting paternal involvement with children by nonresidential fathers” (p. 748, Coley, 2001). The quality of the relationship between mothers and fathers, both inside and outside of marriage, is a key determinant of father involvement.

Fathers appear to withdraw from their child when they are not getting along with the mother, whereas mothers do not show a similar level of withdrawal. This is one way to understand the tendency of fathers to remove themselves from their children’s lives after a breakup with the mother, especially if they have a negative relationship with the mother…[For] most heterosexual American fathers, the family environment most supportive of fathering is a caring, committed, and collaborative marriage (p.286, Doherty, Kouneski, & Erickson, 1998).
Mothers have also been identified to exhibit certain “gatekeeping” behaviors that limit or shape the interactions fathers have with their children, strongly influencing levels of father involvement (De Luccie, 1995; Fagan, & Barnett, 2003; Gaunt, 2008). In addition to mothers, maternal grandmothers have also been identified as gatekeepers, exerting influence that supports or limits fathers’ involvement, particularly among teen fathers (Rhein et al., 1997; Krishnakumar & Black, 2003).

Neighborhood and community factors are increasingly believed to be influential on a father’s involvement with his children, particularly among African American men who reside in inner city neighborhoods plagued by high unemployment and incarceration. As mentioned earlier, unemployed fathers struggle to provide economic support for their children and may withdraw from their lives as a result. Additionally, disproportionate incarceration among African American males further reduces their future employability, their availability to their children, the number of eligible partners, and their attractiveness to mothers as mates (Lane et al., 2004; Lopo & Western, 2005; Lu et al., 2010).

Cultural and societal factors are another external influence on father involvement. Doherty, Kouneski, & Erickson (1998) concluded that while the influences of social support on father involvement are not well articulated,

fathering can be conceptualized as a more contextually sensitive process than mothering is…Undermining from…a social institution or system may induce fathers to retreat from responsible fathering unless their own individual level of commitment to fathering is quite strong (p. 287).

Given the contextually sensitive nature of father involvement, it is noteworthy that there is a growing perception of fathers as expendable, a sentiment reflected in a recent New
York Times op-ed article entitled, “Men, Who Needs Them?” (Hampikin, 2012). Black fathers are increasingly viewed as expendable, a perception “fueled by declining wages and employment…, welfare policies that favored households headed by single-mothers, and the positive portrayal of single motherhood in the media” (p. 52, Lu et al., 2010). In a study of Black mothers and fathers, the majority of mothers believed that a single mother can bring up a child as well as two parents together (Hale, 2002).

*Policies* are another external factor that can have a profound impact on fathers’ decision to be involved with their children. National and state policies on taxes, welfare receipt, health insurance and child support enforcement create circumstances where low income families may encounter financial barriers or other disincentives to father involvement. While much of the United States’ domestic social policy agenda during the 1990’s and early 2000’s was focused on encouraging father involvement and marriage promotion, many regressive social policies continue to present barriers to father involvement (Carlson, Garfinkel, McLanahan, Mincy, & Primus, 2004; McLanahan, 2009; Lu et al, 2010).

*Life course factors* refer to influences from the father’s own life and developmental experiences that inform his level of involvement with his own children. These factors may include the father’s relationship with his own father and how that relationship influences how involved he is in the lives of his own children (Doherty, Kouneski, & Erickson, 1998). It also includes the attitudes the father developed through childhood, adolescence and even young adulthood, that inform his values and behaviors with regard to sexual activity, procreation, and fathering involvement (Misra, Guyer, & Allston, 2003; Lu & Halfon, 2003; Lu et al., 2010).
Outcomes of Father Involvement

In considering the influence of father involvement, it is important that such considerations are done within a framework that accommodates both a caution and a common sense reminder by Palkovitz (2002). The caution:

Because development is multiply determined and plastic, it is somewhat hazardous to get too specific regarding relationships between patterns of paternal involvement and child development outcomes. In focusing on child outcomes we often ignore the fact that patterns of father involvement are only one factor in a large and diverse array of possible contributors to developmental outcomes…The existing database does not allow us to conclusively partial out the effects of father involvement on child outcome variables (p. 130).

The common sense reminder:

It is theoretically possible for fathers and children to hit developmental ceiling effects or saturation points where more father involvement does not yield enhanced child development but is simply redundant. In such instances, more involvement represents a drain on resources of fathers’ time and energy that may be more fruitfully invested elsewhere (p. 126).

Additionally, it is plausible that “too much” father involvement could potentially inhibit the development of autonomy and self-sufficiency in children. It is also important to acknowledge the possibility of “publication bias” in the father involvement literature (Dickerson, 1990). As will be discovered through the subsequent review of the outcomes literature, father involvement is ubiquitously associated with positive outcomes in the literature. As such, it is important to consider that due to publication bias any negative
findings associated with father involvement may not have made their way into the
published literature. So, it is through the lens of both this caution and reminder, that the
following outcomes are reviewed.

As was mentioned earlier in this dissertation, the explicit study of father
involvement and its outcomes extends over several decades and has resulted in a vast
amount of literature. As such, the goal with this summary continues to be one of
selective synthesis, rather than comprehensive documentation of the many outcomes that
have been associated with father involvement.

Cognitive Development

As children develop, their relationships with their fathers present unique
opportunities to engage in interactions that hold the potential to positively impact their
cognitive development (Dubowitz et al., 2001). For example, infants whose fathers were
involved in pregnancy related activities prenatally (e.g. attending prenatal classes), and in
caregiving activities during the perinatal, and early postnatal periods, demonstrated more
advanced cognitive development than did infants without involved fathers (Nugent,
1991). Similarly, infants with involved fathers were less likely to suffer from cognitive
delays compared to infants with less-involved fathers. Interestingly, for infants with
cognitive delays, male infants of involved fathers were more likely to achieve a reduction
in cognitive delay than were female infants (Bronte-Tinkew, Carrano, Horowitz, &
Kinukawa, 2008). As toddlers develop language, fathers, compared to mothers, have
been identified as more challenging partners for their children. In low-income families,
fathers have been observed to demand more cognitively of their children during their
conversations, using more *who, what, where, and why* types of questions and asking toddlers to clarify what they mean more often (Rowe, Coker, & Pan, 2004).

In examining academic success in children ages 5 to 12, above and beyond mother involvement, children whose fathers were involved with their education were more likely to experience academic success than those children who lacked paternal involvement. Further, father involvement also was found to mediate the relationship between contextual factors such as school, neighborhood, family-level resources and academic achievement (McBride, Schoppe-Sullivan, & Ho, 2005).

In a study of adolescents, almost sixty-percent of the children in the sample had consistent contact with their fathers across their first 8 years of life. Compared to the children who lacked such paternal involvement in their lives, these children demonstrated higher levels of academic functioning, higher reading scores and better socio-emotional functioning (Howard, Lefever, Borkowski, & Whitman, 2006). Interestingly, there appear to be gender differences in the impact that father involvement has on academic motivation in adolescents—a construct that has been linked to actual academic achievement. In a study of Latino youth, father involvement was a stronger predictor of boys’ academic motivation than it was for girls (Alfaro, Umaña-Taylor, & Bámaca, 2006).

*Emotional/Social Development*

The relationship between fathers and children has also been identified as a key factor in the child’s development of self-esteem and in the development of prosocial skills. Quality father-child interactions early in life predict secure father-child attachment and secure child-father attachment is associated with fewer childhood behavioral
problems (Cox, Owen, Henderson, & Margand, 1992; Lamb, 2002). Affectionate relationships between fathers and children are associated with reduced levels of depression and anxiety when those children mature to adulthood. However, it has also been noted that a discrepancy between fathers’ and mothers’ levels of affection (father high, mother low) actually exposes the child to greater risk of depression and anxiety later in life—pointing to an interaction effect and the importance of conceptualizing father involvement as multidimensional and within the context of other family relationships (Jorm, Dear, Rodgers, & Christensen, 2003). Other research with Mexican American families also noted that the relationship between mother and father is associated with the quality of father involvement. Father involvement, in turn, was related to lower levels of child depression or conduct problems (Formoso, Gonzales, Barrera, & Dumka, 2007).

There is also research that identifies differing perspectives on father involvement outcomes, within the same family. In families where father involvement is high, mothers are likely to hold a positive perspective on the behavior of their child. However, the involved fathers were more likely to identify problematic behavior in their children. The children of these involved fathers, however, were more likely to report feelings of paternal acceptance, a factor that plays a central role in children’s development of a positive self-concept and self-esteem (Culp, Schadle, Robinson, & Culp, 2000). In a study of both African American and White six year-old children, the presence of a supportive father was associated with children having a greater perceived competence of themselves, a greater level of social competence and fewer depressive symptoms (Dubowitz et al., 2001).
The impact of father involvement has also been identified as influencing adolescent development. Adolescents who report secure attachments with their fathers are likely to report less conflict with their peers and to demonstrate the prosocial skills necessary to develop and navigate peer relationships (Ducharme, Doyle, & Markiewicz, 2002). Conversely, a poor affective relationship between mothers/fathers and their child have been found to put adolescents at a social disadvantage, as they demonstrate poor behavior and lack the skills needed to develop prosocial peer relationships (Paley, Conger, & Harold, 2000). Additionally, in research that looked at both maternal and paternal influences on adolescent behavior, mothers were identified as being more knowledgeable about their children’s friendships than fathers, but in instances where mothers exhibited a lack of maternal monitoring/behavior control, teens were more likely to engage in antisocial behavior. Whereas, supportive fathering was associated with the exhibition of prosocial behavior by adolescents (Stolz, Barber, & Olsen, 2005; Updegraff, McHale, Crouter, & Kupanoff, 2001). Father involvement during childhood has been shown to be a protective factor for adolescents in non-intact families, reducing the likelihood of psychological maladjustment. Further, father involvement during adolescence protects against the development of psychological distress for adult women (Flouri & Buchanan, 2003). The influences of father involvement during adolescence also shape boys’ views on divorce, causing them to state that they were less likely to divorce later in life when surveyed at age 19 (Risch, Jodl, & Eccles, 2004).

Maternal and Child Health

Although less widely studied, the relationships that fathers have with their children and with the mother of their children, have been identified as an important
influence on the physical and mental health and wellbeing of both children and mothers (Kiecolt-Glaser & Newton, 2001; Chang, Halpern, & Kauffman, 2007; Lu et al., 2010; Masho, Chapman, & Ashby, 2010; Weisz et al, 2011; Krishnakumar et al., 2011). In the field of maternal-child health research, however, fathers have historically been excluded from the examination of the factors that contribute to maternal-child health. This shortcoming was noted in a critique of the life span model/approach applied to the study of disparities in birth outcomes, by a prominent scholar in the maternal-child health field:

Where do men fit into a reproductive health life-span model? Men are not mentioned sufficiently in the current model. It is explicitly a ‘women’s health’ oriented model. Yet men play key reproductive roles—in genetics, in social support, in access to care, and in community contexts…[men] too have a longitudinal life course which impacts them and their own contributions to reproduction. Issues like male violence, education/job attainment, smoking behavior, and sexually transmitted diseases all impact on reproductive health. Men’s empirical contribution (longitudinally) to reproductive health needs further attention” (Kotelchuck, 2003, p. 8).

Similarly, as the field of child and family studies has evolved, it too has had to struggle with either the complete omission or stereotypes of fathers in child development and parenting research (Coley, 2001; Tamis-LeMonda & Cabrera, 2002).

While the study of father involvement and fathers’ contributions to their children’s psychosocial development has received considerable attention from child and family scholars, the contributions fathers make to birth outcomes and to maternal health has received far less examination (Alio et al., 2009; Lamb, 2010; Lu et al., 2010). There
is, however, an emerging body of literature that has begun to examine the impact fathers have on the health of their children at birth and the health of their mothers around the time of pregnancy and birth. Alio et al.’s (2009) review of the literature on paternal involvement during the perinatal period and its impact on birth outcomes and maternal health confirmed that there is a paucity of data in this area, but that paternal involvement has important implications. Their review indicates that paternal involvement positively influences “prenatal care usage, abstinence from alcohol and smoking [maternal], and a reduction in low birth weight and small for gestational age infants” (p. 931).

Examining vital records data, Alio et al. (2011) defined parental involvement based on whether or not a father was identified on the child’s birth certificate. They found that compared to non-Hispanic white women, black women with involved fathers had a two-fold increase in infant mortality, while black women with uninvolved fathers had a seven-fold increase in infant mortality. They estimated that lack of paternal involvement widens the black-white gap in infant mortality four-fold and that increased paternal involvement could result in a 65 to 75% reduction in excess mortality.

Similarly, Masho, Chapman, and Ashby (2010) found that unmarried women with no paternity status registered on the birth certificate, were more likely to give birth to preterm low birth weight and term low birth weight infants.

In birth outcomes research, marital status has been identified as a marker for the presence or absence of social, emotional and financial resources, and has been widely identified as an important predictor of birth outcomes and child health (Feldman, Dunkel-Schetter, Sandman, & Wadhwa, 2000; Raatikainen, Heiskanen, & Heinonen, 2005; McNamara, Orav, Wilkins-Haug, Chang, 2006; Masho, Chapman, & Ashby, 2010;
Schmeer, 2011). In 2008, infants of unmarried mothers had an infant mortality rate of 8.87 - 75% higher than the rate for infants of married mothers (5.06) (Mathews & MacDorman, 2012).

There are, however, also protective factors associated with involved, unwed fathers. Infants born to unwed parents where the fathers provided financial support to mothers were less likely to suffer from low birth weight. Further, the incidence of low birth weight among infants born to cohabiting parents was less than for infants born to unwed parents who were not cohabiting (Padilla & Reichman, 2001). However, children born to cohabiting parents tend to experience poorer health overall when compared to those born to married parents (Schmeer, 2011). In their assessment of the impact of family structure on birth outcomes, Albrecht, Miller, and Clarke (1994) found that living with the birth father of the infant offers strong protective factors for Latinos, including an increased likelihood of receiving adequate prenatal care, which (in their study) was the strongest predictor of adequate birth weight and lower risk for infant mortality.

Fathers can also indirectly impact the health of their children through their relationship with the mother. For example, when fathers participate in breastfeeding education with the mother, she is much more likely to initiate breastfeeding than a mother whose partner does not participate in the education (Wolfberg et al., 2004).

Comparing birth outcomes between babies born to fathers who were natives of the United States to those of fathers born outside of the United States, Krishnakumar et al. (2011) found that the children of foreign-born fathers had comparatively better birth outcomes. After controlling for other variables, foreign-born fathers had 15% fewer low-
birth children than those fathers born in the United States, suggesting that fathers do make important contributions to the health of their infants.

The benefit of father involvement and stability of the relationship between mother and father extends to children’s health beyond their first year of life. Children living with both biological parents are less likely to suffer from a burn, a bad fall, or be scarred from an accident than children in other household arrangements (O’Connor, Davies, Dunn, & Golding, 2000). Similarly, children who live apart from their fathers are much more likely to be diagnosed with asthma, than children who remain with both parents (Harknett, 2009). Children living in father absent homes are also more likely to be obese than children who live with both parents (Strauss & Knight, 1999). Additionally, the obesity of fathers strongly predicts obesity in their sons and daughters (Burke, Beilin, & Dunbar, 2001).

The health of mothers also appears to benefit when the father is involved, as Meadows, McLanahan, & Brooks-Gunn (2008) found that the physical and mental health of continuously married mothers is superior to the health of unmarried mothers one year after the birth of her child. Further, those mothers who experienced a disruption in the relationship with the father, experienced worse physical and mental health outcomes than those who remained in a stable relationship.

*Shortcomings in the Literature*

While both child and family and public health/medical scholars have examined father involvement from different perspectives, the resulting bodies of literature are far from complete. Individually and collectively, the bodies of literature from each discipline present both strengths and weaknesses. From child and family scholars, we
benefit from many decades of research that has significantly enhanced our understanding of fathers and provided insights into the factors that predict father involvement as well as a clearer understanding of the outcomes associated with that involvement. However, much of fathering research has focused on the experiences of middle-income white families and the resulting body of research, along with its methodologies and theories, are inappropriate for the study of low-income minority fathers. In spite of their inappropriateness, these methods and theories were initially used to study low-income minority fathers, resulting in stereotypes and the misrepresentation of their experiences and those of their families (Coley, 2001; Tamis-Lemonda & McFadden, 2010).

Within the public health/medical literature, an interest in father involvement is rather recent. As such, the body of literature on father involvement within this discipline is small and growing (Kotelchuck, 2003; Lu et al., 2010). In particular, the greatest emphasis on father involvement within the public health/medical literature is centered on birth outcomes. Given the protective benefits associated with father involvement for maternal-child health, it is essential that efforts to improve birth outcomes be grounded in an understanding of those factors that promote paternal involvement. While the concept of father involvement is certainly more complex than whether or not a father is married to the child’s mother or listed on the child’s birth certificate, vital records and perinatal data do not typically contain measures of father involvement. As such, marital status and the father’s name appearing on a birth certificate are the best proxy variables available to researchers working with these types of data. In spite of limited data and measures of father involvement in public health data sources, public health and medical researchers are beginning to explore and incorporate perspectives from other fields such as
psychology, sociology and demography to better articulate the factors that influence a father’s involvement with his children and their mother (Lu et al, 2010).

The public health/medical research on birth outcomes, particularly that which includes a focus on father involvement, has primarily focused on reducing the racial and ethnic disparities in birth outcomes. However, much progress remains to be made. As mentioned earlier in this dissertation, infant mortality and low birth weight are issues that have implications that cut across many scientific disciplines. In spite of this fact, with very few exceptions have disciplines beyond public health and medicine made an observable effort to provide additional perspectives on this important issue. As such, the literature on racial disparities in birth outcomes isn’t as diverse as it could or should be. Particularly absent are contributions by child and family scholars. The efforts of public health and medical researchers have provided a significant foundation upon which other researchers from other disciplines can continue to help build. What remains is for more researchers and scholars from diverse disciplines to join the discourse. Prominent maternal and child health researchers are eager for this type of collaboration to occur and welcome the contributions that scholars from fields such as child and family studies might make (Kotelchuck, 2003).

A striking weakness in the public health/medical literature is the lack of information on family processes and the role they play in disparities in birth outcomes. As mentioned above, much of the research and intervention in this area “de-emphasizes the role of the mother, father, [and the] family…in fostering [and enhancing] a positive pregnancy process” (Alexander & Korenbrot, 1995. p. 113). For example, in their assessment of the impact of family structure on birth outcomes, Albrecht, Miller, and
Clarke (1994) found that living with the birth father of the infant offers strong protective factors for Latinos, but were unable to identify similar benefits for black and white infants. However, they hypothesize that these benefits do likely exist for black and white infants, but that the large secondary data sets they (and most other researchers) utilized lack sufficiently rich measures of family structure that allow them to detect such benefits. Given that research beyond the domain of birth outcomes has clearly established a link between family formation, structure, and functioning and child development, it will be important for future research to begin addressing this critical gap in the literature (Amato, 2005; Lu & Halfon, 2003; Lu et al., 2010).

Research Questions and Hypotheses

As described in the review of literature above, Doherty, Kouneski, and Erickson (1998) developed a conceptual framework that is grounded in a methodical review of the father involvement literature. In this conceptual framework, they posit that father involvement is influenced by the nature of the relationships that exist between a father, mother, and child, their individual characteristics and other external contextual factors. While the triadic relationship (mother, father, child) is at the center of their framework, it is important to remember that this framework is couched within an ecosystemic perspective that fully acknowledges that factors external to the triadic relationship (e.g., neighborhoods, communities, culture, racism, policy) can exert significant influence on the functioning of the triad. While their conceptual framework defines responsible/involved fathering and organized relevant research within a systemic/ecological framework, they did not also empirically validate the model using a relevant dataset—but challenged other researchers to build upon the foundation of their
There are no known instances in the literature where attempts to validate the model have been made (by Doherty, Kouneski, and Erickson or others), especially using large scale maternal-child health datasets. This study is unique as it utilized two large-scale maternal-child health datasets in an attempt to partially validate this conceptual framework by exploring whether maternal-child health data can be useful for identifying maternal, child, relational and sociodemographic characteristics that may be predictive of father involvement. To that end, this study tests two sets of hypotheses that examine father involvement at the time of birth and at 36 months following birth—one for each of the datasets. Congruent with the literature review provided above, it is hypothesized that the quality/stability of the relationship between the mother and father will have the greatest influence on a father’s involvement with his child, but that social disadvantage or risk will also weigh strongly on whether or not the father is involved.

**Hypotheses for CDC Dataset:** As described in the literature review above, race is often used as a proxy variable to analyze differences in social risk and is often associated with disparities in health and developmental outcomes. As such, it is hypothesized that there is a relationship between maternal race and key sociodemographic (e.g. marital status, poverty, teen pregnancy, less than a high school education), maternal prenatal physical and mental health, and maternal lifestyle/health behavior variables. As described in the Methods section that follows, analysis of variance (ANOVA) and chi-square test will be used to examine the relationship between maternal race and these variables. It is also hypothesized that Black and Latino mothers (due to greater social risk) will be at greater risk for poor outcomes on these same sociodemographic, health and health behavior variables. Lastly, it is hypothesized that maternal
sociodemographics, maternal prenatal physical and mental health, maternal lifestyle/health behaviors will predict father involvement at child birth and that Black mothers (due to greater social risk) will be at greatest risk of low father involvement. As is also described in the Methods section in greater detail, multinomial logistic regression models will be used to evaluate these variables and determine whether they predict different levels of father involvement (low, medium or high).

**Hypotheses for EHS Dataset:** Congruent with the hypotheses for the CDC dataset, it is hypothesized that there is a relationship between maternal race and key sociodemographic (e.g. marital status, poverty, teen pregnancy, less than a high school education), maternal prenatal physical and mental health, and maternal lifestyle/health behavior variables. As described in the Methods section that follows, analysis of variance (ANOVA) and chi-square test will be used to examine the relationship between maternal race and these variables. It is also hypothesized that Black mothers (due to greater social risk) will be at greater risk for poor outcomes on these same sociodemographic, health and health behavior variables. Lastly, it is hypothesized that maternal sociodemographics, maternal prenatal physical and mental health, maternal lifestyle/health behaviors will predict father involvement at child birth and that Black and Latino mothers will be at greater risk of low father involvement. Maternal sociodemographics (e.g. marital status, poverty, teen pregnancy, less than a high school education) and child physical health at birth; maternal physical and mental health, family emotional environment (maternal emotional responsivity and family conflict), child physical health and outcomes at 14 months predict father involvement at 36 months. As is also described in the Methods section in greater detail, logistic regression models will
be used to evaluate these variables and determine whether they predict different levels of father involvement (involved or uninvolved).
Theoretical Framework

As this dissertation attempts to integrate knowledge from both child and family and public health/medical scholarship, it will be important to ground my research within an ecological framework that can: 1) accommodate and integrate disparate epistemological approaches from multiple disciplines; 2) frame development as an interactive, individualized and systemic process that is influenced by individual, relational, and environmental factors; and 3) conceptualize how health processes such as maternal health behaviors and birth outcomes can be impacted by relational factors such as father involvement. To this end, I will utilize an ecological framework that incorporates tenets from both developmental/life-course theory and the biopsychosocial model.

Ecological/Ecosocial Perspective

The application of an ecological perspective to the study of family and health processes dates back to the late part of the 19th century. However, amongst social epidemiologists the perspective fell out of favor in the 1940s, but gained popularity again in the 1990s. Amongst child and family scholars, the perspective grew in popularity in the 1960s as scholars became increasingly aware of the interdependence between human activity and the quality of the environment (Bubolz & Sontag, 1993; Macintyre & Ellaway, 2000).

As a result, child and family researchers have frequently utilized an ecological approach to gain understanding into how individuals, families, and the human-built, social-cultural, and natural physical-biological environments mutually influence one another—particularly in the areas of child and family development (Bubolz & Sontag,
Similarly, social epidemiologists have utilized the same perspective, but with an emphasis on understanding how these patterns of mutual influence—particularly social influences—are manifest in health outcomes (Macintyre & Ellaway, 2000). Emmons (2000) indicated that the study of health status is enhanced by use of an “ecological framework [because it] recognizes that behavior is affected by multiple levels of influence, including intrapersonal factors, interpersonal processes, institutional factors, and public policy” (p. 251). Other social epidemiologists argue that the contemporaneous use of an ecological perspective is very important, as it helps to “account for humans’ habits, modes of life, and relationships to their surroundings….There is much important work to be done to explore the potential influence of the physical and social environment on human health or health behaviors” (p. 333, Macintyre & Ellaway, 2000).

For example, in the study of risk behaviors, social epidemiologists recognize that “health behaviors displayed by individuals cannot be understood without taking into account the characteristics of, and processes occurring at, the levels of both the immediate and broader environment” (p. 336, Macintyre & Ellaway, 2000). This perspective is evident when maternal child health researchers have examined maternal risk taking behavior. They have discovered that the presence of social stressors play a powerful role in maintaining risky behaviors. The risk behavior often provides stress relief and may be reinforced through social relationships that develop in conjunction with the behavior (Emmons, 2000). Similarly, researchers have also identified the nature of the relationship between a mother and father can also influence maternal risk-taking and influence maternal health status (Kiecolt-Glaser & Newton, 2001; Meadows, McLanahan, & Brooks-Gunn, 2008).
Developmental/Life-Course Perspective

The use of a developmental stage perspective, with a focus on critical periods, has occurred frequently in maternal child health research (Kotelchuck, 2003). However, this perspective has gradually given way to the life-course perspective which “holds that health status at any given age reflects not only contemporary conditions but prior living circumstances, in utero onwards” (Krieger, 2001, p. 670). Thus, the life-course perspective is essentially the developmental stage perspective, but from a longitudinal point of view. As such, the life-course perspective does not diminish the importance of understanding risk at critical periods in development, but emphasizes the need to understand the impact of cumulative effect of risk across all developmental stages, for mothers, fathers, and children—from womb to tomb.

For example, rather than focusing only on risk factors for poor birth outcomes during pregnancy, Lu and Halfon (2003) and Lu et al. (2010) urge researchers to shift their focus toward addressing the risks facing young Black girls and boys in infancy, childhood and adolescence, as these risks appear to have the potential to influence their reproductive potential. They suggest that disparities in birth outcomes are a result of developmental trajectories, for both mothers and fathers, which have been set in motion by experiences early in life and the cumulative effects of stress across life. As a result, future research on racial disparities in birth outcomes needs to examine differential exposures to risk and protective factors not only during pregnancy, but over the life course of women [and men]. Eliminating disparities requires interventions and policy development that are
more longitudinally and contextually integrated than currently prevail (p.13, Lu & Halfon, 2003).

The use of a developmental/life course perspective within the public health/medical perspective is congruent and complementary to the way this perspective has been used to study fatherhood by child and family scholars. As such, it provides an interesting intersection of thought that can provide a link between child and family and public health/medical disciplines (Dollahite, Hawkins, & Brotherson, 1997; Palkovitz, 1997). Not only does this theoretical perspective offer a strengths-based approach to fathering, but it is also an appropriate lens for examining low-income minority fathers (Toth & Xu, 1999).

Biopsychosocial Model

Given the need to understand the potential influence that the relationship between a mother and father can have on child health, it is first necessary to contemplate the systemic linkages between the mother, father, and child, while it develops in utero, at birth, and throughout infancy and childhood. The biopsychosocial model offers researchers a useful framework for gaining insight into the health outcomes associated with the interactions between mother, father and child, as well as the influence of other external influences. The biopsychosocial model first gained attention in 1977 when it was presented to physicians as an alternative to the traditional biomedical model (Engel, 1977).

The biomedical model holds that the mind and body are separate from one another, existing alongside one another without mutual influence. The biomedical understanding/diagnosis of illness and disease is reached through reductionist techniques,
starting with the observation of “symptoms, to clusters of symptoms, to syndromes, and finally to diseases with specific pathogenesis and pathology” (p. 131). While recognizing the great advances in medicine that resulted from the use of the biomedical model, Engel (1977) contended that the biomedical model failed to fully explain illness and disease. For example, the biomedical model failed to adequately explain the genesis and progression of mental illness. Nor did it explain why individuals with the same illness would often respond differently from one another. Furthermore, the biomedical model failed to explain how influences in the external environment of the patient, or the patient’s state of mind, would often appear to influence the course of the illness (1977; Engel, 1980). The biopsychosocial model seeks to understand the patient in context, as a part of a larger complex biosphere where the patient’s internal systems are engaged in a mutually influential interaction with systems external to the patient. Perhaps directly, or through a biological or environmental intermediary, the body influences the mind, and the mind influences the body (Engel, 1977 & 1980).

Within an ecological framework that incorporates a life course perspective, the biopsychosocial model is helpful in understanding how the affective experience of a mother— Influenced by her relationship with the father—has the potential to influence the fetal development of her child. Maternal stress and anxiety has been associated with a number of biological processes that in turn have the potential to influence in utero development (e.g. reduced immune status, appetite disturbance, reductions and increases in hormones required for growth) (Hoffman & Hatch, 2000). For example, mothers of lower socioeconomic status (SES) who experienced depression during pregnancy were found to give birth to babies with retarded fetal growth. However, babies born to higher
SES mothers who also experienced depression during pregnancy, did not suffer from retarded fetal growth (Hoffman & Hatch, 2000). Thus, we observe that the maternal mental status has the potential to influence fetal development. However, this relationship appears to be moderated by SES and biological processes, the relationship with the father, and other internal and external factors. Other research highlights the impact of depression on black mothers of lower SES. These mothers were much more likely than their White counterparts to be at risk for low social support and preterm birth (Orr, James, & Prince, 2002; Ritter, Hobfoll, Lavin, Cameron, & Hulsizer, 2000). Yet, we also observe that when mothers and fathers live together, mothers are more likely to report fewer mental health problems, such as depression (Meadows, McLanahan, & Brooks-Gunn, 2008). While extant research fails to fully explain the impact that marital/couple relational functioning has on the health of expectant mothers and their children, the utilization of a biopsychosocial perspective along with other research on family formation and health, holds promise for generating insights into these complex and interdependent processes.
Methods

This study aims to explore the nature of father involvement at birth and in infancy/early childhood using two large scale maternal-child health datasets – Dataset #1: CDC dataset (Weisz, et al., 2011) and Dataset #2: Early Head Start Research and Evaluation Study (United States Department of Health and Human Services, Administration for Children and Families [DHHS/ACF], 2011).

Dataset #1: CDC Dataset

The origins of the CDC dataset can be traced to a decades-long effort to reduce racial disparities in birth outcomes in Syracuse, New York. A key figure and leader in this effort is Dr. Sandra Lane. Her efforts to reduce racial disparities were bolstered by rigorous data collection and program evaluation to assess the effectiveness of the varied interventions that were focused on reducing these disparities. A full account of the history of this ongoing effort and its significant impact can be found in “Why Are Our Babies Dying? Pregnancy, Birth, and Death in America” (Lane, 2008). One of many contributions made by Dr. Lane and her colleagues relates to how race is conceptualized in health disparities research.

Using race as a risk factor, moreover, potentially leads to thinking that blames the victim or presents a category of persons as being the problem. Risk factors, we decided at Syracuse Healthy Start, would be limited to those social, behavioral, or environmental phenomena for which a public health intervention can be fashioned. The level of risk may vary among groups, but all groups include individuals with risks. We addressed those social, behavioral, or environmental risks—and not the person’s ancestry (Lane, 2008, p.76).
As described in Weisz, et al. (2011), the CDC dataset is an amalgamation of linked perinatal and birth data, generated for each live birth (n=2,909 mothers) at the major birth hospital in Syracuse, New York between January 2000 and March 2002. In Syracuse, “nearly 43% of...children <5 years of age live in poverty; the poverty rate for African-American children (57%) is more than double that for white children (27%). Syracuse has New York’s third highest child poverty level…and the second highest Latino child poverty rate in the United States (Lane, et al., 2008).” The CDC dataset includes information that was derived from a dataset developed for the evaluation of Syracuse Healthy Start program, an infant mortality prevention project funded by the US Department of Health and Human Service’s Health Resources and Services Administration. The Syracuse Healthy Start Program utilizes health education, community outreach, and case management services to address the following issues: smoking, perinatal substance abuse, breastfeeding, SIDS reduction, cultural competence of providers, depression, reproductive infection, and domestic violence (Lane, et al., 2001). Variables in the dataset were drawn from 1) a retrospective review of prenatal and hospital delivery medical charts for all women who lived in the nine zip codes in the City of Syracuse, and 2) the Perinatal Data System (PDS) “The PDS is a de-identified population-based birth registry that captures pregnancy and birth information and additional quality improvement data items for use by maternal and child health administrators, planners, and evaluators” (Weisz, et al., 2011, p. 873).

Prenatal and hospital charts were reviewed for all women who lived in nine zip codes [in] the City of Syracuse…One abstraction form was generated for each infant. Prenatal charts were reviewed in out-patient settings, including publicly-
funded clinics, high risk referral clinics, and private offices. If a private provider did not grant access to that office’s prenatal charts, the review was performed on the prenatal summary transmitted to the hospital for delivery (30% of prenatal charts). The prenatal data contained in the hospital delivery charts included all of the variables considered in this study; therefore, the 30% of prenatal charts that were denied review at the prenatal clinical sites did not affect access to the data. Only prenatal care visits in which some kind of screening test occurred were abstracted. Items abstracted from the prenatal chart included reproductive infection screening tests performed, symptoms, conditions, and treatments. Inpatient charts were reviewed at the delivery hospital, and items abstracted included symptoms, conditions, and treatments during the delivery hospitalization, as well as peri-natal, post-natal, and post-partum outcomes. Chart reviewers, blind to the purpose of the review, were recruited from among the major delivery hospital’s obstetrical nursing and para-professional clinical staff, who attended two three-hour training sessions prior to reviewing charts independently. Prenatal chart reviewers were blind to birth outcomes and inpatient chart reviewers were blind to prenatal conditions. All charts were abstracted onto a scannable form…to facilitate data entry. (Weisz, et al., 2011, p. 873-874)

Sample Characteristics

The initial sample for this investigation included 2,909 mothers (38.2% White, 47% Black, 6.9% Latino, and 7.9% other racial and ethnic groups). Two hundred and twenty nine mothers belonging to other racial/ethnic groups (predominantly different
Asian groups) were excluded from the study because of the inability to meaningfully include these groups within the analyses (given their small sample sizes) and because of the differences in the historical and ecological contexts that shape the life events of members of each of these different ethnic/racial groups. Hence, the final sample consisted of 2,569 mothers (38.5% White, 47.4% Black and 14.1% Latino). Information on the following constructs was extracted from the CDC dataset.

**Measures**

**Maternal Sociodemographics**

This construct was assessed using the following 5 variables: 1) maternal age (mom_age), 2) mother’s years of education (mom_educ), and 3) poverty—a newly constructed variable that was based on whether the mother received Assistance to Families with Dependent Children (AFDC) (afdc_mom), whether Medicaid was the primary payer for the birth (medicaid), or whether the mother received Women Infant and Children (WIC) benefits (wic_momp); 4) marital status (maristat).

Father variables included age, race and years of education. However, data was only readily available for those who were married or signed a paternity declaration.

**Maternal Lifestyle/Health Behaviors**

This construct was assessed using the following items: 1) positive urine drug screen for illegal drugs (pnurdrg) (1 = yes, 0 = no), 2) smoking at time of first prenatal care visit (pnsmok) (1 = yes, 0 = no), and 3) alcohol consumption during pregnancy (drink) (1 = yes, 0 = no). A maternal lifestyle/health behaviors risk score was created based on these variables, where 0 = no lifestyle/health behaviors risks were present and 1= one or more of the risks were present.
**Maternal Prenatal Physical Health**

This construct was assessed using the following items: 1) mother diagnosed with Chlamydia (CTorNot) (1 = yes, 0 = no), 2) mother was re-infected with chlamydia following initial treatment (CTPosMulti) (1 = yes, 0 = no), 3) mother experienced a prenatal trauma that required medical attention (e.g. an assault) (pntraum) (1 = yes, 0 = no), and 4) mother reported to her health care provider that she was a victim of domestic violence (pndomvio) (1 = yes, 0 = no). A maternal prenatal physical health risk score was created based on these variables, where 0= no physical health risks were present and 1 = any one of the risks were present.

**Maternal Prenatal Mental Health**

This construct was assessed using the following items: 1) prenatal antidepressant use (pnadepr) (1=yes, 0 = no) and 2) intendedness of pregnancy (whether or not the pregnancy was planned) (preg_pla) (1=yes, 0 = no). While intendedness of pregnancy in and of itself is not a valid measure of mental health, those mothers who did not want to be pregnant at all (vs. becoming pregnant sooner or later than was desired) are significantly at-risk of experiencing feelings of hopelessness or of feeling overwhelmed (Bouchard, 2005; Leathers & Kelley, 2000; Claridge &Fisch, 2008). It is important to note that while women who do not want to pregnant at all—but become pregnant—are at significant risk for poor mental health. It should not be inferred that these women do not subsequently love their children or bond with them.

**Child Physical Health (at Birth)**

This construct was assessed using the following items: 1) preterm delivery (preterm_delivery) (less than 37 weeks; 1= yes, 0 = no), 2) birth weight (dbirthwt) (1=...
low, normal =0), and 3) the presence of a congenital anomaly or abnormality at birth (anomaly) (presence or absence of any one of 29 different congenital anomalies or abnormalities captured in the CDC dataset (cleft-li, club_foo, cong_pn, cong_rub, enceph_c, fetal_et, heart_co, hydrocep, hydronep, limb_red, mecon_as, metabol_, microcap, neur_tub, omphal_c, oth_chro, oth_circ, oth_cns, oth_gast, oth_musk, oth_uro, other_ab, other_co, polydact, rect_con, renal_co, sing_umb, trach_es, trisom_2) (1 = yes, 0 = no). A child physical health score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.

With regard to the inclusion of a variable measuring the presence of anomalies or abnormalities at birth, is important to note that increasingly fewer babies are carried to term when amniocentesis results indicate the presence of an anomaly or abnormality. As such, this variable likely undercounts the actual prevalence of fetal anomalies or abnormalities in the population (S. Lane, personal communication, September 15, 2013).
Father Involvement (at Birth)

Information about father involvement is assessed based on two items: 1) marital status (maristat) and 2) paternity declaration (dadpaternity). Using these two variables, a father involvement variable was created (dadintensity). The three possible values for this new father involvement variable were developed as follows. The value of 1 was assigned when the biological parents were not married to each other and no paternity declaration was made within 48 after birth/prior to hospital discharge. A value of 2 was assigned when the biological parents were not married but the father signed a paternity declaration prior to hospital discharge. A value of 3 was assigned when the biological parents of the child were married.

While the measurement of father involvement through a proxy variable that is based upon marital status and paternity declaration is not a perfect measure of father involvement, this approach is congruent with published literature where the same method was used to measure father involvement using birth certificate data (Alio et al., 2009; Alio et al., 2011). Paternity declaration can still occur after the mother and child have left the hospital and is sometimes established via compulsory means (e.g., court ordered) and would appear in birth certificate derived data. However, given that the paternity declarations included in this dataset occurred within the 48 hours following birth/prior to hospital discharge, it is reasonable to assume that these declarations were made willingly and that the father was indeed in contact with the mother and child—involved enough to at least be with them in the hospital.
Dataset #2: The Early Head Start Research and Evaluation Study

The Early Head Start Research and Evaluation Study is a longitudinal impact evaluation of the EHS program that was conducted between 1996 and 2010. Public-use data files of this dataset are available via the Inter-university Consortium for Political and Social Research (DHHS/ACF, 2011a). Data was collected longitudinally from both an intervention and a control group, in 3 separate waves: birth to 3 years, pre-kindergarten follow-up, and elementary school follow-up (approximately, 5th grade). The nationally representative sample was drawn from EHS programs in Russellville, Arkansas; Venice, California; Denver, Colorado (two programs); Marshalltown, Iowa; Kansas City, Kansas; Jackson, Michigan; New York City, New York; Kansas City, Missouri; Pittsburgh, Pennsylvania; Sumter, South Carolina; McKenzie, Tennessee; Logan, Utah; Alexandria, Virginia; Kent, Washington; Sunnyside, Washington; and Brattleboro, Vermont.

As described in the DHHS/ACF technical report on the EHS program evaluation (2002), the variables contained in the EHS dataset were primarily derived from five different sources.

1. Baseline data on families was provided by the Head Start Family Information System (HSFIS), the administrative system used to enroll families into EHS programs or into the control group. Information about the characteristics of the father, mother, and focus child, including information on family circumstances and the mother's pregnancy were extracted from the Head Start Family Information System (HSFIS).
2. Parent services interviews were completed at 6, 15, and 26 months after random assignment to either the experimental or control group. Information on families’ economic self-sufficiency, family health, and child health were gathered.

3. Additional parent interviews were completed when children were 14, 24, and 36 months old. Information on the child's development and family functioning were obtained during these interviews.

4. Child and family assessments were administered when children were 14, 24, and 36 months old. Trained observers recorded information from their observations of children's behavior and home environments. Children were also directly assessed using Bayley Assessments, Peabody Picture Vocabulary Tests, and the content of videotaped semi-structured parent-child interactions.

5. Interviews with the primary child care provider of the target children were collected when the children were 14, 24, and 36 months old. Both interview and observational data were collected from these child care providers.

In summary, EHS data were based on a mixture of direct child assessments, observations of children's behavior by in-person interviewers, standardized ratings of videotaped parent-child interactions, ratings of children's behaviors by their parents, and parents' self-reports of their own behaviors, attitudes, and circumstances (DHHS/ACF, 2002). Among the services provided to EHS program participants were those that encouraged father-involvement, positive maternal health decision-making, appropriate nutritional intake, appropriate prenatal care, and others.
Sample Characteristics

This analysis was restricted to families in the control group (n=1,474) (STATUS), who did not receive any services from the EHS program. The sample was further restricted to those cases where the respondent was the biological mother (P1_RMOM) and where she was the respondent across each wave of data collection (SAME_R), resulting in a final sample where n=1,038 mothers (36.6% White, 34.1% Black, 22.3% Latino, 4.8% other racial and ethnic groups, and 2.2% missing). Fifty mothers belonging to other racial/ethnic groups (likely different Asian groups) were excluded from the study because of the inability to meaningfully include these groups within the analyses (given their small sample sizes) and because of the differences in the historical and ecological contexts that shape the life events of members of each of these different ethnic/racial groups. The 23 mothers who were missing racial data were also removed from the final dataset and not included in the analysis. Maternal race values (RACE) were collapsed into the following categories (1=White, 2 = Black, 3= Latino). This approach maintained congruence with the analysis of the CDC dataset, where only White, Black and Latino mothers were included in the sample. Hence, the final sample consisted of 965 mothers (39.4 % White, 36.7 % Black and 23.9 % Latino).

Data from the variables of interest from each wave of data collection waves (14, 24, and 36 months) were included in a single data set. As is common in longitudinal datasets, however, many of these variables were missing significant amounts of data—ranging from 2.2% to 50.5%. To determine whether or not the data was missing at random, Little's Missing Completely at Random (MCAR) Test with expectation-maximization (EM) was performed (Little, 1988; IBM Corporation, 2011). The results
of Little's MCAR test with EM indicated that the data was missing at random ($\chi^2 (63, N=965) = 58.03, p = .654$), which allowed for the use of multiple imputation to address the missing values (Schafer, 1999; IBM Corporation, 2011). The analyses presented in this study were conducted on an EHS dataset that included these imputed values.

**Measures**

**Assessments at Birth**

*Maternal Sociodemographics at Birth*

This construct was assessed at birth and included the following items: 1) whether the mother was a high school graduate/GED (HGCG) (0 = yes, 1 = no), 2) whether the mother was a teen (TEEN_MOM) (1 = yes, 0 = no), 3) whether she was married (P0A16) (0 = yes, 1 = no), and 4) whether she was impoverished (poverty) (1 = yes, 0 = no). A new poverty variable (poverty) was created based upon whether the mother had received Assistance to Families with Dependent Children (AFDC) benefits (AFDC), whether she was a Medicaid recipient (MEDICAID), or whether the mother received food stamps (FOODST).

*Child Physical Health (at Birth)*

Two items were used to assess child physical health at birth. They included whether 1) child born more than 3 weeks early (EARLYBTH) (1 = yes, 0 = no) and 2) birth weight less than 2500 grams (LT2500G). A child physical health score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.
Assessments at 14 Months

Maternal Physical Health (14 Months)

Maternal physical health status was assessed using a continuous measure of the mother’s perception of her health status on a 5-point scale, where 1 indicates poor health and 5 indicates excellent health (B1P_MHST).

Maternal Mental Health (14 Months)

Maternal mental health was assessed using the Center for Epidemiological Studies Long Form (CESD-LF) at 14 months post birth (see Appendix B). The CESD-LF measures symptoms of depression. While the CESD-LF does not indicate a diagnosis of clinical depression, it does discriminate between depressed and non-depressed patients. The 20-item CESD scale includes symptoms such as poor appetite, difficulty sleeping, loneliness, sadness, and lack of energy (B1P_CESD) (DHHS/ACF, 2011b). Scores range from 0 to 60, with higher scores indicating more symptoms of depression. CESD scores of 16 to 26 are considered indicative of mild depression and scores of 27 or more indicative of major depression (Zich et al., 1990; Ensel, 1986).

EHS researchers also assessed maternal distress through the parental distress subscale of the Parenting Stress Index—Short Form (PSI-SF). Scores on this subscale (B1P_PD) ranged from 12 to 60, with scores greater than 36 indicating that the mother agrees or strongly agrees “with statements such as, ‘You often have the feeling that you cannot handle things very well,’ and ‘You feel trapped by your responsibilities as a parent,’ and ‘You feel alone and without friends’” (DHHS/ACF, 2011b, p. 1279).
Family Emotional Environment (14 Months)

The family emotional environment was assessed using measures of the quality of interactions between mother and child, and of family conflict. Using the emotional responsivity subscale of the Home Observation for Measurement of the Environment (HOME) (B1P_EMO), researchers conducted observations to evaluate the mother’s warmth toward her infant. Examples of the behaviors measured by the emotional responsivity subscale include: vocalization of parent to child, physical touch, parental response to infant vocalization, and praising of the child. HOME scores are highly correlated with child achievement (Bradley & Caldwell, 1984). The emotional responsivity subscale includes 7 measures, whose values are either 1 (yes) or 0 (no), depending upon whether or not the researchers observed the desired maternal behavior during the visit. Higher aggregate scores are indicative of higher levels of emotional responsivity (DHHS/ACF, 2011b).

The level of conflict in the home was measured by administering one dimension of the Family Environment Scale (FES) which is designed to measure cohesion, expressiveness, and conflict in families (B1P_CONF). The conflict dimension of the FES “measures the extent to which the open expression of anger and aggression and generally conflictual interactions are characteristic of the family. Mothers respond to items on a 4-point scale, where a value of 4 indicates higher levels of agreement with statements such as, ‘we fight a lot,’ and ‘we hardly ever lose our tempers.’ Items were recoded and averaged so that higher scores are indicative of high levels of conflict” (DHHS/ACF, 2011b, p. 403; Fowler, 1981).
The inclusion of these two continuous variables in the analysis provides the opportunity to better understand the relationship between the emotional climate within the family and father involvement.

**Child Physical Health (14 Months)**

Three items were used to assess child physical health at 14 months. They included:
1) child has biological/medical risks (BM_RISKS) (1 = yes, 0 = no),
2) whether the child has ever visited the emergency room (P0_EMRG) (1 = yes, 0 = no),
3) child health status (fair or poor) (B1P_CHFP) (1 = yes, 0 = no), and
4) whether the child has been hospitalized (B1P_HOST) (1 = yes, 0 = no).

A child physical health (at 14 months) score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.

**Child Outcomes (14 Months)**

Child outcomes were assessed in terms of mental development. Child mental development was measured by researchers using the Bayley Mental Development Index (MDI) which measures the cognitive, language, and personal-social development of children under age 3 ½ (B1B_MDI). Items on this scale assess memory, habituation, problem solving, early number concepts, generalization, classification, vocalizations, language, and social skills. Higher scores are indicative of appropriate development. Bayley MDI scores below 85 indicate delayed performance (DHHS/ACF, 2011b; Niccols & Latchman, 2002; United States Department of Health and Human Services, Assistant Secretary for Planning and Evaluation, n.d.).
Assessments at 14, 24, and 36 Months

Father Involvement

In interviews at 14, 24 and 36 months, mothers were asked how often the child saw their fathers. If mothers indicated that the child’s biological father was present, meaning that he saw the child: 1) every day or almost every day, 2) a few times a week, or 3) a few times a month—across all three interview periods—then he was deemed to be continuously involved in the child’s life (BVP_FAT1), (1 = yes, 0 = no), (DHHS/ACF, 2011b).

Analyses were performed using Statistical Package for the Social Sciences, Version 21 (SPSS 21).
Results

_Dataset #1: CDC Dataset_

**Maternal Sociodemographics**

Sociodemographic variables included in the analyses were: 1) mother not a high school graduate (36.8% = yes, 63.2% = no), 2) whether she was a teen mother (19.7% = yes, 80.3% = no), 3) whether the mother was impoverished (65% = yes, 35% = no), and (d) whether or not she was married (28.7% = yes, 71.3% = no).

A Chi Square test was performed to examine the relationship between maternal race and high school completion. As depicted in Table 1, the results indicated that the relationship between maternal race and high school completion was statistically significant, $\chi^2 (2, N= 2,563) = 55.94, p< .001$.

<table>
<thead>
<tr>
<th>High School Completion</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>742</td>
<td>795</td>
<td>83</td>
</tr>
<tr>
<td>Yes</td>
<td>323</td>
<td>510</td>
<td>110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,065</td>
<td>1,305</td>
<td>193</td>
</tr>
</tbody>
</table>

*Note: *$p< .001$.

A Chi Square test was performed to examine the relationship between maternal race and teen pregnancy. As depicted in Table 2, the results indicated that the relationship between maternal race and teen pregnancy was statistically significant, $\chi^2 (2, N= 2,569) = 73.5, p< .001$. 

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>742</td>
<td>795</td>
</tr>
<tr>
<td>Yes</td>
<td>323</td>
<td>510</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,065</td>
<td>1,305</td>
</tr>
</tbody>
</table>

*Note: *$p< .001$.
Table 2

*Teen Motherhood by Maternal Race*

<table>
<thead>
<tr>
<th>Teen Motherhood</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>938</td>
<td>991</td>
<td>134</td>
</tr>
<tr>
<td>Yes</td>
<td>127</td>
<td>320</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
</tr>
</tbody>
</table>

*Note: *$p< .001$.

A Chi Square test was performed to examine the relationship between maternal race and poverty. As depicted in Table 3, the results indicated that the relationship between maternal race and poverty was statistically significant, $\chi^2 (2, N= 2,532) = 280.79, p< .001$.

Table 3

*Poverty by Maternal Race*

<table>
<thead>
<tr>
<th>Poverty†</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>567</td>
<td>283</td>
<td>37</td>
</tr>
<tr>
<td>Yes</td>
<td>486</td>
<td>1,007</td>
<td>152</td>
</tr>
<tr>
<td>Total</td>
<td>1,053</td>
<td>1,290</td>
<td>189</td>
</tr>
</tbody>
</table>

*Note: *$p< .001$; †Poverty defined as receipt of AFDC, Medicaid or WIC benefits.

A Chi Square test was performed to examine the relationship between maternal race and marital status. As depicted in Table 4, the results indicated that the relationship between maternal race and marital status was statistically significant, $\chi^2 (2, N= 2,569) = 313.79, p< .001$. 
Table 4

Marital Status by Maternal Race

<table>
<thead>
<tr>
<th>Married</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>White 561</td>
<td>Black 1,121</td>
<td>Latino 150</td>
</tr>
<tr>
<td>Yes</td>
<td>504</td>
<td>190</td>
<td>43</td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
</tr>
</tbody>
</table>

*Note: *p* < .001.

Maternal Lifestyle/Health Behaviors

This construct was assessed using the following items: 1) positive urine drug screen for illegal drugs (4.5% = yes, 95.5% = no), 2) smoking at time of first prenatal care visit (33.7% = yes, 66.3% = no), and 3) alcohol consumption during pregnancy (1.5% = yes, 98.5% = no). A maternal lifestyle/health behaviors risk score was created based on these variables, where 0 = no lifestyle/health behaviors risks were present and 1 = one or more of the risks were present. It is important to note here that the screening of urine for illegal drugs was done after receiving written consent from the mother during her first prenatal visit. This was done as part of an intervention of the Syracuse Healthy Start project that aimed to provide substance abuse treatment to drug-using mothers as early as possible (S. Lane, personal communication, September 15, 2013).

A Chi Square test was performed to examine the relationship between maternal race and maternal lifestyle/health risk behaviors. As depicted in Table 5, the results indicate that the relationship between maternal race and maternal lifestyle/health risk behaviors was statistically significant, $\chi^2 (2, N = 2,569) = 6.17$, $p = .046$. 
Table 5

*Maternal Lifestyle/Health Risk Behaviors by Maternal Race*

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>667</td>
<td>857</td>
<td>138</td>
<td>1,662</td>
<td>6.17*</td>
</tr>
<tr>
<td>Yes</td>
<td>398</td>
<td>454</td>
<td>55</td>
<td>907</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
<td>2,569</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05.

*Maternal Prenatal Physical Health*

This construct was assessed using the following items - 1) mother diagnosed with chlamydia (7.9% = yes, 92.1% = no), 2) mother was re-infected with chlamydia following initial treatment (0.9% = yes, 99.1% = no), 3) mother experienced a prenatal trauma that required medical attention (2.3% = yes, 97.7% = no), or 4) mother reported to her health care provider that she was a victim of domestic violence (3.7% = yes, 96.3% = no). A maternal prenatal physical health risk score was created based on these variables, where 0 = no physical health risks were present and 1 = any one of the risks were present.

A Chi Square test was performed to examine the relationship between maternal race and prenatal physical health risks. As depicted in Table 6, the results indicated that the relationship between maternal race and maternal prenatal physical health risks was statistically significant, $\chi^2 (2, N = 2,569) = 25.92, p < .001$.

Table 6

*Maternal Prenatal Physical Health Risks by Maternal Race*

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>970</td>
<td>1,105</td>
<td>162</td>
<td>2,237</td>
<td>25.92*</td>
</tr>
<tr>
<td>Yes</td>
<td>95</td>
<td>206</td>
<td>31</td>
<td>332</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
<td>2,569</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .001.
Maternal Prenatal Mental Health

This construct was assessed using the following items - 1) prenatal antidepressant use (2.7%=yes, 97.3%= no) and 2) intendedness of pregnancy (91.8%= yes, 8.2%= no).

A Chi Square test was performed to examine the relationship between maternal race and antidepressant use. As depicted in Table 7, the results indicated that the relationship between maternal race and antidepressant use was statistically significant, $\chi^2 (2, N = 2,569) = 9.52, p < .05$.

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>1,025</td>
<td>1,288</td>
<td>186</td>
<td>2,499</td>
<td>9.52*</td>
</tr>
<tr>
<td>Yes</td>
<td>40</td>
<td>23</td>
<td>7</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
<td>2,569</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05.

A Chi Square test was performed to examine the relationship between mothers who intended to become pregnant and their race. As depicted in Table 8, the results indicated that the relationship between pregnancy intendedness and maternal race was statistically significant, $\chi^2 (2, N = 2,569) = 33.74, p < .001$.

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>White</th>
<th>Black</th>
<th>Latino</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1,013</td>
<td>1,163</td>
<td>182</td>
<td>2,358</td>
<td>33.74*</td>
</tr>
<tr>
<td>No</td>
<td>52</td>
<td>148</td>
<td>11</td>
<td>211</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
<td>2,569</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .001.
**Child Physical Health (at Birth)**

This construct was assessed using the following items: 1) preterm delivery (less than 37 weeks) (11.5% = yes, 88.5% = no), 2) low birth weight (9% = yes, 91% = no), and 3) the presence of a congenital anomaly or abnormality at birth (15.5% = yes, 84.5% = no). A child physical health score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.

A Chi Square test was performed to examine the relationship between maternal race and child physical health outcomes. As depicted in Table 9, the results indicated that the relationship between negative child physical health outcomes and maternal race was not significant, $\chi^2 (2, N = 2,569) = 2.58, p > .05$.

**Table 9**

<table>
<thead>
<tr>
<th>Maternal Race</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Black</td>
<td>Latino</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>802</td>
<td>953</td>
<td>138</td>
</tr>
<tr>
<td>Yes</td>
<td>263</td>
<td>358</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td>1,065</td>
<td>1,311</td>
<td>193</td>
</tr>
</tbody>
</table>

**Father Involvement (at Birth)**

Information about father involvement is assessed based on two items - 1) marital status and 2) paternity declaration. Using these two variables, a father involvement variable was created. The three possible values for this new father involvement variable were developed as follows. The value of 1 was assigned when the biological parents were not married to each other and no paternity declaration was made prior to hospital discharge (38.4%). A value of 2 was assigned when the biological parents were not
married but the father signed a paternity declaration prior to hospital discharge (32%). A value of 3 was assigned when the biological parents of the child were married (29.6%).

A one-way between groups ANOVA was performed to compare the levels of involvement for fathers of babies born to White, Black and Latino mothers. As depicted in Table 10, there was a statistically significant difference between these groups of mothers (F(2, 2,490) = 179.89, p< .001). The effect size, calculated using eta squared, was .13. Post-hoc comparisons using the Tukey HSD test indicated that the mean scores for White (M =2.25, S =.82), Black (M =1.65, SD =.72) and Latino (M =1.87, SD =.76) were all significantly different from one another.

Table 10
One-Way Analysis of Variance of Father Involvement by Maternal Race

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>211.42</td>
<td>2</td>
<td>105.71</td>
<td>179.89*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1,463.17</td>
<td>2,490</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,674.57</td>
<td>2,492</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .001.

Predictors of Father Involvement (at Birth)

Multinomial logistic regression models were developed to explore predictors of father involvement where, 1) biological parents were not married to each other and no paternity declaration was made prior to hospital discharge, 2) when the biological parents were not married but the father signed a paternity declaration prior to hospital discharge, and 3) when the biological parents of the child were married.
Model #1 contains four independent maternal sociodemographic variables (high school completion, teen pregnancy, poverty and race). Dummy codes for maternal race were developed to compare White and Black mothers to Latino mothers.

The results of Model #1 indicate that the fit of the model is statistically significant, $\chi^2 (10, N= 2,453) =924.30, p< .001$. This means that at least one of the predictors was able to distinguish between the three levels of father involvement where 1) parents were unmarried and no paternity declaration had been made, 2) parents were unmarried but had a paternity declaration, and 3) married parents—relative to a null model where the means of each group would have been equal (intercept only). Model #1 explained between 31.4% (Cox and Snell R square) and 35.4% (Nagelkerke R Square) of the variance in father involvement.

As shown in Table 11, Model #1 identified significant predictors of low father involvement (unmarried and no paternity declaration) compared to those with medium father involvement (unmarried with paternity establishment). Significant predictors of low father involvement included: lack of high school completion and maternal race for Black mothers. Mothers who lacked a high school education were 1.23 times (1 divided by .81) more likely to experience low father involvement (O.R. = .81); and compared to Latino mothers, Black mothers were 1.75 times more likely to experience low father involvement (O.R. = .57).

Contrasting those with high levels of father involvement (married) to those with low levels of father involvement (unmarried and no paternity declaration), Model #1 identifies lack of high school completion, teen pregnancy, maternal poverty, and maternal race for Black mothers as significant predictors of low father involvement. Compared to
those with high father involvement, mothers without a high school education were 2.86
times more likely to experience low father involvement (O.R. = .35); teen mothers were
10 times more likely to experience low father involvement (O.R. = .10); impoverished
mothers were 5.26 times more likely to experience low father involvement (O.R. = .19);
and compared to Latino mothers, Black mothers were 3.33 times more likely to
experience low father involvement (O.R. = .30).
Table 11

Model #1: Multinomial Logistic Regression Analysis Differentiating Low Levels of Father Involvement from Medium and High Father Involvement Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Medium Father Involvement (n = 789)</th>
<th>High Father Involvement (n = 722)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>S.E.</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>-.21</td>
<td>.11</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>-.19</td>
<td>.12</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>-.04</td>
<td>.12</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>-.10</td>
<td>.19</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>-.57</td>
<td>.18</td>
</tr>
</tbody>
</table>

*Note: *p < .05, **p < .001.*
In Model #2, maternal lifestyle/health behaviors risk was included (which included a positive urine drug screen for illegal drugs, smoking at time of first prenatal care visit and/or alcohol consumption during pregnancy) and a maternal prenatal physical health risk variable (based upon whether the mother was prenatally diagnosed with chlamydia infection, was re-infected with chlamydia following initial treatment, experienced a prenatal trauma that required medical attention and/or was a victim of domestic violence).

The results of Model #2 indicated that the fit of the model was statistically significant, $\chi^2 (14, N= 2,453) =974.27, p< .001$. Model #2 explained between 32.8% (Cox and Snell R square) and 36.9% (Nagelkerke R Square) of the variance in father involvement.

As shown in Table 12, Model #2 identified significant predictors of low father involvement (unmarried and no paternity declaration) compared to those with medium father involvement (unmarried with paternity establishment). Significant predictors of low father involvement included: maternal race for Black mothers and risky maternal lifestyle/health behaviors. Compared to Latino mothers, Black mothers were 1.72 times more likely to experience low father involvement (O.R. = .58); and mothers who engaged in risky maternal lifestyle/health behaviors were 1.23 times more likely to experience low father involvement (O.R. = .82).

Contrasting those with high levels of father involvement (married) to those with low levels of father involvement (unmarried and no paternity declaration), Model #2 identifies teen pregnancy, maternal poverty, maternal race for Black mothers, maternal
lifestyle/health behaviors risk, and maternal prenatal health risk as significant predictors of low father involvement.

Compared to those with high father involvement, teen mothers were 10 times more likely to experience low father involvement (O.R. = .10); impoverished mothers were 4.35 times more likely to experience low father involvement (O.R. = .23); compared to Latino mothers, Black mothers were 3.03 times more likely to experience low father involvement (O.R. = .33); mothers who had engaged in risky lifestyle/health behaviors were 2.33 times more likely to experience low father involvement (O.R. = .43); and mothers with prenatal health risks were 1.96 times more likely to experience low father involvement (O.R. = .51).
Table 12  

**Model #2: Multinomial Logistic Regression Analysis Differentiating Low Levels of Father Involvement from Medium and High Father Involvement Groups**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Medium Father Involvement (n = 789)</th>
<th>High Father Involvement (n = 722)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>S.E.</td>
</tr>
<tr>
<td>Low than a High School Education—Mother</td>
<td>-.16</td>
<td>.11</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>-.21</td>
<td>.12</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.00</td>
<td>.13</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>-.06</td>
<td>.19</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>-.55</td>
<td>.18</td>
</tr>
<tr>
<td>Maternal Lifestyle/Health Behaviors Risk</td>
<td>-.20</td>
<td>.10</td>
</tr>
<tr>
<td>Maternal Prenatal Physical Health Risk</td>
<td>-.14</td>
<td>.13</td>
</tr>
</tbody>
</table>

Note: *p < .05, **p < .001.
In Model #3, maternal antidepressant use during pregnancy and whether the pregnancy was intended, were included. The results of Model #3 (which includes all the predictor variables) indicate that the fit of the model is statistically significant, $\chi^2 (18, N=2,453) =989.13, p< .001$. Model #3 explained between 33.2% (Cox and Snell R square) and 37.4% (Nagelkerke R Square) of the variance in father involvement.

As shown in Table 13, Model #3 (the full model) identified significant predictors of low father involvement (unmarried and no paternity declaration) compared to those with medium father involvement (unmarried with paternity establishment). Significant predictors of low father involvement included: teen pregnancy, maternal race for Black mothers, and prenatal antidepressant use. Teen mothers were 1.28 times more likely to experience low father involvement (O.R. = .78) than those with medium levels of father involvement; compared to Latino mothers, Black mothers were 1.75 times more likely to experience low father involvement (O.R. = .57); mothers who used antidepressants during pregnancy were 2.6 times more likely to experience low father involvement (O.R. = .38).

Contrasting those with high levels of father involvement (married) to those with low levels of father involvement (unmarried and no paternity declaration), Model #3 identifies having less than a high school education, teen pregnancy, maternal poverty, maternal lifestyle/health behaviors risk, maternal prenatal health risk, and unintended pregnancy were significant predictors of low father involvement.

Compared to those with high father involvement, mothers lacking a high school education were 2.33 times more likely to experience low father involvement (O.R. = .43); teen mothers were 10 times more likely to experience low father involvement (O.R. =
impoverished mothers were 4.35 times more likely to experience low father involvement (O.R. = .23); mothers who had engaged in risky lifestyle/health behaviors were 2.27 times more likely to experience low father involvement (O.R. = .44); mothers with prenatal health risks were 1.92 times more likely to experience low father involvement (O.R. = .52); and mothers who reported that their pregnancy was unintentional were 1.82 times more likely to experience low father involvement (O.R. = .55).
Table 13

Model #3: Multinomial Logistic Regression Analysis Differentiating Low Levels of Father Involvement from Medium and High Father Involvement Groups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Medium Father Involvement (n = 789)</th>
<th></th>
<th></th>
<th></th>
<th>High Father Involvement (n = 722)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>S.E.</td>
<td>Wald</td>
<td>df</td>
<td>Odds Ratio</td>
<td>95% C.I. for Odds Ratio</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>-.15</td>
<td>.11</td>
<td>1.99</td>
<td>1</td>
<td>.86</td>
<td>.70</td>
<td>1.06</td>
<td>.86</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>-.25</td>
<td>.12</td>
<td>4.24</td>
<td>1</td>
<td>.78*</td>
<td>.62</td>
<td>.99</td>
<td>-.25</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>-.01</td>
<td>.13</td>
<td>.01</td>
<td>1</td>
<td>.99</td>
<td>.77</td>
<td>1.26</td>
<td>-.13</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>-.06</td>
<td>.19</td>
<td>.10</td>
<td>1</td>
<td>.94</td>
<td>.64</td>
<td>1.38</td>
<td>.25</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>-.56</td>
<td>.18</td>
<td>9.38</td>
<td>1</td>
<td>.57*</td>
<td>.40</td>
<td>.82</td>
<td>-.09</td>
</tr>
<tr>
<td>Maternal Lifestyle/Health Behaviors Risk</td>
<td>-.18</td>
<td>.10</td>
<td>2.84</td>
<td>1</td>
<td>.84</td>
<td>.69</td>
<td>1.03</td>
<td>-.14</td>
</tr>
<tr>
<td>Maternal Prenatal Physical Health Risk</td>
<td>-.13</td>
<td>.14</td>
<td>.94</td>
<td>1</td>
<td>.88</td>
<td>.67</td>
<td>1.14</td>
<td>-.66</td>
</tr>
<tr>
<td>Prenatal Antidepressant Use</td>
<td>-.98</td>
<td>.36</td>
<td>7.40</td>
<td>1</td>
<td>.38*</td>
<td>.19</td>
<td>.76</td>
<td>-.42</td>
</tr>
<tr>
<td>Unintended Pregnancy</td>
<td>-.23</td>
<td>.17</td>
<td>1.87</td>
<td>1</td>
<td>.79</td>
<td>.57</td>
<td>1.11</td>
<td>-.59</td>
</tr>
</tbody>
</table>

Note: *p < .05, ** p < .001.
Key Findings: CDC Dataset

As demonstrated above, the analysis of this dataset has identified a number of variables that appear to be significant predictors of father involvement. While these predictors will be explored more fully in the “Discussion” section that follows, significant predictors of low father involvement at birth included: 1) mothers with less than high school education, 2) teen pregnancy, 3) maternal poverty, 4) maternal race - Black, 4) maternal risky lifestyle/health behaviors, 5) maternal prenatal health risks, 6) maternal depression/antidepressant use, and 7) unintended pregnancy.

Results from Dataset #2: The Early Head Start Research and Evaluation Study

Maternal Sociodemographics

Maternal sociodemographics were assessed at birth and included: 1) whether the mother was a high school graduate/GED (45.8% = yes, 54.2%= no), 2) whether the mother was a teen (38.9% = yes, 61.1% = no), 3) whether she was married (24.7% = yes, 75.3% = no), and 4) whether she was impoverished (30% = yes, 70% = no). Poverty was measured using a constructed variable, with mothers identified as impoverished if she had ever received Assistance to Families with Dependent Children (AFDC) benefits, Medicaid or food stamps.

A Chi Square test was performed to examine the relationship between maternal race and high school completion. As depicted in Table 14, the results indicate that the relationship between maternal race and high school completion is statistically significant, $\chi^2 (2, N = 965) = 117.28, p = .000$. 
A Chi Square test was performed to examine the relationship between maternal race and teen pregnancy. As depicted in Table 15, the results indicate that the relationship between maternal race and teen pregnancy is statistically significant, $\chi^2 (2, N = 965) = 29.3, p = .000$.

Table 15

<table>
<thead>
<tr>
<th>Teen Motherhood</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>261</td>
<td>178</td>
<td>154</td>
</tr>
<tr>
<td>Yes</td>
<td>119</td>
<td>176</td>
<td>77</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
</tr>
</tbody>
</table>

Note: *$p< .001$.  

A Chi Square test was performed to examine the relationship between maternal race and poverty. As depicted in Table 16, the results indicate that the relationship between maternal race and poverty is statistically significant, $\chi^2 (2, N = 926) = 45.06, p = .000$.

Table 16

<table>
<thead>
<tr>
<th>Poverty†</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>284</td>
<td>204</td>
<td>189</td>
</tr>
<tr>
<td>Yes</td>
<td>96</td>
<td>150</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
</tr>
</tbody>
</table>

Note: *$p< .001$; †Poverty defined as receipt of AFDC, Medicaid or food stamps.
A Chi Square test was performed to examine the relationship between maternal race and marital status. As depicted in Table 17, the results indicate that the relationship between maternal race and marital status is statistically significant, $\chi^2(2, N = 965) = 78.88, p = .000$.

Table 17

Marital Status by Maternal Race

<table>
<thead>
<tr>
<th>Married</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>250</td>
<td>324</td>
<td>153</td>
</tr>
<tr>
<td>Yes</td>
<td>130</td>
<td>30</td>
<td>78</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
</tr>
</tbody>
</table>

*Note: *$p < .001$.

Maternal Physical Health (14 Months)

Maternal physical health status was assessed using a continuous measure of the mother’s perception of her health status on a 5-point scale, where 1 indicates poor health and 5 indicates excellent health.

A one-way between groups ANOVA was performed to compare the maternal physical health at 14 months post birth of White, Black and Latino mothers. As depicted in Table 18, there was a statistically significant difference at the $p < .001$ level between these groups of mothers ($F(2, 962) = 15.03, p = .000$). The effect size, calculated using eta squared, was 0.03. Post-hoc comparisons using the Tukey HSD test indicated that the mean scores for White mothers ($M = 3.54, SD = .95$), Black mothers ($M = 3.76, SD = 1.03$) and Latino mothers ($M = 3.30, SD = 1.0$) all differed significantly from one another.
Table 18

One-Way Analysis of Variance of Maternal Physical Health Status by Maternal Race

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>29.69</td>
<td>2</td>
<td>14.85</td>
<td>15.03*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>949.44</td>
<td>962</td>
<td>.99</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>979.13</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .001.

Maternal Mental Health (14 Months)

Maternal mental health was assessed using the Center for Epidemiological Studies Long Form (CESD-LF) at 14 months post birth. The CESD-LF measures symptoms of depression. While the CESD-LF does not indicate a diagnosis of clinical depression, it does discriminate between depressed and non-depressed patients. The 20-item CESD scale includes symptoms such as poor appetite, difficulty sleeping, loneliness, sadness, and lack of energy (B1P_CESD) (DHHS/ACF, 2011b). Scores range from 0 to 60, with higher scores indicating more symptoms of depression. CESD scores of 16 to 26 are considered indicative of mild depression and scores of 27 or more indicative of major depression (Zich et al., 1990; Ensel, 1986).

A one-way between groups ANOVA was performed to compare the maternal mental health scores of White, Black and Latino mothers. As depicted in Table 19, there was no statistically significant difference between these groups of mothers (F(2, 962) = 0.86, p= .446). The effect size, calculated using eta squared, was 0.002. Post-hoc comparisons using the Tukey HSD test also indicated that the mean scores for White mothers (M = 14.03, SD =9.81), Black mothers (M = 13.56, SD = 9.67) and Latino mothers (M =12.99, SD =10.35) did not differ significantly from one another.
Table 19

One-Way Analysis of Variance of Maternal Depression by Maternal Race

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>167.75</td>
<td>2</td>
<td>83.88</td>
<td>.86</td>
</tr>
<tr>
<td>Within Groups</td>
<td>94,086.73</td>
<td>962</td>
<td>97.80</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>94,254.48</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EHS researchers also assessed maternal distress through the parental distress subscale of the Parenting Stress Index—Short Form (PSI-SF). Scores on this subscale ranged from 12 to 60, with scores greater than 36 indicating that the mother agrees or strongly agrees “with statements such as, ‘You often have the feeling that you cannot handle things very well,’ and ‘You feel trapped by your responsibilities as a parent,’ and ‘You feel alone and without friends’” (DHHS/ACF, 2011b, p. 1279).

A one-way between groups ANOVA was performed to compare the PSI-SF scores of White, Black and Latino mothers. As depicted in Table 20, there was a statistically significant difference between these groups of mothers (F(2, 962) = 4.87, p=.011). The effect size, calculated using eta squared, was 0.01. Post-hoc comparisons using the Tukey HSD test indicated that the mean scores for White mothers (M = 26.74, SD =8.97) were not significantly different from Black mothers (M = 27.78, SD = 9.38), but were significantly different from Latino mothers (M =29.14, SD =9.82). Scores for Black and Latino mothers did not differ significantly from one another.
Table 20

**One-Way Analysis of Variance of Parenting Stress Index—Short Form Scores (Maternal Report) by Maternal Race**

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>847.08</td>
<td>2</td>
<td>423.54</td>
<td>4.87*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>83,727.36</td>
<td>962</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>84,574.43</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .05.

**Family Emotional Environment (14 Months)**

Using the emotional responsivity subscale of the Home Observation for Measurement of the Environment (HOME), researchers conducted observations to evaluate the mother’s warmth toward her infant. Examples of the behaviors measured by the emotional responsivity subscale include: vocalization of parent to child, physical touch, parental response to infant vocalization, and praising of the child. HOME scores are highly correlated with child achievement (Bradley & Caldwell, 1984). The emotional responsivity subscale includes 7 measures, whose values are either 1 (yes) or 0 (no), depending upon whether or not the researchers observed the desired maternal behavior during the visit. Higher aggregate scores are indicative of higher levels of emotional responsivity (DHHS/ACF, 2011b).

A one-way between groups ANOVA was performed to compare the HOME scores of White, Black and Latino mothers. As depicted in Table 21, there was a statistically significant difference between these groups of mothers (F(2,962) =20.51, p = .000). The effect size, calculated using eta squared, was 0.04. Post-hoc comparisons using the Tukey HSD test also indicated that the mean scores for White (M =6.23, SD =1.20), Black (M =5.59, SD =1.59) and Latino mothers (M =5.92, SD =1.21) all differed significantly from one another.
Table 21

One-Way Analysis of Variance of HOME Scores by Maternal Race

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>75.63</td>
<td>2</td>
<td>37.81</td>
<td>20.51*</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1,776.11</td>
<td>962</td>
<td>1.85</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1,851.73</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .001.

The level of conflict in the home was measured by administering one dimension of the Family Environment Scale (FES) which is designed to measure cohesion, expressiveness, and conflict in families. The conflict dimension of the FES “measures the extent to which the open expression of anger and aggression and generally conflictual interactions are characteristic of the family. Mothers respond to items on a 4-point scale, where a value of 4 indicates higher levels of agreement with statements such as, ‘we fight a lot,’ and ‘we hardly ever lose our tempers.’ Items were recoded and averaged so that higher scores are indicative of high levels of conflict” (DHHS/ACF, 2011b, p. 403; Fowler, 1981).

A one-way between groups ANOVA was performed to compare the FES scores of White, Black and Latino mothers. As depicted in Table 22, there was no statistically significant difference between these groups of mothers (F(2,962) =2.62, *p = .092). The effect size, calculated using eta squared, was .005. Post-hoc comparisons using the Tukey HSD test also indicated that the mean scores for White (M = 1.77, SD = .52), Black (M = 1.78, SD = .54) and Latino mothers (M = 1.69, SD = .50) did not significantly differ from one another.
Table 22

One-Way Analysis of Variance of Family Environment Scale Scores by Maternal Race

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.43</td>
<td>2</td>
<td>.71</td>
<td>2.62</td>
</tr>
<tr>
<td>Within Groups</td>
<td>262.71</td>
<td>962</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>264.14</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Child Physical Health (at Birth)

Two items were used to assess child physical health at birth. They included whether 1) the child was born more than 3 weeks early (12.4% = yes, 87.6% = no) and 2) birth weight was less than 2500 grams (7.6% = yes, 92.4% = no). A child physical health score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.

A Chi Square test was performed to examine the relationship between child physical health (at birth) and maternal race. As depicted in Table 23, the results indicate that the relationship between child physical health (at birth) and maternal race is not statistically significant, $\chi^2(2, N = 965) = 1.16, p = .56$.

Table 23
Child Physical Health (at Birth) Score by Maternal Race

<table>
<thead>
<tr>
<th>Poor Birth Outcome</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>348</td>
<td>316</td>
<td>208</td>
</tr>
<tr>
<td>Yes</td>
<td>32</td>
<td>38</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
</tr>
</tbody>
</table>
**Child Physical Health (14 Months)**

Four items were used to assess child physical health at 14 months. They included 1) child has biological/medical risks (11.8% = yes, 88.2% = no), 2) whether the child has ever visited the emergency room (18.9% = yes, 81.1% = no), 3) child health status (fair or poor) (14.5% = yes, 85.5% = no), and 4) whether the child has been hospitalized (15.5% = yes, 84.5% = no). A child physical health (at 14 months) score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.

A Chi Square test was performed to examine the relationship between child physical health (at 14 months) and maternal race. As depicted in Table 24, the results indicate that the relationship between child physical health (at 14 months) and maternal race is not statistically significant, $\chi^2 (2, N = 965) = .20, p = .91$.

Table 24

<table>
<thead>
<tr>
<th>Poor Health Outcomes</th>
<th>Maternal Race</th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
</tr>
<tr>
<td>No</td>
<td>215</td>
<td>206</td>
<td>133</td>
</tr>
<tr>
<td>Yes</td>
<td>165</td>
<td>148</td>
<td>98</td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
</tr>
</tbody>
</table>

**Child Outcomes (14 Months)**

Child outcomes were assessed in terms of mental development. Child mental development was measured by researchers using the Bayley Mental Development Index (MDI) which measures the cognitive, language, and personal-social development of children under age 3 ½. Items on this scale assess memory, habituation, problem solving, early number concepts, generalization, classification, vocalizations, language, and social skills. Higher scores are indicative of appropriate development. Bayley MDI scores below 85 indicate delayed
A one-way between groups ANOVA was performed to compare the MDI scores (at 14 months) of children of White, Black and Latino mothers. As depicted in Table 25, there was not a statistically significant difference between these groups of mothers ($F(2,962) = 2.97, p = 0.07$). The effect size, calculated using eta squared, was .01. Further, post-hoc comparisons using the Tukey HSD test were unable to detect a significant difference between any of the mean scores for White ($M = 99.33, SD = 12$), Black ($M = 97.50, SD = 10.67$) and Latino mothers ($M = 97.93, SD = 10.45$).

Table 25

<table>
<thead>
<tr>
<th></th>
<th>$SS$</th>
<th>$df$</th>
<th>$MS$</th>
<th>$F$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>740.47</td>
<td>2</td>
<td>370.24</td>
<td>2.97</td>
</tr>
<tr>
<td>Within Groups</td>
<td>119,929.14</td>
<td>962</td>
<td>124.67</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>120,669.62</td>
<td>964</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Father Involvement (14, 24, and 36 Months)

In interviews at 14, 24 and 36 months, mothers were asked how often the child saw their fathers. If mothers indicated that the child’s biological father was present, meaning that he saw the child: 1) every day or almost every day, 2) a few times a week, or 3) a few times a month—across all three interview periods—then he was deemed to be continuously involved in the child’s life (BVP_FAT1), (69.6% = yes, 30.4% = no), (DHHS/ACF, 2011b). To maintain consistency with the other dichotomous variables used elsewhere in this dissertation, where the
presence of risk is denoted “1” and absence of risk is denoted by “0”, this variable was recoded correspondingly.

A Chi Square test was performed to examine the relationship between father involvement (at 36 months) and maternal race. As depicted in Table 26, the results indicate that the relationship between father involvement (at 36 months) and maternal race is statistically significant, $\chi^2 (2, N = 965) = 58.98, p = .000$.

Table 26  
**Father Involvement (at 36 months) by Maternal Race**

<table>
<thead>
<tr>
<th>Involved Father</th>
<th>Maternal Race</th>
<th></th>
<th></th>
<th>Total</th>
<th>$\chi^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>White</td>
<td>Black</td>
<td>Latino</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>115</td>
<td>172</td>
<td>44</td>
<td>331</td>
<td>58.98*</td>
</tr>
<tr>
<td>Yes</td>
<td>265</td>
<td>182</td>
<td>187</td>
<td>634</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>380</td>
<td>354</td>
<td>231</td>
<td>965</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *$p< .001$.

**Predictors of Father Involvement**

Logistic regressions were conducted to examine predictors of maternal-reported father involvement. Step 1 of the model contained five sociodemographic independent variables (marital status, maternal high school completion, teen pregnancy, maternal poverty and maternal race). Dummy codes for race were developed to compare White and Black mothers to Latino mothers.

As seen in Table 27, the results of the model at Step 1 indicate that these sociodemographic predictors produced a statistically significant model that is predictive of father involvement, $\chi^2 (6, N=965) = 193.80, p< .001$. Step 1 of the model explained between 18.2% (Cox and Snell R square) and 25.1% (Nagelkerke R Square) of the variance in father involvement, and correctly classified 69.5 % of cases. Of the sociodemographic variables added to the model at Step 1, marital status, maternal poverty and maternal race were each significant
predictors of low father involvement. Unmarried mothers were more than eight times (O.R. = 8.72, \( p < .001 \)) more likely to experience low father involvement, as were impoverished mothers who were two times more likely (O.R. = 2.03, \( p < .05 \)). White and Black mothers were two (O.R. = 2.09, \( p < .05 \)) and almost three (O.R. = 2.73, \( p < .05 \)) times more likely, respectively, compared to Latino mothers to experience low father involvement.

Table 27

*Step 1: Logistic Regression Model of Father Involvement*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarried</td>
<td>2.17</td>
<td>.33</td>
<td>54.63</td>
<td>1</td>
<td>8.72***</td>
<td>4.48 - 16.96</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>.22</td>
<td>.23</td>
<td>2.17</td>
<td>1</td>
<td>1.25</td>
<td>.78 - 2.01</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>.16</td>
<td>.22</td>
<td>1.42</td>
<td>1</td>
<td>1.18</td>
<td>.75 - 1.85</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.71</td>
<td>.21</td>
<td>20.66</td>
<td>1</td>
<td>2.03**</td>
<td>1.32 - 3.14</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>.74</td>
<td>.31</td>
<td>11.16</td>
<td>1</td>
<td>2.09*</td>
<td>1.08 - 4.06</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>1.00</td>
<td>.27</td>
<td>21.40</td>
<td>1</td>
<td>2.73***</td>
<td>1.57 - 4.73</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.58</td>
<td>.38</td>
<td>113.67</td>
<td></td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *\( p < .05 \), **\( p < .01 \), ***\( p < .001 \).*

At Step 2, a child physical health (at birth) variable was entered into the model. The child physical health at birth variable is based upon two measures: 1) whether the child was born more than 3 weeks early and 2) if the child’s birth weight was less than 2500 grams. A child physical health score was created based on these variables, where 0 = no negative child physical health outcomes were present and 1 = any one of the negative child physical health outcomes were present.
As seen in Table 28, the results of the model at Step 2 indicate that the addition of this child physical health at birth variable did not improve the predictive ability of the model over Step 1, which only contained maternal sociodemographics variables, $\chi^2(7, \ N=965) = 196.81, p< .001$. Step 2 of the model continued to explain between 18.61% (Cox and Snell R square) and 25.48% (Nagelkerke R Square) of the variance in father involvement, and correctly classified 69.8% of cases.

Table 28
Step 2: Logistic Regression Model of Father Involvement

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarried</td>
<td>2.17</td>
<td>.34</td>
<td>54.71</td>
<td>1</td>
<td>8.75***</td>
<td>4.48 - 17.06</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>.22</td>
<td>.23</td>
<td>2.09</td>
<td>1</td>
<td>1.24</td>
<td>.76 - 2.02</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>.17</td>
<td>.22</td>
<td>1.45</td>
<td>1</td>
<td>1.18</td>
<td>.75 - 1.86</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.71</td>
<td>.21</td>
<td>20.68</td>
<td>1</td>
<td>2.04**</td>
<td>1.32 - 3.15</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>.73</td>
<td>.32</td>
<td>11.01</td>
<td>1</td>
<td>2.08*</td>
<td>1.07 - 4.06</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>1.01</td>
<td>.27</td>
<td>21.46</td>
<td>1</td>
<td>2.74***</td>
<td>1.58 - 4.75</td>
</tr>
<tr>
<td>Poor Child Physical Health—at Birth</td>
<td>-0.32</td>
<td>.48</td>
<td>2.90</td>
<td>1</td>
<td>.73</td>
<td>0.24 - 2.18</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.56</td>
<td>.38</td>
<td>111.10</td>
<td></td>
<td>.03</td>
<td></td>
</tr>
</tbody>
</table>

Note: *p< .05, **p< .01, ***p< .001.

At Step 3, continuous variables measuring maternal physical health, maternal mental health and maternal distress were entered into the model. Maternal physical health was assessed using a measure of the mother’s perception of her health status at 14 months post birth, with higher scores indicating better health. Maternal mental health was assessed using the Center for
Epidemiological Studies Long Form (CESD-LF) at 14 months post birth, with higher scores indicating more symptoms of depression. Paternal distress (maternal report) was measured by the parental distress subscale of the Parenting Stress Index—Short Form (PSI-SF) with higher scores indicating higher levels of distress.

As seen in Table 29, the addition of these maternal health, mental health and distress variables did not appreciably improve the predictive ability of the model at Step 3, nor were any of them significant predictors of father involvement, $\chi^2 (10, N=965) =206.57, p< .001$. Step 3 of the model explained between 19.26% (Cox and Snell R square) and 26.61% (Nagelkerke R Square) of the variance in father involvement, and correctly classified 70.5 % of cases.
Table 29
*Step 3: Logistic Regression Model of Father Involvement*

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Unmarried</td>
<td>2.16</td>
<td>.34</td>
<td>54.03</td>
<td>1</td>
<td>8.69***</td>
<td>4.44 17.00</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>.18</td>
<td>.23</td>
<td>1.59</td>
<td>1</td>
<td>1.20 .74</td>
<td>1.95</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>.20</td>
<td>.22</td>
<td>1.82</td>
<td>1</td>
<td>1.22 .78</td>
<td>1.92</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.72</td>
<td>.22</td>
<td>20.71</td>
<td>1</td>
<td>2.05** 1.31</td>
<td>3.23</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>.71</td>
<td>.32</td>
<td>10.11</td>
<td>1</td>
<td>2.03* 1.03</td>
<td>4.00</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>.97</td>
<td>.29</td>
<td>19.14</td>
<td>1</td>
<td>2.63** 1.45</td>
<td>4.77</td>
</tr>
<tr>
<td>Poor Child Physical Health—at Birth</td>
<td>-.35</td>
<td>.49</td>
<td>3.18</td>
<td>1</td>
<td>0.70 .23</td>
<td>2.14</td>
</tr>
<tr>
<td>Maternal Physical Health—14 Months</td>
<td>.12</td>
<td>.10</td>
<td>2.63</td>
<td>1</td>
<td>1.13 .92</td>
<td>1.38</td>
</tr>
<tr>
<td>Maternal Depression—14 Months</td>
<td>.02</td>
<td>.01</td>
<td>5.10</td>
<td>1</td>
<td>1.02 .99</td>
<td>1.04</td>
</tr>
<tr>
<td>Parental Distress (Maternal Report)—14 Months</td>
<td>0.01</td>
<td>.01</td>
<td>0.83</td>
<td>1</td>
<td>1.01 .99</td>
<td>1.03</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.42</td>
<td>.57</td>
<td>68.10</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .05, **p < .01, ***p < .001.*

Step 4 of the model included family emotional environment measures, continuous variables that measured maternal emotional responsivity toward her infant and levels of family conflict. Maternal emotional responsivity was measured by the emotional responsivity subscale of the Home Observation for Measurement of the Environment (HOME), where higher aggregate scores are indicative of higher levels of emotional responsivity (DHHS/ACF, 2011b).
Family conflict was measured by the Family Environment Scale (FES) where higher scores are indicative of high levels of conflict (DHHS/ACF, 2011b; Fowler, 1981).

Similar to Steps 2 and 3 of the model, the addition of these measures of the family emotional environment at Step 4 did not appreciably improve the predictive ability of the model at Step 4, \( \chi^2 (12, N= 965) = 223.01, p < .001 \). Step 4 of the model explained between 20.62\% (Cox and Snell R square) and 28.50\% (Nagelkerke R Square) of the variance in father involvement, and correctly classified 70.7\% of cases. Further, as seen in Table 30, none of the family emotional environment variables were significant predictors of father involvement.
Table 30  
**Step 4: Logistic Regression Model of Father Involvement**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Upper</td>
</tr>
<tr>
<td>Unmarried</td>
<td>2.21</td>
<td>.34</td>
<td>55.62</td>
<td>1</td>
<td>9.09***</td>
<td>4.65 17.78</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>.09</td>
<td>.22</td>
<td>.58</td>
<td>1</td>
<td>1.09</td>
<td>.70 1.71</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>.22</td>
<td>.23</td>
<td>2.09</td>
<td>1</td>
<td>1.24</td>
<td>.77 1.99</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.74</td>
<td>.22</td>
<td>21.11</td>
<td>1</td>
<td>2.09**</td>
<td>1.33 3.30</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>.76</td>
<td>.34</td>
<td>11.32</td>
<td>1</td>
<td>2.14*</td>
<td>1.04 4.40</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>.98</td>
<td>.31</td>
<td>18.96</td>
<td>1</td>
<td>2.67**</td>
<td>1.41 5.04</td>
</tr>
<tr>
<td>Poor Child Physical Health—at Birth</td>
<td>-.43</td>
<td>.49</td>
<td>3.82</td>
<td>1</td>
<td>0.65</td>
<td>.21 1.96</td>
</tr>
<tr>
<td>Poor Maternal Physical Health—14 Months</td>
<td>.10</td>
<td>.11</td>
<td>2.22</td>
<td>1</td>
<td>1.11</td>
<td>.89 1.39</td>
</tr>
<tr>
<td>Maternal Depression—14 Months</td>
<td>.02</td>
<td>.01</td>
<td>7.39</td>
<td>1</td>
<td>1.02</td>
<td>1.00 1.05</td>
</tr>
<tr>
<td>Parental Distress (Maternal Report)—14 Months</td>
<td>.01</td>
<td>.01</td>
<td>1.84</td>
<td>1</td>
<td>1.01</td>
<td>.99 1.03</td>
</tr>
<tr>
<td>Maternal Emotional Responsivity</td>
<td>-.10</td>
<td>.08</td>
<td>3.68</td>
<td>1</td>
<td>.91</td>
<td>.77 1.06</td>
</tr>
<tr>
<td>Family Conflict</td>
<td>-.55</td>
<td>.26</td>
<td>12.76</td>
<td>1</td>
<td>.58</td>
<td>.33 1.02</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.06</td>
<td>.87</td>
<td>20.62</td>
<td>1</td>
<td>.05</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .05, **p < .01, ***p < .001.*

The final step of the model, Step 5, added two child outcome variables: physical health at 14 months and mental development. The measurement of child health at 14 months was based on four items: 1) whether the child had biological/medical risks, 2) whether the child has ever visited the emergency room, 3) whether the child’s health status was fair or poor, and 4) whether
the child had been hospitalized. A child physical health score was created based on these
variables, where 0 = no negative child physical health outcomes were present and 1 = any one of
the negative child physical health outcomes were present.

Child mental development was measured using the Bayley Mental Development Index
(MDI) which measures the cognitive, language, and personal-social development of children
under age 3 ½. Higher scores are indicative of appropriate development (DHHS/ACF, 2011b;
Niccols & Latchman, 2002; United States Department of Health and Human Services, Assistant
Secretary for Planning and Evaluation, n.d.).

As with Steps 2, 3 and 4, the addition of these child outcome variables at Step 5 did not
significantly improve the predictive ability of the model, χ² (14, N=965) = 231.64, p< .001. Step
5 of the model explained between 21.33% (Cox and Snell R square) and 29.47% (Nagelkerke R
Square) of the variance in father involvement, and correctly classified 70.9% of cases. As seen in
Table 31, none of the child outcome variables were significant predictors of father involvement.
However, with the addition of these two child outcome variables in the model, family conflict
became a statistically significant predictor of father involvement.
### Table 31

**Step 5: Logistic Regression Model of Father Involvement**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Odds Ratio</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Unmarried</td>
<td>2.20</td>
<td>.33</td>
<td>54.85</td>
<td>1</td>
<td>9.01***</td>
<td>4.63</td>
</tr>
<tr>
<td>Less Than a High School Education—Mother</td>
<td>.10</td>
<td>.22</td>
<td>.62</td>
<td>1</td>
<td>1.10</td>
<td>.71</td>
</tr>
<tr>
<td>Teen Pregnancy</td>
<td>.23</td>
<td>.23</td>
<td>2.21</td>
<td>1</td>
<td>1.26</td>
<td>.78</td>
</tr>
<tr>
<td>Maternal Poverty</td>
<td>.75</td>
<td>.22</td>
<td>21.22</td>
<td>1</td>
<td>2.11**</td>
<td>1.32</td>
</tr>
<tr>
<td>Maternal Race—White</td>
<td>.78</td>
<td>.33</td>
<td>11.55</td>
<td>1</td>
<td>2.17*</td>
<td>1.09</td>
</tr>
<tr>
<td>Maternal Race—Black</td>
<td>.99</td>
<td>.30</td>
<td>19.18</td>
<td>1</td>
<td>2.69**</td>
<td>1.43</td>
</tr>
<tr>
<td>Poor Child Physical Health—at Birth</td>
<td>-.58</td>
<td>.48</td>
<td>5.29</td>
<td>1</td>
<td>.56</td>
<td>.19</td>
</tr>
<tr>
<td>Maternal Physical Health—14 Months</td>
<td>.13</td>
<td>.11</td>
<td>3.11</td>
<td>1</td>
<td>1.14</td>
<td>.90</td>
</tr>
<tr>
<td>Maternal Depression—14 Months</td>
<td>.02</td>
<td>.01</td>
<td>7.24</td>
<td>1</td>
<td>1.02</td>
<td>1.00</td>
</tr>
<tr>
<td>Parental Distress (Maternal)—14 Months</td>
<td>.01</td>
<td>.01</td>
<td>1.88</td>
<td>1</td>
<td>1.01</td>
<td>.99</td>
</tr>
<tr>
<td>Maternal Emotional Responsivity</td>
<td>-.08</td>
<td>.09</td>
<td>2.98</td>
<td>1</td>
<td>.92</td>
<td>.75</td>
</tr>
<tr>
<td>Family Conflict</td>
<td>-.58</td>
<td>.25</td>
<td>13.70</td>
<td>1</td>
<td>.56*</td>
<td>.32</td>
</tr>
<tr>
<td>Poor Child Physical Health—14 Months</td>
<td>.24</td>
<td>.20</td>
<td>2.68</td>
<td>1</td>
<td>1.27</td>
<td>.84</td>
</tr>
<tr>
<td>Bayley Mental Development Index</td>
<td>-.01</td>
<td>.01</td>
<td>5.66</td>
<td>1</td>
<td>.99</td>
<td>.96</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.90</td>
<td>1.03</td>
<td>4.52</td>
<td></td>
<td>.15</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *p < .05, ** p < .01, ***p < .001.*
Key Findings: EHS Dataset

As demonstrated above, the analysis of this dataset has identified a number of variables that appear to be significant predictors of father involvement. While these predictors will be explored more fully in the “Discussion” section that follows, significant predictors of diminishing levels of father involvement include: 1) being unmarried at the time of birth, 2) maternal poverty, 3) race for both Black and White mothers, compared to Latino mothers, but with Black mothers having a 1.6 times greater likelihood of low father involvement; and 4) family conflict (between mothers and fathers).
Discussion

As outlined in the review of the literature provided earlier in this paper, father involvement has long been examined by child and family scholars, and more recently, it has also become a key interest of public health/maternal-child health researchers. In spite of this extensive examination, much remains to be known about father involvement in low income, racially diverse populations, especially when it comes to understanding how maternal behaviors and characteristics influence paternal involvement (Hawkins & Dollahite, 1997; Tamis-LeMonda & Cabrera, 2002; Lamb, 2010; Coley, 2001; Jarret, Roy, & Burton, 2002; Tamis-LeMonda & McFadden, 2010; Lu et al., 2010; Carlson & Magnuson, 2011).

This study makes a key contribution to the literature on father involvement in low-income, racially diverse families and, in particular, provides new insights into how maternal characteristics and behaviors can be useful predictors of father involvement. While the results of this study make an important contribution toward the validation of Doherty, Kouneski, and Erickson’s (1998) responsible fathering conceptual framework, the key contribution to the literature is that this was accomplished using sources of data that have not traditionally been examined in child and family studies research. Using large-scale maternal-child health datasets to look at family processes is a departure from the typical use of small, often convenience, samples in child and family research. The results presented in this study can be generalized to other low-income, racially diverse populations, as the CDC dataset is a population dataset that captures data on nearly all births in the city of Syracuse, New York and the EHS dataset is a nationally representative, randomly selected sample.
Key Findings

The results of this analysis identified nine predictors that are significantly associated with diminishing levels of father involvement.

**Unmarried Parents.** In births where the parents were unmarried, mothers were more than 6 times more likely to report, at 36 months post-birth, the absence of father involvement. This finding is consistent with others in the literature where father involvement was observed to diminish over time in cases where parents were unmarried. In the analysis of “Fragile Families” data, researchers identified that more than 40% of nonmarital relationships had ended one year following birth and that more than 60% of those relationships had ended by the child’s fifth birthday (Center for Research on Child Wellbeing, 2003, 2007). Other analysis of “Fragile Families” data indicates that a significant portion of diminished father involvement is accounted for by mothers establishing new romantic relationships and bearing additional children within them. The nonmarital fathers of the older children then appear to be “crowded out” to better accommodate the new mothers’ relationships and the children borne through those relationships (Tach, Mincy, & Edin, 2010). Chi square analyses of both the EHS and CDC data identified a significant relationship between maternal race and marital status.

**Mothers without a high school education.** Given the associations between nonmarital childbearing and low father involvement described above, it is not surprising that low levels of educational attainment also predict low levels of father involvement. Low levels of maternal education have been identified as a key contributor to the weakening of the linkage between marriage and childbearing. Less well educated women are also more likely to postpone marriage but not delay childbearing (Fein, Burstein, & Lindberg, 2003; Osborne & McLanahan, 2007).
Chi square analyses of both the EHS and CDC data identified a significant relationship between maternal race and high school completion.

**Teen pregnancy.** Due to the lack of data on fathers, it was only possible to identify mothers who gave birth while still teenagers. It is assumed that the fathers of these children were also teenagers, but it was not possible to verify this assumption with the data that was available. Teen motherhood was a significant predictor of low father involvement in this study, a finding that is also congruent with the literature. In a study of minority teen parenthood in an urban community, a father’s financial insecurity or confusion on how to care for children was the strongest predictor of a stated lack of interest in fathering. In turn, stated disinterest predicted lack of involvement. (Rhein et al., 1997). Also in teen pregnancies, maternal grandmothers have been identified as functioning as gatekeepers, where they exert influence that has the potential to limit father involvement (Rhein et al., 1997; Krishnakumar & Black, 2003). Chi square analyses of both the EHS and CDC data identified a significant relationship between maternal race and teen pregnancy.

**Maternal poverty.** As mentioned previously, the nature of the data provided information about the economic wellbeing of mothers, but not fathers. While financial support has long been conceptualized as a key aspect of father involvement, and a factor that influences fathers’ desire to be involved, little is known about how maternal poverty predicts low father involvement at both the time of birth and during early childhood (Doherty, Kouneski, & Erickson, 1998; Coley, 2001). It is hypothesized that poor mothers are likely to live in disadvantaged communities where the marriage market suffers from a shortage of viable partners, due to factors such as high levels of male incarceration and unemployment (Lane, et al., 2004). Impoverished mothers are also likely to be poorly educated and more likely to postpone
marriage but not delay childbearing (Fein, Burstein, & Lindberg, 2003; Osborne & McLanahan, 2007). As a result, poor mothers may be at higher risk of bearing children with men who are ill-equipped for the role of an involved father. Chi square analyses of both the EHS and CDC data identified a significant relationship between maternal race and poverty.

**Race for both Black and White mothers, compared to Latino mothers, but with Black mothers having the greatest likelihood of low father involvement.** While race was identified as a factor that is associated with lower father involvement, it is important to note that this finding is purely descriptive, it is not intended to “blame the victim or present a category of persons as being the problem” but rather reflects the fact that certain groups face greater “social, behavioral, or environmental risks...[These] phenomena [are factors] for which a public health intervention can be fashioned...[and while] risk may vary among groups... all groups include individuals with risks. [Interventions should address these]... those social, behavioral, or environmental risks—and not [a] person’s ancestry” (Lane, 2008, p.76). Absent measures of these social, behavioral and environmental risks, race serves as the best available proxy variable in these data sets.

This finding is reminiscent of the “Latino paradox” that is reflected in the birth outcomes literature, where despite their socioeconomic disadvantage, Latino babies have better birth outcomes compared to Black babies and outcomes that are equal to or better than those of White babies. In looking at birth outcomes for Latino babies, researchers have identified that within the Latino cultures there is stronger support for two-parent families and that increased levels of father involvement contribute to the better birth outcomes (McGlade, Saha, & Dahlstrom, 2004). Extrapolating from this literature suggests that a stronger cultural emphasis on involved fathering may account for the higher levels of involvement of Latino fathers in these two datasets. That
Black mothers would be at greater risk for lower levels of father involvement is consistent with the father involvement literature where greater socioeconomic disadvantage, incarceration and institutionalized racism create greater barriers to father involvement (Carlson & Cabrera, 2004; Lane, et al., 2004). Other research has documented that Black children are more likely to have a visiting relationship with their fathers, whereas White and Latino children are more likely to live with their fathers. White children (especially those born outside marriage) are more likely to never see their fathers, compared to Latinos and Blacks (Cabrera & García-Coll, 2004). An analysis of variance of the EHS data also identified a significant relationship between maternal race and father involvement.

**Maternal risky lifestyle/health behaviors and maternal prenatal health risks.** These findings are also congruent with the literature that has explored the relationship between father involvement and maternal health behaviors and outcomes. In research that has used marital status as a proxy for father involvement (as is the case in the analysis of the CDC dataset in the present study), positive maternal health behaviors and outcomes were more likely to be present when father involvement was high (Teitler, 2001). Similarly, in other research, the presence of maternal health risks and negative health behaviors occurred most frequently in cases of low levels of father involvement (Martin, et al., 2007). The measures of maternal risky lifestyle/health behaviors and maternal prenatal health risks in the CDC dataset represent risks that exist prior to birth and were predictive of low father involvement. In the EHS dataset, poor maternal health reported at 14 months did not predict father involvement at 36 months. This suggests that efforts to reduce maternal risky lifestyle/health behaviors and maternal prenatal health risks may represent an opportunity to reduce the likelihood of low father involvement. An analysis of variance of both the CDC and EHS datasets identified a significant relationship
between maternal race and maternal risky lifestyle/health behaviors and maternal prenatal health risks, and a significant relationship between maternal race and maternal health status at 14 months post birth.

**Maternal depression/antidepressant use.** While there does not appear to be extensive literature that identifies maternal depression as a predictor of father involvement, maternal depression is clearly associated with many of the psychosocial factors that have been identified as predictors of low levels of father involvement (Orr, James, & Blackmore-Prince, 2002; Dunkel-Schetter, Wadhwa, & Stanton, 2000; Ritter, Hobfoll, Lavin, Cameron, & Hulsizer, 2000; Hoffman & Hatch, 2000; Meadows, McLanahan, & Brooks-Gunn, 2008). A chi square analysis of variance of the CDC dataset identified a significant relationship between maternal race and the prenatal use of antidepressants (which would be accompanied by a clinical diagnosis of depression with severe enough symptomatology that the health care provider judged that the risks of antidepressant use to the fetus were outweighed by the risks of untreated depression in the mother). An analysis of variance of the EHS data, however, did not identify a significant relationship between maternal race and maternal depression, which was assessed by the CESD-LF, but the analysis of variance did identify a relationship between maternal race and maternally-reported parental stress. Maternal anxiety (which is comorbid with depression) has been identified to be negatively associated with father involvement (Claridge & Fisch, 2008). In studies that have examined father involvement in childhood, father involvement has been identified as a protective factor against maternal depression (Chang, Halpern, & Kaufman, 2007). As is discussed further in the paragraph below, maternal depression is also associated with unintended pregnancy.
**Unintended pregnancy.** The finding that unintended pregnancy would predict low father involvement is also consistent with other research in this area, and is related to other predictors of low father involvement such as poverty, being unmarried and the lack of a high school diploma. Couples who report an unplanned pregnancy are likely to experience a problematic psychosocial environment in their relationship and to report relationship and role strain, especially in unmarried couples—which erodes the strength of the relationship and may cause the father to withdraw (Claridge & Fisch, 2008; Leathers & Kelley, 2000; Bouchard, 2005). A chi square analysis of variance of the CDC dataset also identified a significant relationship between maternal race and unintended pregnancy.

**Family conflict.** While high levels of conflict between a father and mother has been identified as a risk for low father involvement, the data examined in the present study suggests an inverse relationship (Cabrera, Hofferth, & Chae, 2011). Here we find that increased levels of maternally-reported conflict (e.g., “we fight a lot”) predicts father involvement. This paradoxical finding is somewhat explained through closer examination of how the variables measuring both father involvement and family conflict are constructed. In the EHS data, an “involved father” was defined by how often the father saw his child (ranging from daily to a few times a month, across the first 36 months of the child’s life). As such, if a father did not see his child at all, it is likely that he is not in close contact with the mother, which would limit the amount of conflict that could occur between them. Inversely, if a father is involved (in contact with mother and child), greater opportunity exists for conflict to arise. While conflict may be symptomatic of a lack of problem solving or negotiating skills between parents, it is also likely evidence of a desire to connect and be engaged (Weiss & Heyman, 1990). It is clear, however, that sustained conflict between parents is associated with relationship dissatisfaction and poor outcomes in
early childhood (Lamb & Lewis, 2013). An analysis of variance of the EHS data did not identify a significant relationship between maternal race and family conflict, but it did identify a significant relationship between maternal race and the quality of maternal-child interactions (HOME scores), which was the other measure of the family emotional environment in the EHS data. The quality of maternal-child interactions at 14 months, however, was not predictive of father involvement at 36 months.

*How This Dissertation Contributes to the Literature on Determinants of Father Involvement*

As outlined in the review of literature provided earlier in this document, significant efforts have been made to better understand what father involvement “looks like” from the perspective of fathers, particularly for minority and low-income fathers. These efforts have also attempted to better conceptualize and categorize those factors that determine the degree to which a father is involved in the lives of his children. In spite of these efforts, this body of knowledge is still nascent and requires further investment and examination. The results of this study add to this body of knowledge and validate and elucidate some of the factors that have previously been identified as influencing father involvement.

For example, Doherty, Kouneski, and Erickson’s (1998) responsible fathering conceptual model emphasizes “the interacting unit of child, father, and mother, each formulating meanings and enacting behaviors that influence the other. The three are embedded in a broader social context that affects them as individuals and affects the quality of their relationships” (p. 285). Similarly, Lu et al.’s (2010) ecosystemic framework that identifies barriers to, and supports of, father involvement that are organized into the following categories: 1) intrapersonal, 2)
interpersonal, 3) neighborhood and community, 4) cultural and societal, 4) policy, and 5) life course.

Due to the constraints that arise when analyzing secondary data, the variables examined in the present study do not perfectly correspond to those identified in the models/frameworks described above, but there are significant areas of conceptual overlap that are further validated by the results presented here. For example, in the present study, being unmarried or having an unintended pregnancy are both predictors of diminished father involvement, suggesting that indeed, aspects of the maternal/paternal dyadic (interpersonal) relationship influence the father’s relationship with his child. Further, individual maternal (intrapersonal) characteristics and behaviors, such as lack of a high school education, becoming pregnant as a teen, engaging in maternal risky lifestyle/health behaviors, the presence of maternal prenatal health risks, and maternal depression/antidepressant use are also predictive of low father involvement. Finally, factors rooted in the social context such as maternal poverty and race for both Black and White mothers, compared to Latino mothers, also predict a greater likelihood of low father involvement. We also see that neighborhood and community, cultural and societal, policy, and life course factors also wield influence on the characteristics and behaviors that were identified as determinants of father involvement—which presents an opportunity for further research.

As mentioned at the beginning of the Discussion section, this study makes a key contribution to the father involvement literature on low-income, racially diverse families by using large-scale maternal-child health datasets to look at family processes—something that has not been done before and is a departure from the use of small, often convenience, samples typical of father involvement research. Doing so allows for the results of this study to be generalized to other similar populations.
Validation of a Theoretical Framework

This dissertation integrated knowledge from both child and family and public health/medical scholarship within an ecological framework that incorporates tenets from both developmental/life-course theory and a biopsychosocial model. The results of this study provide evidence that further validates this perspective as one that is useful for conceptualizing the complex, nested processes that occur within and between individuals, families, society and the larger environmental milieu.

For example, the findings of the present study, which include individual, interpersonal and social/cultural characteristics as predictors of father involvement, validate the appropriateness of an ecological/ecosocial perspective that “recognizes that behavior is affected by multiple levels of influence, including intrapersonal factors, interpersonal processes, institutional factors, and public policy” (Emmons, 2000, p. 251). Further, social epidemiologists have established that “health behaviors displayed by individuals cannot be understood without taking into account the characteristics of, and processes occurring at, the levels of both the immediate and broader environment” (p. 336, Macintyre & Ellaway, 2000). The findings of this study are also consistent with those published elsewhere in the literature that identify a relationship between the factors such as maternal health status and maternal risk-taking behaviors and the nature of the dyadic relationship (Kiecolt-Glaser & Newton, 2001; Meadows, McLanahan, & Brooks-Gunn, 2008).

The findings of the present study also validate the appropriateness of a developmental/life-course perspective in examining father involvement. Proponents of this perspective emphasize the importance of not only attending to those risk factors present during pregnancy, but to shift the focus of intervention to long before pregnancy ever occurs (Lu & Halfon, 2003; Lu et al.,
2010). Predictors of low father involvement that could potentially be mitigated by early intervention include teen pregnancy, maternal poverty, the lack of a maternal high school education, involvement in risk-taking behaviors (e.g., alcohol, tobacco and illegal drug use), and health risks (sexually transmitted infection, domestic violence).

Lastly, the present study also lends credence to the use of the biopsychosocial model in examining father involvement. It is common for most family health research that is grounded in the biopsychosocial model to focus on the impact that relational processes have on health outcomes, taking a somewhat unidirectional perspective on this phenomenon where family processes impact health outcomes. However, the results of this study also suggest that maternal health status/behaviors can predict family processes, such as father involvement.

Limitations of the Present Study

Conducting research with secondary datasets that were primarily designed to explore research questions that are markedly different from those explored in this study, presents obvious challenges. The principle limitation is that proxy variables are not direct measures of the key constructs of interest. Rather, these proxy variables are highly correlated with those constructs of interest. As such, some natural decrement in the validity of the measure is likely to occur as a degree of overlap exists between the construct of interest and the proxy variable. Large secondary datasets present the advantage of large sample sizes that are representative of the larger population, as was the case with both datasets used in this study. However, these datasets were not developed with the primary purpose of exploring family processes. For example, in the examination of father involvement in the CDC dataset, father involvement was measured through proxy variables that included marital status and paternity declaration. In the EHS dataset, father involvement was measured by maternal report and was dichotomous—the father
was either involved or not. This type of variable does not allow us to discriminate very precisely between different levels or degrees of father involvement and it relies entirely on the perspective of the mother, with the father’s perception of his involvement unknown. So although, in the case of the EHS dataset, mothers were specifically answering a question about the father’s involvement, her perception of involvement is still a proxy measurement of those behaviors and attitudes that have been identified as constituting “father involvement.” As discussed in the Literature Review, it is also important to note the shortcomings of relying upon maternal report when gathering data on fathers. Relying on mothers to provide data on the actions or motivations of fathers introduces information bias that may distort the validity of the measure. Additionally, looking at fatherhood from the perspective of the mother also introduces the possibility that paternal behaviors will be evaluated from a deficit or role inadequacy perspective (Hawkins & Dollahite, 1997).

While the conceptualization and operationalization of father involvement as a dichotomous (EHS dataset) or categorical (CDC dataset) variable, is consistent with other studies of father involvement (e.g., Alio et al., 2011), it falls short of the multidimensional conceptualization of father involvement described by others who have examined involvement in great detail (e.g., Pleck, et al., 2010). Richer measures of father involvement would have likely yielded better insights into how the predictors identified in this study impact different aspects of father involvement.

Another limitation of the present study is that it is cross sectional vs. longitudinal in design. As such, the datasets offer a snapshot in time of the lives of study participants and does not reflect how the constructs of interest are likely plastic and changing over time. It is reasonable to conclude that the constructs measured in this study indeed vary over the course of
relationships and throughout different stages of development. For example, couples who are unmarried at the time of birth may choose to marry or even more likely, couples who are married at the time of birth may later divorce. Similarly, fathers may exhibit different levels of involvement at different times in the child’s life. Longitudinal research would afford us insights into how the predictors of father involvement that have been identified in the present study, predict involvement at different stages in time/development.

Although the datasets used in this study were significantly larger than most of the datasets traditionally analyzed in child and family studies, large amounts of missing data on fathers limits the ability to generalize from these findings to all low-income fathers and families. While this study is useful in examining father involvement in low-income families, another aspect that limits the generalizability of these results is that only Black, White and Latino mothers were able to be included in the study. Other racial and ethnic groups were largely absent in the populations represented in these two datasets. Also, due to the limitations of the datasets, race for the fathers was not able to be analyzed. It is unknown how these predictors of father involvement might apply to low income families from other racial and ethnic groups.

Lastly, while the present study identified nine significant predictors of father involvement, the nature of the variables themselves and the nature of this study limit our ability to dig deeper to understand the factors and processes that undergird the genesis of the predictors/risk factors themselves. It is possible that both mediating and moderating mechanisms are also at work in this model that influence how these predictors influence father involvement. For example, what circumstances led a couple to conceive a child outside of marriage, or a mother to not complete her high school education or to become pregnant as a teen? Through what mechanisms do these maternal characteristics and behaviors influence father involvement?
What is it about disadvantaged/at-risk mothers that increase the likelihood that they will conceive a child with someone who will not be involved as a father? What factors contribute to racial differences and disparities or poverty? To understand how we might work to reduce these risk factors will require a deeper understanding of their origins and the dynamics that maintain them.

**Future Directions for Research and Policy/Programming**

**Research**—While the present study has been successful in adding to our understanding of what maternal characteristics/behaviors contribute to father involvement, much more work remains to be done. Research into the experiences of low-income fathers, especially those of racial and ethnic minorities, continues to be an area in need of increased investment and attention. In particular, it is important to collect data from father’s themselves. Far too much of what we purport to know about fathers is largely based upon maternally reported information or administrative data and does not shed light on the meanings fathers make of their experiences, and their beliefs and attitudes toward father involvement. We know from the Fragile Families research that the aspirations and attitudes held by fathers are not accurately reflected in some measures of involvement or in maternally reported data (Tamis-Lemonda & McFadden, 2010). In addition to gathering data directly from fathers, it is also important for future research to gather data on the ecological factors that surround them. As discussed in the Literature Review, several determinants of father involvement are rooted in the context, neighborhoods and environments that surround fathers (Doherty, Kouneski, & Erickson, 1998; Lu et al., 2010). Measures of these ecological factors, coupled with measures of intra- and interpersonal variables, will provide greater insights and understanding into the complex, processes that determine father involvement.
The results of this study validate the ongoing need to invest in boys and girls if we are to create circumstances later in life that are supportive of involved fathering. Too many of our current policies and interventions are focused on addressing risk factors after they have been made manifest and it may be too late to effectively intervene. The results of the current study speak to the need for early intervention. For example, risk of low father involvement may be mitigated somewhat by interventions that focus on reducing poverty for girls long before they reach childbearing age; by educating and empowering girls to avoid early sexual activity or risky health behaviors that contribute to future risk; or by successfully engaging girls in obtaining an education and improving their prospects of economic stability. Of equal, or perhaps greatest importance, is the need to intervene around the cultural, economic and psychosocial environment that tends to foster risk, as many of these risk factors are comorbid and end up being reinforced by this unsupportive environment—both within families and within the social/cultural context.

That the CDC dataset used for the first set of analyses in this study was originally developed to examine factors related to maternal-child health outcomes and was repurposed to look at aspects of father involvement, is noteworthy in two ways. First, the dataset was able to generate insights into something it was not originally designed to examine: father involvement. Second, and most importantly, the size of the dataset and the fact that it captures every birth at a community’s major birth hospital provides a rich study population—not a sample—and presents a highly unique opportunity in the field of child and family studies. Child and family scholars are most often known to use small convenience samples, which presents problems around generalizability of findings.

Using public health data for child and family research is a response to the challenge from maternal-child health researchers who desire greater collaboration with child and family
scholars, who recognize that public health interventions are of limited use if they do not also address the family and social dynamics that impact health (Kotelchuck, 2003). Future research in this area will benefit from this collaboration by helping to advance our understanding of how health and family processes intersect and what can be done to foster greater father involvement, while improving outcomes for mothers and children. As public health and child and family scholars continue to collaborate, there is also an opportunity to enhance the quality of the data being gathered. Researchers would do well do gather data on health characteristics AND wellbeing (e.g., psychosocial measures of family processes), thus creating rich repositories of information that could be used to advance our understanding of how health and family/social processes interact and influence one another, creating greater opportunities to effect change and target investments and interventions.

Future research on fathers needs to also explore ways in which researchers might more effectively collect father data. In both of the datasets used for this study, all information about fathers was derived through mother report. As a result, both datasets had large amounts of missing data on fathers. This missing data diminished the true value of these large datasets and limits the generalizations that can be made from the results. Given that the CDC dataset was a true population dataset and that the EHS dataset was created through random selection, both datasets held real potential for generating results that could have been justifiably generalized to low-income families. Unfortunately, as it is not possible to determine whether differences exist between fathers for whom data is available and those for whom it is not, it is necessary to exercise restraint when interpreting the results of the present study.

As was mentioned in the Introduction to this study, there continue to be significant gaps in our understanding of fatherhood, the factors that influence paternal involvement and its
influence on maternal and child outcomes. While not diminishing the importance of mothers, it is clear that fathers make unique and important contributions to the development of their children, over and above those of the mother and that their involvement offers protective benefits to children who are at-risk for poor outcomes (Fitzgerald & Bocknek, 2013; Roogman, Bradley, & Raikes, 2013). Future research must focus on increasing our understanding of the determinants of involvement, particularly among minority and low-income fathers, in order to help more children reap the benefits associated with an involved father (Coley, 2001; Jarret, Roy, & Burton, 2002; Tamis-LeMonda & McFadden, 2010; Lu et al., 2010; Carlson & Magnuson, 2011).

**Policy and Programming**—While the data examined in this study did not allow for the direct assessment of father characteristics, behaviors and sociodemographics in relationship to father involvement, the literature suggests that many of the risks observed in the maternal data are similar to those faced by low-income, minority fathers (Rhein et al., 1997; Coley, 2001). As a result, researchers and policymakers have agreed that it is important to focus on creating environments and contexts that foster resilience against those risks. In recent years, we have seen an increase in government policy and fatherhood programming that seek to cultivate this type of resiliency, particularly among low-income and minority fathers.

Since 1995, the US federal government has been committed to advancing policies that support father involvement. As is described below, it has also made significant investments in programming that supports that same objective. Ironically, there are still many policies and practices in place at the federal, state and local levels that discourage involved fathering. For example, there are tax policies; housing, income and food assistance programs; and child support enforcement laws that result in financial disincentives to both marriage and paternity
establishment among low income families (Lu et al., 2010). The removal of these financial barriers to marriage and paternity establishment needs to be a priority of policymakers who are serious about creating a context that is truly supportive of involved fathering.

For more than a decade the US federal government has funded fatherhood programming at both the national and state/local level. Many of these initiatives have focused on skill building, education and employment supports to strengthen the relationship fathers have with their children and to help them better contribute to their children’s wellbeing. Programs have also focused on early intervention with boys to help them succeed educationally and to develop a self-identity that connects their sexual choices and reproductive potential with a perspective of manhood that includes a strong identity as a father who is committed to, and responsible for, his children. To varying degrees, the evaluations of these types of programs suggest that they can be effective in helping to build resiliency in both fathers and boys, increasing their ability to be involved fathers (United States Department of Health and Human Services, n.d.; Lu et al., 2010).

Given the benefits that accumulate to children of involved fathers and the detriments associated with the lack of father involvement, efforts to support involved fathering are critical. It is key to our nation’s wellbeing for policymakers to focus on removing the legal and policy barriers described above, and that they remain committed to investing in fatherhood research and programming.
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SELECTED PUBLICATIONS
