

Is Marriage Protective for all Children?

Cumulative Risks at Birth and Subsequent Child Behavior among Urban Families

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Cynthia Osborne

LBJ School of Public Affairs
University of Texas at Austin
2315 Red River Rd.
Austin, TX 78713
512-471-9808
cosborne@prc.utexas.edu

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Is Marriage Protective for all Children? Cumulative Risks at Birth and Subsequent Child Behavior

Today, 37% of all births are to unmarried mothers (Hamilton, Martin, & Ventura, 2006). This represents a doubling in nonmarital childbearing in the past 25 years. Reducing nonmarital childbearing and promoting marriage among unmarried parents have become major policy concerns because, although the increase in nonmarital births has occurred at all education levels and among all race/ethnic groups, the trends have disproportionately affected lower educated and minority women (Ellwood & Jencks, 2004), which is fueling the growing inequality in this country. A concern is that two very different trajectories have been created for children; one for children born to married parents that is largely advantageous and one for children born to unmarried mothers that is beset with multiple risks (McLanahan, 2004).

The increase and large differences across groups in nonmarital childbearing are especially concerning because of the strong association between living in an unmarried household and negative social, academic, and behavioral outcomes for children (Amato, 2005; McLanahan & Sandefur, 1994). Behavioral problems at very early ages, especially childhood aggression, are associated with anti-social behavior in adolescence and adulthood (McLeod & Kaiser, 2004; Moffitt, Caspi, Harrington, & Milne, 2002), and thus set the stage for subsequent development.

In the developmental literature, marriage is considered a “protective” family environment for children, whereas living in an unmarried household is often considered a risky environment (Sameroff, 1983; Liaw & Brooks-Gunn, 1994). Prior research, however, has not been able to identify precisely and fully what it is about living in an unmarried household that best explains this association, nor whether marriage is an equally protective environment for children of all parental education levels and race/ethnic groups. If marriage is not protective *within* socioeconomic

subgroups, then it is likely that marriage per se does not *cause* a better environment for children, or at the very least it does not confer the same benefits to all families, and thus policy efforts to improve child well-being by promoting marriage may have little or varying degrees of success.

At the aggregate level, it is likely that the difference in child well-being across family structures is explained by a complex mix of factors, and trying to identify any specific variable that explains the difference may be impossible and ineffective. Nonmarital childbearing does not occur in isolation; mothers who have a child while unmarried differ considerably, on average, on a host of characteristics from mothers who have a child in marriage. In addition to lower levels of education and minority status, unmarried mothers are generally younger, poorer, have poorer health, and have many other risk factors that are associated with negative child development.

Prior research finds that rather than any particular risk, it is the cumulative number of risk factors a child is exposed to at birth and early childhood that best predicts subsequent cognitive and behavioral outcomes (Ackerman, Izard, Schoff, Youngstrom, & Kogos, 1999; Brooks-Gunn, Klebanov, & Liaw, 1995; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Liaw & Brooks-Gunn, 1994; Rutter, 1979; Sameroff, 1986). Thus, it is likely that it is the difference across families in the number of risks (or cumulative risk) that children are exposed to at birth and early childhood that best accounts for subsequent differences in child outcomes; rather than a difference in any particular risk factor.

Because relationship status is so highly correlated with education level and race/ethnicity, however, aggregate level data may exaggerate the differences across families within a given socioeconomic group. If marriage is a protective environment for all children, then within each education level and race/ethnic group, children born to married parents should be exposed to fewer

risk factors at birth. If marital status is mostly a proxy for education level and race/ethnicity, however, then within group differences across relationship statuses should be minimal.

For example, not all mothers who have a nonmarital birth are disadvantaged. Although the number is relatively small, some women with a college degree choose to have a child while unmarried, and these women are likely to have sufficient resources to support this child, similar to that of married mothers. Therefore, it is not clear that marriage would be a protective environment for children of highly-educated mothers. Alternatively, not all married mothers are advantaged. Children born to lower-educated *married* mothers may be exposed to many more risks than children born to highly-educated *unmarried* mothers, and children's exposure to cumulative risks among lower-educated mothers may not vary much by marital status.

Moreover, marriage may not be a protective environment for all race/ethnic groups. Prior research suggests that the difference in economic resources, parenting behaviors, and child outcomes between married and unmarried families is greater for White families than Black or Hispanic families (Manning & Brown, 2006; Osborne, Manning, & Smock, 2007; Osborne, McLanahan, & Brooks-Gunn, 2005). In addition, nonmarital childbearing is more normative for Black and Hispanic families than White families, with 70% of Black children and almost half of Hispanic children born to unmarried mothers, compared to 22% of White children (Hamilton et al., 2006). Thus, marriage may be more protective for White children than for Black or Hispanic children.

Current Investigation

In this study, I use data from the Fragile Families and Child Well-being Study (Fragile Families Study) (N=3,126), a new large birth-cohort study of mostly low-income, unmarried mothers, to address four broad research questions. First, how do the number and type of risks

that children are exposed to at birth differ by their mother's relationship status? Is the pattern similar within all education levels and race/ethnic groups? In this aim, I will determine the number and type of risk factors that children are exposed to at birth, based on their mother's relationship status with the child's biological father (married, cohabiting, and single). Twenty-one risk factors will be examined including 1 biological, 3 socioeconomic, 3 family structural, 8 maternal, and 6 paternal risk measures (described below), and the risks are combined to create a cumulative risk index (0 to 21). Because relationship status is highly correlated with education level and race/ethnicity, I will examine differences in risk by relationship status *within* education levels and race/ethnic groups. The specific aim is to determine if marriage is a protective environment for a child, regardless of the mother's education level and race/ethnicity.

Second, do differences across relationship statuses in risk factors at birth explain differences in child behavior at age 3? Is this association similar for all education levels and race/ethnic groups? Two children's behavioral problems are assessed, aggressive and anxious depressive behavior, based on the Child Behavior Checklist for 2 to 3 year olds (Achenbach, 1992).

Third, does measuring risk individually or as a cumulative risk score explain more of the difference in child behavior across family structures? I also explore whether the effect of the cumulative risk index on child behavior is linear and additive or if there is a threshold effect.

And finally, what risks matter most? I am interested in determining the set of risk factors that contributes most to the difference in cumulative risk and to differences in child behavior. If the difference is driven largely by paternal differences, for example, then policy makers would have insight as to where to target their efforts. If the contribution of each set of risks to the cumulative risk score is similar across groups, then a multifaceted policy agenda is necessary. In addition, because I do not observe these parents prior to their unions, I cannot determine whether

marriage creates a protective environment for children or whether couples with fewer risks choose marriage over nonmarriage for childbearing. However, I can determine whether the risks on which married and unmarried couples differ are exogenous to marriage or whether they are potentially policy amenable.

This study adds to the extant literature in several ways. First, I examine differences in cumulative risks across married, cohabiting, and single mother families. Prior research has examined risks by household poverty status (Liaw & Brooks-Gunn, 1994; Klebanov, Brooks-Gunn, McCaron, & McCormick, 1998) (which is correlated with marital status), but not by relationship status. Secondly, I look at differences in relationship status *within* given education levels and race/ethnic groups. This interaction is important because of the strong correlation between marital status and education level and race/ethnicity. Lastly, I include measures of paternal risk factors. In prior research, primarily the mother's characteristics have been considered. Children's non-coresident fathers, however, are often involved in their lives, particularly in the first years, and his risk factors may influence the child. Moreover, cohabiting fathers differ considerably from married fathers, and thus their characteristics should be included as well.

Method

Data

I use data from the first three waves of the Fragile Families Study. The Fragile Families Study is a longitudinal, birth cohort survey that follows approximately 5,000 mothers (4,897) starting at the child's birth. The baseline interviews were conducted in 20 large cities (populations of 200,000 or more) throughout the United States, between 1998 and 2000. The mothers were interviewed in the hospital at their child's birth. Almost 90% of the mothers were

re-interviewed when the child was approximately 1 year old, and 88% were interviewed when the child was approximately 3 years old. Both the 1 year and 3 year core surveys were conducted by telephone. In addition, when the child was approximately 3 years old a supplemental child module was completed by 80% of mothers who completed the core interview at age 3. (For a complete description of the sample and study design, see Reichman, Teitler, Garfinkel, & McLanahan, 2001)

Information on the 21 risk factors is drawn primarily from the baseline wave of the core study, with the exception of maternal depression which was not asked until the child was age 1. Information on the child's behavioral outcomes is based on the child assessment module and based on mothers' reports.

This analysis includes a sample of 3,126 mothers. The sample excludes 1,579 mothers who did not complete the year 3 child module (and thus did not report their child's behavior), 125 mothers who categorized their race/ethnicity as "other", and 67 mothers who did not have a sampling weight. Supplementary analyses show that the cumulative risk factors at birth of mothers who were dropped from the sample do not differ systematically from the mothers who participated in the study. Also attrition rates do not differ significantly by mothers' relationship status at birth (see Berger, Paxson, & Waldfogel, 2005 for a more complete discussion of attrition from the Fragile Families sample). Missing data for a limited number of control variables are imputed based on the mean of the subgroup (by marital status, education level, and race/ethnicity), and account for no more than 2% of cases for any particular variable, with the exception of poverty status. For this variable, I use the constructed Fragile Families poverty ratio variable that is generated using hot-decking techniques. Weights to adjust for the over sample of nonmarital to marital births and to

account for attrition are applied and the SVY commands in STATA are employed to account for the complex sampling design. The data are representative of births in urban areas.

Measures

Child Behavioral Problems

I assess two child behavioral problems, aggressive and anxious/depressive behavior, based on subscales from the Achenbach 1992 Child Behavior Checklists for 2 to 3 year olds (Achenbach, 1992). At the year 3 interview, each mother was read a statement and asked to indicate whether the statement was not/never true (0), somewhat/sometimes true (1), or very/often true (2) of her child. The aggressive behavior scale consists of the sum of 15 characteristics ($\alpha = .8624$) including defiant, demands must be met immediately, disobedient, easily frustrated, fights often, hits others, has angry moods, punishment does not change actions, screams a lot, selfish, temper tantrums, easily jealous, moody, unusually loud, and whiny. The anxious/depressed scale consists of 10 items ($\alpha = .6527$), including: too dependent, feelings hurt easily, looks unhappy, self-conscious/embarrassed, too fearful, unhappy, upset by separation from parent, overtired, shy, and wants attention.

In preliminary analyses, I examined three additional child measures including child's health (BMI and maternal reported health) and cognitive ability (PPVT). Although these outcomes are important indicators of child well-being, I decided against including them in the final analysis for several reasons. At age three, there was no significant difference in overweight/obesity or maternal reported child health by family structure. For the PPVT, the sample sizes were too small to estimate differences within education levels or race/ethnic groups

with any precision because fewer respondents completed the in-home component of the child module than completed it by telephone.

Cumulative Risk Factors

Building on Sameroff's (1986) risk index, I examine 21 risk factors at the child's birth including 1 biological (low birth weight), 3 socioeconomic (< 150% of poverty line, public housing, unsafe neighborhood), 3 family structural (family density > 2, mother has child from other partner, father has child from other partner), 8 maternal (< 21 years old, fair/poor health, prenatal smoking, prenatal drug use, substance abuse problem, domestic violence victim, no perceived social support, depression (at year 1)), and 6 paternal (< 21 years old, < high school degree, health limits ability to work, unemployed at child's birth, substance abuse problem, and incarcerated). All are based on the mothers' reports. The 21 risks are summed to create a cumulative risk index (0 to 21; $\alpha = .56$). In addition, I create 5 categories based on the number of risks children are exposed to at birth including 0 risks, 1 to 2 risks, 3 to 4 risks, 5 to 6 risks, and 7 or more risks. Based on the distribution of the risk index, 7 or more risks represent the top decile of risk.

Biological

Low birthweight is defined as weighing less than 2500 grams at birth.

Socioeconomic

Less than 150% of the poverty line is based on the constructed poverty ratio variable in the Fragile Families data which uses self reported household income and household roster reports to create a family's poverty ratio. Mothers were asked if they lived in public housing and how safe they considered their streets around their home at night. Mothers who responded unsafe or very unsafe are coded as living in an unsafe neighborhood.

Family Structural

The family density measure is based on the ratio of children to adults living in the household. A ratio of more than two children per adult is considered a risk. Children from prior unions is measured by a dichotomous variable indicating that the mother has a child from a prior union and a dichotomous variable indicating that the father has a child from a prior union.

Maternal

The 8 maternal risk factors include dichotomous variables indicating that the mother is under 21 years of age, reports her health status as fair or poor versus good or excellent, reports that she smoke or used drugs during pregnancy, has a substance abuse problem at the child's birth, is hit or slapped by the child's biological father sometimes or often, has no perceived access to borrowing \$200 or having a family member or friend provide child care. The maternal depression is based on the CIDI composite and the questions were asked at the year 1 interview. Because of the association between maternal depression and maternal reports of child behavior, it is important to include this measure even though it is not measured at the child's birth.

Paternal

Six paternal risks are considered indicating that the father is less than 21 years of age, has less than a high school degree or GED, has a health problem that limits his ability to work, did not work in the week prior to the child's birth, has a substance abuse problem, and is incarcerated at the child's birth. All are based on the mother's reports.

Analytic Strategy

The primary aims of this analysis are to describe the level and types of risk factors that children are exposed to at birth based on the relationship status of their parents, and how the risks

are associated with children's behavioral problems at age 3. Because of the high correlation between education level, race/ethnicity, and relationship status, particular attention is paid as to how these risks and their effects differ by relationship status within a given education level (less than high school, high school or GED, some college, and college or more) or race/ethnic groups (non-Hispanic White, non-Hispanic Black, Hispanic).

To address the first aim, I begin by describing the level of risks that children are exposed to at birth based on their mother's relationship status with the child's biological father (married, cohabiting, or single). The results are presented for all children, and separately for children based on the mothers' education level and race/ethnicity. Because small cell sizes prevent being able to create three-way interactions between relationship status, education level, and race/ethnicity, I create predicted probabilities of the number risks, which allows me to hold constant either education level or race/ethnicity and to adjust one variable at a time.

In the descriptive analysis, I also examine the distribution of the number of risks children are exposed to at birth to understand the proportion of children who are exposed to relatively few risks and the proportion who are exposed to extreme risk (7 or more). I present the percent of children who are exposed to 0 risks, 1 to 2 risks, 3 to 4 risks, 5 to 6 risks, or 7 or more by relationship status. In addition, I analyze the types of risk factors that are most common to children and how this differs across groups.

To address the second aim, which is to determine how these risks are associated with subsequent child behavior, I use ordinary least squares models to predict child behavior at age 3 based on the child's risks at birth. I estimate four models for each outcome (aggressive and anxious/depressive behavior): the first model shows the association between family structure and child behavior, net of maternal education level and race/ethnicity. The second model adds in

each of the 21 risks measured individually. I conducted a correlation analysis on all of the risks and found that no two risks have a correlation coefficient higher than .29. If the correlation between the risk factors is too high, it is difficult to get a precise estimate from any particular variable. The third model includes the cumulative risk score, rather than the risks measured individually. This analysis sheds light on whether the cumulative risk explains more of the family structure differences in child outcomes than the risks measured individually, as determined by changes in the coefficients on family structure between models. The final model measures the risks categorically (0, 1-2, 3-4, 5-6, or 7+ risks), to determine if the effect of the risk index is linear and additive or if there is a threshold effect. In addition, I test interaction terms between each of the individual risks and the cumulative risk index with relationship status, education level, and race/ethnicity to determine if the effect of these risks on child behavior is similar for each group.

Results

Descriptive Analysis

Table 1 shows the distribution of the independent and dependent variables included in this analysis, separately by mothers' relationship status at the child's birth. The results are weighted to account for the over sample of nonmarital births in the Fragile Families data and are representative of births in large urban areas. Table 1 illustrates how highly correlated relationship status is with maternal education level and race/ethnicity. The results indicate that married mothers are significantly more likely to be highly educated and White as compared to unmarried mothers who are more likely to have lower levels of education and minority status. Specifically, 31% of married mothers have a college degree as compared to less than 2% of cohabiting or single mothers.

Moreover, approximately 40% of unmarried mothers have less than a high school degree, as compared to approximately 20% of married mothers. With regard to race/ethnicity, almost half of married mothers are White as compared to less than 15% of cohabiting mothers and approximately 10% of single mothers. Almost 40% of cohabiting mothers are Hispanic and over 45% are Black. Among single mothers, approximately 20% are Hispanic and over two-thirds are Black.

For nearly every risk factor and each of the behavioral outcomes, married mothers differ significantly from both cohabiting and single mothers, and the differences between cohabiting and single mothers are relatively modest. Overall, children born to married mothers are exposed to fewer biological, socioeconomic, family structural, maternal, and paternal risks as compared to children born to cohabiting or single mothers; and children born to married mothers have fewer subsequent behavioral problems.

The risk factors with the largest differences between married and unmarried families are low birthweight, poverty status and public housing, having children from prior relationships, maternal age, depression, prenatal smoking, lack of social support, and paternal age and employment. In each case, the prevalence of the risk factor is at least two times greater in cohabiting than married parent families and often even more prevalent in single parent families. This is particularly true for paternal employment in which less than 1% of married fathers are unemployed at the child's birth, as compared to approximately 3% of cohabiting fathers and almost 22% of the fathers who no longer live with their child's mother.

Despite the large differences across relationship statuses, in many cases, the prevalence of the risk factor is quite small for all groups. For example, at birth, fewer than 10% of all children have a high family density, were exposed to drugs prenatally, have a mother with a substance abuse problem or who is a victim of domestic violence, or have a father with a

disability, a substance abuse problem, or who is incarcerated. It is important to note that these factors may be underreported because they are based on the mother's report shortly following the birth of her child, and she may be less likely to report problematic behaviors at this time.

Nevertheless, the reported prevalence of these risk factors is relatively low.

By contrast, the prevalence of several risk factors is quite high in many families. For example, over half of children born to cohabiting parents and over two-thirds of children born to single mothers have incomes below 150% of the poverty line. Over a third to two-fifths of unmarried mothers are young (less than 21 years old) and they or the child's biological father have children from prior relationships. Approximately 20% of unmarried mothers smoked while pregnant and the same percentage reports no access to social support. In addition, a substantial portion of unmarried fathers are young and approximately one third has less than a high school degree.

To the extent that these risk factors are predictive of subsequent child behavior, the level and large differences in the prevalence of these risk factors across family structures may account for differences in child well-being. Importantly, because the risk factors in this analysis are also correlated with mothers' education level and race/ethnicity, the observed differences in the risk factors across relationship status may be driven largely by the significant education and race/ethnic differences across groups.

Table 2 provides the cumulative number of risks children are exposed to at birth by their mother's relationship status. The results show that children born to married mothers are exposed to the fewest number of risks (1.54), whereas children born to single mothers are exposed to the greatest number of risks (4.35). Children born to cohabiting mothers are exposed to over twice as many risks as compared to children born to married mothers (3.53 versus 1.54), but significantly fewer than children born to single mothers.

The differences across relationship statuses are also highlighted in the distribution of the number of risks children are exposed to. Approximately 38% of children born to married mothers are exposed to zero risks at birth, compared to only 3% of children born to cohabiting mothers and 2% of children born to single mothers; an additional 37% of children born to married mothers experience only 1 or 2 risks at birth. Therefore, fully 75% of children born to married mothers are exposed to fewer than 3 risks at birth, and only 0.4% are in the extreme risk category of being exposed to 7 or more risk factors. By contrast, only 35% of children born to cohabiting mothers and 18% of children born to single mothers are exposed to 0 to 2 risks, whereas a substantial number of children born to cohabiting (9%) and single (19%) mothers are exposed to 7 or more risks at birth.

The final panel in Table 2 shows that children born to married and unmarried parents differ significantly on each of the five domains of risk investigated in this analysis; moreover, the differences between cohabiting and single parent families is relatively modest on each domain, and is statistically similar between the two groups for family structural and maternal risks.

Interestingly, however, the contribution of each risk domain to the overall risk score is similar for each relationship status, with few exceptions. For example, paternal risk factors contribute to 21% of the overall risk score for married families (.32/1.54) as compared to 19% for cohabiting families (.68/3.53) and approximately 23% for single families (1.01/4.35). Maternal risk factors contribute to approximately 30% of the overall risk score for each relationship status. Family structural risks contribute more to unmarried parent families' risks (approximately 22%) as compared to married parent families (16%), whereas socioeconomic risks contribute more to married parent families' than unmarried families' overall risk scores. Examining the contribution of each risk domain to the overall risk score helps to illustrate

whether there is a specific set of risk factors that distinguish married from unmarried parent families. I expected, for example, that paternal risks would contribute a much larger share to the overall risk score for single parent families. I reasoned that the mother is likely no longer with the child's biological father because he is a larger risk. The level of paternal risk is higher among single parent families than cohabiting or married parent families, but the contribution of paternal risks to the overall risk score is fairly similar, indicating that this risk domain is not what distinguishes children born to single mothers from other children. It appears as if the type of risks do not differ significantly between married and unmarried parent families, but rather the level of risk is simply higher for each domain among unmarried parent families.

As stated previously, the differences in risks across relationship statuses may be largely driven by differences in education levels and race/ethnicity across relationship groups. To determine if marriage provides a protective environment for children regardless of the mothers' education level and race/ethnicity, it is important to examine how risks across relationship statuses differ within a given education level or race/ethnic group (see Table 3). The risk scores in Table 3 are adjusted to account for the high correlation between education level and race/ethnicity by holding race/ethnicity constant at its mean when examining education levels, and by holding education levels constant when examining race/ethnic groups. Small cell sizes do not permit 3-way interactions between relationship status, education level, and race/ethnicity.

The results show that for each education level and race/ethnic group children born to married parents are exposed to fewer risks as compared to children born to cohabiting or single parents. Interestingly, there are no statistical differences within any education level or race/ethnic group in the number of risks that children born to cohabiting or single parent families are exposed to. The one exception is that Black children born to single mothers are exposed to

more risks (4.21) than Black children born to cohabiting mothers (3.54). The real demarcation in risk exposure, however, seems to be between married and unmarried parent families.

The pattern is similar within education levels when the risk scores are not adjusted for race/ethnicity (not shown), but the level of risk is lower for college educated families (who are predominantly White) and there are slightly greater differences between cohabiting and single parent families (single parent families are predominantly Black). The adjusted pattern is also similar to the unadjusted pattern within race/ethnic groups, however the level of risk is lower among Whites (who are largely college educated) and the cohabiting – single parent differential is somewhat larger.

The results suggest that marriage is as important of a protective environment for children as the parent's education level. For example, children born to college educated single mothers (2.62) are exposed to a (statistically) similar number of risks at birth as children born to married mothers with less than a high school degree (3.13) and statistically more risks than children born to married mothers with a high school diploma or GED (2.13). However, the type of risk that the child is exposed to differs somewhat based on the parent's education level. For children born to college educated mothers, the most common risk factors are the parents having children from prior unions (approximately 30%), and the exposure to poverty is quite minimal (approximately 7%). By contrast, the level of poverty is over 30% for children born to lower educated married parents, and the prevalence of children from prior unions is less common (approximately 15%). Thus, to the extent that poverty is "riskier" for children than having sibling from prior unions, then the children born to lower educated married parents may be worse off than the children born to college educated single parents, despite a similar number of risks.

With regard to race/ethnicity, there are no significant differences in the cumulative risk scores among married parents (holding education constant); thus White, Hispanic, and Black children born to married parents have statistically similar cumulative risk scores. White and Hispanic children born to cohabiting parents and to single parents have similar risk scores, but Black children born to unmarried parents have slightly higher cumulative risk scores than White children. The unadjusted cumulative risk scores (not shown) indicate that marriage is more protective for White children than for Black or Hispanic children, meaning that the number of risks for married White families is considerably lower than the number of risks for married Black or Hispanic families. Consistent with prior studies (Osborne, et al., 2007; Manning & Brown, 2006), I find that the difference between married and unmarried families with regard to these risks is much greater among Whites than Black or Hispanic families. For example, 9% of White married families have incomes below 150% of the poverty line, compared to about one-half of White unmarried parent families. By contrast, 26% of married Blacks are poor compared to 51% of cohabiting Blacks and 70% of single Blacks; among Hispanics, over half of married Hispanics are poor which is similar to Hispanic cohabiting families, and over 75% of Hispanic singles are poor. However, married White families are also more likely to be college educated and once education is held constant, marriage appears to have similar benefits for all race/ethnic groups.

Multivariate Analysis

The second aim of the analysis is to determine how the risk factors that children experience at birth are associated with behavioral problems at age 3, and how these risk factors help to explain the differences in behavioral problems that children experience based on their mothers' relationship status at birth. For each child behavior, 4 models are estimated. The first

model estimates the association between mothers' relationship status at birth and child behavior at age 3, net of maternal education level and race/ethnicity. Model 2 shows the results for all of the risk factors entered independently, Model 3 shows the results using the cumulative risk score, and Model 4 shows the results using the risk score measured categorically. A goal of this analysis is to determine which of these models provides a better understanding of how the risks at birth are associated with subsequent child behavior, and which model best helps to explain the difference in child behavior across relationship statuses.

Table 4 shows the results for aggressive behavior. Model 1 shows that relative to children born to married mothers children born to cohabiting and single mothers have more reported aggressive behavior at age 3, net of the mothers' education level and race/ethnicity. Children born to cohabiting parents have an aggressive behavior score that is 25% of a standard deviation higher than children born to married mothers, all else equal, and children born to single mothers have an aggressive score that is 39% of a standard deviation higher than children born to married mothers. The mother's education level is not predictive of aggressive behavior, net of relationship status and race/ethnicity, and race/ethnicity is marginally associated with aggressive behavior, with minority mothers reporting more aggressive behavior among their 3-year-olds than White mothers.

Model 2 shows that the inclusion of the 5 sets of risks factors considered in this analysis fully accounts for the differences in child behavior by relationship statuses; the coefficients for cohabiting and single parent families decline by more than half and become insignificant. Several risk factors at birth are associated with aggressive behavior at age 3, including maternal depression, prenatal smoking, paternal unemployment, and the child's father having a substance abuse problem. In addition, race/ethnic minority mothers report significantly more aggressive

behavior in their 3-year-old children as compared to White mothers. As stated above, married and unmarried parent families differ considerably with regard to the prevalence of maternal depression, prenatal smoking, and paternal unemployment. Thus, given that these factors are predictive of child behavior and that there are large differences in these factors by relationship status, it is not surprising that they fully explain the difference in child behavior across relationship statuses.

Although the correlation between any two risk factors is lower than .30 (not shown), there is considerable inter-item correlation in Model 2, which makes it difficult to estimate precisely the effect of a specific risk. A strategy to deal with this inter-item correlation is to use a cumulative risk score.

Model 3 shows that using a cumulative risk score explains less of the difference in aggressive behavior across relationship statuses as compared to Model 2 in which the risk factors were entered individually. The cumulative risk score fully accounts for the differences in child behavior between married and cohabiting parent families, but children born to single parent families have aggressive behavior that is 26% of a standard deviation higher than children born to married parent families, net of the cumulative risk score. Each risk factor that a child is exposed to at birth is associated with an increase of approximately 7% of a standard deviation in aggressive behavior, indicating that each risk factor is associated with only a modest increased level in aggression. However, 9% of children born to cohabiting mothers and 19% of children born to single mothers experience 7 or more risks at birth, putting these children at extreme risk. If the effect is cumulative and linear, then these children have an aggressive score that is approximately half of a standard deviation higher than children exposed to zero risks.

To determine if the effect of the cumulative risk score is linear, I estimated the effect of risk using categorical measures of risk. The results in Model 4 show that the effect of risk is not linear. The effect of 1 or 2 risks is not statistically significant from 0 risks. The effect of being exposed to 3 or 4 risks and 5 or 6 risks is similar, and the effect of 7 risks or more is statistically larger than these other effects. Children exposed to 7 or more risks have an aggressive behavior score that is 65% of a standard deviation higher than children exposed to minimal risk. In preliminary analyses, I tried several different cut-points, and found the results are robust to these categories.

Surprisingly, maternal college education is positively correlated with child behavioral problems at age 3 when all of the risk factors are held constant, and the association is quite large (over 40% of a standard deviation higher than less than high school). Part of this effect seems to be driven by the small number of college educated mothers in the sample; if the sample is not weighted to account for the over-sample of nonmarital births by education level and race/ethnicity, then the association between education and child behavior is inverse, as is normally predicted. However, when the sample weights are applied and all factors are considered in the analysis, the association between maternal education and child behavior problems becomes positive, a similar association exists between income and child behavior. In addition, this may be driven by differences in maternal reports based on the mothers' perceptions of "normal" child behavior. Mothers with higher levels of education and income may report that their child's behavior is more problematic than it actually is based on their assumptions of how children should act (Lareau, 2003). This issue needs further exploration.

An important question is whether the effect of these risks are similar for all relationship status groups, particularly within a given education level and race/ethnicity. I estimated interaction effects between relationship status and risks for both the cumulative risk score, and

the risk score measured categorically. I found no evidence that the effect of these risks differs by relationship status, and this finding holds when I looked within a given education level or race/ethnic group. Thus the effect on subsequent child behavior of being exposed to biological, socioeconomic, family structural, maternal, or paternal risks at birth is similar regardless of the mothers' relationship status, education level, or race/ethnicity.

Table 5 shows the results for anxious/depressive behavior. The pattern of results is similar to that of aggressive behavior, however, the three models do not explain as much of the difference in child behavior across relationship statuses. Model 1 shows that children born to cohabiting or single parent families have an anxious/depressive behavior score that is one-third of a standard deviation higher than children born to married parents, net of the mother's education level or race/ethnicity. In addition, mothers with lower levels of education and minority status report more anxious/depressive behavior in their 3-year-old children.

Model 2 controls for the 21 individual risk factors that children are exposed to at birth. This model suggests that the risks explain about 24% of the effect for cohabitators $((.33-.25)/.33)$ and 40% of the effect $((.32-.19)/.32)$ for single parent families, but children born to unmarried parents have more reported anxious/depressive behavior net of the risk factors considered in the model. None of the individual risk factors is significantly associated with child behavior, with the exception of maternal depression. Mothers who exhibit depressive symptoms are significantly more likely to report anxious/depressive symptoms in their child at age 3.

Model 3 measures risk as a cumulative risk score, rather than entering the risks individually into the model. This model suggests that each risk factor a child is exposed to at birth is associated with a 5% of a standard deviation increase in anxious/depressive behavior at age 3. Model 4, however, suggests that the effect of this risk index is not linear; children

exposed to fewer than 3 risks have similar reported anxious/depressive behavior at age 3 as children exposed to zero risks, whereas children exposed to 3 or more risks have reported anxious/depressive behavior that is approximately one-third of a standard deviation higher than children exposed to minimal risk.

Discussion

Given the increase in the proportion of children born to unmarried parents among disadvantaged families, it is important to forge a better understanding as to what this demographic trend portends for children's well-being and how it might exacerbate inequalities among families. Nonmarital childbearing does not occur in a vacuum, and this analysis sought to better describe the level and type of risks that accompany children born to unmarried parent families. The results show that regardless of the parents education level or race/ethnicity, children born to married parents are exposed to significantly fewer risks at birth as compared to children born to cohabiting or single parents. Moreover, the differences in risks among unmarried parents are modest to negligible. Thus, marriage is a protective environment for all children.

Importantly, this finding does not imply that marriage *causes* a better or more protective environment for children, as many of the current policy initiatives suggest. The risks on which married and unmarried parent families differ most are low birthweight, poverty status and public housing, having children from prior relationships, maternal age, depression, and prenatal smoking, lack of social support, and paternal age and employment. Parental age and children from prior unions are the most common risks that children are exposed to at birth and these risks are clearly exogenous to marriage and will not change upon marriage. The other risk factors are possibly endogenous to marriage, but it is equally likely that they are predictive of marriage; this

is especially likely to be true with regard to marriage following a nonmarital birth. Without an increase in income, stable paternal employment, and better maternal psychological functioning, it is unlikely that a marriage will occur.

But rather than consider whether marriage causes these risks or if marriage is a consequence of the low prevalence of these risks, it may be more useful to consider which of these risk factors are policy amenable. To the extent that policies can affect these risks, children will benefit, regardless of marriage, and families may be more likely to marry. For example, policies can focus on delaying childbearing until the parents are mature, providing mental health services for depressed mothers, and employment services for the fathers. In addition, better prenatal care will reduce the incidence of low birthweight and prenatal smoking.

This analysis also shows that the differences in risks that children are exposed to at birth are predictive of differences in child behavior at age 3. In particular, the father's unemployment and substance abuse problems are associated with more aggressive behavior, regardless if the father lives in the household. Importantly, maternal depression is strongly associated with both aggressive and anxious/depressive behavior. This may be purely an artifact of reporting – depressed mothers are more likely to report behavioral problems in children. However, maternal psychological functioning may also impair the mother's ability to parent her child, which will have direct effects on children's outcomes. I find that the effect of the risks that children are exposed to at birth has similar effects on subsequent child behavior, regardless of the parent's relationship status, education level, or race ethnicity. Measuring the risks individually, rather than cumulatively, does a slightly better job explaining differences in child behavior across relationship groups. This finding is most likely due to the fact that the risks included in this

analysis do not have a linear and additive effect on child behavior, indicating that there is a threshold effect and that some risks have larger impacts than others.

This study has several limitations. First, the child behavior measures are based on maternal reports. By controlling for maternal depression, I have tried to account for reporting bias, but it is likely that bias remains. It is also very likely that mothers have a different reference for what “normal” behavior is in children, and thus reporting is inconsistent.

Second, although the sample is quite large, some of the cell sizes are small. For example, there are very few Black or Hispanic, college educated, married mothers in the sample, and very few White, college educated, unmarried mothers. Although I weight the sample to correct for the oversample of nonmarital births and to correct for differences in education level and race/ethnicity, it is possible that I am not getting the most accurate portrait of certain groups.

Finally, I cannot determine whether marriage is a cause of consequence of these risk factors. This finding would have important implications for policies designed to promote marriage. I can however, determine the types of risks that could possibly change as a result of marriage as well as those that are policy amenable.

A subsequent draft of this paper will explore more fully the theoretical model that underlies this research agenda. In addition, I will describe the risk factors and their significance in much more detail. In future work, I will explore how the inequality in risks that children are exposed to at birth changes over the course of their childhood. Preliminary analyses show that the difference in risks expands over time, and this is especially true if family structure transitions are considered. These findings have important implications toward understanding the growing inequality in this country. If I find that the cumulative risk across family structure grows more unequal over time, and children’s outcomes are influenced by these risks, then this implies that

children's outcomes will become increasingly less equal. As policy makers attempt to promote marriage among unmarried parents, it is important to keep in mind that a couple is not simply "unmarried." They and their children are faced with a host of risk factors that may not change considerably upon marriage. Identifying what these risks are and addressing them comprehensively as a family makes a transition to marriage is crucial for the ultimate well-being of the children.

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Table 1: Distribution of Independent and Dependent Variables by Parents' Relationship Status at Child's Birth

	Married <i>n</i> = 732	Cohabiting <i>n</i> = 1,156	Single <i>n</i> = 1,238	Total <i>N</i> = 3,126
Education				
College	31.4	1.2 ^a	1.7 ^a	16.2
Some College	22.3	18.8	16.7	19.5
High School	30.5	37.1	39.9	34.2
< High School	21.3	43.1 ^a	42.1 ^a	30.1
Race/Ethnicity				
White	49.2	14.7 ^a	10.1 ^{ab}	30.4
Hispanic	31.2	39.6	21.5 ^{ab}	30.7
Black	19.7	45.8 ^a	68.5 ^{ab}	38.9
Biological				
Low birthweight	4.1	8.9 ^a	15.6 ^a	8.3
Socioeconomic				
< 150% poverty	27.6	53.0 ^a	69.5 ^{ab}	44.8
Public housing	5.1	14.9 ^a	14.9	10.1
Unsafe neighborhood	14.4	18.9	17.6	16.4
Family Structural				
Family density > 2	0.1	2.9	8.5 ^{ab}	3.4
Mother has other child	9.9	40.5 ^a	35.1 ^a	24.0
Father has other child	12.9	34.8 ^a	47.4 ^{ab}	27.4
Maternal				
<21 years	7.4	32.7 ^a	46.4 ^{ab}	23.8
Depression (at year 1)	7.9	17.0 ^a	13.7 ^a	11.7
Fair/poor health	5.2	9.8	12.5 ^a	8.3
Prenatal smoking	7.1	21.6 ^a	19.9 ^a	13.9
Prenatal drug use	2.7	2.8	5.7 ^{ab}	3.5
Substance abuse problem	0.7	1.1	4.3 ^a	1.7
Domestic violence victim	5.4	6.0	4.6	5.4
No social support	10.8	20.3 ^a	18.6 ^a	15.2

Table 1: Distribution of Independent and Dependent Variables by Relationship Status at Child's Birth (continued)

	Married <i>n</i> = 732	Cohabiting <i>n</i> = 1,156	Single <i>n</i> = 1,238	Total <i>N</i> = 3,126
Paternal				
<21 years	4.8	18.7 ^a	27.1 ^{ab}	14.1
< high school degree	22.7	35.0 ^a	33.5 ^a	28.5
Health limits work	2.5	6.9 ^a	7.7 ^a	4.9
Unemployed	0.3	3.4 ^a	21.8 ^{ab}	6.7
Substance abuse problem	1.7	3.6	6.3 ^a	3.4
Incarcerated at child's birth	0.2	0.5	4.3 ^{ab}	1.3
Child Behavior at age 3 (Standardized M=0; SD=1)				
Aggressive	-.32 (.09)	-.07 ^a (.08)	.08 ^a (.09)	-.15 (.05)
Anxious/Depressed	-.41 (.09)	.11 ^a (.09)	.13 ^a (.08)	-.14 (.04)

Source: Fragile Families and Child Well-being Study. Sample is weighted to reflect US births in urban populations of 200,000 or more. a = differs significantly from married at the $p \leq .05$ level. b = differs significantly from cohabiting at the $p \leq .05$ level.

Table 2: Cumulative Risk Score by Relationship Status at Child's Birth
for each Education Level and Race/Ethnic Group

	Married <i>n</i> = 732	Cohabiting <i>n</i> = 1,156	Single <i>n</i> = 1,238	Total <i>N</i> = 3,126
Total Risk Score (0-21)	1.54 (.18)	3.53 ^a (.13)	4.35 ^{ab} (.14)	2.77 (.11)
Distribution of Risks (%)				
Zero Risks	38.2	3.1 ^a	2.2 ^a	20.0
1-2 Risks	36.8	32.5	15.9 ^{ab}	30.3
3-4 Risks	18.1	34.9 ^a	39.4 ^a	27.8
5-6 Risks	6.6	20.7 ^a	23.3 ^a	14.4
7 + Risks	0.4	8.9 ^a	19.1 ^{ab}	7.4
Type of Risk Factor				
Biological (0-1)	.04 (.02)	.09 ^a (.02)	.16 ^{ab} (.03)	.08 (.01)
Socioeconomic (0-4)	.47 (.08)	.87 ^a (.06)	1.02 ^{ab} (.04)	.71 (.04)
Family Structural (0-3)	.24 (.05)	.78 ^a (.05)	.91 ^a (.06)	.55 (.05)
Maternal (0-8)	.47 (.09)	1.11 ^a (.07)	1.26 ^a (.07)	.83 (.05)
Paternal (0-6)	.32 (.05)	.68 ^a (.05)	1.01 ^{ab} (.07)	.59 (.03)

Source: Fragile Families and Child Well-being Study. Sample is weighted to reflect US births in urban populations of 200,000 or more. a = differs significantly from married at the $p \leq .05$ level. b = differs significantly from cohabiting at the $p \leq .05$ level.

Table 3: Predicted Probabilities of Cumulative Risk Scores by Parents' Relationship Status at Child's Birth.

Adjusted for Education Level and Race/Ethnicity

	Married <i>n</i> = 732	Cohabiting <i>n</i> = 1,156	Single <i>n</i> = 1,238	Total <i>N</i> = 3,126
Total Risk Score (0-21)	2.16	3.29 ^a	3.96 ^{ab}	3.28
Adjusted By Education Level				
Adjusted for Race/Ethnicity				
College	.82	1.95 ^a	2.62 ^a	1.94
Some College	1.41	2.55 ^a	3.21 ^a	2.54
High School	2.13	3.26 ^a	3.93 ^a	3.25
< High School	3.13	4.26 ^a	4.93 ^a	4.26
By Race/Ethnicity				
Adjusted for Education Level				
White	1.64	2.77 ^a	3.44 ^a	2.76
Hispanic	2.13	3.27 ^a	3.93 ^a	3.26
Black	2.41	3.54 ^a	4.21 ^{ab}	3.53

Source: Fragile Families and Child Well-being Study. Sample is weighted to reflect US births in urban populations of 200,000 or more. a = differs significantly from married at the $p \leq .05$ level. b = differs significantly from cohabiting at the $p \leq .05$ level.

Table 4: Results of OLS Models: Aggressive Behavior at Age 3
(Standardized M = 0; SD = 1)

	(1)	Individual Risks (2)	Cumulative Risk Score (3)	Categorical Risk Score (4)
Relationship Status				
(Married)				
Cohabiting	.25*	.10	.17	.18
Single	.39**	.17	.26*	.25+
Education				
(< High school)				
High school	.02	.03	.09	.08
Some college	-.05	-.02	.07	.06
College	.28	.32+	.44*	.41*
Race/Ethnicity				
(White)				
Black	.22+	.22*	.17	.18
Hispanic	.23+	.29**	.19	.19
Risk Score (0-21)			.07**	
Categorical Risk Score				
(0 Risks)				
1-2 Risks				.09
3-4 Risks				.27+
5-6 Risks				.22
7+ Risks				.65*** ^a
Risk Factors				
Biological				
Low birthweight		.06		
Socioeconomic				
< 150 poverty line		-.15+		
Public housing		-.15		
Unsafe neighborhood		.07		
Family Structural				
Family density \geq 2		-.18		
Mom has other child		.12		
Dad has other child		.13		

Table 4 (continued): Results of OLS Models: Aggressive Behavior at Age 3
(Standardized M = 0; SD = 1)

	(1)	All Risk Factors (2)	Cumulative Risk Score (3)	Categorical Risk Score (4)
Maternal				
< 21 years		.16+		
Depression		.37**		
Fair/poor health		.00		
Prenatal smoking		.22*		
Prenatal drug use		-.04		
Substance abuse		.09		
Domestic Violence		-.06		
No social support		.03		
Paternal				
< 21 years		.04		
< high school degree		-.01		
Health limits work		.02		
Unemployed		.53*		
Substance abuse		.48*		
Incarcerated at birth		.17		
Constant	-.52	-.62	-.69	-.68
R squared	.0414	.1057	.0554	.0587
N	3126	3126	3126	3126

Source: Fragile Families and Child Well-being Study. Sample is weighted to reflect US births in urban populations of 200,000 or more. a = 7+ risks is significantly different than the other risk categories; no other risk category differs from another.
+ $p \leq .10$; * $p \leq .05$; ** $p \leq .01$.

Table 5: Results of OLS Models: Anxious/Depressive Behavior at Age 3
(Standardized M = 0; SD = 1)

	(1)	All Risk Factors (2)	Cumulative Risk Score (3)	Categorical Risk Score (4)
Relationship Status				
(Married)				
Cohabiting	.33**	.25*	.27*	.27*
Single	.32**	.19+	.22+	.21
Education				
(< High school)				
High school	-.00	.03	.05	.05
Some college	-.32**	-.25*	-.23*	-.23*
College	-.29*	-.21	-.16	-.16
Race/Ethnicity				
(White)				
Black	.28**	.24*	.24*	.23*
Hispanic	.22+	.19+	.19+	.17
Risk Score (0-21)			.05*	
Categorical Risk Score				
(0 Risks)				
1-2 Risks				.05
3-4 Risks				.31* ^a
5-6 Risks				.23
7+ Risks				.39*
Risk Factors				
Biological				
Low birthweight		.09		
Socioeconomic				
< 150 poverty line		-.01		
Public housing		-.09		
Unsafe neighborhood		-.04		
Family Structural				
Family density \geq 2		-.23		
Mom has other child		.05		
Dad has other child		.17+		

Table 5 (continued): Results of OLS Models: Anxious/Depressive Behavior at Age 3
(Standardized M = 0; SD = 1)

	(1)	All Risk Factors (2)	Cumulative Risk Score (3)	Categorical Risk Score (4)
Maternal				
< 21 years		.09		
Depression		.34**		
Fair/poor health		-.08		
Prenatal smoking		-.05		
Prenatal drug use		.02		
Substance abuse		-.01		
Domestic Violence		-.02		
No social support		.16		
Paternal				
< 21 years		-.08		
< high school degree		.10		
Health limits work		-.09		
Unemployed		.33+		
Substance abuse		.19		
Incarcerated at birth		.14		
Constant	-.37	-.48	-.51	-.51
R squared	.1127	.1509	.1211	.1248
N	3126	3126	3126	3126

Source: Fragile Families and Child Well-being Study. Sample is weighted to reflect US births in urban populations of 200,000 or more. a = 3 or more risks is significantly different than the 1 to 2 risk category; no other risk category differs from another. + $p \leq .10$; * $p \leq .05$; ** $p \leq .01$.