

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

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Abstract

This study examines the effects of the relationship structure between biological parents on infant health and behavior using a sample of children born to unmarried parents in the United States. Using descriptive and multivariate analysis, we find that: (1) There is no difference in child wellbeing measured at age one between children whose biological parents marry within the first year after childbirth, and children whose biological parents remain in a cohabiting union; (2) The relationship structure of the biological parents matters most at childbirth with children born to cohabiting biological parents realizing better outcomes, on average, than those born to mothers who are less involved with the child's father; and (3) Children born to 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.

Keywords: Marriage, Cohabitation, Infant Wellbeing, Fragile Families, Child Asthma

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1 Introduction

While marriage remains the most common foundation of family life in the U.S., the traditional process of family formation, specifically marriage before having children, has been dwindling.¹ Over the past three decades, the proportion of American children born outside of marriage increased from approximately 12% in 1970, to nearly one third of all births today (Sigle-Rushton & McLanahan, 2002a).² It is estimated that approximately 39% of all non-marital births in the U.S. were to mothers cohabiting with the biological father between 1990 and 1994, compared to 29% in 1980-84 (Bumpass & Lu, 2000). Currently about half of all non-marital births in large urban areas are to cohabiting parents and an additional 30% are to mothers dating their child's father, but living separately³ (McLanahan & Garfinkel, 2002).

As the proportion of children experiencing cohabitation and other non-marital relationships between their biological parents rises, understanding the consequences of these non-traditional family arrangements for child wellbeing becomes increasingly important for researchers and policy makers. While the effect of one important change in family structure on children, namely parental divorce, has been studied extensively,⁴ the impact of the relationships of never-married parents on the children involved is less understood. In particular, the influence of the relationship dynamics between the biological parents—progressing from cohabiting to married, stable cohabiting, cohabiting to not romantically involved, visiting to cohabiting, etc.—on child development have rarely been studied in large survey data.

Existing literature mainly focuses on the comparison between children in families with married

¹Cohabitation has become increasingly common in most countries since the 1970s (e.g., Blossfeld, 1995; and Hoem & Hoem, 1992). At the same time extramarital fertility has been rising. For example, in France, Austria and East Germany, 30-45% of all births now occur to non-married women (Lesthaeghe, 2001).

²Calculations 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).

³This type of relationship structure between a couple is commonly referred to as a “visiting” relationship. This paper will hereby refer to parents who are romantically involved but live in separate households as being in a “visiting” relationship.

⁴See Cherlin (1999) and Liu (2005) for recent surveys of this literature. See Morrison & Ritualo (2000) for evidence on the economic consequences of cohabitation and remarriage for children who experienced parental divorce.

parents and those in alternative family structures. Most studies of children with cohabiting parents or in single-mother families find that these children fare worse than children from 'intact' families (Deleire & Kalil, 2002; Acs & Nelson, 2002, 2004; Manning, 2002; Manning & Brown, 2003; Manning & Lichter, 1996; Brown, 2002, 2004; Newcomb, 1979; and Osborne et al., 2003).⁵ Some evidence suggests that not all non-marital family arrangements are equally detrimental for the child. Delaire & Kalil (2002) find that teenagers who live with their single mothers and at least one grandparent often show comparable (and sometimes even superior) achievements as children in married two-parent families. On the other hand, using detailed measures of the relationship between social and biological parents, Brown (2004) finds that cohabiting biological parents, cohabiting stepfamilies, and married stepfamilies are equally detrimental for child wellbeing.

It is difficult to assess the extent in which the differences between children in families of married parents and those in other family arrangements reflect intrinsic benefits of the marital environment, or merely mirror differences in the characteristics of those parents who get married compared to those who cohabit, visit, etc..⁶ The prevalence of out-of-wedlock childbearing among the low-income and less educated population is well-documented (Sigle-Rushton & McLanahan, 2002*b*; Ellwood & Jencks, 2004; Manning & Brown, 2003; Hao 1996; and McLanahan & Sandefur, 1994). Consequently, the fact that children of unmarried parents tend to realize worse outcomes compared to those with married parents may largely reflect the these disadvantages of the parents,⁷ rather than parental marital status itself. A similar argument can be made regarding the finding that greater instability within the parents' romantic relationship is associated with lower child wellbeing (e.g., Osborne & McLanahan, 2004).

In an attempt to distinguish the impact of parental relationship status on child wellbeing from other

⁵This evidence combined with the growing prevalence of unmarried parenthood prompted an expansion of U.S. family policy initiatives (e.g., the Building Strong Families project) towards encouraging and stabilizing marriage among these *fragile families*, hoping that marriage will infer benefits to these families and their children. Some researchers are strong supports of greater efforts by the public towards maintaining and increasing traditional family constellations (e.g., Glenn et al., 2002).

⁶For a recent survey of the literature on the potential benefits to marriage with an emphasis on these methodological concerns see Ribar (2004).

⁷It is for this reason that families of unmarried parents are sometimes referred to as *Fragile Families* (e.g., Brown, 2004 and Osborne & McLanahan, 2004).

factors that may jointly affect parental relationship status and child outcomes, most studies include measures of relevant background variables in their empirical analysis and investigate the robustness of the estimated effects to such controls. Some studies have a sample design that allows them to extend this type of analysis to omitted variables. For example, Björklund et al. (2004) utilize the variation between siblings using U.S. and Swedish data. Once unobserved family influences common to all siblings are controlled for, they no longer find a negative effect of living in a non-intact family. However, given that non-marital family structures tend to be less stable and short-lived, using a sample of unmarried families with at least two children may result in the over-representation of stable non-intact (unmarried) families. The results of which may not be representative of children in unmarried families in general. Furthermore, given that changes in family structure occur relatively infrequently across siblings, the absence of statistical evidence of such effects may be due to the lack of variation in sibling panel data.

This study examines the effects of different types of relationship structures between the biological parents on young children's wellbeing. We use a sample of children born to unmarried parents drawn from the Fragile Families and Child Wellbeing Study (FFCWS), to assess differences in child outcomes among various types of parental relationship transitions within a year following a child's birth. Three types of non-marital relationship arrangements between the biological parents at childbirth are considered: cohabitation, visiting, and no romantic involvement. We examine the impact parental relationship transitions between each of these relationship structures within the first year since childbirth, in addition to entry into marriage, on child health and behavioral outcomes. Our analysis contributes to the literature in several ways:

1. Most existing research addresses how family structure changes 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 (Manning et al., 2004, among others), existing evidence on the effects of family structure on child wellbeing may not be representative of the average impact of non-marital family structures. This paper uses recent data from the FFCWS, a new survey, to study the role of the relationship between the biological parents in

early childhood outcomes. We are aware of only one previous study that investigates this relationship in young children in similar depths, Osborne et al. (2003). Their study focuses on behavioral outcomes of children of stable cohabiting and stable married couples.⁸ The present study considers health outcomes in addition to child behavioral problems, and includes in our analysis children born to non-married and non-cohabiting biological parents.

2. Existing studies on the effect of family structures on child wellbeing often face data limitations that prevent the identification of the precise nature of the family arrangement and relationship structure between the mother and the biological father. This can obscure the interpretation of the effect of non-marital arrangements and may lead to misguided recommendations for family policies. The FFCWS allows us to construct exact measures of the relationship status between the biological parents at childbirth and thereafter.

3. While the children in our sample experience different family and relationship arrangements, including marriage and separation of the biological parents, they are all born out-of-wedlock. This greater homogeneity at birth compared to previous studies that use samples that also include children born within marriage may help to separate the effect of family structure changes, such as marriage or separation, on child development from (unobserved) factors that jointly affect child wellbeing and biological parents' relationship structures.⁹

Our results suggest that differences in child outcomes between children whose parents marry within the first year after childbirth and those whose parents remain unmarried are largely explained by parental relationship structure at childbirth. More specifically, we find no evidence that children born to cohabiting biological parents benefit from their subsequent marriage. However, we find that children

⁸Osborne et al. (2003) find that children born to married parents are less likely to report behavioral problems by age 3, compared to those in cohabiting families. They report that marriage within the first 3 years since childbirth among cohabiting parents does not yield gains in child wellbeing and argue that observed benefits of marriage may be largely accounted for by the characteristics of those who enter marriage.

⁹Comparing child outcomes between children born within marriage and those born out-of-wedlock may be inappropriate as there may be factors that jointly influence the parents' fertility and marital decisions. Such factors must be accounted for if children born within marriage are included in the analysis. Otherwise, the estimated effect may overstate the benefits of marriage.

of cohabiting biological parents realize better outcomes, on average, than those born to mothers who were less involved with the child's biological father. Children born to 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 remainder of the paper is organized as follows. Section 2 provides a theoretical background for main hypotheses and discusses previous findings. Section 3 describes the sample used in this paper, presents descriptive evidence of the association between parents' relationship and child wellbeing, and discusses the multivariate models used to test the hypotheses. Section 4 presents the main empirical findings and the final section concludes.

2 Background and Hypotheses

We seek to test how different relationship arrangements between the biological parents, including cohabitation, (entering into) marriage, romantically involved but not living together (visiting), and not romantically involved affect outcomes of young children born to unmarried parents. In formulating our hypotheses, we draw on the theories of marriage and household production, known as "new household economics" (Becker, 1965, 1991; Weiss & Willis, 1997; Willis, 1999; Ribar, 2004). In particular we assume that parents allocate scarce resources between a child's wellbeing ("quality") and other competing objectives such as parents' own consumption needs or siblings' wellbeing. Parents may make decisions separately but both care about child quality. To increase child quality, parents use time inputs, and goods and services purchased in markets. We organize our review of the role of biological parents' relationship arrangements and child wellbeing around three aspects: match quality, resource availability, investment behavior and biology, and social norms.

Match Quality

Relationships are formed or maintained if their perceived value to those involved exceeds that of the alternatives. Partners who face good relationship prospects are more likely to enter and continue the relationship than those who face bad ones. In turn, the type of relationship arrangement an individual enters with a partner and the way it progresses reflect, on average, the perceived quality and prospects of the match. In particular, couples who have entered a marital arrangements are expected to be more likely to continue in the relationship than couples in non-marital relationships. By the same rationale, couples whose relationship arrangement evolves, (e.g. from visiting to cohabiting or from cohabiting to married) are on average in a match with better prospects than those who do not evolve. A stable relationship arrangement may reflect a higher-quality match than a change from the same relationship towards an arrangement with less involvement. If match quality benefits child wellbeing, we would expect children with parents who are in stable or advancing relationships would generally be better off than children living in other type of arrangements.¹⁰ We note that the “benefits” under this hypothesis are not caused by the relationship, rather they stem from pre-existing characteristics of the couple.

Resource Availability

Children may also benefit directly from greater involvement between their parents, since a closer relationship can increase the time and financial resources immediately available for the child. Since married or cohabiting parents typically live with the child in one household, resources can be pooled and consumption synergies can be realized.¹¹ Married and cohabiting parents may also capitalize on

¹⁰Osborne and McLanahan (2004) find that children born to unmarried mothers are more likely to be exposed to multiple partnership changes of their mother than children born within marriage. Greater family instability, as measured by the number of maternal relationship transitions, are associated with poor parenting, and inferior child health and behavior when the child is 3 years old. Their study focuses primarily on the effect of the number of mother’s relationship transitions within the first 3 years of the child’s life, on child health and behavioral outcomes. However, unlike the present study, they do not identify the exact type of relationships the mother exits and enter into (cohabiting, visiting, single); nor do they distinguish between relationships the mother has with the biological father, or other partners.

¹¹Winkler (1997) shows that married couples are more likely to pool their incomes than cohabitators; and Bauman (1999) finds that income of a cohabiting partner does little to amend the economic hardship than does that of a spouse.

the division of labor resulting from establishing a joint household. Specialization of labor is economically efficient as it exploits comparative advantages of each spouse in the home production of shared public goods (such as “child quality”). As a result, resources can be used more effectively to improve child quality. In addition, the earnings potential of the parents may rise as they increase each other’s productivity or foster their partner’s career. Marriage or cohabitation may also induce a stabilizing effect on the parents, which can lead to greater productivity at home and in the labor market.

An important difference between marital and non-marital arrangements is that marriage provides legal protection and requires property sharing between the partners (Hamilton, 1999). The lack of legal protection and bargaining power of the partners in non-marital relationships may increase the costs of preventing a partner from defaulting within a cohabiting or visiting union. Given the higher separation costs, the risk that one partner leaves may be lower within marriage. 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. This is another reason to expect child wellbeing to be better in a marital environment, compared to non-marital arrangements between the parents. Conversely, if the parents are well-matched, and both partners see low added returns to marriage, the costs of getting married may deter some cohabiting couples from marriage. If the resources required by one partner to prevent the other from defecting from the union are low relative to the costs of getting married (i.e. if the parents are well-matched), children in families of cohabiting parents may enjoy the same or a greater amount of resources than those with married parents.

Investment Behavior and Biology

The child investment behavior may also differ by parents’ relationship status. In non-marital relationship arrangements, the parents’ incentives to invest in their children may be reduced. In a visiting union or a non-romantic arrangement where the child lives with the mother, the father may have less incentive to contribute towards his children, given that: (1) he is uncertain as to what extent he will be

able to enjoy the benefits of these investments; and (2) he is unable to verify that his transfers are used effectively (Willis, 1999).

Biological fathers (parents) may make greater transfers or investments in their children than non-biological fathers for several reasons. First, biological fathers may be more emotionally attached to the child. Second, they may be forced to pay child support regardless of the relationship with the mother¹². Third, biological fathers may have an interest in the continuation of their family lineage. Traditionally certain interests (typically of the biological father) in children such as the continuation of the family name, access to the child, and having a legitimate heir to ensure intergenerational transfers of wealth could only be secured through marriage. To the extent that a parent today sees marriage as a way to realize such interests, marriage can result in greater investments in the child by this parent and potentially overall.

Social Norms

While it is becoming more acceptable to have children before marriage, parents may still face social pressure to get married eventually and their children may still be stigmatized if they do not. While the immediate social pressure on children may be small, it could affect young children if it results in couples getting married who are poorly matched. In particular, if a couple is not well-matched and has an unwanted child (i.e., due to a contraceptive failure), a marriage (or advancement in the relationship status) as a result of social pressure may not necessarily provide a better environment for a child. On the other hand, if social pressure leads to an accelerated advancement of a relationship between a well-matched couple who experiences an unplanned birth, the positive association between the degree of involvement and child wellbeing based on the earlier arguments should apply.

¹²An example is The Family Support Act of 1988. It required states to establish legal paternity for all births, to develop and apply child support formulas based on a father's resources, and to establish stronger collection procedures.

Previous Literature

The theoretical discussion provides several reasons why a more advanced relationship status between parents, in particular between the biological parents, may lead to greater investment in child wellbeing. Existing empirical findings are limited in drawing conclusions about potential benefits of parental marriage compared to cohabiting unions, visiting unions, or no romantic involvement.

Few studies have examined the effect of family structure on child wellbeing among children of non-married parents. Studies that examine the effect of parental cohabitation on children pay little attention to distinguish between cohabiting families of two biological parents and those with one biological parent and a non-related partner (Manning & Lamb, 2003; Morrison & Ritualo, 2000; Thomson et al., 1994), thereby the effect of cohabitation are potentially confounded by the effect of living with a “step-parent”.

Furthermore, studies that examine the effect of parental cohabitation on children tend to focus on outcomes measured during school age and adolescence (Acs & Nelson, 2002, 2004; Manning & Lamb, 2003; Björklund et al., 2004). Given that cohabiting unions tend to be short-lived (Bumpass & Lu, 2000), these findings may be derived from an over-representation of stable cohabiting families. In this case, the effect of marriage among cohabiting parents may be understated. Furthermore, these studies often failed to identify whether the family structure has been persistent since birth, and therefore unable to draw conclusions on whether the effects are attributable to current family structures or differences in initial family conditions.¹³

A notable exception is the study by Osborne et al. (2003). They examine the effect of marriage on child behavioral outcomes within 3 years since childbirth. Osborne et al. find that children born to married parents are less likely to report behavioral problems by age 3, compared to those in persistently

¹³For example, studies generally find that children with married-parents do better than those with parents in alternative relationship settings. However, some of these children may have been born when their parents were unmarried (e.g. cohabiting), while others were born within marriage. The effect of current family structure is confounded by the effect of family circumstances surrounding the birth of the individual. Without accounting for initial conditions surrounding childbirth, the estimated effect of living with married-parents may be biased.

cohabiting families. They also find that children born to cohabiting parents that subsequently marry within the first 3 years since childbirth do not exhibit better outcomes. Osborne et al. conclude that observed benefits of marriage may be largely accounted for by the characteristics of those who enter marriage prior to childbirth. However, the study excludes the sample of unmarried biological parents who were not cohabiting but visiting or are not romantically involved at childbirth. In addition, they only consider one dimension of child wellbeing, namely behavioral outcomes.

Using data from the Fragile Families and Child Wellbeing Study (FFCWS), we test whether the relationship between the biological parents affects child health and behavioral outcomes. In a sample of children born outside of marriage to biological parents in various relationship structures (i.e. cohabiting unions, visiting unions, or no romantic involvement), we examine to what extent relationship arrangements at birth and changes in relationship status afterwards lead to better child outcomes at age 1.

Prior to the FFCWS, large datasets containing information on children born out-of wedlock and details on the nature of parental relationships were unavailable.¹⁴ 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. In contrast, our study sample is homogeneous in the sense that these children 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 potential advantages/disadvantages of parents' marriage following a child's birth for children involved.

¹⁴The availability of the FFCWS has also stimulated research in the related area of marital behavior of unmarried biological parents (see Osborne, 2005, Harknett & McLanahan, 2004).

3 Data and Empirical Models

3.1 Sample

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. Within the sample, 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 development¹⁵. This data is unique in that it provides information on a large set of unmarried biological parents in various living arrangements and relationship structures. A rich set of family socioeconomic and demographic characteristics, relationship quality, and child development outcome variables associated with family structure transitions are available.

The 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. The sample of unmarried families is chosen because they are homogeneous in the sense that they all have children prior to marriage. In our sample of children, 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. The latter group includes children whose biological mother is single or cohabits with a social father (i.e. an unrelated partner) at childbirth.

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 dependent and independent variables employed in our analysis. The table reports the sample means by

¹⁵For a detailed description and sampling methods, see Reichman et al. (2001).

the relationship transitions of the biological parents. The sample descriptives of those who get married within a year after child birth by relationship status at childbirth (cohabiting (3), visiting (4), and not (romantically) involved (5)) are shown in last three columns. The values for biological parents who were consistently cohabiting are in the second column and the averages for those who were unmarried and not cohabiting (“unmarried”) at childbirth and remained unmarried and not cohabiting at the second interview are reported in the first column. Using the sample of biological parents in stable cohabiting unions (column (2)) as control group, Table 1 also reports results from means tests.

3.2 Descriptive Evidence

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 an asthma attack by age 1. Of all out-of-wedlock children, 12.8% report asthma or an asthma attack.¹⁶ 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 involved¹⁷.

From Table 1, we see that children whose biological parents are not cohabiting and remain unmarried when they reach age 1 are more likely to have asthma or an asthma attack by the age of 1 (15.6%), compared to those whose parents are continuously cohabiting (8.2%), or married following the birth of their children (between 2% to 10%). This pattern is consistent with the hypothesis that a lack of involvement between the biological parents at child birth is detrimental for child wellbeing. Children whose parents are in “visiting” relationships at childbirth are significantly less likely to have asthma or

¹⁶According to the 2002 National Health Interview Survey, about 12% of U.S. children under the age of 18 are diagnosed with asthma but the incidence is greater among minority children (CDC, 2004). Diagnosing asthma in babies is more difficult than in older children but an estimated 50% of kids with asthma develop symptoms by age 2.

¹⁷Summary statistics furnished upon request from the authors.

an asthma attack during infancy than children in a stable cohabiting union. The difference in asthma incidence between children of stable cohabiting parents and those of parents who get married within the first year after the child's birth, however, is not statistically significantly different from zero.

The general health status measure ("health status") is based on mother's reported rating of the child's health condition. 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 (column 1 in Table 1) are more likely to report that their children are in poor health, compared to those in cohabiting relationships with the biological father or those in arrangements where the parents get married within the first year after birth. However, the differences in the means 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 0.77¹⁸. The *Cronbach's alpha* for the behavioral index is 0.501¹⁹. The behavioral problems score is greater on average for children of parents in stable cohabiting relationships or children with non-cohabiting parents than for children of parents who are getting married in the first year after birth. However, the differences are not statistically significant.

¹⁸When 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.

¹⁹Estimation 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.

3.3 Multivariate Models

The descriptive statistics provide some evidence consistent with our hypothesis that a relationship between the biological parents that advances towards marriage is beneficial for child wellbeing. To explore the robustness of the association between parental relationship and child wellbeing, we also conduct a multivariate analysis. Multivariate regression and probit analysis are employed to assess (1) whether children who experience the marriage of their biological parents within the first year after childbirth are better-off than children whose parents remain unmarried, controlling for relationship status at birth; and (2) Holding other determinants of child wellbeing constant, whether children born into various non-marital relationship settings benefit from (biological) parental relationship transitions toward greater commitment.

For biological parents (i) who are unmarried at child birth, the process of investing in their child's wellbeing and the potential influence of the parents' relationship arrangements may be formalized as follows (assuming a continuous dependent variable and linear effects):

$$Y_i = \alpha_0 + \alpha_1 X_i + \alpha_2 \{M\}_i + \alpha_3 \{NI_0\}_i + \alpha_4 \{V_0\}_i + \alpha_5 \{NI_1\}_i + \alpha_6 \{V_1\}_i + \varepsilon_i, \quad (1)$$

where Y_i is a measure of child wellbeing, X_i is a set of parental investment variables since child birth, and $M =$ "Married" (as of age 1), $NI_t =$ "Not Romantically Involved", and $V_t =$ "Visiting" stand for the relationship status at birth ($t = 0$) and at age 1 ($t = 1$). The error term, ε_i , captures unobserved child- or family-specific heterogeneity. The reference category is $C_t =$ "Cohabiting". For example, α_2 captures the effect of parental marriage between child birth and age 1 on child wellbeing relative to cohabitation, controlling for initial relationship status and other non-marital arrangement at age 1.

The effects of parental relationship arrangements (at age 1) may differ by the specific type of relationship transition the parents experienced within the first year since childbirth. To test for the effect of parental relationship transitions within the first year of the child's life (i.e. allowing for differential

effects by initial status compared to Equation (1)), we consider the following specification:

$$\begin{aligned}
 Y_i = & \alpha_0 + \alpha_1 X_i + \alpha_2 \{C \rightarrow M\}_i + \alpha_3 \{C \rightarrow V\}_i + \alpha_4 \{C \rightarrow NI\}_i \\
 & + \alpha_5 \{V \rightarrow M\}_i + \dots + \alpha_8 \{V \rightarrow NI\}_i + \alpha_9 \{NI \rightarrow M\}_i + \dots + \alpha_{12} \{NI \rightarrow NI\}_i + \varepsilon_i,
 \end{aligned} \tag{2}$$

where a set of binary variables are used to capture 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.

We note that the reference category (i.e. the omitted category) for the parental relationship experience is arbitrary. We choose the stable cohabiting arrangement as it is the most common arrangement (30% of out-of-wedlock children experience stable cohabiting biological parents). In model (2), a statistically significant positive coefficient of, for example, α_2 indicates 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.

The empirical framework adopted here can be interpreted as a health production process. Measures at birth capture pre-birth influences and constant background factors. Measures of relationship status change and other inputs are based on the entire period from birth to assessment. This type of specification is also known as the Cumulative Model (Todd & Wolpin, 2003) and is widely used when the appropriate data are available (e.g., Heiland, 2002). Adopting this view of child health production, the additional determinants of child wellbeing that we control for fall into one of three categories: the quantity of care, quality of care, and health and care endowments.

To account for differences between children with respect to the quantity of care received, we control for financial resources of the biological parents (income and house or apartment ownership), their work

behavior, whether the grandmother lives in the same household as the child at childbirth, the amount of non-maternal child care, the number of children (less than 18 years old) in the household, and the birth order of the child (based on mother's birth history). Financial resources may proxy for the ability of the parents to purchase inputs in the child health production process. An arrangement where the grandmother resides in the same household may be beneficial for the child if the grandmother provides additional care. As a non-maternal childcare measure, care provided by a grandmother may exert no effect (or a detrimental effect) if it is a poor substitute for maternal care on average.

Measures of the quality of care provided include the educational attainment of the biological parents, a set of parenting style measures (whether mother spansks the child, how often mother reads, sings, or plays with child), and whether the father engages in activities that can endanger the health of the child ("smokes", "substance abuse limiting work"). Child health endowments are measured using (detrimental) health inputs during pregnancy (maternal smoking, drug use or drinking), controls for ethnicity/race, child gender, and whether the child is of low birth weight. Differences in the parents' innate abilities to provide for the child are captured by each parent's age at childbirth, whether the mother is foreign-born, parents' health, parents' religiosity and participation in religious activities. All background characteristics are measured at baseline (childbirth).

Factors that influence parents' investment in their children's wellbeing may be correlated with factors that also determine the course of the biological parents' relationship. By controlling for parents' background characteristics that relate to both the union formation between the parents and child outcome, we test the extent to which the correlation between parents' relationship status and child wellbeing is robust. Stable magnitudes of the estimated coefficients would be consistent with independent effects of parents' relationship arrangements on child wellbeing.

The literature on marriage and relationship transitions suggests that 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 are better 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.

Fields and Casper (2001) find that among unmarried couples, it is more common that the woman is more educated and have higher earnings compared to married couples. According to *New Home Economics* theory (Becker, 1981), the greater availability of women's resources relative to their partner may lead to non-specialization within the union that is less efficient, since it fails to capitalize on the comparative advantages in the home production of public goods by each partner. Such inefficiencies reduce the gains of being married. Married and unmarried parents may differ by their expected gains from being married: couples who marry are those who foresee relatively large gains to being married, while unmarried couples may see little or no gains from entry into marriage.

As part of the robustness analysis, we assess whether including the determinants of union status and formation affects the estimates. Specifically, we control for parental background factors such as age, race/ethnicity, whether the parents are of different racial backgrounds, and existing children. To account for differences in the expected gains from a union, we control for each parent's education background, father's education relative to the mother's, and each parent's religious affiliation and participation of religious activities.

Cohabiting parents may have been involved longer compared to parents who are less involved, and hence have had more time to transition into cohabitation before marriage. To account for this difference, we control for the length of time in which the parents have known each other (not necessarily romantically involved) before the child was born, and the parity of the focal child.

Table 1 summarizes the means of the explanatory variables by relationship status/transition. Compared to mothers who remained unmarried after childbirth and are non-cohabiting, mothers who got married following the birth of a child or those who were continuously cohabiting, on average, are older, more likely to be white, more likely to be better educated, and more likely to own an apartment or house. At the same time, the biological fathers of these children are more likely to have higher earnings

and are more likely to own a house or apartment compared to the fathers of children of parents who remained unmarried and non-cohabiting. In addition, cohabiting mothers who marry within a year since childbirth are more likely to have earnings above \$25,000, and have more than a high school education than continuously cohabiting mothers. Interestingly, continuously cohabiting mothers are comparable in these dimensions as visiting and subsequently married mothers.

In terms of health behavior, although married mothers who were romantically involved with the biological father at baseline (either cohabiting or visiting) are less likely to drink alcohol or use drugs during pregnancy, their partners (child's biological 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 and interact more with the child through reading, singing and playing games.

4 Results

This section presents estimation results on the differences in the outcomes of young children by relationship structure between the biological parents. We obtain results using the three dimensions of child wellbeing measured at age 1 discussed above: whether the child has asthma or an asthma attack, child's general health status, and a behavioral problem index. We estimate the following three models based on Equation (1): (I) the overall effect of marriage within the first year after childbirth relative to all other arrangements; (II) the effect of marriage between the biological parents relative to all other arrangements controlling for parental relationship at childbirth; and (III) the effects of marriage, visiting, not romantically involved one year after birth relative to cohabitation controlling for relationship structure at childbirth. Based on Equation (2), we estimate the effect of the relationship transitions relative to a continuous (stable) cohabiting relationship.

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 the relationship between the biological parents on the probability that their child develops asthma or has an asthma attack by age 1. Model (1) in Table 2A examines the overall association between parents' marriage (and all other arrangements) and child's propensity to develop asthma within the first year since childbirth. The only controls included in addition to relationship status are child gender and whether the baby is of low birth weight (< 88 oz. at birth).

The results show that children whose biological parents marry after childbirth are less likely to develop asthma or an asthma attack than those in any other arrangements. However, once relationship structure (cohabiting as the reference group) at childbirth is accounted for, the effect is reduced in half and no longer statistically significant. The results indicate that children whose parents were either visiting or not romantically involved at childbirth face a higher asthma risk, on average, than children born into families of cohabiting parents. Controlling for parents' baseline relationship status, there is no evidence of an association between incidences of child asthma and the specific relationship structure of the biological parents observed one year after birth (column 3).

The fourth column of Table 2A allows for a more detailed view of what relationship developments are potentially detrimental for infants (children of stable cohabiting biological parents are the reference group). 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 biological father. Children who experience the separation of initially cohabiting parents or initially visiting parents have an 8 to 9 percent greater risk of having asthma. Consistent with Models (2) and (3), we find some evidence that even if the relationship advances, children born to visiting or non-involved parents are more likely to have asthma compared to those born to stable cohabiting parents (visiting-cohabiting, not involved cohabiting). However, children born to visiting parents who get married within the first year of the child's life are no worse off (but also not statistically significantly

better off) than children of stable cohabiting parents.

Table 3A assesses whether the results of Model (4) in Table 2A—repeated in the first column of Table 3A—are robust to the inclusion of controls for additional inputs in the child production process. As expected, the inclusion of these measures improves the fit of the models substantially. However, while the estimates of the relationship effects tend to become somewhat smaller as additional controls are included, the overall pattern implied by the relationship development remains unaltered.

Model (2) in Table 3A includes controls for each parent’s background characteristics (such as race/ethnicity, if foreign born, and religion). Consistent with findings based on physician-diagnosed asthma in children, we find that children of African American and Hispanic mothers have a greater incidence of asthma (up to 11%) compared to children of white non-Hispanic mothers (Gergen et al., 1988 and Rodríguez et al., 2002). We also find that male children and those who are of low birth weight are at higher risks to develop asthma in all models. The former has also been found in samples representative of all children in the U.S. (e.g., Gergen et al., 1988).

Model (4) adds measures of parental health endowments and health behavior to the background controls in Model (2). In both models, children’s greater propensity to develop asthma among those born to mothers who devolves 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. Having a better-educated mother is associated with a lower risk of developing asthma by the age of 1, but its effect does not appear to mitigate the effect of parental relationship status on child development. However, there is no evidence that children of low-earnings parents are more likely to develop asthma.²⁰

Model (3) adds controls for socioeconomic status such as parents’ education and financial resources (including earnings, labor supply, home/apartment ownership, living with grandmother) to Model (1). Models (5) and (6) also include these variables and the magnitudes of the relationship effects are similar

²⁰Some previous studies reported no significant effect of socioeconomic status on child asthma using more representative samples of U.S. children (e.g., Gergen et al., 1988).

for these models. The higher likelihood and pseudo R-squared values show that this set of inputs contributes significantly to explaining differences in child wellbeing. The magnitudes of the effects of relationship transitions towards less involvement between the biological parents in Models (2) and (4) are smaller compared to when socioeconomic conditions are controlled for. This suggests that the parental background factors included in (2) and (4) predict child asthma incidence as well as parents' relationship instability.²¹

Model (6) further includes parental relationship-specific controls: the length of time the parents knew each other prior to childbirth, parity of the focal child, and whether the child was wanted by the father (whether the father suggested abortion as reported by the mother). While being of lower parity has an independent negative effect on asthma incidence, the inclusion of these two parental relationship characteristics does not appear to alter the effect of relationship status on asthma incidence.

4.2 Child's General Health Status and Behavioral Problems

The effects of the biological parents' relationship developments on children's general health status are presented in Tables 2B and 3B. The specifications considered follow the probit models for child asthma discussed in the previous section.

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

Tables 2C and 3C illustrate the effects of parental relationship on children's propensity to display behavioral problems. Using the continuous behavioral problems scale discussed previously, we

²¹Both, a reduced risk of getting married after birth for minority mothers (Harknett & McLanahan, 2004) and an elevated asthma risk of their children (Gergen et al., 1988 and Rodríguez et al., 2002) have been reported before.

find some evidence that children of parents who marry within the first year since childbirth display less problematic behavior compared to their counterparts whose biological parents remain unmarried. Parental marriage within the first year following the child's birth reduces child problematic behavior by up to 0.1 units on the behavioral problem scale. Union status at birth explains some of the differences in child behavioral outcomes, but the effect of parental marriage remains significant. Model (3) in Table 2C shows that infants whose mother is not romantically involved with the biological father at age one (holding union status at birth constant) are more likely to display behavioral problems.

Model (4) in Table 2C shows which relationship development is particularly detrimental for child behavioral development. Children born into families in which the parents are in a visiting union at birth but end the relationship within the first year of the child's life may be worse off than children whose biological parents remain in a persistently cohabiting union.²² However, this effect becomes insignificant as mother's characteristics are included in the regression (see Table 3C), indicating that maternal inputs or endowments (such as race/ethnicity, education, religion, and foreign-born status) exert strong independent effects on children's behavioral development, while they are also predictive of the stability of the relationship arrangements.

The additional controls 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 marry 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. As expected, negative parenting behavior such as spanking, is associated with more behavior

²²Using FFCWS, Osborne and McLanahan (2004) examine the cumulative effect of the number of maternal relationship transitions on child health and behavioral outcomes (Their study uses a different sample by including children born within marriage). They find that greater family instability (as measured by the number of maternal relationship transitions within the first 3 years since childbirth), is detrimental for child health and behavior outcomes measured at age 3. Contrast to our study, Osborne and McLanahan do not differentiate between the effects of evolving or devolving relationships, nor do they distinguish between relationships involving the biological father or unrelated partners. Although the primary goals of the two studies differ, our findings appear to be consistent. We both find that children who experience a disturbance of parental relationship status, such as the separation of their biological parents (e.g. a transition in mother's romantic relationship as defined in their study), are at higher risks of poor health and behavioral development.

problems. Productive parenting, such as if mother reads or interacts with the child to stimulate positive development, are linked to fewer behavior problems.

4.3 Summary of Additional Analysis

In this section, we provide a brief discussion of our secondary multivariate analysis: testing the robustness of the main findings. Since these results are mostly comparable and support our main findings, the corresponding tables are omitted here. The detailed results are available from the authors upon request.

We repeat the analysis of the effect of relationship status on child's general health status using ordered probit models to account for the categorical nature of the general child health measure.²³ The ordered probit estimates show the same pattern as above. We find no significant effect of parents' marriage on child health once union status at childbirth is accounted for. The only disparity of our secondary analysis (compared to the main results), is that the ordered probit estimates of Model (3) in Table 2B (not shown) suggest that a child born to parents who are not involved at birth are significantly more likely to be unhealthy on average than a child born to cohabiting parents.

To check if our main results are consistent among subsets of children, we replicated the analysis using more homogenous (but smaller) sub-samples. Specifically, we re-estimated all specifications using the following sub-samples: (1) children whose father did not suggest abortion, (2) children born to cohabiting parents, (3) children born to visiting parents, (4) children of same race/ethnicity (based on mother's race/ethnicity). The results in the sub-samples (1)-(3) are qualitatively identical and the magnitudes of the relationship effects are similar to the ones found in our original, relatively heterogeneous study sample. Among children born to African American mothers (48% of the sample), the absence

²³The child's general health status variable is based on mother's report of whether the child's is: excellent (1), very good (2), good (3), fair (4), and poor (5). The mother's evaluation of her child's health in the survey is discrete in nature, however in our main analysis this outcome measure is treated as a continuous variable. By treating it as a continuous variable, the incremental effect of a given explanatory variable on the child health is restricted to be the same, such that the effect on progressing from "poor" to "fair" health is treated similarly as progressing from "very good" to "excellent" health.

of romantic involvement between the biological parents at birth is associated with higher propensity of child asthma reported. Interestingly, asthma is less frequently reported if the biological parents are in visiting relationships rather than cohabiting by age one. Among Hispanics (31% of the sample), as opposed to whites and African Americans, children born to parents who were not romantically involved at childbirth exhibits worse health outcomes at age one, compared to their counterparts born to cohabiting parents. No involvement between the biological parents at age one, however, is found to be more beneficial than living with cohabiting parents for Hispanic children compared to white or African American children.

5 Conclusions

Over the past forty years, a growing proportion of American children are born outside of marriage. As non-traditional family settings are becoming more common, it is becoming increasingly important for us to understand the ramifications of growing up in non-marital family arrangements between the biological parents (such as cohabiting, visiting and other non-traditional relationship arrangements) for children's wellbeing. Using three early childhood outcome measures, this study investigates the implications of the relationship structures (and potential transitions of relationship structures) between the biological parents within the first year of an infant's life on child wellbeing. Parental relationship status at childbirth is found to have a substantial effect on subsequent child health outcomes. Specifically, our results indicate that children born into families with cohabiting biological parents are less likely to have asthma by age one, on average, than those born to mothers who were less involved with the child's biological father at childbirth.

The hypothesis that out-of-wedlock children benefit from marriage of their biological parents is rejected. Among children born to cohabiting parents, we find no significant differences in child outcomes measured at age one between those whose biological parents marry within the first year after childbirth, and those whose parents remain in cohabitation arrangements. This result is found consistently using

three separate measures of child wellbeing, and confirms the earlier findings by Osborne et al. (2003) who analyze behavioral outcomes for children at age three. We note that these findings do not contradict previous research showing that out-of-wedlock children are worse off compared to children born into marriage. However, they cast doubt on the hypothesis that marriage between the biological parents would bestow direct benefits to children, since the environment provided by stable cohabiting biological parents appears equally beneficial to a child as the one provided by a relationship that progresses into marriage.

While we find some evidence that children of parents who are cohabiting or are married one year after the child's birth have better outcomes than one-year-old children of visiting or not romantically involved biological parents, these differences are largely explained by the biological parents' relationship at childbirth. The health advantage (based on asthma incidence) that children of biological parents who cohabit at childbirth enjoy may reflect greater parental investment during childbearing. Given that relationship status at childbirth is a key predictor of subsequent parental involvement (in particular of the biological father as shown in Carlson et al. (2005)), the effect of relationship arrangement at birth on child wellbeing may also capture the extent of parental investment in the child after birth.

The broader hypothesis that we investigate is whether more involvement of the biological father with the mother benefits the child. We find that children born into families 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 subsequently married biological parents. With respect to reported child health problems, there is no evidence that a relationship between the biological parents that is progressing towards greater involvement of the parents is better for the child than a stable cohabiting union (or compared to declining involvement between the parents). Conversely, we find some evidence that less involvement between the biological parents increases the prevalence of child problematic behavior, consistent with existing evidence of detrimental effects of partnership instability (Osborne and McLanahan, 2004). All results are robust to the inclusion of controls for parental characteristics, socioeconomic

status, other inputs in the child development process, and qualitatively similar within sub-samples of African American and Hispanic children.

Fearing that unmarried parenthood may have harmful effects on children, recent family policies in the U.S. are geared towards promoting marriage among unmarried parents. Children born within marriage are generally found to exhibit better outcomes compared to their counterparts born outside of marriage. However, drawing conclusions that such differences in child outcomes are attributable to parental marriage may be inappropriate, as families that have children before vs. after marriage may be selectively different. Out-of-wedlock children are born to mothers who are, on average, younger, more likely a minority, and of lower educational attainment and socioeconomic status (Ellwood, 2004; Carlson et al., 2004; and Osborne, 2005). Contrary to previous studies, by sampling from the sub-population for whom these policies are immediately relevant, the present study analyzes potential differences in child outcomes among children born outside of marriage, and examine whether marriage “following” the birth of child may improve child wellbeing. Our findings that children born and raised within cohabiting unions exhibit similar outcomes compared to children born to cohabiting but subsequently married parents provide some evidence that policy initiatives that promote marriage among unmarried parents may not help to alleviate the disadvantages faced by children in unmarried family settings. Initiatives that focus on the socioeconomic gap between parents who have children out-of-wedlock and those who do not are more likely to be effective.

References

- Acs, G., and S. Nelson** (2002): “The Kids are Alright? Children’s Well-Being and the Rise in Cohabitation,” *Assessing the New Federalism Policy Brief*, Washington D.C.: The Urban Institute.
- Acs, G., and S. Nelson** (2004): “Should We Get Married in the Morning? A Profile of Cohabiting Couples with Children,” *Assessing the New Federalism Discussion Paper*, Washington D.C.: The Urban Institute.
- Bauman, K.J.** (1999): “Shifting Family Definitions: The Effect of Cohabitation and Other Non-family Household Relationships on Measures of Poverty,” *Demography*, 36(3): 315–325.
- Becker, G.S.** (1965): “A Theory of the Allocation of Time,” *Economic Journal*, 75: 493–517.
- Becker, G.S.** (1991): *A Treatise on the Family*. Enl. ed. Cambridge, MA: Harvard University Press.
- Blossfeld, H.-P.** (1995): *The new role of women: family formation in modern societies*, Boulder, C.O.: Westview Press.
- Björklund, A., D.K. Ginther, and M. Sundström** (2004): “Family Structure and Child Outcomes in the United States and Sweden,” IZA Discussion Paper No. 1259.
- Brown, S.** (2002): “Child Well-Being in Cohabiting Families,” Pp: 173–187, in: *Just Living Together: Implications of Cohabitation on Families, Children, and Social Policy*, Booth, A., and A. Crouter (eds.). Manwah, N.J.: Lawrence Erlbaum Associates.
- Brown, S.** (2004): “Family Structure and Child Well-Being: The Significance of Parental Cohabitation,” *Journal of Marriage and The Family*, 66: 351–367.
- Bumpass, L., and H.-H. Lu** (2000): “Trends in cohabitation and implications for children’s family contexts in the United States,” *Population Studies*, 54: 29–41.
- Carlson, M., S. McLanahan, and P. England** (2004): “Union formation in Fragile Families,” *Demography*, 41(2): 237–261.
- Carlson, M., S. McLanahan, and J. Brooks-Gunn** (2005): “Unmarried But Not Absent: Fathers’ Involvement With Children After a Nonmarital Birth,” Center for Research on Child Well-Being Working Paper No. 05-07-FF.
- CDC** (2004): “Nine Million U.S. Children Diagnosed with Asthma,” CDC/NCHS Press Office, <http://www.cdc.gov/od/oc/media/pressrel/r040331.htm>.
- Cherlin, A.** (1999): “Going to Extremes: Family Structure, Children’s Well-Being, and Social Sciences,” *Demography*, 36: 421–428.

- Cronbach, L.J.** (1951): "Coefficient Alpha and the Internal Structure of Tests," *Psychometrika*, 16: 297–334.
- Deleire, T., and A. Kalil** (2002): "Good things come in threes: Single-Parent Multigenerational Family Structure and Adolescent Adjustment," *Demography*, 39(2): 393–413.
- Ellwood, D., and C. Jencks** (2004): "The Spread of Single-Parent Families in the United States Since 1960," *The Future of the Family*, Moynihan, D.P., L. Rainwater, and T. Smeeding (eds.). New York: Russell Sage.
- Fields, J., and L. Casper** (2001): "America's Families and Living Arrangements," Current Population Reports P20-537. Suitland, MD: U.S. Census Bureau.
- Fitch, C., R. Goeken, and S. Ruggles** (2005): "The Rise of Cohabitation in the United States: New Historical Estimates," Minnesota Population Center Working Paper No. 2005-03.
- Gergen, P.J., D.I. Mullally and R. Evans** (1988): "National survey of prevalence of asthma among children in the United States, 1976 to 1980," *Pediatrics*, 88(1): 1–7.
- Gibson, C., K. Edin, and S. McLanahan** (2003): "High Hopes but even Higher Expectations: The Retreat from Marriage Among Low-Income Parents," Center for Research on Child Wellbeing Working Paper No. 2003-06-FF.
- Glenn, N., S. Nock, L. Waite, et al.** (2002): "Why Marriage Matters: Twenty-One Conclusions from the Social Sciences." New York: Center of the American Experiment, Coalition of Marriage, Family and Couples Education, Institute for American Values.
- Hancox, R.J., B.J. Milne, D.R. Taylor, J.M. Greene, J.O. Cowan, E.M. Flannery, G.P. Herbison, C.R. McLachlan, R. Poulton, and M.R. Sears** (2004): "Relationship between socioeconomic status and asthma: a longitudinal cohort study," *Thorax*, 59(5): 376–380.
- Hamilton, G.** (1999): "Property Rights and Transaction Costs in Marriage: Evidence from Prenuptial Contracts," *Journal of Economic History*, 59(1): 68–103.
- Hao, L.** (1996): "Family Structure, Private Transfers, and the Economic Well-Being of Families with Children," *Social Forces*, 75(1): 269–292.
- Harknett, K., and S. McLanahan** (2004): "Racial and Ethnic Differences in Marriage after the Birth of a Child," *American Sociological Review*, 69: 790-811.
- Heiland, F.** (2002): "A Dynamic Analysis of the Effect of Women's Fertility and Employment Decisions on Child Development," *Proceedings of the 2002 North American Summer Meetings of the Econometric Society: Labor Economics and Applied Econometrics*, Levine, D.K., W. Zame, A. Case, R. Fernandez, J. Rust, and K. Wolpin (eds.). <http://www.dklevine.com/proceedings/labor-economics.htm>.

- Hoem, B., and J.M. Hoem** (1992): "The disruption of marital and nonmarital unions in contemporary Sweden," Pp. 61-93, in: *Demographic Applications of Event History Analysis*, J. Trussell, R. Hankinson, and J. Tilton (eds.). Oxford: Clarendon Press.
- Knab, J., and S. McLanahan** (in press): "Measuring Cohabitation: Does How, When, and Who You Ask Matter?" in: *Counting Couples II: Measurement Issues in Family Demography*.
- Lesthaeghe, R.** (2001): "Postponement and recuperation: Recent fertility trends and forecasts in six Western European countries," Paper presented at the IUSSP Seminar on "International Perspectives on Low Fertility: trends, theories and policies", Tokyo, March 21-23, 2001.
- Likert, R.A.** (1932): "A Technique for the Measurement of Attitudes," *Archives of Psychology*, 140: 5-55.
- Liu, S.H.** (2005): "Is My Parents Divorce to Blame for My Failure in Life? A joint Model of Child Educational Attainments and Parental Divorce," manuscript, University of Miami.
- Manning, W.** (1993): "Marriage and Cohabitation Following Premarital Conception," *Journal of Marriage and the Family*, 55: 839-850.
- Manning, W., and D. Lichter** (1996): "Parental Cohabitation and Children's Economic Well-Being," *Journal of Marriage and the Family*, 58(4): 998-1010.
- Manning, W.** (2001): "Childbearing in Cohabiting Unions: Racial and Ethnic Differences," *Family Planning Perspectives*, 33: 217-223.
- Manning, W.** (2002): "The Implications of Cohabitation for Children's Well-Being" Pp: 121-152, in: *Just Living Together: Implications of Cohabitation on Families, Children, and Social Policy*. Booth, A., and A. Crouter (eds.). Manwah, N.J.: Lawrence Erlbaum Associates.
- Manning, W., and S. Brown** (2003): "Children's economic well-being in cohabiting parent families," Center for Family and Demographic Research Working Paper No. 03-05.
- Manning, W., and K.A. Lamb** (2003): "Adolescent Well-Being in Cohabiting, Married, and Single-Parent Families," *Journal of Marriage and the Family*, 65(4): 876-893.
- Manning, W., P. Smock, and D. Majumbar** (2004): "The relative stability of cohabiting and marital unions for children," *Population Research and Policy Review*, 23: 135-159.
- McLanahan, S., and G. Sandefur** (1994): *Growing Up with a Single Parent: What Hurts, What Helps*. Cambridge, MA: Harvard University Press.
- McLanahan, S., and I. Garfinkel** (2002): "Unwed parents: Myths, realities and policy making," Center for Research on Child Well-Being Working Paper No. 02-15-FF.
- Morrison, D.R., and A. Ritualo** (2000): "Routes to Children's Economic Recovery after Divorce: Are Maternal Cohabitation and Remarriage Equivalent?" *American Sociological Review*, 65: 560-580.

- Newcomb, P.R.** (1979): “Cohabitation in America: An Assessment of Consequences,” *Journal of Marriage and the Family*, 41(3): 597–603.
- Osborne, C., S. McLanahan, and J. Brooks-Gunn** (2003): “Young Children’s Behavioral Problems in Married and Cohabiting Families,” Center for Research on Child Well-Being Working Paper No. 03-09-FF (revised 9/04).
- Osborne, C., and S. McLanahan** (2004): “The Effects of Partnership Instability on Parenting and Young Children’s Health and Behavior,” Center for Research on Child Well-Being Working Paper No. 04-16-FF.
- Osborne, C.** (2005): “Marriage following the Birth of a Child of Cohabiting and Visiting Parents,” *Journal of Marriage and The Family*, 67: 14–26.
- Reichman, N., I. Garfinkel, S. McLanahan, and J. Teitler** (2001): “The Fragile Families: Sample and Design,” *Children and Youth Services Review*, 23(4/5): 303–326.
- Rodríguez, M.A., M.A. Winkleby, D. Ahn, J. Sundquist, and H.C. Kraemer** (2002): “Identification of Population Subgroups of Children and Adolescents With High Asthma Prevalence,” *Arch. Pediatr. Adolesc. Med.*, 156: 269–275.
- Ribar, D.C.** (2004): “What Do Social Scientists know About the Benefits of Marriage? A Review of Quantitative Methodologies,” IZA Discussion Paper No. 998.
- Sigle-Rushton, W. and S. McLanahan** (2002a): “The Living Arrangements of New Unmarried Mothers,” *Demography*, 39(3): 415–433.
- Sigle-Rushton, W. and S. McLanahan** (2002b): “For Richer or Poorer: Marriage as Poverty Alleviation in the United States?” *Population*, 57(3): 509–528.
- Todd, P.E., and K.I. Wolpin** (2003), “On the Specification and Estimation of the Production Function for Cognitive Achievement,” *The Economic Journal*, 113: F3–F33.
- Thomson, E., T.L. Hanson, and S. McLanahan** (1994): “Family Structure and Child Wellbeing: Economic Resources vs. Parental Behaviors,” *Social Forces*, 73(1): 221–242.
- Thomson, E., J. Mosley, T. Hanson, and S. McLanahan** (2001): “Remarriage, Cohabitation, and Changes in Mothering,” *Journal of Marriage and The Family*, 63: 370–380.
- Weiss, Y., and R.J. Willis** (1997): “Match Quality, New Information, and Marital Dissolution,” *Journal of Labor Economics*, 15(1): S293–S329.
- Willis, J.** (1999): “A Theory of Out-of-Wedlock Childbearing,” *The Journal of Political Economy*, 107(6): S33–S64.
- Winkler, A.** (1997), “Economics Decision-Making by Cohabitators: Findings Regarding Income Pooling,” *Applied Economics*, 29(8): 1079–1090.

Table 1: Descriptive Statistics by Family Structure Transitions

Parents' Union Status at Baseline	Unmarried	Cohabiting	Cohabiting	Visiting	Not Involved
Parents' Union Status at 1-Year	Unmarried	Cohabiting	Married	Married	Married
<i>Child Outcome Variables</i>					
Asthma or Asthma Attack by Age 1	.160*	.082	.103	.022*	.100
Health Status (1 = Excellent; 5 = Poor)	1.52	1.48	1.42	1.48	1.50
Behavioral Index(1 = Least Prob; 5 = Very Prob)	2.63	2.58	2.50	2.54	2.37
<i>Child Characteristics</i>					
Low Birth Weight (< 88 lbs)	.107	.099	.094	.022*	.000*
Child is Female	.451	.475	.507	.500	.600
<i>Parents' Background Characteristics</i>					
Mother's Race: White Non-Hispanic	.143*	.227	.254	.196	.000*
Mother's Race: Black	.579	.385*	.230*	.413	.200
Mother's Race: Hispanic	.253*	.360	.469*	.370	.800*
Mother's Race: Other	.009	.007	.009	.000*	.000*
Parents are of Different Race	.188*	.142	.188	.109	.200
Mother is Foreign Born	.090*	.175	.225	.217	.300
Mother's Age at Childbirth	23.2*	24.3	24.5	24.6	25.5
Father's Age at Childbirth	25.9*	27.0	27.4	26.6	28.4
<i>Parents' Religion and Religious Activities</i>					
Mother's Religion (None)	.144*	.106	.127	.000*	.100
Mother's Religion (Catholic)	.242*	.382	.408	.326	.700 ⁺
Mother's Religion (Baptist)	.308*	.240	.146*	.196	.100
Mother Attends Relig. Activities (1=Never;4= \geq 1/Wk)	1.92*	1.79	2.11*	2.37*	2.30
Father's Religion (None)	.097	.119	.080 ⁺	.109	.000*
Father's Religion (Catholic)	.136*	.350	.413 ⁺	.261	.100*
Father's Religion (Baptist)	.189	.214	.169	.109*	.100
Father Attends Relig. Activities (1=Never;4= \geq 1/Wk)	1.13*	1.50	1.84*	1.76	1.50
<i>Mother's Educational Background</i>					
Less than High School	.400	.387	.338	.391	.500
High School Diploma (or GED)	.332	.347	.319	.326	.400
Some College	.234	.238	.263	.261	.100
College and Beyond	.032	.026	.070*	.022	.000*
<i>Father's Educational Background</i>					
Less than High School	.345*	.407	.343 ⁺	.370	.200
High School Diploma (or GED)	.371	.336	.305	.348	.100*
Some College	.179*	.220	.272	.239	.200
College and Beyond	.031	.033	.070*	.043	.100
<i>Father's Education Relative to the Mother's</i>					
Same as Mother	.432*	.486	.469	.478	.300
More than Mother	.248	.250	.254	.261	.200
Less than Mother	.249	.258	.268	.261	.100

(Continued)

Table 1 (Continued): Descriptive Statistics by Family Structure Transitions

Parents' Union Status at Baseline	Unmarried	Cohabiting	Cohabiting	Visiting	Not Involved
Parents' Union Status at 1-Year	Unmarried	Cohabiting	Married	Married	Married
<i>Mother's Earnings Income</i>					
\$0	.411 ⁺	.370	.394	.435	.500
\$1 to \$9,999	.385	.363	.357	.239 ⁺	.100 [*]
\$10,000 to \$25,000	.171 [*]	.211	.164	.239	.400
More than \$25,000	.445	.426	.479	.522	.500
<i>Father's Earnings Income</i>					
\$0	.439 [*]	.148	.131	.174	.500 ⁺
\$1 to \$9,999	.229	.237	.160 [*]	.217	.100
\$10,000 to \$25,000	.233 [*]	.407	.418	.478	.200
More than \$25,000	.100 [*]	.208	.291 [*]	.130	.200
<i>Home Investments</i>					
Number of Children in Household (Age < 18)	2.34 [*]	2.20	2.20	2.17	2.20
Grandmother in Household (Childbirth)	.426 [*]	.215	.202	.522 [*]	.100
Grandmother in Household (1 Year)	.319 [*]	.143	.160	.283 [*]	.100
Mother's Weekly Hours Worked (1 Year)	36.6	37.5	35.5	34.5	38.6
Father's Weekly Hours Worked (1 Year)	43.8	45.0	45.7	44.7	45.9
Mother Does Not Work (1 Year)	.447	.469	.474	.500	.500
Father Does Not Work (1 Year)	.357 [*]	.131	.117	.130	.200
Mother Owns Her Own House or Apartment (1 Year)	.047 [*]	.119	.207 [*]	.130	.200
Father Owns His Own House or Apartment (1 Year)	.045 [*]	.128	.207 [*]	.130	.300
<i>Parents' Health and Health Behavior</i>					
Mother's Self-Reported Health = Fair or Poor	.080	.080	.070	.087	.000 [*]
Mother: Prenatal Smoking (If at all)	.225	.217	.230	.217	.200
Mother: Prenatal Drug Use (If at all)	.066 [*]	.039	.028	.022	.000 [*]
Mother: Prenatal Drinking (If at all)	.113 ⁺	.089	.075	.043	.000 [*]
Father's Self-Reported Health = Fair or Poor	.055 [*]	.082	.070	.065	.000 [*]
Father Smokes (If at all)	.308 [*]	.416	.423	.478	.300
Father: Substance Abuse Limiting Work	.127 [*]	.082	.066	.065	.200
<i>Parenting Behavior and Alternative Child Care</i>					
Child Cared by Others (Hours/Week)	16.5 [*]	12.7	11.1	14.1	12.2
Mother Spanks the Child (If at all)	.297 [*]	.205	.239	.304	.000 [*]
Mother Reads to the Child (Days/Week)	4.12	3.98	4.14	3.61	4.10
Mother Sings to the Child (Days/Week)	5.46	5.47	5.70	5.52	5.60
Mother Plays Outdoor Games with Child (Days/Week)	5.99	6.05	6.21	5.72	6.00
Mother Plays Indoor Games with Child (Days/Week)	5.90	5.89	6.05	5.47	5.78
<i>Parental Relationship Characteristics</i>					
Years Parents Know Each Other before Childbirth	3.57 [*]	4.35	3.78 ⁺	4.19	5.08
Parity of Focal Child (within union of biological parents)	1.19 [*]	1.29	1.23	1.28	1.30
Father Suggested Abortion During Pregnancy	.226 [*]	.115	.075 ⁺	.196	.200
Number of Observations	1365	697	213	46	10
(% of sample)	(58.6)	(29.9)	(9.1)	(2.0)	(0.4)

Note: Significantly different from "Persistently Cohabit" (i.e. cohabiting at both baseline and 1 year) at: (*) = 5% level; (+) = 10% level. "Unmarried" refers to unmarried and non-cohabiting biological parents.

Table 2A: 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)
<i>Parental Union Status Transition between Childbirth and 1 Year</i>				
Married at 1 Year	-.040 ⁺	-.021	-.016	
	(.019)	(.021)	(.022)	
<i>Union Status at Childbirth</i>				
- (Cohabit)				
- Visiting		.050*	.047*	
		(.017)	(.018)	
- Not Involved		.072*	.054*	
		(.022)	(.026)	
<i>Union Status at 1 Year</i>				
- (Cohabit)				
- Visiting			-.045	
			(.027)	
- Not Involved			.023	
			(.018)	
<i>Union Transition between Childbirth → 1 Year</i>				
- Cohabit → Married				.029
				(.030)
- (Cohabit → Cohabit)				
- Cohabit → Visiting				.029
				(.072)
- Cohabit → Not Involved				.080*
				(.034)
- Visiting → Married				-.081
				(.036)
- Visiting → Cohabit				.116*
				(.032)
- Visiting → Visiting				-.001
				(.044)
- Visiting → Not Involved				.087*
				(.027)
- Not Involved → Married				.041
				(.129)
- Not Involved → Cohabit				.153*
				(.087)
- Not Involved → Visiting				-.021
				(.082)
- Not Involved → Not Involved				.105*
				(.028)
Log Pseudolikelihood	-865.2	-857.5	-854.7	-846.9
Pseudo R ²	0.025	0.034	0.037	0.046
Wald Test χ^2	47.05*	58.75*	64.24*	75.65*
N	2321	2321	2321	2321

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. All specifications include controls for whether the child was of low birth weight, and whether the child is female. b. Robust standard errors reported in parentheses; c. * = Significance at 5% level, and + = Significance at 10% level.

Table 2B: 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)
<i>Parental Union Status Transition between Childbirth and 1 Year</i>				
Married at 1 Year	-.059 (.052)	-.043 (.053)	-.052 (.055)	
<i>Union Status at Childbirth</i>				
- (Cohabit)				
- Visiting		.034 (.038)	.044 (.040)	
- Not Involved		.062 (.047)	.074 (.054)	
<i>Union Status at 1 Year</i>				
- (Cohabit)				
- Visiting			-.072 (.076)	
- Not Involved			-.018 (.043)	
<i>Union Transition between Childbirth → 1 Year</i>				
- Cohabit → Married				-.051 (.062)
- (Cohabit → Cohabit)				
- Cohabit → Visiting				-.004 (.153)
- Cohabit → Not Involved				.017 (.062)
- Visiting → Married				.026 (.128)
- Visiting → Cohabit				.069 (.056)
- Visiting → Visiting				-.113 (.079)
- Visiting → Not Involved				.037 (.054)
- Not Involved → Married				.066 (.210)
- Not Involved → Cohabit				.118 (.153)
- Not Involved → Visiting				.435 (.294)
- Not Involved → Not Involved				.045 (.052)
Constant	1.527* (.025)	1.503* (.031)	1.510* (.033)	1.503* (.035)
R^2	.019	.020	.020	.022
F-Test	12.01*	7.75*	5.76*	3.37*
N	2320	2320	2320	2320

Notes: a. All specifications include controls for whether the child was of low birth weight, and whether the child is female. b. Robust standard errors reported in parentheses; c. * = Significance at 5% level, and + = Significance at 10% level.

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

	(1)	(2)	(3)	(4)
<i>Parental Union Status Transition between Childbirth and 1 Year</i>				
Married at 1 Year	-.108*	-.098*	-.070	
	(.048)	(.050)	(.051)	
<i>Union Status at Childbirth</i>				
- (Cohabit)				
- Visiting		.025	.001	
		(.037)	(.039)	
- Not Involved		.033	-.024	
		(.044)	(.050)	
<i>Union Status at 1 Year</i>				
- (Cohabit)				
- Visiting			.023	
			(.076)	
- Not Involved			.089*	
			(.040)	
<i>Union Transition between Childbirth → 1 Year</i>				
- Cohabit → Married				-.083
				(.057)
- (Cohabit → Cohabit)				
- Cohabit → Visiting				.210
				(.136)
- Cohabit → Not Involved				.031
				(.059)
- Visiting → Married				-.033
				(.123)
- Visiting → Cohabit				-.032
				(.054)
- Visiting → Visiting				-.065
				(.092)
- Visiting → Not Involved				.112*
				(.052)
- Not Involved → Married				-.203
				(.220)
- Not Involved → Cohabit				-.001
				(.098)
- Not Involved → Visiting				.053
				(.244)
- Not Involved → Not Involved				.054
				(.050)
Constant	2.605*	2.589*	2.567*	2.574*
	(.023)	(.028)	(.030)	(.032)
R^2	.004	.005	.007	.009
F-Test	3.37*	2.16 ⁺	2.24*	1.58 ⁺
N	2314	2314	2314	2314

Notes: a. All specifications include controls for whether the child was of low birth weight, and whether the child is female. b. Robust standard errors reported in parentheses; c. * = Significance at 5% level, and + = Significance at 10% level.

Table 3A: 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	.029 (.030)	.037 (.031)	.032 (.029)	.038 (.031)	.033 (.029)	.034 (.029)
- (Cohabit → Cohabit)						
- Cohabit → Visiting	.029 (.072)	-.028 (.054)	-.031 (.049)	-.018 (.060)	-.022 (.054)	-.023 (.053)
- Cohabit → Not Involved	.080* (.034)	.069* (.034)	.085* (.036)	.064* (.033)	.082* (.035)	.082* (.035)
- Visiting → Married	-.081 (.036)	-.084 ⁺ (.028)	-.072 (.031)	-.087 ⁺ (.024)	-.074 (.028)	-.075 (.028)
- Visiting → Cohabit	.116* (.032)	.068* (.029)	.079* (.030)	.071* (.029)	.080* (.030)	.081* (.030)
- Visiting → Visiting	-.001 (.044)	-.032 (.034)	-.009 (.039)	-.027 (.035)	-.007 (.040)	-.008 (.040)
- Visiting → Not Involved	.087* (.027)	.041 ⁺ (.025)	.054* (.027)	.041 ⁺ (.025)	.054* (.027)	.054* (.027)
- Not Involved → Married	.041 (.129)	.088 (.159)	.138 (.176)	.120 (.174)	.183 (.195)	.164 (.192)
- Not Involved → Cohabit	.153* (.087)	.158* (.091)	.164* (.093)	.162* (.092)	.169* (.094)	.168* (.094)
- Not Involved → Visiting	-.021 (.082)	-.041 (.067)	-.051 (.051)	-.041 (.066)	-.049 (.053)	-.051 (.050)
- Not Involved → Not Involved	.105* (.028)	.083* (.030)	.102* (.033)	.089* (.031)	.109* (.034)	.111* (.035)
Child Initial Health Endowment						
Child is of Low Birthweight	.112* (.028)	.107* (.029)	.104* (.028)	.103* (.029)	.104* (.029)	.105* (.029)
Child is Female	-.059* (.013)	-.062* (.013)	-.064* (.013)	-.063* (.013)	-.064* (.013)	-.064* (.013)
Parents' Background Characteristics						
(Mother's Race: White Non-Hispanic)						
Mother's Race: Black		.106* (.023)	.105* (.023)	.099* (.024)	.097* (.024)	.097* (.024)
Mother's Race: Hispanic		.094* (.032)	.083* (.031)	.088* (.032)	.075* (.031)	.075* (.031)
Mother's Race: Other		.045 (.064)	.054 (.068)	.041 (.063)	.047 (.066)	.047 (.066)
Parents are of Different Race		.018 (.021)	.026 (.021)	.013 (.021)	.021 (.021)	.023 (.021)
Mother is Foreign Born		-.072* (.016)	-.073* (.015)	-.075* (.016)	-.075* (.015)	-.075* (.015)
Mother's Age at Childbirth		-.000 (.002)	-.001 (.002)	-.001 (.002)	-.001 (.002)	-.002 (.002)
Father's Age at Childbirth		-.001 (.001)	-.000 (.001)	-.001 (.001)	-.000 (.001)	-.000 (.001)

(Continued)

Table 3A (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)
Parents' Religion and Religious Activities						
Mother's Religion (None)		-.020 (.021)	-.028 (.019)	-.022 (.020)	-.029 (.019)	-.031 (.018)
Mother's Religion (Catholic)		.003 (.021)	.009 (.021)	.007 (.021)	.013 (.021)	.012 (.021)
Mother's Religion (Baptist)		-.007 (.017)	-.009 (.016)	-.007 (.017)	-.009 (.016)	-.010 (.016)
Mother Attends Religious Activities (1 = Never; 4 = \geq Once/Week)		.003 (.005)	.005 (.005)	.004 (.005)	.005 (.005)	.005 (.005)
Father's Religion (None)		-.017 (.023)	-.014 (.022)	-.021 (.022)	-.018 (.021)	-.019 (.021)
Father's Religion (Catholic)		-.033 (.020)	-.026 (.019)	-.036 ⁺ (.019)	-.030 (.019)	-.029 (.019)
Father's Religion (Baptist)		.016 (.020)	.013 (.019)	.013 (.020)	.011 (.019)	.010 (.019)
Father Attends Religious Activities (1 = Never; 4 = \geq Once/Week)		.009 (.006)	.007 (.006)	.008 (.006)	.007 (.006)	.007 (.006)
Mother's Education Level at Childbirth						
(Less than High School)						
High School (or GED)			-.074* (.020)		-.071* (.020)	-.071* (.020)
Some College			-.088* (.025)		-.083* (.026)	-.083* (.026)
College and Beyond			-.096* (.014)		-.093* (.016)	-.092* (.016)
Father's Education Level at Childbirth						
(Less than High School)						
High School (or GED)			.051* (.025)		.049* (.025)	.049* (.025)
Some College			.040 (.041)		.035 (.041)	.035 (.041)
College and Beyond			-.012 (.062)		-.022 (.058)	-.021 (.058)
Father's Education Relative to Mother's Education						
(Same as Mother)						
More than Mother			-.053* (.022)		-.048* (.022)	-.049* (.022)
Less than Mother			.038 (.029)		.037 (.030)	.037 (.030)
Mother's Earnings Income						
\$0			.001 (.040)		.001 (.040)	.001 (.041)
\$1 ~ \$9,999			.045 (.043)		.047 (.044)	.046 (.044)
\$10,000 ~ \$25,000			.025 (.045)		.026 (.045)	.025 (.046)
(> \$25,000)						

(Continued)

Table 3A (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)
<i>Father's Earnings Income</i>						
\$0			-.031 (.024)		-.027 (.024)	-.027 (.024)
\$1 ~ \$9,999			-.013 (.021)		-.009 (.022)	-.009 (.022)
\$10,000 ~ \$25,000			-.017 (.020)		-.014 (.020)	-.014 (.020)
(> \$25,000)						
<i>Home Investments</i>						
Number of Children in Household (Age < 18)			.012* (.005)		.012* (.005)	.011* (.005)
Grandmother in the Household (Childbirth)			-.025 (.015)		-.024 (.015)	-.024 (.015)
Grandmother in the Household (1 Year)			-.016 (.016)		-.017 (.016)	-.016 (.016)
Mother's Weekly Hours Worked (1 Year)			-.000 (.001)		-.001 (.001)	-.001 (.001)
Father's Weekly Hours Worked (1 Year)			.000 (.000)		.000 (.000)	.000 (.000)
Mother Does Not Work (1 Year)			-.010 (.030)		-.018 (.030)	-.017 (.030)
Father Does Not Work (1 Year)			.001 (.019)		.004 (.019)	.003 (.019)
Mother Owns Her Own House or Apartment (1 Year)			.078* (.036)		.083* (.037)	.083* (.037)
Father Owns His Own House or Apartment (1 Year)			-.022 (.024)		-.025 (.023)	-.025 (.023)
<i>Mother's Health and Health Behavior</i>						
Fair or Poor Health				.073* (.031)	.062* (.028)	.062* (.029)
Prenatal Smoking				.014 (.019)	.005 (.017)	.005 (.017)
Prenatal Drug Use				.013 (.032)	.011 (.031)	.009 (.030)
Prenatal Drinking				-.008 (.022)	-.004 (.022)	-.003 (.022)
<i>Father's Health and Health Behavior</i>						
Fair or Poor Health				.037 (.030)	.041 (.030)	.041 (.030)
Smokes				-.004 (.015)	-.010 (.014)	-.009 (.014)
Substance Abuse Limiting Work				-.038 ⁺ (.018)	-.036 ⁺ (.017)	-.036 ⁺ (.017)
<i>Parental Relationship Characteristics</i>						
Years Parents Know Each Other before Childbirth						.001 (.002)
Parity of Focal Child (within union of biological parents)						.002 (.011)
Father Suggested Abortion During Pregnancy						.011 (.017)
Log Pseudolikelihood	-846.9	-791.9	-756.5	-781.8	-747.0	-745.4
Pseudo R ²	0.046	0.080	0.114	0.090	0.123	0.124
Wald Test χ^2	75.65*	119.55*	172.27*	137.13*	184.33*	185.88*
N	2321	2224	2196	2210	2182	2178

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. Robust standard errors reported in parentheses; b. * = Significance at 5% level, and + = Significance at 10% level.

Table 3B: 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	-.051 (.062)	-.087 (.063)	-.051 (.063)	-.078 (.062)	-.043 (.063)	-.042 (.062)
- (Cohabit → Cohabit)						
- Cohabit → Visiting	-.004 (.153)	.058 (.162)	.079 (.160)	.086 (.161)	.111 (.159)	.118 (.160)
- Cohabit → Not Involved	.017 (.062)	.015 (.065)	.024 (.066)	-.001 (.062)	.014 (.063)	.016 (.063)
- Visiting → Married	.026 (.128)	.011 (.127)	.028 (.123)	.019 (.124)	.035 (.120)	.042 (.119)
- Visiting → Cohabit	.069 (.056)	.084 (.057)	.091 (.059)	.087 (.057)	.095 (.058)	.095 (.059)
- Visiting → Visiting	-.112 (.079)	-.121 (.084)	-.112 (.089)	-.106 (.081)	-.105 (.086)	-.104 (.086)
- Visiting → Not Involved	.037 (.054)	.046 (.057)	.035 (.059)	.027 (.056)	.016 (.058)	.018 (.059)
- Not Involved → Married	.066 (.210)	-.225 (.179)	-.169 (.189)	-.193 (.182)	-.129 (.190)	-.095 (.195)
- Not Involved → Cohabit	.118 (.153)	.080 (.145)	.074 (.150)	.088 (.143)	.086 (.149)	.094 (.151)
- Not Involved → Visiting	.435 (.295)	.369 (.304)	.340 (.296)	.346 (.264)	.325 (.259)	.337 (.257)
- Not Involved → Not Involved	.045 (.052)	.051 (.061)	.055 (.063)	.029 (.061)	.036 (.063)	.041 (.064)
Constant	1.053* (.035)	1.273* (.097)	1.294* (.166)	1.262* (.099)	1.304* (.168)	1.296* (.170)
Controls						
- Parents' Background Characteristics ¹		✓	✓	✓	✓	✓
- Parental Economic Resources ²			✓		✓	✓
- Parental Health and Health Behavior ³				✓	✓	✓
- Parental Relationship Characteristics ⁴						✓
R^2	.022	.055	.087	.092	.121	.123
F-Test	3.37*	3.83*	3.65*	14.07*	4.09*	3.97*
N	2320	2227	2199	2227	2199	2199

Notes: *a.* All specifications include controls for whether the child is of low birth weight, and whether the child is female; *b.* Robust standard errors reported in parentheses; *c.* * = Significance at 5% level, + = Significance at 10% level; 1. Parents' background characteristics include: Mother's age at childbirth, father's age at childbirth, mother's race, and whether mother is foreign born, and whether parents are of different racial background; 2. Parental economic resources include: each parent's education at childbirth, father's education relative to the mother's at childbirth, each parent's earnings income at childbirth, the number of children under 18 in the household, whether grandmother lives in the household (baseline and 1 Year), each parents' hours of work per week, whether each parent is not working (1 Year), and whether each parents owns his/her own house/apartment; 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: years parents know each other prior to childbirth, parity of the focal child (within the union of the biological parents), and whether father has suggested abortion during pregnancy.

Table 3C: 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 (.057)	-.062 (.059)	-.048 (.059)	-.062 (.059)	-.041 (.061)	-.035 (.062)	-.033 (.062)
- (Cohabit → Cohabit)							
- Cohabit → Visiting	.210 (.136)	.204 (.134)	.118 (.140)	.224 (.135)	.191 (.153)	.146 (.159)	.137 (.161)
- Cohabit → Not Involved	.031 (.059)	-.004 (.062)	-.035 (.063)	-.012 (.061)	-.050 (.065)	-.088 (.064)	-.089 (.066)
- Visiting → Married	-.033 (.123)	-.016 (.122)	-.020 (.120)	-.021 (.123)	-.065 (.127)	-.075 (.128)	-.077 (.129)
- Visiting → Cohabit	-.032 (.054)	-.062 (.056)	-.064 (.057)	-.056 (.057)	-.080 (.058)	-.081 (.060)	-.081 (.060)
- Visiting → Visiting	-.065 (.092)	-.073 (.096)	-.079 (.097)	-.062 (.096)	-.087 (.096)	-.084 (.099)	-.087 (.099)
- Visiting → Not Involved	.112* (.052)	.079 (.056)	.080 (.058)	.077 (.056)	.074 (.058)	.065 (.060)	.062 (.061)
- Not Involved → Married	-.203 (.220)	-.127 (.285)	-.100 (.304)	-.112 (.280)	.041 (.332)	.105 (.347)	.126 (.456)
- Not Involved → Cohabit	-.001 (.098)	-.001 (.092)	-.002 (.101)	-.003 (.095)	-.050 (.098)	-.054 (.110)	-.066 (.111)
- Not Involved → Visiting	.053 (.244)	.032 (.232)	-.040 (.218)	.035 (.224)	-.031 (.240)	-.099 (.224)	-.091 (.220)
- Not Involved → Not Involved	.054 (.050)	.072 (.060)	.085 (.061)	.079 (.060)	.114 (.064)	.102 (.066)	.097 (.068)
Constant	2.574* (.032)	2.581* (.094)	2.558* (.163)	2.522* (.095)	2.956* (.142)	2.887* (.199)	2.867* (.203)
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	.009	.028	.069	.042	.052	.102	.103
F-Test	1.58 ⁺	2.12*	3.25*	2.15*	3.55*	3.36*	3.17*
N	2314	2223	2195	2223	1986	1975	1975

Notes: a. All specifications include controls for whether the child is of low birth weight, and whether the child is female; b. Robust standard errors reported in parentheses; c. * = Significance at 5% level, + = Significance at 10% level; 1. Parents' background characteristics include: Mother's age at childbirth, father's age at childbirth, mother's race, and whether mother is foreign born, and whether parents are of different racial background; 2. Parental economic resources include: each parent's education at childbirth, father's education relative to the mother's at childbirth, each parent's earnings income at childbirth, the number of children under 18 in the household, whether grandmother lives in the household (baseline and 1 Year), each parents' hours of work per week, whether each parent is not working (1 Year), and whether each parents owns his/her own house/apartment; 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 spansks 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); 5. Parental relationship characteristics include: years parents know each other prior to childbirth, parity of the focal child (within the union of the biological parents), and whether father has suggested abortion during pregnancy.