Assortative Mating among Unmarried Parents with a Newborn: Differences by Marital Transition after Childbirth

Shirley H. Liu*
Department of Economics
University of Miami, Coral Gables, FL 33124-6550, USA

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Abstract

Assortative mating, the tendency for individuals to choose partners with similar socioeconomic and demographic characteristics, is a prominent feature of the marriage market. Existing evidence on assortative matching is based primarily on married couples/parents, and few studies examining mate-selection patterns among unmarried parents do not distinguish between unmarried parents who marry after childbirth, and those who remained persistently unmarried. This study use data from the Fragile Families and Child Wellbeing Study to examine assortative mating patterns among unmarried parents, between parents who transition into marriage after childbirth and parents who remained persistently unmarried. In addition, we examine whether the differences in assortative mating patterns can be explained by differences in marriage market conditions, as suggested by economic theories. We find that unmarried parents who transitioned into marriage after childbirth are *less* assortatively matched with respect to age, education, and race; but *more* assortatively matched by labor earnings, compared to parents who remained unmarried. There are also significant differences in assortative mating patterns by race, with the largest difference found between white and Hispanic mothers.

Keywords: Assortative Mating, Unmarried Parents, Marriage Market Conditions, Premarital Childbearing, Fragile Families

JEL Classification codes: J12, J13.

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

1 Introduction

Assortative mating, the tendency for individuals to choose partners with similar socioeconomic and demographic characteristics, is a prominent feature of the marriage market. As opposed to single individuals, couples can exploit gains from the joint production and consumption of household public goods, and the gains are higher if the couple's traits are matched assortatively (Becker 1973, 1974, 1991). Yet most of our information on assortative mating is based on studies that focus on married couples or married parents (Epstein & Guttman 1984; Mare 1991; Oppenheimer 1988; Rockwell 1976), very little is known about the patterns of assortative mating among unmarried parents, in particular between the unmarried biological parents of a new born.

Understanding the patterns of assortative mating of new unmarried parents has important policy implications. Over the past three decades, the number of children born to unwed parents increased from 12% in 1970 to nearly one-third of all births today (Sigle-Rushton & McLanahan 2002b). There are also significant racial differences: among whites, 26% are non-marital births, compared to 69% for blacks and 41% for Hispanics. This decoupling of marriage and fertility behavior is found to be particularly common among the low-income, less-educated population (Sigle-Rushton & McLanahan 2002a; Manning & Brown 2003; McLanahan & Sandefur 1994), which has not yet occurred for higher-educated adults (Ellwood & Jencks 2002). The rise in out-of-wedlock childbearing caused considerable alarm among researchers and policy-makers, as it potentially undermines the economic contributions of fathers and endangers the welfare of women and children. Encouraging marriage among these *fragile families* in the hopes that marriage will benefit parents and their children has become a major policy focus of the new welfare legislation.

Children benefit from having married parents as they enjoy greater amount of parental resources and higher joint production synergies through assortative mating, it remains unclear as to whether similar benefits can be expected for children born to unmarried parents if their parents marry. While it is well-established that unmarried parents tend to have less resources, our understanding of their assortative mating patterns remain limited. Studies of assortative mating among cohabiting couples produced mixed results (Spanier 1983; Gwartney-Gibbs 1986; Schoen & Weinick 1993; McLanahan & Casper 1995; Lichter 2000), and the few studies on assortative mating among unmarried parents who live apart are based on very selective samples (Jaffe & Chacon-Guignau 1995; Ho 1986). Blackwell and Lichter (1998) examine patterns of assortative mating among married, cohabiting, and dating couples, rather than parents. In addition, it is limited to current (more stable) relationships. Garfinkel et al. (2002) examine assortative mating between married and unmarried parents, however they do not differentiate

between unwed parents who remain persistently unmarried and those who eventually transitioned into marriage. Since unmarried families tend to be less stable and short-lived (Bumpass & Lu 2000; Manning et al. 2004), studies on assortative mating among parents who are observed to be unmarried at one point in time only partially captures the partnership dynamics. Gwartney-Gibbs (1986) is the only study that examine assortative mating patterns and accounts for potential relationship transitions. This study finds that married couples who once cohabit are less assortatively matched than couples who did not cohabit. However, the focus is on couples rather than parents.

Using data from the Fragile Families and Child Wellbeing Study (FFCWS), this study examines assortative mating behavior among unmarried parents with a new born. Prior to the FFCWS, information on both biological parents of children born outside of marriage have been scant at best. The FFCWS provides detailed marriage, fertility, socioeconomic information on both biological parents for a large representative sample of children born to unmarried parents. This study examines potential differences in assortative mating patterns between unmarried parents who transition into marriage after childbirth, and parents who remain persistently unmarried, to help shed light on the potential gains of encouraging marriage among unwed parents on children involved, and potential implications of policies encouraging marriage among unmarried parents on women and children involved.

Two questions are addressed in this paper: using descriptive methods, we first examine whether unmarried parents who transition into marriage after childbirth have assortative mating patterns similar to persistently unmarried parents. Second, Willis (1999) points out that assortative mating behavior are potentially driven by marriage market conditions (i.e., supply of potential partners), which have been largely ignored in existing empirical literature. Therefore, we examine whether the patterns of assortative mating based on descriptive evidence persist after marriage market conditions are accounted for using regression techniques.

This study have several interesting findings. Consistent with previous findings on the differences in assortative mating patterns between married and unmarried parents, we find that parents who are married at the time of childbirth are more assortatively matched by age, race, and labor earnings, compared to parents who are unmarried at the time of childbirth. Among the sample of parents who are unmarried at the time of childbirth, those who transition into marriage after childbirth are *less* assortatively matched with respect to age, education, and race; but *more* assortatively matched by labor earnings, compared to parents who remained unmarried within 3 years after childbirth.

Among parents who are unmarried at childbirth, there are significant differences in assortative mating patterns by race. White mothers are significantly less homogamous with respect to race/ethnicity compared to black or

Hispanic mothers. The largest difference in assortative mating patterns is found between white and Hispanic mothers. Compared to white mothers who marry after childbirth, (1) Hispanic mothers who marry after childbirth are significantly more likely to be matched with partners who are younger, of the same race/ethnicity, and have lower earnings; while Hispanic mothers who remained unmarried are significantly more likely to be with male partners who are younger, equally/more educated, of the same race, and have higher labor incomes.

The paper is organized as follows. Section 2 reviews previous research on assortative mating. Section 3 describes the data and sample construction for the analysis. Descriptive results on patterns of assortative mating is presented in section 4, and regression results incorporating marriage market conditions are discussed in section 5. The sixth and final section discusses the implications of our findings for recent family policies.

2 Background

The rise in premarital childbearing promoted policies to encourage marriage among unmarried parents, in the hopes that marriage would infer benefits to these families. The decoupling of marriage and fertility behavior has been found among the socioeconomically disadvantaged population, which has not occurred for the higher educated adults. This divergence in fertility and marital behavior may indicate that low-income unmarried parents may face distinct determinants of marriage and exhibit different mate selection patterns. To fully appreciate the implications of encouraging marriage among unwed parents, it is important for us to understand the underlying mechanisms of mate selection among unmarried parents. Potential differences in assortative mating patterns between those who marry after childbirth and those who remained unmarried may help shed light on the potential gains of parental marriage on children born out-of-wedlock.

There is ample evidence of assortative mating among married couples: Married couples tend to select partners with similar age, race/ethnicity, and educational background. Recent research began to examine on the process of mate selection among unmarried couples, however few focus on assortative mating among unmarried parents. Despite the extensive body of research on assortative mating, surprising little attention has focused exclusively on assortative mating behavior between unmarried parents with a newborn who subsequently transitioned into marriage, and those who remained unmarried.

In this section, we first present economic theories of out-of-wedlock childbearing, and its implications on assortative mating among unmarried parents. It helps to highlight the importance of marriage market conditions in explaining in marriage and fertility behavior among the low-income population. Second, existing empirical

evidence on assortative mating is discussed.

2.1 Economic Theories of Out-of-Wedlock Childbearing and Assortative Mating

Becker's theory of marriage (1973, 1974, 1991) emphasizes the gains to marriage through the joint production and consumption of household public goods. By forming a union, parents can increase the availability of resources and realize gains to specialization. Households of married or cohabiting parents may capitalize on opportunities to divide responsibilities between the partners according to their individual capacities. Specialization in household production is economically efficient as it exploits comparative advantages of each partner in the production of goods that they both enjoy (such as children). Thus, considerations of ability and complementarities of skills are expected to play a role in partner selection and union formation. Within this framework, one would expect that unmarried parents would be less assortatively matched given that the father is not expected to play a significant role in household production (Willis 1999).

Studies typically measure the benefits of marriage by comparing the wellbeing of out-of-wedlock children to children born to married parents. The large gains to marriage typically found partly reflect favorable characteristics of parents who form a union and get married. To put estimates of the relationship between marriage and child wellbeing among out-of-wedlock children into context, questions regarding the differences between parents who get married before birth, those who get married after birth and those who remained unmarried are of interest. While we are not aware of a theory of marriage after childbearing, we turn to theories of marriage and premarital childbearing for insights into the different motivations and circumstances that may determine who gets married before and after childbearing, and who remain unmarried after childbearing.

Economic theories of marriage and childbearing emphasize differences in marriage market opportunities and endowments as determinants of mate selection. Becker (1973, 1974, 1991) shows that when (1) there are at least as many men as women, or (2) females are in excess supply and lack the economic resources to bear children outside of marriage, an equilibrium assignment of men and women occurs as all couples assortatively match to maximize the total gains across all possible couples, and all children will be born within marriage. Lam (1988) shows that household collective goods such as children induce positive assortative mating, i.e., marriage between partners with similar traits (e.g., highly educated males mate with highly educated females).

The growth of non-marital fertility, in particular among the low-income population, has provoked considerable alarm about the demise of the traditional family and concern about its potentially harmful effects on the wellbeing of women and children (Da Vanzo & Rahman 1993). In particular, out-of-wedlock childbearing may

undermine fathers' contributions to their children. Willis' (1999) integrates economic theories of marriage and fertility to explain this trend: out-of-wedlock childbearing can be explained as an equilibrium outcome of marriage market behavior caused by the possibility that men may free-ride on the willingness and ability of women to rear their children at low or zero economic costs to themselves. The conditions under which this may happen require that women be relatively self-sufficient economically and be in excess supply. Within this framework, unmarried parents have lower incentives to mate assortatively, as the father is not expected to play an important role in the household economy and the childrearing process.

These factors are all consistent with black-white differentials in rates of out-of-wedlock childbearing. Cherlin (1992) points out that historically, male-female ratio has been lower for blacks than for whites. Wilson and Neckerman (1986) argue that the supply of "marriageable black men is further reduced by high rates of incarcerations and unemployment. Several studies have found that cross-sectional variations in sex ratios have a significant impact on the prevalence of female-headed households. Economic factors are also consistent with black-white differences. Female-male wage ratios are higher among blacks then among whites (Fuchs 1988). Moreover, after decades of progress (Smith & Welch 1986), black men have suffered disproportionately as the widening of the wage distribution during the past few decades has reduced the earnings of those at the bottom of the skill distribution. In addition, the welfare system provides an alternative source of support for mothers, which is most relevant for low-income women. Rosenzweig (1999) finds evidence that increasing generosity of welfare tends to increase out-of-wedlock births.

2.2 Empirical Evidence

Nearly all of the research on assortative mating focuses on married couples (Epstein & Guttman 1984; Mare 1991; Oppenheimer 1988; Rockewell 1976). Moreover, few studies that examine mate selection among cohabiting couples report mixed results. Schoen and Weinick (1993) find that cohabiting couples are more likely than married couples to choose partners of similar educational background but less likely to choose partners of similar age and religion. McLanahan and Casper (1995) also find that cohabiting couples differ from married couples with respect to age and educational homogamy. Finally, Blackwell and Lichter (2000) find that cohabiting couples are somewhat less homogamous in terms of race and education compared to married couples.

Even less is known about assortative mating among unmarried parents who live apart. Using data from Venezuela birth registration, Jaffe and Chacon-Guignau (1995) find that positive assortment on age, education, and occupational level is stronger among married couples than among unmarried parents. However these data

may not be generalizable to the U.S., since socially sanctioned consensual unions are historically quite common in Latin America (Greene & Rao 1995) and unmarried fathers who appear on birth certificates may be a select group. Ho (1986) uses data from 55 pairs of unwed birth parents in the Denver metro area, finds more age and educational similarity between unmarried parents than married parents. However, the measure of educational homogamy in this study may be inaccurate as some of the parents are less than twenty years of age and may not have completed their education. In addition, couples that participate in this study may be a select (more committed) group of unmarried parents. A particular concern is that fathers who are unlikely to have a committed relationship with the mothers of their children may also less likely to appear in studies of assortative mating. The resulting sample of unmarried parents may not representative.

Blackwell and Lichter (1998) use the National Survey of Family Growth (NSFG) to examine patterns of mate selection among married, cohabiting, and dating couples across educational groups, race/ethnicity, and religion. They conclude that, in general, all three types of relationships tend to be homogamous. However, their study examines couples rather than parents, and it is limited to current (potentially more stable) relationships, which is expected to be more homogamous than short-term relationships (Becker 1991). Garfinkel et al. (2002) use the NSFG to examine assortative mating patterns with respect to age, education and race between married and unmarried parents. They find that never married parents are similar but not identical to married parents in their choice of partners: white unmarried mothers are more likely matched with a non-white father compared to white married mothers; and unmarried women are more likely than married women to have a child with a more educated male. Although their study differentiate between married and unmarried parents at childbirth, and between married parents who remained married and those who separate/divorced, they do not differentiate between unmarried parents who eventually marry and those who remained unmarried.

3 Data and Study Sample

This study examines differences in assortative mating patterns between unmarried parents who transition into marriage within three years after childbirth and parents who remained unmarried, using data from the Fragile Families and Child Wellbeing Study (FFCWS). The FFCWS collected data on a cohort of approximately $4,898$ births in 20 large cities (with population of $200,000$ or more) across the U.S. between 1998 to 2000. The weighted

sample is representative of all births in U.S. large cities in 1999.[1,2] The FFCWS over-sampled births to unmarried parents. Both biological parents were interviewed at the time of childbirth (baseline), when the child reaches age one, and then at age three. Detailed information such as socioeconomic and demographic characteristics, and fertility and marriage histories of both biological parents are collected.

The FFCWS collects information based one birth per each pair of parents. Patterns of assortative mating between the biological parents of each child in the study is examined. We exclude 756 births from the original sample as their parents' relationship at baseline cannot be identified (i.e., we do not know whether the child is born to parents who were "married", "cohabiting", in a "visiting" relationship,[3] or "not-romantically involved") resulting in a sample size of $4,142$ births. In addition, information on parents' relationship transitions after childbirth needs to be identified. A total of 977 observations are dropped given that the relationship between the biological parents cannot be identified at the one-year and the three-year follow-ups. At this point, the sample size is $3,165$.

The goal of this paper to examine assortative mating patterns among unmarried parents. Therefore, we restrict our study sample to only include births to unmarried parents, resulting in a sample size of $2,221$. Among the sample of children born to unmarried parents, approximately 20% experienced the marriage between their biological parents within three years since childbirth.

Differences in marriage market conditions may explain variations in assortative mating patterns between married and unmarried parents, and between racial groups. In our study, the marriage market is defined at the city level, using mother's city of residence at baseline as the reference.[4,5] Information on marriage market conditions for each city are gathered through the 2000 Census. Five measures of marriage market conditions are used. To capture the potential differences in the supply of (marriageable) females to males in each city, we employ (1) ratio of females to males in each city (population age 18 and older); (2) percentage of the population in the city that are never married (population age 15 and older); (3) the never-married population as a percentage of the married-population (population age 15 and older). Female economic self-sufficiency in each city are measured via (1) the percentage of females that participate in the labor force, and (2) the ratio between the median female

[1]The cities include: Austin, TX; Pittsburgh, PA; Boston, MA; Oakland, CA; Baltimore, MD; San Antonio, TX; Philadelphia, PA; Detroit, MI; New York City, NY; Jacksonville, FL; San Jose, CA; Indianapolis, IN; Chicago, IL; Toledo, OH; Newark, NJ; Richmond, VA; Milwaukee, WI; Corpus Christi, TX; Norfolk, VA; and Nashville, TN.

[2]See Reichman et al. (2001) for more information on the study design and the sampling of cities.

[3]Parents who are romantically-involved but living apart are categorized as being in a "visiting" relationship.

[4]The identifiers for the city of residence for the parents in the FFCWS are of restricted access. We are grateful for receiving permission to utilize this information. However, due the sensitive nature of the information, we cannot present our results that identifies each city.

[5]In our analysis, we further stratify the sample by race within each city to account for potential racial differences in marriage market conditions and opportunities.

income to the median male income.

Patterns of assortative mating along the dimensions of age, education, race/ethnicity, and labor market activities between unmarried parents who subsequently marry and those who remained unmarried are examined. Assortative mating patterns may potentially differ across different racial groups, and marriage market conditions may also vary significantly for racial minorities as compared to whites. To examine potential differences in mate selection patterns between different racial groups, the analysis is further stratified according to mother's race. Among our sample of out-of-wedlock children, 16% are born to white mothers, while 50% and 31% are to black and Hispanic mothers, respectively (the remaining are to mothers of other races). There are also significant differences in marriage rates among unwed mothers by race: among the sample of white and Hispanic unwed mothers, 26% and 27% are observed to have married the child's biological father within three years since childbirth respectively. For black unmarried mothers, only 12% marry the child's biological father after childbirth.

4 Results

This study examines differences in assortative mating patterns between unmarried parents who transitioned into marriage within three years after childbirth, and unmarried parents who remained unmarried. Furthermore, we examine whether differences in mate-selection patterns can be explained by local marriage market conditions as suggested by Becker (1973, 1964, 1991) and Willis (1999). First, assortative mating patterns based on descriptive statistics are presented. Table 1 presents the differences in assortative mating patterns between parents who are married *vs.* unmarried at childbirth, and between unmarried parents who marry *vs.* remaining unmarried after childbirth. Although the subsample of parents who are married at the time of childbirth are excluded in our main analysis, the sample means for this subsample is included here to highlight the importance of accounting parents' marital status at birth when examining differences in assortative mating patterns by parental marital status. Previous studies typically do not make this distinction, and therefore the sample of "married" parents may be confounded with couples who marry after having children.

Separate analysis by race are also conducted: racial differences in assortative mating patterns among unmarried parents who subsequently married are presented in Table 2; Table 3 presents racial differences in assortative mating patterns among parents who remained unmarried three years after childbirth.

4.1 Unmarried Parents with a Newborn

We begin by examining assortative mating patterns between unmarried parents who transitioned into marriage after childbirth and parents who remained unmarried within three years since childbirth. Table 1 reports the age, educational attainment, race/ethnicity, and labor income differences by parental relationship at the time of childbirth, and potential transitions into marriage after childbirth for unmarried parents. Our study sample includes all parents who are unmarried at the time of childbirth. The sample means for parents who transitioned into marriage after childbirth and those who remained unmarried (henceforth termed "persistently unmarried") are presented in column 2 and 3, respectively. To illustrate the differences in assortative mating patterns between parents who are married and those who are unmarried at childbirth, sample means for parents who are married at the time of childbirth are also presented (column 1). Equality test of means are reported using unmarried parents who subsequently married within 3 years after childbirth as the reference group (Column 2).

From 1964 to 1990, the average age difference in median age at first marriage between men and women ranged from 1.7 to 2.0 years, while the age difference for higher order marriages ranged from 3.3 to 4.2 years (National Center for Health Statistics, 1995). The mean age difference between the partners among parents who are married in our sample is approximately 2.4 years, while the average age difference among parents who are unmarried at childbirth being somewhat higher, between 2.6 to 2.8 years. Unmarried parents (at childbirth) are significantly younger than parents who are married at childbirth: the fraction of mothers who are less than 20 years of age is between 18% to 24% among parents who are unmarried at birth, compared to only 3% for parents who are married before childbirth.

While we do not find significant difference in age assortment between parents who marry before *vs.* after childbirth, our results indicate that a higher fraction of unmarried parents who marry after childbirth are less assortatively matched by age compared to persistently unmarried parents: while 18% of persistently unmarried mothers are matched with a younger partner, this figure is 22% among unmarried mothers who subsequently transitioned into marriage. This difference is statistically significant at the 10 percent level.

Our results on educational attainment go in the opposite direction. While overall the fraction of couples in which the female is more educated then her partner is similar across all three groups (between 26% to 28%), we find some difference in couple's education assortment by mother's education, in particular if the mother is college-educated. A significant higher fraction of persistently unmarried mothers who are college-educated have a child with a less educated male (61%), compared to college-educated mothers who either marry the child's

father before or after childbirth (36% and 52%, respectively).

Overall, the fraction of mixed-race couples are similar across all three groups, between 13% to 15%. However, assortative mating patterns on race varies significantly by mother's race/ethnicity. A significantly lower fraction of white mothers who marry their partners before childbirth are with a non-white male, compared to white mothers who are unmarried at the time of childbirth (9% *vs.* 30% and 35%, respectively). The opposite is true for black and Hispanic mothers: higher fractions of black and Hispanic mothers who marry their partners before childbirth are with partners who are less-educated, compared to their counterparts who are unmarried. These differences are, however, statistically insignificant.

In terms of labor market activities and earnings, parents who are married at the time of childbirth are significantly more likely to both participate in the labor market and have higher earnings compared to parents who are unmarried at childbirth. This is perhaps not surprising given that unmarried parents are more likely to be younger. Unmarried parents are also less assortatively matched by their labor earnings (compared to parents who marry before childbirth), in particular parents who remain unmarried three years after childbirth being less homogamous than those who marry after childbirth: while only 6% of mothers who marry before childbirth are with lower-earning partners, the same is true for 9% of unmarried mothers who marry after childbirth and 10% of persistently unmarried mothers. These differences however, are not statistically significant.

4.2 Unmarried Parents Who Transitioned into Marriage after Childbirth: Differences by Mother's Race

Table 2 presents assortative mating patterns among unmarried parents who subsequently transitioned into marriage after childbirth. Our sample includes Sample means are separately reported by mother's race.[6] Equality test of means are reported using white, non-Hispanic mothers as the reference group.

The age differences between the partners are similar across all racial subsamples: the father is, on average, 2 to 3 years older than the mother. In terms of mother's age, a lower fraction of black mothers who marry the child's father after childbirth are less than 20 years old (12%), compared to white (19%) and Hispanic mothers (22%). While higher proportions of black and Hispanic mothers tend to be less assortatively matched with their partners by age (i.e., older than their male partners) compared to white mothers, these differences are not statistically significant.

Hispanic mothers who marry their child's father after childbirth are disproportionately less-educated. While

[6] Sample means for mothers who are of "other" race/ethnicity are omitted from Table 2

overall we do not find racial differences in terms of the fractions of mothers being matched with a less educated father among mothers of different races, a significantly higher fraction of Hispanic mothers who attained only high school level education have children with less educated partners. In terms of assortative mating by race/ethnicity, a significantly higher fraction of white mothers marry partners from different racial/ethnic backgrounds (30%), compared to their black (4%) and Hispanic (13%) counterparts.

In terms of labor force participation, a significantly lower fraction of Hispanic mothers are in unions in which both partners participate in the labor market, and more likely to be in relationships in which only the male partner works. Among mothers who participate in the labor market, Hispanic mothers who marry after childbirth have significantly less labor income compared to white and black mothers. Even though black mothers who marry after childbirth have lower earnings than white mothers, they are more assortatively matched with their partners by earnings compared to white parents: 9% of white mothers who marry after childbirth earn higher labor income than their partners, as opposed to only 7% for blacks. The opposite is true for Hispanic mothers: a higher fraction of Hispanic mothers are matched with partners with lower earnings than both white and black mothers (13%). These differences are not statistically significant.

4.3 Unmarried Parents who Remained Unmarried: Differences by Mother's Race

Table 3 presents assortative mating patterns among parents who remained unmarried. The means are separately reported by mother's race.[7] Equality test of means are reported using white, non-Hispanic mothers as the reference category.

Contrary to unmarried parents who marry after childbirth, we do find differences in age assortment among persistently unmarried parents. The age difference between the partners is significantly smaller for Hispanic mothers who remained unmarried after childbirth, compared to their white and black counterparts: the mean partners' age difference is 2.39 years for Hispanic mothers, compared to 3.4 for white mothers and 2.8 years for black mothers. In addition, significantly higher fractions of black and Hispanic unmarried mothers are matched with younger males (18% and 21% respectively), compared to their white counterparts (13%).

Overall, we find less assortment by educational attainment among whites and blacks, compared to Hispanics: higher fractions of white and black mothers are matched with less-educated partners, compared to Hispanic mothers. This difference is particularly pronounced among black mothers who attained some college education: over 63% of college-educated black mothers who remained unmarried after childbirth are with a less-educated

[7] Sample means for mothers who are of "other" race/ethnicity are omitted from Table 3

partner, compared to only 51% of white mothers with similar education levels.

The patterns of matching by race/ethnicity among persistently unmarried parents are found to be similar to unmarried parents who marry after childbirth: white mothers are significantly more likely to be with a partner of different racial/ethnic background compared to black and Hispanic mothers.

Significant lower fractions of unmarried black and Hispanic mothers are in unions in which both partners participate in the labor market, compared to unmarried white mothers. In addition, black mothers are significantly less likely to be in a relationship in which either (1) only the male partner works, or (2) neither partner works. Among unmarried mothers who do work, higher fractions of black and Hispanic mothers earn labor income of more than $\$25,000$, compared to white unmarried mothers. However, the fractions of black and Hispanic who are matched with partners who earn at least $\$25,000$ a year are significantly lower compared to their white counterparts. In terms of relative earnings between the partners, we do not find significant differences in the fraction of unions in which female earnings are higher than male earnings by mother's race.

5 Assortative Mating and Marriage Market Conditions

Finally, we examine whether the patterns of assortative mating found in our descriptive analysis are potentially driven by marriage market conditions. Regression methods are used to account for potential differences in characteristics of local marriage markets. These results are presented in Table 4.

Based on our descriptive evidence discussed in the previous section, we find that unmarried parents who marry after childbirth are less assorted by age compared to persistently unmarried parents. Compared to persistently unmarried parents, although we find that parents who marry after childbirth are less assorted by education and race, they are more assorted by labor income. The differences in educational attainment, race/ethnicity, and earnings are statistically significant.

We further examine differences in assortative mating patterns by race among (1) unmarried parents who transitioned into marriage after childbirth, and (2) parents who remain persistently unmarried. Among parents who marry *after* childbirth. Among parents who marry after childbirth, we find similar patterns of assortative mating by age, educational attainment, and earnings across all racial/ethnic groups. The patterns of education and racial assortment are similar, but not identical across racial groups. Hispanic mothers with a high school degree are significantly more likely to be matched with a less-educated male than white and black mothers. White mothers who marry after childbirth are more likely matched with males of different racial/ethnic backgrounds

compared to black and Hispanic mothers. Among parents who remain *persistently unmarried*, compared to white mothers, black and Hispanic mothers are significantly more likely to be with partners who are (1) younger and (2) of the same race/ethnicity. The age difference between the partners are significantly smaller for Hispanic mothers, compared to persistently unmarried white mothers.

In this section, we examine whether these differences in assortative mating patterns persist if we account for differences in marriage market conditions discussed in section 3 (as suggested by economic theories of marriage and fertility (Becker 1973, 1974, 1991; Lam 1988; Willis 1999). We define the marriage market faced by a given couple as the city of residence at baseline (i.e., at the time of childbirth). Five measures of marriage market conditions are used, and all are measured at the city level: (1) female-male ratio (population age 18 and older); (2) the never-married population as a percentage of the total population (age 15 and older); (3) the never-married population as a percentage of the married population (age 15 and older); (4) percentage of females who participate in the labor market; and (5) ratio of the median female income to the median male income (among individuals who are full-time, year-round employed).

We examine the effect of marriage market conditions affect assortative mating patterns along four dimensions: age, educational attainment, race/ethnicity, and labor earnings. Following economic theory on assortative mating, a couple is considered to be less assortatively matched if: (1) the male is younger than the female; (2) the male is less educated than the female; (3) the partners are of different race/ethnicity; and (4) the female has higher earnings than her male partner. Using unmarried white mothers who marry their children's fathers after childbirth as the reference group, we examine how the inclusion of the marriage market characteristics affect the patterns of assortative mating across all racial groups and by whether the parents transitioned into marriage after childbirth or remained unmarried. All specifications are estimated using linear probability models. Sampling weights are included to adjust the over-sampling of unmarried parents in the original study design in the FFCWS.

Table 4 presents assortative mating patterns among unmarried parents with a newborn by (1) martial transition after childbirth and (2) mother's race. The reference group is unmarried white mothers who marry their children's fathers after childbirth. For each measure of assortative mating examined, estimation results of models without accounting for differences in marriage market conditions are presented in the first column, and the results after controlling for marriage market characteristics are presented in the second column.

5.1 Assortative Mating on Age

First we examine whether there are differences in age assortment between unmarried parents who marry after childbirth and those who remained unmarried. Differences by mother's race are also considered. A couple is defined to be less assortatively matched by age if the male (father) is younger than the female (mother). Thus the dependent variable takes the value of "1" if this is true, and "0" otherwise.

Among mothers who marry their children's fathers after childbirth, white mothers are, on average, more assortatively matched by age with their partners compared to black or Hispanic mothers. The difference is significant especially between white and Hispanic mothers: a Hispanic mother who marry her partner after childbirth is 9% more likely be older than her partner, compared to a white mother. If we look at mothers who remained unmarried, persistently unmarried white mothers are less likely to be matched with a younger partner than white mothers who marry their children's fathers after childbirth (this difference is not statistically significant); while the opposite is true for black and Hispanic mothers who remained unmarried three years after childbirth. Within our sample, unmarried Hispanic mothers are 12% more likely to be matched with a younger partner, compared to white mothers who marry their partners after childbirth.

Differences in local marriage market conditions partially explain the differences in assortative mating patterns by age. The results suggest that although unmarried Hispanic mothers are more likely to be older than their partners, this is partially attributable to differences in marriage market conditions for Hispanics.

5.2 Assortative Mating on Educational Attainment

Our results for educational attainment go in the opposite direction: While white mothers who marry their partners after childbirth are more assorted with their partners in terms of age, they are less assorted in terms of education (compared to persistently unmarried mothers). In particular, white mothers who marry after childbirth are 11% more likely to be matched with a less-educated partner than a Hispanic mother who is persistently unmarried. Differences in marriage market characteristics such as the supply of females per male, and the relative economic wellbeing of females in the local marriage market, partially explain the difference in the assortative mating patterns between white mothers who marry after childbirth, and Hispanic mothers who remained unmarried.

5.3 Assortative Mating on Race and Ethnicity

Assortative mating on race/ethnicity is strongly related to the race/ethnicity of the mother. White mothers who marry their children's fathers are significantly more likely to be married to a partner of different racial/ethnic background compared to black and Hispanic mothers. Among mothers who marry the fathers after childbirth, the highest level of homogamy appear among black mothers (30% less likely than white mothers to have a partner of different race/ethnicity), then followed by Hispanic mothers (20%). Mothers of "other" race/ethnicity are significantly more likely to be in a racially-mixed relationship than white mothers. Among persistently unmarried mothers, the same pattern on race/ethnic homogamy exists: black mothers are 24% less likely to be with a partner of different race/ethnicity, Hispanic mothers are 20% less likely. In addition, white mothers who remained unmarried are also more racially homogamous compared to white mothers who marry their children's fathers after childbirth. This difference, however, is not statistically significant.

Consistent with the differences in patterns of assortative mating by age and educational attainment, marriage market conditions partially explain the differences in the assortment by partners' race/ethnicity between white and Hispanic mothers, but not between blacks and whites.

5.4 Assortative Mating on Labor Earnings

One important aspect of assortative mating is by the relative earning powers between the partners. Becker's theory predicts positive assortative mating by age, education, and race (i.e., similarity between the partners along these three dimensions), and negative assortative mating by earnings (in particular, the male earns more than the female). Following Becker's framework, Willis (1999) points out that if female incomes are high, both relatively and in absolute terms, some females are more likely to bear children outside of marriage with little or no contributions from the father. Recall that our sample includes only unmarried parents with a newborn. We define a couple to be less assortatively matched by earnings if the female has higher labor earnings than her male partner.[8]

While Hispanic mothers who marry their children's fathers after childbirth are less homogamous with respect to labor earnings compared to white mothers who marry after birth, persistently unmarried Hispanic mothers are significantly more homogamous by earnings. Although we do not find significant differences between blacks and whites among mothers who marry after birth, persistently unmarried black mothers are significantly less likely

[8] A large fraction of parents in our sample do not report their labor earnings. These individuals are excluded from the analysis on the assortative mating patterns on labor earnings.

(13%) to be with lower-earning partners than white mothers who marry after birth.

Differences in marriage market conditions only explain the differences in earning assortment patterns between white mothers who marry their children's fathers, and Hispanic mothers who remain persistently unmarried. Marriage market characteristics do not explain the variation in assortative mating patterns on earnings between white mothers who marry after childbirth, and any of the other groups.

6 Summary and Conclusion

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Table 1: Select Parental Characteristics and Patterns of Assortive Mating

Marital Status at Childbirth	Married	Unmarried (Study Sample)	
		Married in 3 Years	Remained Unmarried
Age Difference[a]			
Mean	2.403	2.611	2.780
Mother's Age at Childbirth < 20	0.032^{*}	0.179	0.240^{*}
Father's Age at Childbirth < 20	0.003^{*}	0.081	0.123^{*}
Father is Younger than Mother	0.203	0.220	0.184^{+}
Educational Attainment			
Mother's Education: Some College and Beyond	0.663^{*}	0.327	0.260^{*}
Father's Education: Some College and Beyond	0.631^{*}	0.343	0.228^{*}
Father's Education $<$ Mother's Education (Overall)	0.280	0.275	0.268
- Mother's Education: High School Diploma / GED	0.194	0.299	0.305
- Mother's Education: Some College and Beyond	0.364^{*}	0.521	0.605^{+}
Different Race / Ethnicity			
Overall	0.127	0.155	0.150
- Mother is White	0.087^{*}	0.295	0.345
- Mother is Black	0.082	0.044	0.065
- Mother is Hispanic	0.175	0.130	0.161
Labor Force Participation			
Both Parents Work	0.291^{*}	0.220	0.163^{*}
Only Mother Works	0.011	0.011	0.024^{*}
Only Father Works	0.668	0.693	0.617^{*}
Neither Parents Works	0.030^{*}	0.076	0.196^{*}
Labor Income			
Mother's Labor Income ($> \$25,000$)	0.512^{*}	0.178	0.099^{*}
Father's Labor Income ($> \$25,000$)	0.598^{*}	0.281	0.182^{*}
Mother's Labor Income $>$ Father's Labor Income	0.058	0.094	0.099
Unweighted N	944	436	1785

Notes:

1. Equality test of means: $(*)$ = Statistically significantly different at the 5% level compared to "Children born to unmarried parents who marry within 3 years since childbirth (Column 2)"; $(+)$ = 10% level;

a. "Age Difference" is defined as father's age $-$ mother's age at baseline (childbirth).

Table 2: Select Parental Characteristics and Patterns of Assortive Mating among Unmarried Parents Who Transitioned into Marriage within Three Years Since Childbirth: Differences by Mother's Race

Mother's Race	White Non-Hispanic	Black	Hispanic
Age Difference[a]			
Mean	2.890	3.182	2.175
Mother's Age at Childbirth < 20	0.189	0.117	0.216
Father's Age at Childbirth < 20	0.066	0.053	0.107
Father is Younger than Mother	0.189	0.226	0.232
Educational Attainment			
Mother's Education: Some College and Beyond	0.420	0.343	0.261^{*}
Father's Education: Some College and Beyond	0.442	0.401	0.250^{*}
Father's Education $<$ Mother's Education (Overall)	0.295	0.234	0.279
- Mother's Education: High School Diploma / GED	0.219	0.186	0.447^{*}
- Mother's Education: Some College and Beyond	0.525	0.447	0.583
Father is of Different Race	0.295	0.044^{*}	0.130^{*}
Labor Force Participation			
Both Parents Work	0.368	0.197^{*}	0.162^{*}
Only Mother Works	0.000	0.015	0.016^{+}
Only Father Works	0.621	0.693	0.741^{*}
Neither Parents Works	0.011	0.095^{*}	0.081^{*}
Labor Income			
Mother's Labor Income ($> \$25,000$)	0.286	0.207	0.061^{*}
Father's Labor Income ($> \$25,000$)	0.404	0.295^{+}	0.186^{*}
Mother's Labor Income $>$ Father's Labor Income	0.086	0.074	0.133
Unweighted N	95	137	185

Notes:

1. Equality test of means: $(*)$ = Statistically significantly different at the 5% level compared to white mothers (column 1); $(+)$ = 10% level; *a*. "Age Difference" is defined as father's age $-$ mother's age at baseline (childbirth).

Table 3**:** Select Parental Characteristics and Patterns of Assortive Mating among Unmarried Parents Who Remained Unmarried after Three Years Since Childbirth: Differences by Mother's Race

Mother's Race	White Non-Hispanic	Black	Hispanic
Age Difference[a]			
Mean	3.435	2.880	2.390^{*}
Mother's Age at Childbirth < 20	0.264	0.251	0.202^{+}
Father's Age at Childbirth < 20	0.122	0.130	0.112
Father is Younger than Mother	0.128	0.181^{*}	0.212^{*}
Educational Attainment			
Mother's Education: Some College and Beyond	0.321	0.267^{+}	0.202^{*}
Father's Education: Some College and Beyond	0.333	0.214^{*}	0.191^{*}
Father's Education $<$ Mother's Education (Overall)	0.279	0.283	0.236
- Mother's Education: High School Diploma / GED	0.345	0.291	0.336
- Mother's Education: Some College and Beyond	0.512	0.632^{+}	0.625
Father is of Different Race	0.345	0.065^{*}	0.161^{*}
Labor Force Participation			
Both Parents Work	0.223	0.145^{*}	0.168^{+}
Only Mother Works	0.015	0.028	0.022
Only Father Works	0.645	0.585^{+}	0.653
Neither Parents Works	0.117	0.242^{*}	0.156
Labor Income			
Mother's Labor Income ($> \$25,000$)	0.063	0.124	0.084
Father's Labor Income ($> \$25,000$)	0.243	0.165^{*}	0.173^{*}
Mother's Labor Income $>$ Father's Labor Income	0.102	0.099	0.095
Unweighted N	265	976	499

Notes:

1. Equality test of means: $(*)$ = Statistically significantly different at the 5% level compared to white mothers (column 1); $(+)$ = 10% level; *a*. "Age Difference" is defined as father's age $-$ mother's age at baseline (childbirth).

Table 4: Patterns of Assortative Mating Among Unmarried Parents: With and Without Controls for Marriage Market Conditions

	Father Younger than Mother		Father Less Educated than Mother		Father and Mother of Different Race		Father's Earnings Less than Mother's	
Controls for Marriage Market Conditions:	(No)	(Yes)	(No)	(Yes)	(No)	(Yes)	(No)	(Yes)
Mother's race × **Married within** 3 **Yrs after childbirth**								
Reference Group: (White × Married)								
Black × Married	0.081	0.083	−0.015	−0.023	−0.310*	−0.336*	−0.027	−0.062
	(0.053)	(0.053)	(0.057)	(0.058)	(0.047)	(0.048)	(0.084)	(0.089)
Hispanic × Married	0.090*	0.076+	0.006	0.013	−0.199*	−0.186*	0.179*	0.189*
	(0.045)	(0.046)	(0.050)	(0.051)	(0.041)	(0.042)	(0.079)	(0.080)
Other Race × Married	−0.117	−0.111	0.162	0.195+	0.417*	0.409*	−0.170	−0.217+
	(0.092)	(0.092)	(0.102)	(0.102)	(0.082)	(0.082)	(0.126)	(0.127)
White × Unmarried	−0.046	−0.057	−0.064	−0.055	−0.061	−0.048	0.094	0.126+
	(0.042)	(0.042)	(0.047)	(0.047)	(0.039)	(0.039)	(0.064)	(0.065)
Black × Unmarried	0.002	0.008	−0.044	−0.048	−0.241*	−0.254*	−0.131*	−0.171*
	(0.037)	(0.038)	(0.041)	(0.042)	(0.035)	(0.035)	(0.055)	(0.058)
Hispanic × Unmarried	0.121*	0.109*	−0.110*	−0.103*	−0.198*	−0.185*	−0.110+	−0.074
	(0.039)	(0.040)	(0.043)	(0.044)	(0.036)	(0.037)	(0.060)	(0.061)
Other Race × Unmarried	0.003	−0.001	−0.224*	−0.198*	0.424*	0.428*	−0.159	−0.139
	(0.067)	(0.067)	(0.074)	(0.074)	(0.060)	(0.060)	(0.154)	(0.153)
Constant	0.141*	−0.399	0.289*	0.155	0.324*	1.165*	0.170*	0.348
	(0.034)	(0.385)	(0.038)	(0.431)	(0.032)	(0.338)	(0.048)	(0.740)
R-Square	0.026	0.030	0.015	0.030	0.138	0.149	0.102	0.143
Weighted N	1883	1883	1873	1873	1919	1919	358	358

Notes: 1. Estimates are based on linear probability models; 2. Sampling weights are included in the estimation of all models; 3. Standard errors reported in parentheses; 4. Statistical significance reported at the 5% level (∗) and the 10% level (+); 5. Controls for "Marriage market conditions" include: female-male ratio (city population age 18 and older), never married population as a % of total population in city age 15 and older, never married population as a % of married population in city age 15 and older, % females in the labor force (city-level), and the ratio of median female income to median male income in the city of residence (full-time, year-round employed).