

**Explaining Educational Differences in Marriage after a Nonmarital Birth**

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*Abstract:* Using recent data from the Fragile Families and Child Wellbeing study, we analyze the unmarried parents of a birth cohort of almost 3,700 children. Mothers' educational attainment and fathers' educational attainment relative to mothers' are both positively associated with marriage during the 5 years following a nonmarital birth. We find that attitudes toward marriage and family do not explain educational differences in marriage, couple's economic circumstances partly explain the relationship between education and marriage, and that local labor market conditions play a large role in explaining educational differences in marriage. In particular, educational differences in marriage are much smaller in localities with relatively better economic opportunities for those with low rates of educational attainment and more pronounced in localities with relatively poor labor market conditions for those with low levels of educational attainment. The strong explanatory role of labor markets applies to both male and female labor market conditions.

## **Explaining Educational Differences in Marriage after a Nonmarital Birth**

Recent research has documented stark and widening educational differences in marital status, particularly among parents (Carlson et al 2004, Ellwood and Jenks 2004, Lundberg and Pollak 2007, McLanahan and Percheski 2008). Among mothers who gave birth in 1990, only 47% of mothers with less than a high school education were married compared with 95% of college-educated mothers (Centers for Disease Control and Prevention 2008). Among births that took place 15 years later in 2005, this disparity had grown even larger: only 36% of mothers with less than a high school education were married compared with 92% of college-educated mothers (Centers for Disease Control and Prevention 2008).

Educational differences in marital status at birth are well-documented, but we know far less about educational differences in relationship outcomes following a nonmarital birth. Although more than 1 out of 3 babies are born outside of marriage, we know surprisingly little about the relationship trajectory of their unmarried parents. Recent research from the Fragile Families and Child Wellbeing study has begun to fill this gap by providing detailed information on characteristics and relationship trajectories of unmarried couples who have a child together (Carlson et al. 2004). The Fragile Families study is well-suited for examining educational differences in marriage after a birth, but thus far has not been used for this purpose. Educational differences in marriage following a nonmarital birth are of particular interest, because these differences may compound the economic disadvantages faced by children of less educated mothers, and

they may contribute to the intergenerational transmission of economic disadvantages (McLanahan 2004).

Using recent data from the Fragile Families and Child Wellbeing study, we analyze the unmarried parents of a birth cohort of almost 3,700 children. We find that mothers' educational attainment and fathers' educational attainment relative to mothers' are both positively associated with marriage during the 5 years following a nonmarital birth. The focus of our paper is testing hypotheses for these observed educational differences.

We examine the role of mother and father's attitudes, economic circumstances, and other individual-level characteristics in mediating the relationship between educational attainment and marriage outcomes. We also examine the role of local labor market conditions by level of education in mediating the relationship between educational attainment and marriage outcomes. We find that attitudes toward marriage and family do not explain educational differences in marriage, couple's economic circumstances partly explain the relationship between education and marriage, and that local labor market conditions play a large role in explaining educational differences in marriage. In particular, educational differences in marriage are much smaller in localities with relatively better economic opportunities for those with low rates of educational attainment and more pronounced in localities with relatively poor labor market conditions for those with low levels of educational attainment.

## **Background**

The retreat from marriage in recent decades has occurred most dramatically for those with less than a college education (Ellwood and Jencks 2004). Marriage has declined and nonmarital childbearing and divorce have increased more for those with lower education than for those with higher education (Schoen and Cheng 2006; Goldstein and Kenney 2001; McLanahan 2004). Further, spouses have become increasingly likely to share a level of educational attainment (Schwartz and Mare 2005; Schoen and Cheng 2006). As a result, marriage is one means by which social and economic advantages are consolidated by families and transmitted to the next generation.

Although a large literature has examined the relationship between economic circumstances and marriage (Burstein 2007), surprisingly little research has focused specifically on educational differences in family formation behavior. Education and economic circumstances are correlated, but not perfectly. Some with low levels of formal education will nevertheless have success in the labor market, and some with high levels of formal education may not. Education also has meaning beyond its value in the labor market. For instance, education may influence one's attitudes. For these reasons, a separate examination of education and marriage is warranted.

Our analysis will focus on three possible mechanisms through which differences by level of education can affect family formation: attitudes toward marriage and gender roles, individual-level economic and health circumstances, and economic opportunities in the local labor market.

*Attitudes toward Marriage and Gender Roles.* Previous research shows that positive attitudes towards marriage are associated with an increase in the chances of

marriage (Carlson et al. 2004; Sassler and Schoen 1999). In theory, if those with higher levels of educational attainment have more positive views of marriage, that might help explain educational differences in marital behavior. However, previous research suggests that marriage attitudes are *not* an important explanation for overall declines in marriage and increases in divorce and cohabitation. Cherlin (2004) argues that marriage retains a strong symbolic significance and value in spite of trends toward delayed marriage, high rates of marital instability, and increasing prevalence of marital alternatives such as cohabitation. Previous research on attitudes toward marriage among low-income groups in particular casts further doubt on the theory that attitudes explain educational differences in marriage. Qualitative research has shown that low-income groups place a high value on marriage (Edin and Kefalas 2005; Gibson-Davis, Edin, and McLanahan 2005). This and other research has suggested that poor mothers hold the institution of marriage in such high regard that they are loathe to enter marriages they fear will be unstable (Waller and Peters 2007; Gibson-Davis, Edin, and McLanahan 2005).

Attitudes toward gender roles in families may influence marriage decisions and could help to explain educational differences in marriage. Ellwood and Jencks (2004) propose this theory, but the evidence testing the idea is limited. Sassler and Schoen (1999) find that traditional gender expectations are positively related to marriage for men but not for women. Carlson et al. (2004) find that traditional gender role attitudes are not related to marriage after a nonmarital birth. To our knowledge, no one has looked specifically at gender role attitudes as a potential explanation for educational differences in marriage.

*Individual-level Economic and Health Circumstances.* Education may be related to marriage and family formation decisions because of its relationship to economic circumstances. Research has consistently shown that men's earnings, employment and long-term economic prospects are positively associated with marriage and that income is associated with relationship stability (Burstein 2007; Carlson et al. 2004; Ellwood and Jencks 2004; McLanahan and Percheski 2008; Smock and Manning 1997; Sweeney 2002; Xie et al. 2003). Financial instability has been found to be a major source of relationship conflict and instability (Smock et al. 2005). Qualitative research suggests that men are less likely to be involved with their children and the mothers of their children when they cannot live up to the expectation that they be the breadwinner (Anderson 1990). Other qualitative and quantitative research suggests women do not view men as marriageable unless they have steady employment (Wilson 1987; Edin 2000; Gibson, Edin, and McLanahan 2005; Smock et al. 2005).

The relationship between women's economic circumstances and marriage is more ambiguous. Although early findings about women's economic activity and marriage prospects found no effect (Smock and Manning 1997), increasingly research is showing that women's earnings are also positively related to marriage and relationship stability (Carlson et al. 2004; Gassman-Pines and Yoshikawa 2006; Oppenheimer 1997; Sweeney 2002; Sweeney and Cancian 2004). Sweeney (2002) finds that the importance of women's earnings for marriage formation shows strong growth between the cohort born in the early 1950s and the cohort born in the early 1960s, while the importance of men's earnings remain strong and stable.

Finally, poor health and drug or alcohol abuse can both affect and be affected by economic circumstances, and may therefore in part explain the connection between education, economic circumstances, and later probability of marriage. Pandey and Kim (2008) find that having a work-limiting health status significantly reduces mother's income. Carlson et al (2004) find a significant negative effect of father's alcohol and drug usage on moving into or maintaining a cohabiting union, and a negative but not significant effect of usage on later marriage probability.

*Economic Opportunities in the Local Labor Market.* Anticipated economic circumstances may be another important component of marriage decisions. Oppenheimer's (1988) often-cited model of marital search suggests that economic uncertainty leads to marital delay. Lundberg and Pollak (2007) suggest that anticipated economic circumstances affect the ability of partners to make credible commitments to long term relationships such as marriage. Local labor market conditions are likely to influence one's perception of future employment and earnings, and in turn, to influence marital decisions. Therefore, local labor market conditions may help to explain educational differences in marriage if economic opportunities improve markedly with one's level of educational attainment.

Prior research has found that men's economic opportunities are related to marriage and help to explain relatively low marriage rates among those with low levels of education. Using marital data from the March Current Population Surveys and labor market data from the Regional Economic Information System covering the late 1980s through the mid-1990s, Lichter, McLaughlin, and Ribar (2002) find that economic restructuring and the erosion of economic opportunities led to lower rates of marriage for

young, low-educated women (Lichter, McLaughlin, and Ribar 2002). Analyzing Metropolitan Statistical Areas from the 1970, 1980, and 1990 Censuses, Blau et al. (2000) found that male wages at the area level were positively associated with marriage for low-educated women. Another study, analyzing national-level data from the 1968-1996 Current Population Surveys by birth cohort and race suggests that rising female wages and the decline in male wages relative to females are associated with the national decline in marriage.

Strong labor markets may encourage marriage directly by facilitating perceptions of economic stability. Strong labor markets may also encourage marriage indirectly via marriage markets. If strong labor markets encourage more male labor migrants than female, they may encourage marriage by leading to high sex ratios. Blau et al. 2000 along with many other studies find that weak female marriage markets are negatively associated with marriage.

For our purposes, there are several limitations of the Census and the Current Population Survey data sources relied upon in prior research: these sources lack detailed individual-level characteristics, lack information on male/female couple characteristics, lack information on attitudes toward marriage and gender roles, and rely on state labor market rather than more local labor market data. In contrast, the Fragile Families data have all of this individual- and couple-level information and has geographic information for more local labor markets.

## **Data and Methods**

The microdata for our paper come from the Fragile Families and Child Wellbeing study. Fragile Families is a longitudinal study that follows a birth cohort of approximately 3,700 children born to unmarried parents. The study has the advantage of interviewing both mothers and fathers, and includes rich data on attitudes, economic circumstances, and individual background characteristics. The 20 cities for the study were randomly selected from strata defined by labor market and policy characteristics, providing the opportunity to analyze how labor market contexts influence marital transitions. The sample is representative of births to unmarried parents in cities with populations of 200,000 or more. Baseline interviews with mothers were completed in the hospital shortly after the birth, and were collected between 1998 and 2000. Fathers were also interviewed soon after the birth, either at the hospital or as soon as possible thereafter.

We use data from the mothers' and fathers' baseline surveys, and mothers' follow-up surveys at 1 year, 3 years, and 5 years after the birth. Mother response rates to the baseline and three follow-up surveys were 87, 90, 88, and 87 percent, respectively. Father response rates were 75, 71, 69, and 67 percent, respectively. We exclude cases that are missing information on our key independent variables, mother and father's education (n=200), or our dependent variable, marriage (n=156). To maximize the sample included in our analysis, mother proxy reports of fathers' educational attainment were used when father responses were not available. When both mother and father reports of father's educational attainment were available, their reports matched for 72% of cases. When mother and father reports disagreed, half of the time mothers reported

higher education than the fathers did and the other half of the time mothers reported lower education than the fathers did. For our multivariate analysis we use event history methods, which allow us to utilize available information for parents who attrited in later waves. After our sample exclusions, our analysis is based on 3354 parent-couples, representing just over 90 percent of the original unmarried sample in the Fragile Families study. We observe these couples for an average of 51 months before they marry or are censored. Our event history analysis is based on 169,991 person-months of data.

Mothers' were asked questions about the fathers' background, so missing information on father's education, race/ethnicity, employment status, age, and other basic demographic variables were based on mothers' proxy reports. Missing data on mother or father covariates were imputed using a regression-based imputation approach, but the results presented are consistent with results based on listwise deletion.

*Dependent variable.* As explained below, our analysis models the hazard of marriage using event history models. Our dependent variable is a time-varying measure of marriage to the baby's father, which takes on the value of 0 in all months preceding a marriage and a value of 1 in the month that parents married. In our sample and time frame, approximately 5% of mothers married a new partner. Because of our focus on testing the role of both mother and father's attitudes, economic circumstances, and labor market prospects in marriage transitions, we do not analyze marriages to new partners for whom we lack complete attitudinal and background information. Mothers who married a new partner are not distinguished from other mothers who remained unmarried to the baby's father. One alternative to this approach is to censor couples when mothers or

fathers marry a new partner. [We expect our results to be robust to this alternative approach but have not yet performed the robustness check.]

Duration is measured from the time of the birth, which initiated the parents' inclusion in the study, until the exact month of marriage or censoring, and is measured in person-months. Exact marriage dates were not available for 97 respondents who were unmarried at baseline and married to the father at a later wave of data collection; for these respondents marriage dates were imputed as the midway point between the last interview in which they indicated they were unmarried and the first interview in which they indicated they were married. An additional 4 respondents gave the year but not month at marriage; we imputed the month of June for these respondents. In total, 101 marriage dates were imputed, representing approximately 3 percent of our sample and 15 percent of all marriage dates.

Table 1 shows the percent of couples who were married 1, 3, and 5 years after the birth of their child.

*Independent variables.* The key independent variables are measures of educational attainment. Mother's education is measured using a time-varying measure of mother's level of education, divided into four groups: less than high school, high school, some college, and bachelor's degree and higher. The high school category includes those with a GED. The some college group is somewhat heterogeneous including those with some type of college, technical, or vocational education beyond high school. Table 1 shows that at baseline, 40% of mothers had less than a high school degree, 34% had a high school degree or equivalent, 24% had some college, and 3% had a college degree. A little more than half of mother/father couples had the same level of educational

attainment, in about one-fourth of couples the father had more education than the mother, and in the remaining one-fourth of couples the father had less education than the mother. We measure father’s education relative to mothers to avoid collinearity between mother and father’s education in our regression models. Measures of both women and men’s educational attainment are time-varying, and changes in educational status between waves of data collection are assumed to have occurred at the midway point between waves.

*Explanatory variables.* We incorporate 2 sets of individual-level explanatory variables: mother and father’s attitudes toward marriage and family and mother and father’s economic and health circumstances. Table 1 presents descriptive information for these variables.

Twelve attitudinal variables are included from the baseline survey. Seven of these measure general attitudes toward marriage (relative to being single, relative to cohabitation, as the best setting for raising children), two of these measure the emphasis on steady employment for marriage, and the remaining three measure attitudes toward gender roles in households and families. The wording for these questions is included in Appendix Table 1. For 10 of these 12 attitudinal measures, mothers and fathers responded to these questions with strongly agree, agree, disagree, or strongly disagree. For our analysis, we dichotomize these measures so 1 represents agreement or strong agreement and 0 represents disagreement or strong disagreement. For the 2 measures of the emphasis on steady employment for marriage, 1 represents “very important” and 0 represents “somewhat important” or “not at all important.”

We use four time-varying measures of economic circumstances for mothers and fathers: employment, income-to-poverty ratios, indicators that self-reported health is fair or poor, and indicators of a self-reported drug or alcohol problem. These measures were collected in each survey wave, and when values change between waves the change in value was assumed to take place midway between the two interviews. The measure of mother's employment at baseline is based on a question that asks mothers whether they were employed in the year prior to the birth. Otherwise, employment measures were based on questions that asked mothers and fathers whether they were employed in the prior week. The income-to-poverty ratios were constructed as the ratio of household income to poverty thresholds defined by year and family composition.

In addition to individual-level explanatory variables, we also consider local labor market conditions. To measure the economic opportunities available in a city to men and women with particular levels of education, we use unemployment rates, employment-to-population ratios and median income, calculated separately by city, education level (less than high school, high school, some college, 4 year college degree and higher), and gender. These numbers were compiled using the Current Population Survey for the years 1998-2005, the years covered by the Fragile Families data. City-level indicators were calculated using the reported data for adults aged 25-54 years old.

Unemployment rates and employment-to-population ratios measure different aspects of employment. Unemployment rates exclude those “not in the labor market,” e.g, those enrolled in school, stay at home parents, or discouraged workers, from both the numerator and denominator; whereas employment-to-population measures indicate the overall employment rate including everyone in the population in the denominator.

Because these two labor-market measures are highly correlated, we do not include them in models simultaneously. For men, we use employment-to-population ratios as our measure of employment opportunities, because we want to capture the extent that men are out of the labor force. For women, we take a different approach because being out of the labor force does not necessarily impede marriage for women but being unemployed and looking for work may be a barrier to marriage. Therefore, we chose to use the unemployment rate for women. We also include a measure of median income for both men and women, which reflects both the returns to education and the prevailing wages in a city. Our median income measures are standardized to 2005 dollars.

Table 2 shows the city averages for each of our labor market indicators by education level and sex. The table demonstrates that, on average across the 20 cities, economic prospects improve as educational attainment increases. Unemployment rates are lower, employment-to-population ratios are higher, and median incomes are higher for each successive level of educational attainment for both men and women.

*Control variables.* In all of our models we control for mother and father’s school enrollment, mother’s race and ethnicity, whether mother and father report a different race/ethnicity, mother’s religiosity, father’s religiosity relative to mother’s, mother’s number of children, mother’s age, mother and father’s age difference, mother and father’s multipartnered fertility, and whether the mother or father lived with both biological parents at age 15. The measures of school enrollment, number of children, age, and multipartnered fertility are time-varying. If time-varying control variables changed between waves of data collection we assume that the change occurred at the midway point between waves. Mean values for our control variables can be found in Table 1.

*Analytic Approach.* We calculate Cox Proportional Hazard Models, which have the advantages of taking into account duration until marriage and right censoring and allowing for time-varying covariates. We model the time to marriage as a function of mother's educational attainment and father's education relative to mothers, and examine the effect of adding explanatory variables on the relationship between education and marriage.

For our analysis of the role of labor market conditions in explaining educational differences in marriage, the Fragile Families study covers a relatively short time period and does not allow for an analysis of changes over time in economic conditions. We do not address the time series divergence in marriage by education. Instead, we limit our focus to a comparison of educational differences in marriage within five years of a non-marital birth, and their association with labor market opportunities. To try to address the possibility that unobserved characteristics of localities may drive the estimated relationships between economic conditions and educational differences in marriage, we include city fixed effects, which control for time invariant city conditions that could influence marriage. The fixed effects do not address time varying characteristics of localities that may affect marriage.

Another concern is that of sample selection: Educational attainment and economic conditions prior to our observation period are likely to have influenced selection into our sample. In particular, if, as we hypothesize, higher educational attainment and better economic opportunities encourage marriage transitions after a nonmarital birth, then, by the same logic, higher education and better economic opportunities would tend to increase marriage prior to our observation period, thereby reducing the proportion who

select into our unmarried-parent sample. Those parents who end up in the unmarried sample in higher education groups and better labor markets may be negatively selected on personal or relationship characteristics that impede marriage, which may tend to work against our hypothesis. We have a theoretical and empirical response to this issue.

Our theoretical model is one in which contextual characteristics exert an influence on a sequence of family formation decisions that is consistent in direction. Our theoretical model predicts that poor economic conditions will lead to more nonmarital births, less marriage after a birth, and more divorce. We have no reason to think that the influence of economic conditions would manifest before a birth (by discouraging marriage) and then have no effect on marriage after a nonmarital birth. This argument is an important one for the Fragile Families study as a whole and any study that observes families after some decisions have already been made.

Two sets of supplementary analyses using the Fragile Families study provide evidence consistent with our theoretical model. First, we analyze the relationship between labor markets and educational attainment and marital status at birth in the Fragile Families study. Next, we analyze the relationship between labor markets and educational attainment and marital stability following a birth. Consistent with our theoretical model, we find that labor markets and educational attainment are positively related to marriage before a birth and to marital stability after a birth. Our analysis proceeds by focusing on the hypotheses that educational attainment and labor market strength will encourage marital transitions following a nonmarital birth.

## **Results**

Table 3 tests the hypotheses that individual-level attitudinal or economic characteristics explain marriage differences by education. Model 1 shows that mothers' educational attainment is positively related to marriage. Compared with mothers with less than a high school education, the hazard of marriage is 1.3, 1.7, and 2.9 times as high for mothers with a high school degree, some college, and a college degree, respectively. Model 1 also shows that couples in which the father has less education than the mother have significantly lower odds of marrying than couples in which the father has the same or more education than the mother.

Model 2 shows that educational differences in marriage persist, and are in fact even larger, after controlling for school enrollment, religiosity, and a range of demographic background characteristics. Based on Model 2, mothers with a high school degree have 1.5 times the hazard of marriage compared with mothers with less than a high school diploma, mothers with some college have 2 times the hazard, and college-educated mothers have 3 times the hazard of marriage compared with mothers with less than a high school education. Model 2 also shows that the hazard rate of marriage is significantly higher when fathers have more education than mothers and significantly lower when fathers have less education than mothers compared with couples in which parents have the same level of educational attainment.

The control variables in Model 2 are related to marriage in the expected direction. Mothers' school enrollment, interracial relationships, and multipartnered fertility are negatively related to marriage. Religiosity is positively related to marriage. The number of children in the household is also positively related to marriage, suggesting that mothers

and fathers who have more than 1 shared child are more likely to marry. The hazard ratios for other control variables are not statistically significant but are in the expected direction.

Model 3 shows that mother and father's attitudes toward marriage and gender roles have little effect on the relationship between education and marriage compared with Model 2, which includes the same set of controls but omits attitudinal measures. Controlling for attitudes toward marriage and gender roles in families and households does not help to explain why mothers with lower levels of educational attainment are less likely to marry and why father's education relative to mother's is positively related to marriage. Some attitudinal variables are predictive of marriage, but separate analyses (not shown) suggest that educational attainment is not consistently associated with attitudes that encourage marriage. In separate analyses we explored whether the relationship between attitudes and marriage varied by education and whether mother/father discordance in gender role attitudes varied by education. These exploratory analyses provided further evidence that the attitudes measured in our study do not help to explain differences in marriage by education.

Model 4 shows that the individual-level economic circumstances of mothers and fathers help to explain a small portion of the educational differences in marriage compared with Model 2, which includes the same set of controls but omits individual-level economic circumstances. The Model 4 hazard ratios on mothers' education move slightly closer to 1 but remain statistically significant. College-educated mothers still have 2.3 times the hazard of marriage compared with mothers with less than a high school education after controlling for mother and father's economic circumstances. The

inclusion of economic variables in Model 4 does not change the positive relationship between father having more education than the mother and marriage.

Model 4 shows that mothers' employment is negatively related to marriage, and fathers' employment is positively related to marriage. The positive relationship between men's employment and marriage is consistent with a large body of prior research (Burstein 2007; Xie et al. 2003). The negative relationship between mothers' employment and marriage is at odds with some recent research, which suggests that mothers' employment facilitates marriage (Sweeney 2002; Ellwood and Jencks 2004). Our measure of the timing of changes in employment status is imprecise (imputed as the mid-point between survey waves), making the time-ordering of employment and marriage changes uncertain. Therefore, this negative relationship may actually reflect that mothers who marry are more likely to quit working than mothers who remain unmarried. Similar time-ordering ambiguity applies to the income-to-poverty ratios. The positive relationship between mothers' income-to-poverty ratio may reflect the pro-income effect of marriage for women, and the negative relationship between fathers' income-to-poverty ratio may reflect a small negative effect of marriage on men's income-to-poverty ratio. Omitting the income-to-poverty ratio from our models does not affect the pattern of results, but the imprecision in the timing of these employment and income-to-poverty measures remains a limitation of our analysis.

Table 4 tests the hypothesis that city-level economic opportunities specific to one's education level help to explain education differences in marriage. Model 1 includes the basic set of control variables and the individual-level economic variables. Model 1 is identical to Table 3, Model 4, except that it includes city fixed effects. We

use this model as the benchmark to see whether local-level economic opportunities have an influence on marriage and help to explain educational differences in marriage above and beyond their influence on individual-level economic circumstances. If economic opportunities matter after controlling for individual economic circumstances, this may indicate that economic security and assessment of one's future economic prospects play a role in marriage decisions and that point-in-time measures of economic circumstances may be incomplete measures of economic influences on marriage.

Model 1 repeats the familiar result that marriage is positively related to mothers' educational attainment. Model 1 also shows that father having more education than the mother is positively related to marriage. Model 2 adds two measures of the male labor market, which vary across the 20 cities and the 4 levels of educational attainment: the employment-to-population ratio and the median annual income. The addition of labor market measures in Model 2 substantially diminishes the hazard ratios on mothers' educational attainment. In Model 2, hazard ratios increase only slightly with mothers' educational attainment, and none of these hazard ratios is statistically significant.

The male employment-to-population ratio is positively related to marriage, but not statistically significant. (In separate analyses, the employment-to-population ratio is a significant predictor of marriage when male median income is omitted from the model.) Male median income is positively and significantly related to marriage.

Model 2 suggests that male labor market conditions are an important element in the relationship between mothers' education and marriage. Although Table 1 showed that just over half of mothers and fathers share the same level of educational attainment, separate analyses suggest that these results are driven by the educationally homogenous

couples. Models 1 and 2 and our separate analyses of educationally homogamous and heterogamous couples support the following hypothesis: Mothers with relatively lower levels of education are less likely to marry because the fathers of their children tend to have relatively low levels of education and face relatively poor labor market conditions compared with more educated men.

As discussed previously, we opted to focus on male employment-to-population ratios in Model 2 rather than unemployment rates in order to capture the extent to which men in certain cities with particular levels of education were unemployed *or* out of the labor force. Separate analyses showed that male unemployment rates only slightly diminish educational differences in marriage, whereas male employment-to-population ratios greatly diminish educational differences in marriage. This combination of results suggest that educational differences in “discouraged workers” may help explain marriage differences. The pattern of results is suggestive that when a large proportion of low educated men are out of the labor force (not working or looking for work), marriage rates are depressed, and that in cities where only a relatively small proportion of low educated men are out of the labor force, marriage rates come to resemble those of their higher educated counterparts.

Model 3 substitutes female labor market conditions in place of male labor market conditions, but to similar effect. Once city and educational differences in labor market opportunities for women are taken into account, the relationship between women’s educational attainment and marriage becomes substantially weaker and statistically insignificant. Female unemployment rates are negatively related to marriage ( $p=.057$ ) and female median income is positively related to marriage (not statistically significant).

Although neither is a statistically significant predictor of marriage in Model 3, when these labor market indicators are included in separate models, both achieve statistical significance ( $p < .05$ ). Model 3 suggests that women with lower educational attainment are less likely to marry compared with their higher educated counterparts, because they have worse economic prospects. This finding is consistent with recent literature and provides further evidence that the negative relationship between women's employment and marriage in Table 3 may be reverse causal.

In Model 3, the positive relationship between educational hypergamy (women partnering with a more-educated man) and marriage persists. This result is expected, given that the labor market prospects for women with a particular levels of education would not logically mediate the positive relationship between hypergamy and marriage.

Model 4 shows that educational differences in marriage following a nonmarital birth disappear when both men and women's labor market conditions are taken into account.

## **Conclusion**

The educational differences in the retreat from marriage have been well-documented in prior research, but surprisingly little research has attempted to test explanations for educational differences in marriage. In our paper, we took advantage of a rich source of information on unmarried couples to test a series of explanations for educational differences in marriage. By focusing on unmarried couples who had recently had a baby together, we were able to test the importance of the attitudes of each member of a couple and the economic circumstances of each member of a couple. We combined

this survey information with labor market measures from the Current Population Survey to see whether differences in economic opportunity by education can help us understand differences in marriage.

In our sample of unmarried parents, differences in marriage by mothers' educational attainment were large. Twenty-two percent of college-educated mothers married the father of their child within 5 years of a nonmarital birth compared with only 13 percent of mothers with less than a high school education. This pattern of educational differences is similar to the pattern of educational differences in nonmarital births and divorce.

Across all of our models, couples in which the father had more education than the mother were more likely to marry than their counterparts. This result is consistent with prior research (Goldstein and Harknett 2006) and is consistent with the idea that couples that adhere to a more traditional division of labor – with the father having an advantage over the mother in the labor market – have more stable relationships (Becker, Landis, and Michael 1977; Brines and Joyner 1999).

Our main purpose was to investigate explanations for educational differences in marriage. We found that attitudes have little to do with educational differences in marriage. Taking into account mothers and fathers' attitudes about marriage, cohabitation, and the best setting for raising children, as well as mothers' and fathers' gender role attitudes, did not change the relationship between mothers' educational attainment and the odds of marriage.

Instead, educational differences in marriage had much more to do with economic circumstances and opportunities. Mother and father's economic circumstances at the

time their baby was born were predictive of their subsequent marriage. For example, couples in which the father was employed were more likely to marry. Our analysis of local labor market opportunities suggest that the economic influences on marriage go beyond point-in-time measures of economic circumstances. The male employment rates and wages by education level in a city helped to explain educational differences in marriage even after controlling for individual measures of economic circumstances. Female unemployment rates and wages by education level in a city had a similar explanatory effect.

The strong role of local labor market conditions in explaining educational differences in marriage may result from both direct and indirect effects of labor markets on marriage. Local labor market conditions may have a direct effect on marriage if perceptions of future economic opportunity and feelings of economic security or insecurity have an important influence on marriage decisions. Local labor markets may have indirect effects via marriage markets. In theory, strong local labor markets may attract labor migrants, and these labor migrants may be disproportionately male. IF this is the case, then favorable labor market conditions may encourage marriage because they lead to high sex ratios in the marriage market. A third interpretation of the labor market results in our research is that the relationship between labor markets and marriage is a spurious one. We controlled for city fixed effects in our analysis of labor markets, but we cannot rule out the possibility that unobserved, time-varying characteristics of cities may confound our estimated results.

Previous work on labor markets and marriage has tended to focus on explaining longitudinal trends in marriage. This work has found support for the idea that a decline

in male economic opportunities contributed to the retreat from marriage. Our research focused on understanding differences in marriage across education groups, but found consistent results with respect to male employment prospects. Whereas some prior research found that women's economic opportunities contributed to a delay or decline in marriage, our findings are consistent with an emerging literature that suggests that women's economic circumstances are positively related to marriage.

A few limitations in the present analysis are worth reiterating. Our study focused on marriage following a nonmarital birth, rather than on marriage more generally. This focus introduces selectivity into our sample. We attempted to allay concerns about sample selection with supplementary analyses of selection into the nonmarital birth sample and of marital stability, which showed results consistent with those we presented. Our study included a relatively small college sample, but nevertheless, educational differences were large enough to be detected. We lacked precise information on the time-ordering of our individual-level measures of economic circumstances. Our attitudinal measures were not exhaustive.

In spite of these limitations, the patterns of results suggest a clear hierarchy among the explanations we tested. Our results suggest that attitudes are relatively unimportant, individual economic circumstances are somewhat important, and labor market conditions are quite important in explaining educational differences in marriage. This pattern of results suggests that future research into educational differences in marriage should pay close attention to the role of labor market conditions.

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Table 1: Individual-Level Descriptives at baseline

	% or mean
Married at 1-year follow-up	9.4
Married at 3-year follow-up	13.7
Married at 5-year follow-up	15.5
Mother less than high school (ref.)	39.5
Mother high school	33.8
Mother some college	23.7
Mother college degree	3.1
Father same education as mother (ref.)	51.3
Father more education than mother	24.3
Father less education than mother	24.4
<b>Controls</b>	
Mother enrolled in school	18.3
Father enrolled in school	15.3
Mother is white	14.5
Mother is black	55.5
Mother is Hispanic	27.3
Mother is not white, black, or Hispanic	2.7
Parents are not the same race/ethnicity	15.5
Mother attends religious services regularly	18.0
Mother attends religious service occasionally	65.3
Father is more religious than mother	29.2
Father is less religious than mother	38.9
Number of children in household	1.9
Mother's age	23.9
Father is older than mother by 5 years or more	28.0
Mother is older than father by 2 years or more	13.3
Mother has children with other men	42.3
Father has children with other women	42.6
Mother lived with both biological parents at age 15	36.0
Father lived with both biological parents at age 15	39.1

Table 1 continued.

Mothers' attitudes	
Husband steady job important	90.6
Wife steady job important	72.6
Main benefit to marriage is financial	43.6
More advantages to being single than married	36.3
A single mom can raise children ...	83.1
Better to be married than cohabiting	54.3
Better for kid if parents are married	65.8
Marriage is the same as cohabitation	48.5
Parents should stay together for children	10.1
Important decisions should be made by man	13.9
Better for mom to stay home and dad to work	29.2
More important to spend time with family than work a lot	61.4
Fathers' attitudes	
Husband steady job important	92.4
Wife steady job important	51.6
Main benefit to marriage is financial	46.9
More advantages to being single than married	39.6
A single mom can raise children ...	53.6
Better to be married than cohabiting	62.6
Better for kid if parents are married	78.3
Marriage is the same as cohabitation	48.3
Parents should stay together for children	21.8
Important decisions should be made by man	33.4
Better for mom to stay home and dad to work	39.4
More important to spend time with family than work a lot	70.0
Economic circumstances	
Mother employed	67.6
Father employed	75.9
Mother's income-to-poverty ratio	1.6
Father's income-to-poverty ratio	2.2
Mother health is fair or poor	8.4
Father health is fair or poor	8.1
Mother drug/alcohol problem in last year	3.4
Father drug/alcohol problem in last year	7.1
N	3354

Table 2: Labor Market Descriptives in 20 Fragile Families cities by level of educational attainment

	< High school	High school	Some college	College
Average male employment-to-population ratio and (Std Dev)	70.3 (9.07)	83.7 (4.74)	88.0 (3.83)	93.4 (2.66)
Average male median income and (Std Dev)	22419 (3125.31)	33466 (3194.63)	42116 (4351.82)	62058 (9643.43)
Average female unemployment rate and (Std Dev)	10.4 (4.44)	5.0 (1.98)	3.3 (1.30)	2.5 (0.99)
Average female median income and (Std Dev)	14619 (2563.33)	22095 (2889.78)	28551 (2819.01)	41397 (3275.74)
N	20	20	20	20

Note: Labor market data were derived from the Current Population Survey, 1998-2005 for men and women age 25-54 years old by education group. Median income is standardized to 2005 dollars.

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Table 3: Hazard Ratios for Marriage after a Nonmarital Birth by Education with Individual-Level

Explanatory Variables	Model 1	Model 2	Model 3	Model 4
	Education	+ Controls	+ Attitudes	+ Economic
<b>Education</b>				
Mother less than high school (ref.)				
Mother high school	1.31 *	1.46 **	1.48 **	1.39 **
Mother some college	1.67 **	1.95 **	1.94 **	1.73 **
Mother college degree	2.86 **	3.15 **	2.91 **	2.31 **
Father same education as mother (ref.)				
Father more education than mother	1.14	1.29 *	1.29 *	1.24 *
Father less education than mother	0.75 **	0.78 *	0.80 *	0.82
<b>Controls</b>				
Mother enrolled in school		0.84 **	0.86	0.83
Father enrolled in school		0.88	0.87	0.87
Mother is black		0.44	0.48 **	0.48 **
Mother is Hispanic		1.07	1.09	1.12
Mother is not white, black, or Hispanic		0.89	0.92	0.90
Parents are not the same race/ethnicity		0.79 *	0.82	0.82
Mother attends religious services regularly		1.67 **	1.40 *	1.65 **
Mother attends religious service occasionally		1.36 *	1.22	1.34 *
Father is more religious than mother		0.81	0.86	0.79 *
Father is less religious than mother		0.75 **	0.79 *	0.75 **
Number of children in household		1.17 **	1.16 **	1.21 **
Mother's age		1.01	1.01	1.01
Father is older than mother by 5 years or more		1.06	1.02	1.05
Mother is older than father by 2 years or more		1.10	1.08	1.09
Mother has children with other men		0.70 **	0.71 **	0.72 **
Father has children with other women		0.57 **	0.60 **	0.61 **
Mother lived with both biological parents at		1.12	1.06	1.08
Father lived with both biological parents at		0.94	0.91	0.92
<b>Mothers' attitudes</b>				
Husband steady job important			1.01	
Wife steady job important			0.80 *	
Main benefit to marriage is financial			0.99	
More advantages to being single than married			0.77 **	
A single mom can raise children ...			0.89	
Better to be married than cohabiting			1.36 **	
Better for kid if parents are married			1.19	
Marriage is the same as cohabitation			1.05	
Parents should stay together for children			0.89	
Important decisions should be made by man			1.10	
Better for mom to stay home and dad to work			1.11	
More important to spend time with family than			1.21 *	
<b>Fathers' attitudes</b>				
Husband steady job important			1.08	
Wife steady job important			0.82 *	
Main benefit to marriage is financial			0.99	
More advantages to being single than married			0.89	
A single mom can raise children ...			0.95	
Better to be married than cohabiting			1.32 *	
Better for kid if parents are married			1.00 **	
Marriage is the same as cohabitation			1.10	
Parents should stay together for children			0.91	
Important decisions should be made by man			1.01	
Better for mom to stay home and dad to work			0.99	
More important to spend time with family than			1.21	
<b>Economic circumstances</b>				
Mother employed				0.78 **
Father employed				1.49 **
Mother's income-to-poverty ratio				1.21 **
Father's income-to-poverty ratio				0.93 **
Mother health is fair or poor				0.79
Father health is fair or poor				0.76
Mother drug/alcohol problem in last year				0.88
Father drug/alcohol problem in last year				0.81
Person-months	169991	169991	169991	169991

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Note: \*\*= $p < .01$ ; \*= $p < .05$ .

Labor market data were derived by pooling data from the 1998-2005 Current Population Surveys for men and women aged 25-54 years old by city and education group. Median income is standardized to 2005 dollars.

All models include the control variables and individual-level economic variables shown in Table 3, Model 4. Coefficients on these individual-level covariates are not shown in the table.

Models are estimated with robust standard errors to account for clustering at the city level.

Appendix Table 1: Questions wording and response categories of attitude variables	
Row Label	Question Wording and Response Categories
	<p>How important do you think the following qualities are for a successful marriage?</p> <p><i>Very important (1)</i> <i>Somewhat Important / Not Important (0)</i></p>
Husband steady job Important	The husband having a steady job?
Wife steady job important	The wife having a steady job?
	<p>For each of the following statements, please tell me whether you strongly agree, agree, disagree, or strongly disagree:</p> <p><i>Strongly Agree / Agree (1)</i> <i>Disagree / Strongly Disagree (0)</i></p>
Main benefit to marriage is financial	The main advantage of marriage is that it gives financial security.
More advantages to being single than married	All in all, there are more advantages to being single than to being married.
A single mom can raise children ...	A mother living alone can bring up her child as well as a married couple.
Better to be married than cohabiting	It is better for a couple to get married than to just live together.
Better for kid if parents are married	It is better for children if their parents are married
Marriage is the same as cohabitation	Living together is just the same as being married.
	<p>Please tell me whether you strongly agree, agree, disagree, or strongly disagree with the following statements:</p> <p><i>Strongly Agree / Agree (1)</i> <i>Disagree / Strongly Disagree (0)</i></p>
Parents should stay together for children	When there are children in the family, parents should stay together even if they don't get along.
Important decisions should be made by man	The important decisions in the family should be made by the man of the house
Better for mom to stay home and dad to work	It is much better for everyone if the man earns the main living and the woman takes care of the home and family
More important to spend time with family than work a lot	It is more important for a man to spend time with his family than to work as many hours as he can