Family Structure and Well-Being of Out-of-Wedlock Children: The Significance of the Biological Parents' Relationship

Shirley H. Liu*

Department of Economics

University of Miami, Coral Gables, FL 33124-6550, USA

Frank Heiland

Department of Economics and Center of Demography and Population Health

Florida State University, Tallahassee, FL 32306-2180, USA

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Abstract

This study examines the role of the relationship between the biological parents for child development using longitudinal data from the Fragile Families and Child Wellbeing Study (FFCWS). We extend prior research by considering children born to unmarried parents, in an investigation of the effect of relationship between the biological parents on infant health and behavioral problems. We find some evidence that children born into families of cohabiting biological parents realize better outcomes, on average, than those born to mothers who are less involved with the child's father. The hypothesis that children born to cohabiting biological parents benefit from subsequent marriage of their parents is rejected. Children born into a family of cohabiting or visiting parents who end their relationship within the first year of the child's life are up to 9 percent more likely to have asthma compared to children of continuously cohabiting, continuously visiting, cohabiting-at-birth or visiting-at-birth and married-subsequently biological parents. The effects found are robust to controls for economic and parental resources.

Keywords: Marriage, Cohabitation, Infant Well-being, Fragile Families, Asthma

*Corresponding author. Tel.: (305) 284-4738; fax: (305) 284-6550. *E-mail addresses:* s.liu2@miami.edu (S. Liu); fheiland@fsu.edu (F. Heiland). Shirley H. Liu acknowledges financial support through the James W. McLamore Summer Awards in Business and the Social Sciences from the University of Miami.

1 Introduction

While marriage remains the most common foundation of family life in the U.S., nontraditional arrangements in which children are born into and raised are increasingly common. The traditional process of family formation, specifically marriage before having children, has been dwindling. Over the past three decades, the proportion of American children born outside of marriage increased from approximately 12% in 1970, to about one third of all births today (Single-Rushton and McLanahan, 2003).[1] These children are born into a variety of relationship arrangements between the mother and the (biological) father. It is estimated that 39% of all non-marital births in the 1990s were to mothers that cohabited with the biological father (Bumpass and Lu, 2000) and an additional 30% are to single mothers who are living alone but are dating the child's father (McLanahan and Garfinkel, 2002).[2]

Understanding the consequence of non-marital family arrangements for the development of the children involved is of particular interest to researchers and policy makers since families formed by unmarried parents have been found to have fewer economic resources (Sigle-Rushton and McLanahan, 2002; Manning and Brown, 2003; McLanahan and Sandefur, 1994) and may provide a less stable family environment[3] (Manning et al. 2004) than families of married parents. While the effect of one important aspect of change in family structure, namely parental divorce on child outcomes, has been studied extensively[4], the role of marriage, cohabitation, and other arrangements between the biological parents for child development has received considerably less attention.[5]

Previous research has provided evidence that children from families of unmarried parents are less likely to graduate from high school or to attend college (Deleire and Kalil, 2002) compared to children

[1] Calculations on cohabitation trends from census data are consistent with this development. In 1960, of all couple households less than 1% were unmarried couples compared to more than 8% in 2000 (see Fitch et al., 2005).

[2] Sigle-Rushton and McLanahan (2002) find that in the sample of new unmarried urban mothers from the Fragile Family and Child Wellbeing Study, about 50% are cohabiting at the time of the child's birth and only 17% are living alone.

[3] It is for this reason that families of unmarried parents are sometimes referred to as *fragile families* (Brown, 2004; and Osborne and McLanahan, 2004).

[4] See Cherlin (1999) and Liu (2005) for recent surveys of this literature.

[5] For a recent survey of the literature on the potential benefits to marriage (with a methodological emphasis) see Ribar (2004).

of traditional intact families. Some studies find that not all constellations with unmarried parents are detrimental. In particular, Deleire and Kalil (2002) find that the developmental outcomes of teenagers who live with their single mother and with at least one grandparent are often comparable (and sometime even superior) to the outcomes of children in married families. On the other hand, Brown (2004) finds no difference between cohabiting biological parents, cohabiting stepfamilies, and married stepfamilies for child well-being. Most studies on the development of children from families of cohabiting parents conclude that growing up with married parents is better than being raised by cohabiting parents (Acs and Nelson, 2002, 2004; Brown, 2001, 2004; Osborne et al., 2003; and Manning 2002). This evidence combined with the growing prevalence of unmarried parenthood prompted a recent policy focus on encouraging and stabilizing marriage among these *fragile families*, hoping that marriage will incur benefits to these families and their children.[6]

The existing evidence suggesting that being raised in an unmarried family is worse than growing up in an intact family with married parents mostly comes from school-age children and adolescents. With the exception of Osborne and McLanahan (2004) and Osborne et al. (2003), differences in developmental outcomes among young children have largely been ignored.

However, two studies that attempt to isolate the effect of living in an intact vs. non-intact family on child development from (unobserved) factors that jointly affect child development and marital status (Osborne et al. 2003; and Björklund et al. 2004) do not find benefits for children from intact families. Osborne et al. (2003) is the only study that examines the differences in child behavioral outcomes among married and cohabiting families for very young children. They found that children born to married parents are less likely to report behavioral problems by age 3, compared to those in cohabiting families. On the other hand, they find that marriage within the first 3 years since childbirth among cohabiting parents does not yield gains in child well-being. They conclude that observed benefits of marriage may be largely accounted for by the characteristics of those who enter marriage. However,

[6]Some researchers have supported a greater effort by the public towards maintaining and increasing traditional family constellations (see e.g., Glenn et al., 2002).

their study ignores the important sample of unmarried biological parents who are not cohabiting but visiting or are not romantically involved. They also do not account for intrinsic differences in marital and fertility behaviors among different family types. In such a setting, the benefits of marriage are likely to be overstated. Consequently, more and better evidence is needed to inform policy makers regarding the usefulness of current marriage policies.

This study examines the effects of different relationship arrangements between the biological parents for young children born to unmarried parents. In particular, using a representative sample of children born to unmarried parents drawn from the Fragile Families and Child Wellbeing Study (FFCWS), we assess whether parental marriage following a child's birth improves child health and behavioral outcomes relative to other relationship arrangements such as cohabitation, visiting, and no romantic involvement of the mother with the biological father. We are motivated by the question whether encouraging marriage among unmarried parents would be beneficial for young children. To account for the potential endogeneity of parental relationship arrangement in the child development process, we investigate the robustness of the results to controls for parental characteristics and economic and parental resources.

The analysis makes several contributions to the literature. Until recently, research on the effects of the relationship between the parents on young children's development was complicated by the lack of large representative surveys of children experiencing such environments. As a result, most existing research address how family structure changes may affect the development of individuals who are born into and/or raised in unmarried families based on outcomes measured at adolescence rather than childhood. Since unmarried families are known to be less stable, the existing evidence on the effect of family structure on achievement may not be representative of the average impact of non-marital family structures. Second, existing studies that examine the effect of parental marriage on children born outside of marriage often fail to distinguish between marriages to a biological parent vs. a stepparent, thereby confounding the effect of marriage to the child's biological parent to that of a stepparent. The FFCWS allows us to identify the exact nature of the relationship between the mother and the biological

father of the child following childbirth.

The remainder of the paper is organized as follows. Section 2 provides a theoretical background for the hypotheses analyzed in this paper. Section 3 describes the sample construction and methods used to test the hypotheses. Section 4 presents the empirical findings and the final section concludes and outlines the future research agenda.

2 Background and Hypotheses

The main hypothesis that we seek to test in this paper is whether there are benefits to marriage of the biological parents for out-of-wedlock children compared to children experiencing alternative arrangements such as cohabitation, visiting, or no romantic involvement. We adopt Becker's influential view of household production ("new household economics"). Specifically, the analytical framework used here is based on the proposition that (I) parents must allocate scarce resources between a child's well-being ("quality") and other competing goods such as parents' own consumption needs or siblings' well-being, and (II) that parents achieve their objective, here child quality, using time inputs and goods and services purchased in markets (Becker, 1965). Within this framework marriage may be viewed as a consumption good by the potential spouses, i.e. being married yields a greater level of satisfaction than being single, all else constant.[7] Since marriage in the U.S. involves exactly two people and, once established, is costly to undo, the process and the cost of obtaining it are different from market-purchased goods and home-produced goods that only involve one person's inputs. Marriage is costly due to the expenses associated with getting married including the costs to search for a viable mate. The risk of losing the marriage prematurely, i.e. becoming divorced, increases the cost of getting married from a lifetime perspective.

How may being married affect the investment decisions in children? The desire for marriage and

[7]The argument is similar if we were to think of marriage as an input in some home-produced good, like "love" or "pleasure".

have children may interact through several channels. In traditional societies, the (man's) desire for children (i.e. legitimate heirs to continue the lineage) may only be satisfied via a marriage. A child born to married parents is likely to receive greater investments from the biological father in this case compared to a child born out of wedlock. Today, this legitimization function of marriage likely still plays an important role. While it may be more acceptable to have a child before getting married, signaling the intent to get married ultimately (e.g., by eloping before the birth) may serve as an accepted intermediate step towards the same end. If all parents would get married ultimately, i.e. in all cases the intent was established early on, the act of getting married should have little effect on the child's developmental trajectory since the motives behind the child investment behavior before marriage are the same as after marriage. In cases without the intent to marry, out of wedlock children may be unwanted and neglected subsequently. In such a context, marriage may be found to be beneficial, capturing the greater interest in the child by the biological father that translates into greater investment.

Alternatively, in the absence of the need to legitimize the relationship for the child's sake, marriage may occur when the couple is a good match or if the transaction costs are small. Given the higher separation cost, the risk that one partner leaves may be lower for married couples. This implies that resources may be freed up (including parental time) that would otherwise be used to prevent the partner from defecting from the (non-marital) union. Marriage may be found to be beneficial in this case since additional resources are available to the child. On the other hand, if the match between the parents is good (more likely to be the case when there is sufficient time to search), or both partners see little benefit to getting married, the costs of marriage may deter some couples from ever getting married. If they are well matched, or see equally low returns to marriage, the resources required by one partner to prevent defection from the union of the other partner (compensating differentials) are likely to be low. Thus, the child may benefit from living in a family of unmarried cohabiting or visiting parents, even compared to out-of-wedlock children in some families where the parents do get married eventually.

Stable involvement between the biological parents is expected to be better for the child than an environment where the quality of the relationship between the unmarried biological parents deteriorates

(e.g., goes from visiting to not romantically involved) since in the latter case the opportunity of the biological father to invest in the child is likely to decline. Finally, a stable non-romantic involvement of the biological parents does not rule out that the father can invest in the child, however on average it is likely to be less frequent. The overall effect of such an arrangement also depends on how frequently a new partner of the mother is present and to what extent a new partner may assume the role of a social father.

From our theoretical discussion, it is clear that the effect of marriage on child development is theoretically ambiguous, but we do expect that Using data on parental marital status, living arrangements, and parenting behavior from FFCWS, in the sequel we test whether marriage is beneficial for children by comparing health and behavioral outcomes of children whose parents eventually get married, to children whose parents remained unmarried. Promoting marriage would be an effective policy if the findings suggest that even among children all born out-of-wedlock, children of parents who eventually get married exhibit significantly better outcomes compared to those whose parents remained unmarried. Moreover, given similar resource constraints faced by married and unmarried-but-cohabiting parents, differences (or lack thereof) in child outcomes between these two types of families provide more compelling evidence to assess policies promoting marriage. To explore further the role of relationship arrangement between the biological parents for child well-being, we also test whether non-cohabiting arrangements, including visiting and no romantic involvement, are detrimental for child development.

Prior to the FFCWS, large datasets containing information on children born out-of wedlock and details on the nature of parental relationships were unavailable. To draw conclusions on the potential benefits of marriage, previous research was limited to comparing children in non-traditional family settings to children born into intact families. Parents that have children before marriage may be very different from those who have children after getting married. In contrast, in the FFCWS, children are homogeneous in the sense that they are all born out-of-wedlock, and some of them experience their parents' marriage later while some do not. This setup is much better suited to enhance our understanding of the advantages/disadvantages that various parental relationship structures may have on the children

involved.

3 Data and Methods

The study sample consists of 2,331 children born to unmarried parents drawn from the Fragile Families and Child Wellbeing Study (FFCWS). The FFCWS collected data on approximately 4,700 births in 75 hospitals in 16 large cities (with population of 200,000 or more) across the U.S. between 1998 to 2000. Of the sample of births, 3,600 were to unmarried parents while the rest are to married couples. Biological parents were interviewed at the time of childbirth and subsequently every two years, on topics such as parent-parent and parent-child relationships, socio-economic activities, parents' and child's health, and child development[8]. These data are unique in that they provide information on a large set of unmarried parents in various living arrangements and relationship structures. A rich set of human capital, relationship quality, and child development outcome variables associated with family transitions are available.

The study sample includes only children born outside of marriage, with at least one parent (usually the mother) interviewed at both the baseline (birth of child) and when the child reaches one year old. Out of the study sample, 49% are born to unmarried mothers who were cohabiting with the child's biological father at baseline. Another 33% are born to biological parents who are in visiting relationships, while the remaining are to mothers not romantically involved with the child's biological father. As mentioned previously, factors that influence marriage decisions may be different between couples with and without children. The sample of unmarried families is chosen because they are homogeneous in the sense that they all have children prior to marriage.

This analysis aims to examine whether there are benefits of parental marriage among children born to unmarried parents, and more specifically, potential differences in marital benefits compared to other relationship structures between the biological parents. Table 1 presents the summary statistics of the de-

[8]For a detailed description and sampling methods, see Reichman et al. (2001).

pendent variables and independent variables employed. The study sample is separated into four groups based on changes in family structure between baseline and wave 1 (i.e. from the time of childbirth to when the child is one year old). Among parents who married following the birth of their child, they are separated into three groups based on their relationship status at the time of childbirth: Cohabiting, visiting, and not (romantically) involved. The control group is families who were unmarried at childbirth and remained unmarried at wave 1. Means tests of variables are performed between each of these three groups and the control group.

3.1 Dependent Variables

We examine health and behavioral outcomes of children by age 1: whether the child has asthma or asthma attacks, child's general health status, and a behavioral problem index. All three outcome measures are based on mother's reports at the one year follow up. Mothers are asked to report whether their child has asthma (or were told it does by a health care professional) or asthma attack by age 1. Among children born to cohabiting parents, about 10% are reported to either have asthma and/or have had an asthma attack by age 1, compared to 15% among the parents in visiting relationships and 17% among parents who are not involved[9].

From Table 1, we see that children whose parents remain unmarried when they reached age 1 are more likely to have asthma or an asthma attack by the age of 1 (13%), compared to those whose parents married following their births (between 2% to 10%). In particular, children whose parents in "visiting" relationships at childbirth are significantly less likely to be reported to have asthma or an asthma attack. Parents who chose not to co-reside before marriage may be a selected group, as they may be less accepting of cohabitation prior to marriage due to unobserved differences in attitudes toward marriage and family.

The general health status measure is based on mother's reported rating of the child's health condi-

[9] Summary statistics furnished upon request from the authors.

tion. Mothers are asked to rate their child's health from 1 being "Excellent", to 5 meaning the child is in "Poor" health. Unmarried mothers who did not reside with the child's biological father at childbirth are more likely to report that their children are in poor health, compared to those in cohabiting relationships with the father. Table 1 presents the mean child health status by different family structure transitions. Parents who remain unmarried when the child reaches age 1 are more likely to report the child being in poorer health. However, the differences between each of these relationship statuses are not statistically significant.

We construct a behavioral problem index based on the mother's answers to the following six questions: whether the child is shy, fussy or cry often, gets upset easily, reacts strongly when upset, whether the child is sociable and whether he or she is friendly to strangers. Mothers are asked to rate each question from a scale of 1 to 5, with $1 =$ (Not at all), and $5 =$ (Very much). The behavioral problem index is constructed based on the mean responses to the six questions, with a mean of 2.60 and standard deviation of 0.77[10]. The *Cronbach's alpha* for the behavioral index is 0.501[11]. Children born into cohabiting relationships in general are less likely to be reported to exhibit problematic behavior, as opposed to children of parents who were in visiting relationships or not involved at childbirth. More specifically, cohabiting parents who later married within the first year of childbirth report significantly fewer child behavioral problems, compared to those who remain unmarried.

3.2 Independent Variables

Mother's reported marital status at the one-year follow-up is the main dependent variable. The parenting behavior and investments in children's human capital may differ among different types of

[10] When constructing the index, the original responses to the first four questions are used, with a 1 being least problematic and a 5 being the most troubled. The responses to the last two questions are reversed so that a 1 would also represent desirable behavior and a 5 would be least desirable.

[11] Estimation of the *Cronbach's alpha* is unaffected by the reversal of the item scale. The Cronbach's alpha assesses the reliability of a summative rating scale composed of variables specified. The reliability α is defined as the square of the correlation between the measured scale and the underlying factor. See Cronbach (1951) and Likert (1932) for a detailed discussion.

unmarried family settings. In addition, benefits from parental marriage for children in each of these family settings may also differ. To examine differences in potential marital benefits for children, we separate the sample of unmarried parents who got married following childbirth into three main categories: parents who were cohabiting at childbirth, romantically involved but not residing together at childbirth (i.e. "visiting"), and those who are not involved when the child was born.

Parents are the primary investors in their children's human capital. For unmarried parents, factors that influence their investment decisions in their children's human capital may be endogenous to the determinants of their own marital decisions. Children born to cohabiting parents may have better outcomes compared those to non-cohabiting parents since they already enjoy greater economic and social resources similar to those born to married parents. However, since these children are born into a two-parent family setting, the gains of parental marriage for them may also be smaller than for those born to non-cohabiting parents.

For many unmarried couples who become pregnant, setting up an independent cohabiting household is their immediate goal (Gibson et al. 2003). Women who are white, older, more religious, have no children from previous relationships, and higher educated are more likely to marry before the child is born (Manning, 1993, 2001). Therefore, visiting parents may be selectively different from cohabiting parents in that they continued to live apart. In addition, cohabiting parents face lower costs in transitioning into marriage on the margin, as they have already set up a joint household prior to childbirth.

Local marriage market conditions and attitudes may also affect marriage behavior for unmarried parents. At the margin, in areas where marriage laws are more stringent, only those who foresee large benefits to marriage would marry, while others may simply resort to cohabitation. Furthermore, the stigma associated with unmarried parenthood and cohabitation may be higher in some communities as opposed to others. In relatively more conservative areas, cohabitation before marriage may be looked down upon, therefore unmarried parents may face higher pressure to enter into marriage rather than cohabitation. Cohabiting parents may also have been involved longer and hence have more time to make the transition into cohabitation before marriage, compared to those not living together. Therefore,

we control for the length of the relationship before the child was born and parity of the focal child to account for this difference.

To account for observed differences among unmarried couples, we control for parental background characteristics such as mother's age at childbirth, race, and whether the mother is foreign born. Additionally, we also consider whether the father is of a different race to the mother, and whether the mother and/or the father have other children with different partners. All background characteristics are measured at baseline (childbirth). Human capital of the parents is also included to account for differences in economic resources and parental ability. They include parental education, earnings, and parental health and health behavior. State of residence and local marriage rates are included to account for differences in environmental factors that may also affect the propensity to marry among unmarried parents.

Cohabiting parents and non-resident parents may also differ in unobserved aspects. The close proximity of cohabitation may imply higher frequency of sexual activity, hence higher risk of contraceptive failure. On the one hand, since cohabiting parents face lower costs of entering into marriage, as they already established a joint household, they may be more likely to marry upon a contraceptive failure. However, on the other hand, the taste for marriage may differ among unmarried parents. Couples who are pregnant but do not live together may have more conservative attitudes towards cohabitation and hence not consider it as an option before marriage. Upon pregnancy, these non-cohabiting parents may be more likely to consider marriage, compared to those already living together.

Table 1 summarizes the means of the independent variables used in this analysis. Comparing to mothers who remained unmarried after childbirth, mothers who got married following the birth of a child, on average, are older, more likely to be white, and more likely to be better educated. At the same time, fathers of these children are more likely to have higher earnings compared to children of parents who remained unmarried. In addition, mothers who were in visiting relationships and later marry the father are those with higher earnings. In terms of health behavior, although married mothers who were involved (either cohabiting or visiting) with the biological father at baseline are less likely to drink alcohol or use drugs during pregnancy, the fathers are more likely to smoke. Finally, cohabiting

parents who marry after childbirth may invest more parenting time in their child compared to the other groups, as we observe that these mothers utilize fewer hours of alternative childcare per week but are more likely to play with the child and to read or sing to it.

3.3 Methods

We use multivariate regression and probit analysis to test whether children who experience a marriage of the biological parents are better-off than children whose parents cohabit, are dating but do not live together ("visiting"), or are currently not romantically involved.

Specifically, for a couple (i) that is unmarried at child birth, the process of investing in their child's human capital and the potential influence of the evolution of the parents' relationship arrangements may be formalized as follows:

$$Y_i = \alpha_0 + \alpha_1 X_i^s + \alpha_2\{C \rightarrow M\}_i + \alpha_3\{C \rightarrow V\}_i + \alpha_4\{C \rightarrow NI\}_i \tag{1}$$

$$+\alpha_5\{V \rightarrow M\}_i + ... + \alpha_8\{V \rightarrow NI\}_i + \alpha_9\{NI \rightarrow M\}_i + ... + \alpha_{12}\{NI \rightarrow NI\}_i + \varepsilon_i,$$

where Y_i is the stock of human capital for the child at the time of measurement, which is determined by a set of parental investment variables since child birth, X_i^s, and a set of binary variables that captures the evolution of the parents' relationship since child birth. The first letter(s) stand for status at birth (C=Cohabiting, V=Visiting, NI=Not Romantically Involved) and the second letter(s) denote the status of the relationship one year later. For example, if the biological parents are cohabiting at birth and get married within a year the indicator $\{C \rightarrow M\}_i$ equals one. The error term, ε_i, captures unobserved child- or family-specific heterogeneity.

We note that the reference category (i.e. the omitted category) for the relationship experience is arbitrary, but we chose the stable cohabiting arrangement in the models below as it is the most common arrangement. In that case a statistically significant positive coefficient of, for example, α_2

would indicate that children who experience their biological parents to transition from cohabiting at birth to marriage a year later are better off than those who experience a stable cohabiting arrangement.

4 Preliminary Results

This section presents estimation results on the differences in outcomes of young children by family structure. We obtain results using the three dimensions of child development measured at age 1 discussed above: whether the child has asthma or asthma attack, the child's general health status, and a behavioral problem index. We estimate the following four models: (I) overall effect of parental marriage relative to all other arrangements; (II) effect of parental marriage relative to all other arrangements controlling for relationship structure at child birth; (III) effect of marriage, visiting, not romantically involved one year after birth relative to cohabiting at that time controlling for relationship structure at child birth; and (IV) the detailed transitions relative to stable cohabiting relationship status outlined in equation (1).

4.1 Child's Propensity to Develop Asthma or Have an Asthma Attack

Tables 2A and 3A present estimates of the probit marginal effects of parental marriage on a specific health condition, namely the probability that the child would develop asthma or an asthma attack by the age of 1. Model (1) in Table 2A looks at the raw differences in the effect of parents' marriage relative to all other arrangements. It suggests that children whose biological parents get married after childbirth are less likely to have asthma or an asthma attack than those in any other arrangements. However, this effect is not robust. Once relationship structure at childbirth is controlled for, the effect is reduced in half and no longer statistically significant. The results indicate that children in visiting and non-involvement parental relationships at birth face a greater asthma risk, on average, than children born into families of cohabiting parents. The weakening of the marriage effect is consistent with the detrimental arrangements of lesser involvement also being less likely to lead to subsequent marriage.

The fourth column of Table 2A allows a more detailed view of what arrangements are potentially detrimental for infants. The results indicate that children born into families of cohabiting biological parents are less likely to have asthma, on average, than those born to mothers who are less involved with the child's father. Children who experience the relationship break-up of initially cohabiting parents or initially visiting parents have an 8 to 9 percent greater risk of experiencing asthma. A lack of a romantic involvement with the father throughout or a return to a romantic relationship after no involvement also has a negative impact on the child. This is may be the result of the unstable environment provided to the child in these cases.

Interestingly, children in families with initially cohabiting parents who then get married are not better off than those infants in stable cohabiting arrangements. Table 3A assess whether the results of Model (4) in Table 2A are robust to the inclusion of controls for various parental background characteristics and measures of economic status. While the estimates tend to become somewhat smaller, the overall pattern implied by the effects remains unaltered.

Parental background and economic status show the expected importance in child development. They related to the available resources that can be devoted to child human capital investments, and proxy for parental ability to combine inputs efficiently. Model (2) in Table 3A include controls for mother's background characteristics; and Model (3) adds controls for parents' economic conditions. Children's greater propensity to develop asthma among those born to mothers who go from cohabiting or visiting to no romantic involvement with the biological father can be partially explained by other family environmental or endowment heterogeneity correlated with race/ethnicity and whether the mother is foreign-born. Better education of the mother is associated with a smaller risk of developing asthma by the age of 1 but does not appear to mitigate the effect of relationship status on development.

Model (4) adds parental health and health behavior variables to the background controls. Parental health and health behavior are highly correlated with economic status, and explain less of the differences in child outcomes compared to the economic variables. Together, as in Model (5), economic status and parental health practices do appear to mitigate the differences in child's probability to de-

velop asthma by relationship experience.

Finally, we add controls for the length of time the parents knew each other prior to childbirth, and the parity of the focal child in Model (6). While being of lower parity has an independent negative effect on asthma incidence, the inclusion of these two parental relationship characteristics does not alter the role of the relationship status.

4.2 Child's General Health Status and Behavioral Problem

The effect of the evolution of parental relationship status on children's general health status is presented in Tables 2B and 3B. Children's initial health endowment, as measured by whether the child is of low birth weight ($<$ 88 oz. at birth) are included in all model specifications.

The results in Table 2B show that while the sign of the estimated effect of marriage on child reported health indicates that marriage may be beneficial compared to alternative arrangements, the effects are not statistically significantly different from zero. In addition, no differential effects between non-marital relationship arrangements are found. Inclusion of additional controls does not alter this conclusion as shown in Table 3B. Other inputs mostly display the expected sings. The detailed results are not shown but are available from the authors upon request.

Tables 2C and 3C illustrate the relationship effects for children born to unmarried parents on their propensity to display behavioral problems. Based on a 5-point behavioral problems scale, the hypothesis that children born to cohabiting biological parents benefit from subsequent marriage of their parents is rejected. As for the reported child health, the sign of marriage indicator is positive but the effect is not statistically significantly different from zero. Children born into families where parents are not cohabiting by romantically involved ("visiting") but end the relationship during the first year of the child's life, may be worse off than children subject to other arrangements (see Model (4) in Table 2C). However, this effect becomes insignificant as mother's characteristics are included in the regression (see Table 3C) indicating that family environmental or endowment heterogeneity correlated with race/ethnicity and

whether the mother is foreign-born exert strong independent effects on behavioral development while they are also predictive of the stability of the relationship arrangements.

The additional controls mostly show the expected effects (results not reported here). In particular, we find that parenting behavior and style are important in determining problematic behavior of children. On average, cohabiting mothers who married after the child's birth spend more quality time with their children, compared to visiting mothers who later married and those who remained unmarried. We include parent-child interaction variables to proxy for parenting behavior, in addition to background controls. Negative parenting behavior, such as spanking, is associated with more behavior problems. Productive parenting, such as if mother reads or interacts with the child to stimulate positive development, are associated with fewer behavior problems.

5 Conclusions

This paper investigates to what extent the relationship structures between the biological parents within the first year of an infant's life effects child well-being using three early childhood outcomes. We find evidence that the relationship status at childbirth has an effect on subsequent child outcomes. Specifically, our results indicate that children born into families of cohabiting biological parents are less likely to have asthma, on average, than those born to mothers who are less involved with the child's father.

Our main hypothesis that children born to cohabiting biological parents benefit from subsequent marriage of their parents is rejected. In fact, we find no difference between a stable cohabiting situation and cohabiting at birth with subsequent marriage. Even after controlling for family background conditions including measures of the economic conditions at the time of the child's birth, there is no evidence that a marriage between the child's mother and father during the first year after birth is more beneficial for an infant than other arrangements that do not involve marriage. The results cast doubt on the notion that marriage per se benefits child well-being since the environment provided by stable

cohabiting parents appears equally beneficial to a child than a relationship that evolves into marriage after birth.

Another hypothesis that we investigate is whether more involvement of the biological father with the mother benefits the child. We find that children born into a family of cohabiting or visiting parents who end their relationship within the first year of the child's life are up to 9 percent more likely to have asthma compared to children of continuously cohabiting, continuously visiting, cohabiting-at-birth or visiting-at-birth and married subsequently biological parents. For reported health and behavioral problems, there are no statistically significant effects of type of relationship arrangement on child outcome. All results are robust to the inclusion of controls for parental characteristics, economic status, and other inputs in child development process.

Regarding the research agenda, three aspects are particularly important for future extensions of this research. First, the developmental trajectory needs to be studied beyond the first year of the child's life. The absence of a contrast between parents who do get married and those who do not found here may be the result of parental child investment behavior consistent with the expectation of getting married in the future. A high enough percentage of couples that remain unmarried but plan to get married and act accordingly may suffice to eliminate differences between those who get married shortly after birth and those who do not. Second, the role of potential substitutes for the fathers needs to be investigated. The preliminary evidence presented here does not rule out that there are benefits to having additional (male) care providers in the child's life. Further investigations into the role of cohabitation with a person other than the father will help to shed light on this aspect. Finally, the results may be subject to selection biases. Estimates from a joint model of the child quality production process and the relationship decision, as suggested in the methods section of the paper, will be less likely to suffer from such concern.

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Table 1: Descriptive Statistics by Family Structure Transitions

Parents' Union Status at 1-Year	Unmarried		Married	
Parents' Union Status at Baseline	Unmarried	Cohabiting	Visiting	Not Involved
Child Outcome Variables				
Asthma or Asthma Attack by Age 1	0.13	0.10	0.02*	0.10
Health Status (1 = Excellent; 5 = Poor)	1.51	1.42	1.48	1.50
Behavioral Index(1 = Least Problematic; 5 = Very Problematic)	2.61	2.50*	2.54	2.37
Mother's Background Characteristics				
Mother's Age at Childbirth	23.5	24.5*	24.6	25.5
Race: White Non-Hispanic	0.17	0.25*	0.20	0.00*
Race: Black	0.51	0.23*	0.41	0.20*
Race: Hispanic	0.29	0.47*	0.37	0.80*
Race: Other	0.03	0.04	0.02	0.00*
Mother is Foreign Born	0.12	0.23*	0.22	0.30
Mother's Educational Background				
Less than High School	0.40	0.35	0.39	0.50
High School Diploma (or GED)	0.34	0.32	0.33	0.40
Some College	0.24	0.26	0.26	0.10
College and Beyond	0.03	0.07*	0.02	0.00*
Father's Educational Background				
Same as Mother	0.45	0.47	0.48	0.30
More than Mother	0.25	0.25	0.26	0.20
Less than Mother	0.25	0.27	0.26	0.10
Parents' Earnings Income				
Mother: \$0	0.40	0.39	0.43	0.50
Mother: \$1 to \$9,999	0.38	0.36	0.24*	0.10*
Mother: \$10,000 to \$25,000	0.18	0.16	0.24	0.40
Mother: More than \$25,000	0.44	0.48	0.52	0.50
Father: \$0	0.34	0.13*	0.17*	0.50
Father: \$1 to \$9,999	0.23	0.16*	0.22	0.10
Father: \$10,000 to \$25,000	0.29	0.42*	0.48*	0.20
Father: More than \$25,000	0.14	0.29*	0.13	0.20
Parents' Health and Health Behavior				
Mother's Self-Reported Health = Fair or Poor	0.08	0.07	0.09	0.00*
Mother: Prenatal Smoking (If at all)	0.22	0.23	0.22	0.20
Mother: Prenatal Drug Use (If at all)	0.06	0.03*	0.02	0.00*
Mother: Prenatal Drinking (If at all)	0.10	0.08	0.04+	0.00*
Father's Self-Reported Health = Fair or Poor	0.06	0.07	0.07	0.00*
Father Smokes (If at all)	0.34	0.42*	0.48+	0.30
Father: Substance Abuse Limiting Work	0.11	0.07*	0.07	0.20
Parental Relationship Characteristics				
Length of Relationship prior to Childbirth (Months Parents know each other prior to childbirth)	46.5	45.6	50.2	76.1
Parity of Focal Child	2.05	2.03	2.09	2.10
Parenting Behavior and Alternative Child Care				
Child Cared by Others (Hours/Week)	15.2	11.1*	14.1	12.2
Grandmother Lives in the Household	0.26	0.16*	0.28	0.10
Mother Spanks the Child (If at all)	0.27	0.24	0.30	0.00*
Mother Reads to the Child (Days/Week)	4.07	4.14	3.61	4.10
Mother Sings to the Child (Days/Week)	5.46	5.70+	5.52	5.60
Mother Plays Outdoor Games with Child (Days/Week)	6.01	6.21+	5.71	6.00
Mother Plays Indoor Games with Child (Days/Week)	5.89	6.05	5.47	5.78
Number of Observations	2062	213	46	10

Note: Significantly different from "Unmarried" at: (∗) = 5% level; (+) = 10% level.

Table 2**A:** Effect of Parental Union Transitions on the Probability that the Child has Asthma or Asthma Attack within the First Year since Birth[†]

	(1)	(2)	(3)	(4)
Parental Union Status Transition between Childbirth and 1 ***Year***				
Married at 1 Year	$-.044^{*}$	$-.025$	$-.020$	
	(.019)	(.021)	(.023)	
Union Status at Childbirth				
- (Cohabit)				
- Visiting		$.052^{*}$	$.049^{*}$	
		(.017)	(.018)	
- Not Involved		$.074^{*}$	$.055^{*}$	
		(.023)	(.025)	
Union Status at 1 *Year*				
- (Cohabit)				
- Visiting			$-.047$	
			(.027)	
- Not Involved			.024	
			(.017)	
Union Transition between Childbirth $\rightarrow$ 1 *Year*				
- Cohabit $\rightarrow$ Married				.028
				(.031)
- (Cohabit $\rightarrow$ Cohabit)				
- Cohabit $\rightarrow$ Visiting				.033
				(.077)
- Cohabit $\rightarrow$ Not Involved				$.079^{*}$
				(.034)
- Visiting $\rightarrow$ Married				$-.087$
				(.035)
- Visiting $\rightarrow$ Cohabit				$.120^{*}$
				(.032)
- Visiting $\rightarrow$ Visiting				$-.007$
				(.043)
- Visiting $\rightarrow$ Not Involved				$.092^{*}$
				(.028)
- Not Involved $\rightarrow$ Married				.024
				(.125)
- Not Involved $\rightarrow$ Cohabit				$.139^{*}$
				(.086)
- Not Involved $\rightarrow$ Visiting				$-.007$
				(.101)
- Not Involved $\rightarrow$ Not Involved				$.109^{*}$
				(.028)
Log Likelihood	-890.7	-882.6	-879.6	-871.5
Likelihood Ratio χ^2	4.52^{*}	20.70^{*}	26.69^{*}	43.02^{*}

Notes: [†]. Marginal effect of the covariates on the probability that the child develops asthma or asthma attack by the age of 1 are reported; *a.* Standard errors reported in parentheses; *b.* $*$ = Significance at 5% level, and $+$ = Significance at 10% level.

Table 2**B:** Effect of Parental Union Transitions on Child Health Status: Y = Child Health Status as Reported by Mother (1 = Excellent; 5 = Poor)

	(1)	(2)	(3)	(4)
Parental Union Status Transition between Childbirth and 1 ***Year***				
Married at 1 Year	−.075	−.059	−.065	
	(.052)	(.0.054)	(.056)	
Union Status at Childbirth				
- (Cohabit)				
- Visiting		.032	.039	
		(.038)	(.041)	
- Not Involved		.060	.064	
		(.047)	(.054)	
Union Status at 1 *Year*				
- (Cohabit)				
- Visiting			−.078	
			(.080)	
- Not Involved			−.007	
			(.043)	
Union Transition between Childbirth → 1 *Year*				
- Cohabit → Married				−.059
				(.063)
- (Cohabit → Cohabit)				
- Cohabit → Visiting				−.017
				(.156)
- Cohabit → Not Involved				.030
				(.063)
- Visiting → Married				−.003
				(.123)
- Visiting → Cohabit				.070
				(.058)
- Visiting → Visiting				−.122
				(.097)
- Visiting → Not Involved				.044
				(.052)
- Not Involved → Married				.019
				(.258)
- Not Involved → Cohabit				.099
				(.148)
- Not Involved → Visiting				.442^{+}
				(.226)
- Not Involved → Not Involved				.049
				(.052)
Constant	1.509*	1.487*	1.491*	1.481*
	(.018)	(.026)	(.028)	(.031)
R^2	.001	.002	.002	.005

Notes: a. Standard errors reported in parentheses; *b.* $*$ = Significance at 5% level, and $+$ = Significance at 10% level.

Table 2**C:** Effect of Parental Union Transitions on Child Problematic Behavior: Y = Child Behavioral Problem Index (1 = Least Problematic; 5 = Very Problematic)

	(1)	(2)	(3)	(4)
Parental Union Status Transition between Childbirth and 1 ***Year***				
Married at 1 Year	$-.111^{*}$	$-.100^{*}$	$-.072$	
	(.050)	(.051)	(.053)	
Union Status at Childbirth				
- (Cohabit)				
- Visiting		.026	.001	
		(.036)	(.039)	
- Not Involved		.036	$-.021$	
		(.044)	(.051)	
Union Status at 1 *Year*				
- (Cohabit)				
- Visiting			.020	
			(.076)	
- Not Involved			$.090^{*}$	
			(.040)	
Union Transition between Childbirth $\rightarrow$ 1 *Year*				
- Cohabit $\rightarrow$ Married				$-.083$
				(.060)
- (Cohabit $\rightarrow$ Cohabit)				
- Cohabit $\rightarrow$ Visiting				.204
				(.148)
- Cohabit $\rightarrow$ Not Involved				.031
				(.060)
- Visiting $\rightarrow$ Married				$-.042$
				(.117)
- Visiting $\rightarrow$ Cohabit				$-.032$
				(.055)
- Visiting $\rightarrow$ Visiting				$-.069$
				(.091)
- Visiting $\rightarrow$ Not Involved				$.115^{*}$
				(.050)
- Not Involved $\rightarrow$ Married				$-.215$
				(.244)
- Not Involved $\rightarrow$ Cohabit				$-.001$
				(.140)
- Not Involved $\rightarrow$ Visiting				.060
				(.214)
- Not Involved $\rightarrow$ Not Involved				.058
				(.049)
Constant	2.611^{*}	2.595^{*}	2.573^{*}	2.581^{*}
	(.017)	(.025)	(.027)	(.029)
R^2	.002	.003	.003	.007

Notes: a. Standard errors reported in parentheses; *b.* $*$ = Significance at 5% level, and $+$ = Significance at 10% level.

Table 3**A:** Effect of Parental Union Transitions on the Probability that the Child has Asthma or Asthma Attack within the First Year since Birth[†]

	(1)	(2)	(3)	(4)	(5)	(6)
Parental Union Transition from Childbirth → 1 Year						
- Cohabit → Married	.028	.041	.043	.042	.044	.045
	(.031)	(.032)	(.032)	(.032)	(.033)	(.033)
- (Cohabit → Cohabit)						
- Cohabit → Visiting	.033	.020	.029	.036	.042	.036
	(.077)	(.071)	(.073)	(.076)	(.077)	(.075)
- Cohabit → Not Involved	.079*	.063*	.066*	.061*	.064*	.062*
	(.034)	(.032)	(.032)	(.032)	(.032)	(.032)
- Visiting → Married	−.087	−.083	−.077	−.086	−.079	−.075
	(.035)	(.032)	(.034)	(.031)	(.033)	(.035)
- Visiting → Cohabit	.120*	.082*	.088*	.088*	.090*	.089*
	(.032)	(.030)	(.030)	(.030)	(.031)	(.030)
- Visiting → Visiting	−.007	−.027	−.011	−.017	−.008	−.005
	(.043)	(.036)	(.040)	(.039)	(.041)	(.042)
- Visiting → Not Involved	.092*	.051*	.059*	.060*	.062*	.066*
	(.028)	(.025)	(.026)	(.027)	(.027)	(.027)
- Not Involved → Married	.024	.025	.047	.053	.071	.122
	(.125)	(.123)	(.131)	(.139)	(.142)	(.174)
- Not Involved → Cohabit	.139*	.124*	.128+	.141*	.131+	.163*
	(.086)	(.084)	(.086)	(.088)	(.086)	(.094)
- Not Involved → Visiting	−.007	−.018	−.016	−.014	−.013	−.019
	(.101)	(.089)	(.091)	(.093)	(.094)	(.092)
- Not Involved → Not Involved	.109*	.090*	.106*	.112*	.113*	.129*
	(.028)	(.027)	(.030)	(.032)	(.032)	(.034)
Mother's Background Characteristics						
(Race: White Non-Hispanic)						
Race: Black		.117*	.118*	.114*	.113*	.103*
		(.022)	(.022)	(.023)	(.023)	(.023)
Race: Hispanic		.084*	.078*	.083*	.073*	.068*
		(.027)	(.027)	(.028)	(.028)	(.028)
Race: Other		.063	.066	.057	.060	.056
		(.066)	(.067)	(.065)	(.066)	(.065)
Foreign Born		−.075*	−.078*	−.076*	−.080*	−.076*
		(.016)	(.015)	(.016)	(.015)	(.016)
Mother's Age at Childbirth		−.000	.002	−.000	.001	−.002
		(.001)	(.001)	(.001)	(.001)	(.002)
Mother's Education at Childbirth						
(Less than High School)						
High School (or GED)			−.055*		−.054*	−.048*
			(.015)		(.015)	(.016)
Some College			−.070*		−.068*	−.056*
			(.017)		(.017)	(.019)
College and Beyond			−.094*		−.092*	−.078*
			(.016)		(.017)	(.023)

(Continued)

Table 3**A (Continued):** Effect of Parental Union Transitions on the Probability that the Child has Asthma or Asthma Attack within the First Year since Birth[†]

	(1)	(2)	(3)	(4)	(5)	(6)
Father's Education at Childbirth						
(Same as Mother)						
More than Mother			$-.020$		$-.017$	$-.019$
			(.016)		(.016)	(.016)
Less than Mother			.029		.032	.029
			(.020)		(.021)	(.020)
Mother's Earnings Income						
\$0			.007		.005	$-.008$
			(.039)		(.039)	(.039)
$\$1 \sim \$9,999$			.053		.053	.041
			(.042)		(.042)	(.042)
$\$10,000 \sim \$25,000$			.028		.027	.019
			(.044)		(.044)	(.043)
($> \$25,000$)						
Father's Earnings Income						
\$0			$-.042^{+}$		$-.038$	$-.042$
			(.021)		(.026)	(.025)
$\$1 \sim \$9,999$			$-.026$		$-.023$	$-.023$
			(.021)		(.022)	(.022)
$\$10,000 \sim \$25,000$			$-.024$		$-.023$	$-.025$
			(.021)		(.021)	(.021)
($> \$25,000$)						
Mother's Health and Health Behavior						
Fair or Poor Health				.069*	.060*	.060*
				(.030)	(.029)	(.029)
Prenatal Smoking				.016	.005	.001
				(.019)	(.018)	(.018)
Prenatal Drug Use				.003	$-.002$	$-.001$
				(.030)	(.029)	(.029)
Prenatal Drinking				$-.002$	$-.002$	$-.008$
				(.022)	(.022)	(.022)
Father's Health and Health Behavior						
Fair or Poor Health				.028	.025	.025
				(.030)	(.029)	(.029)
Smokes				$-.003$	$-.007$	$-.006$
				(.016)	(.015)	(.015)
Substance Abuse Limiting Work				$-.026$	$-.027$	$-.032$
				(.019)	(.019)	(.018)
Parental Relationship Characteristics						
Months Parents Know Each Other before Childbirth						.000
						(.000)
Parity of Focal Child						.021*
						(.021)
Log Likelihood	-871.5	-845.8	-829.9	-836.9	-822.8	-809.1
Likelihood Ratio χ^2	43.02*	94.35*	126.24*	108.35*	136.56*	152.40*

Notes: [†]. Marginal effect of the covariates on the probability that the child develops asthma or asthma attack by the age of 1 are reported; *a.* Standard errors reported in parentheses; *b.* $*$ = Significance at 5% level, and $+$ = Significance at 10% level.

Table 3**B:** Effect of Parental Union Transitions on Child Health Status: Y = Child Health Status as Reported by Mother (1 = Excellent; 5 = Poor)

	(1)	(2)	(3)	(4)	(5)	(6)
Parental Union Transition from Childbirth → 1 Year						
- Cohabit → Married	−.055	−.075	−.045	−.064	−.036	−.033
	(.062)	(.062)	(.062)	(.061)	(.061)	(.061)
- (Cohabit → Cohabit)						
- Cohabit → Visiting	.004	.016	−.002	.049	.030	.021
	(.155)	(.152)	(.152)	(.150)	(.150)	(.150)
- Cohabit → Not Involved	.015	.044	.036	.026	.023	.025
	(.063)	(.063)	(.062)	(.062)	(.062)	(.062)
- Visiting → Married	.023	.006	−.002	.015	.006	.007
	(.122)	(.120)	(.120)	(.119)	(.118)	(.118)
- Visiting → Cohabit	.070	.106^{+}	.102^{+}	.110^{+}	.108^{+}	.108^{+}
	(.057)	(.057)	(.057)	(.057)	(.057)	(.057)
- Visiting → Visiting	−.106	−.098	−.107	−.083	−.094	−.094
	(.096)	(.095)	(.096)	(.095)	(.094)	(.095)
- Visiting → Not Involved	.043	.064	.040	.045	.029	.035
	(.052)	(.053)	(.054)	(.054)	(.054)	(.054)
- Not Involved → Married	.051	−.050	−.086	−.004	−.022	−.159
	(.255)	(.252)	(.251)	(.249)	(.248)	(.277)
- Not Involved → Cohabit	.102	.103	.092	.112	.110	.100
	(.147)	(.145)	(.145)	(.144)	(.144)	(.148)
- Not Involved → Visiting	.428^{+}	.364^{+}	.386^{+}	.349	.384^{+}	.393^{+}
	(.224)	(.222)	(.221)	(.219)	(.219)	(.219)
- Not Involved → Not Involved	.049	.073	.062	.050	.054	.066
	(.052)	(.051)	(.056)	(.057)	(.057)	(.058)
Constant	1.449*	1.279*	1.090*	1.276*	1.101*	1.120*
	(.031)	(.084)	(.132)	(.086)	(.132)	(.135)
Controls						
- Mother's Background Characteristics[1]		√	√	√	√	√
- Parental Economic Resources[2]			√		√	√
- Parental Health and Health Behavior[3]				√	√	√
- Parental Relationship Characteristics[4]						√
R^2	.017	.047	.064	.083	.096	.099

Notes: *a*. All models include control for initial health endowment (1 if child is of low birth weight); *b*. Standard errors reported in parentheses; *c*. $*$ = Significance at 5% level, $+$ = Significance at 10% level; 1. Mother's background characteristics include: Mother's age at childbirth, race, and whether mother is foreign born; 2. Parental economic resources include: mother's education at childbirth, father's education relative to the mother's at childbirth, and each parent's earnings income at childbirth; 3. Parental health and health behavior include: Whether each parent is in fair or poor health, prenatal smoking (mother), prenatal drinking (mother), prenatal drug-use (mother), smokes (father), and whether father has substance abuse issues which limits his ability to work; 4. Parental relationship characteristics include: months parents know each other prior to childbirth, and parity of the focal child.

Table 3**C:** Effect of Parental Union Transitions on Child Problematic Behavior: Y = Child Behavioral Problem Index (1 = Least Problematic; 5 = Very Problematic)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parental Union Transition (Childbirth → 1 Yr)							
- Cohabit → Married	−.083	−.066	−.051	−.063	−.043	−.038	−.042
	(.060)	(.060)	(.060)	(.060)	(.064)	(.063)	(.063)
- (Cohabit → Cohabit)							
- Cohabit → Visiting	.204	.193	.217	.219	.196	.224	.203
	(.148)	(.146)	(.146)	(.147)	(.154)	(.154)	(.153)
- Cohabit → Not Involved	.031	.012	.013	.003	−.040	−.047	−.055
	(.060)	(.060)	(.060)	(.060)	(.064)	(.064)	(.063)
- Visiting → Married	−.042	−.044	−.045	−.048	−.092	−.104	−.108
	(.117)	(.116)	(.115)	(.116)	(.119)	(.119)	(.118)
- Visiting → Cohabit	−.032	−.076	−.057	−.068	−.096^{+}	−.076	−.086
	(.055)	(.055)	(.055)	(.055)	(.057)	(.058)	(.057)
- Visiting → Visiting	−.069	−.110	−.073	−.083	−.132	−.093	−.095
	(.091)	(.092)	(.092)	(.092)	(.096)	(.098)	(.097)
- Visiting → Not Involved	.115*	.058	.060	.067	.046	.050	.054
	(.050)	(.051)	(.052)	(.052)	(.0543)	(.055)	(.055)
- Not Involved → Married	−.215	−.231	−.274	−.196	−.128	−.135	−.033
	(.244)	(.243)	(.241)	(.243)	(.254)	(.253)	(.284)
- Not Involved → Cohabit	−.001	−.018	−.014	−.003	−.073	−.062	−.047
	(.140)	(.140)	(.139)	(.140)	(.149)	(.149)	(.154)
- Not Involved → Visiting	.060	.006	.025	.016	−.048	−.037	−.061
	(.214)	(.213)	(.212)	(.214)	(.221)	(.221)	(.221)
- Not Involved → Not Involved	.058	.037	.058	.063	.072	.095	.098
	(.049)	(.049)	(.053)	(.056)	(.054)	(.060)	(.061)
Constant	2.581*	2.575*	2.679*	2.516*	2.936*	2.977*	3.031*
	(.029)	(.081)	(.126)	(.084)	(.129)	(.166)	(.167)
Controls							
- Mother's Background Characteristics[1]		√	√	√	√	√	√
- Parental Economic Resources[2]			√			√	√
- Parental Health and Health Behavior[3]				√		√	√
- Parenting Behavior[4]					√	√	√
- Parental Relationship Characteristics[5]							√
R^2	.007	.020	.045	.034	.052	.079	.088

Notes: *a*. All models include control for initial health endowment (1 if child is of low birth weight); *b*. Standard errors reported in parentheses; *c*. $*$ = Significance at 5% level, $+$ = Significance at 10% level; 1. Mother's background characteristics include: Mother's age at childbirth, race, and whether mother is foreign born; 2. Parental economic resources include: mother's education at childbirth, father's education relative to the mother's at childbirth, and each parent's earnings income at childbirth; 3. Parental health and health behavior include: Whether each parent is in fair or poor health, prenatal smoking (mother), prenatal drinking (mother), prenatal drug-use (mother), smokes (father), and whether father has substance abuse issues which limits his ability to work; 4. Parenting Behavior include: mother spanks the child, reads to the child (days/week), sings to the child (days/week), plays indoor games with child (days/week), plays outdoor games with child (days/week), alternative childcare (hours/week), and whether a grandmother lives in the household with child; 5. Parental relationship characteristics include: months parents know each other prior to childbirth, and parity of the focal child.